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TAKING GROUNDWATER

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ABSTRACT

In February 2012, in a case called Edwards Aquifer Authority v. Day, *the Texas Supreme Court held that landowners hold property rights to the groundwater beneath their land and that a regulatory restriction on groundwater use could constitute a taking of private property. The decision provoked strong reactions, both positive and negative, throughout the world of water law, for it signaled the possibility of severe restrictions on groundwater use regulation.*

This Article considers the deeper issue that confronted the Texas Supreme Court, and that has confronted other courts across the country: how should the Takings Clause of the Fifth Amendment, and parallel clauses of state constitutions, apply to groundwater use regulation? Initially, this Article explains why this issue is exceedingly and increasingly important. It then reviews all of the groundwater/takings decisions from federal and state courts in the United States. Finally, this Article considers the implications of foundational property theories for the application of takings doctrine to groundwater use.

The analysis leads to several key conclusions. Most importantly, it undermines arguments for granting groundwater use rights and heightened protection against regulatory limitations. Recently, litigants

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and commentators skeptical of government regulatory authority have widely advanced those arguments. But they find little support in past groundwater/takings case law, and no property theory justifies adopting such an approach. That does not mean that groundwater use rights should not qualify for constitutional protection. Despite some recent arguments to the contrary, such treatment is grounded in precedent and is entirely compatible with sensible groundwater management. This Article therefore concludes that the application of a relatively mainstream version of takings doctrine, which treats groundwater rights as property but allows substantial government regulation of groundwater use, is both the most traditional and the most theoretically justifiable approach.

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INTRODUCTION

Groundwater may be our most underappreciated natural resource.[1] On an average day, 130 million Americans drink water from a well.[2] In many

1. For a technical definition of groundwater, as well as an explanation of what it is and how it moves, see *infra* notes 46–57 and accompanying text.

2. *See* AM. GROUND WATER TRUST, PUB. INFO. PAMPHLET NO. 10: BACTERIA AND WATER WELLS, *available at* http://www.agwt.org/content/bacteria (last visited Dec. 19, 2013); NAT'L GROUNDWATER ASS'N, GROUNDWATER USE FOR AMERICA (2010), *available at* http://www.ngwa.org/Documents/Awareness/usfactsheet.pdf ("43.8% of America's population regularly depends upon groundwater for its drinking water supply.") (footnote omitted).

rural areas, no other water source is available.[3] Approximately 40,000 municipal water supply systems depend upon groundwater, as does much of the bottled water industry.[4] Nearly 100,000 American farms depend upon groundwater, which provides approximately forty-two percent of the nation's irrigation supplies.[5] In some places, groundwater is the predominant agricultural water source, and in many other areas it is the most reliable.[6] Groundwater aquifers also recharge many of our surface waterways, and thus play a critical role in sustaining rivers, lakes, wetlands, and streams.[7] We generally give groundwater very little thought. Because it is concealed from view, most people have only vague, and often inaccurate, conceptions of what groundwater is, where it comes from, and how it moves.[8] But obscurity does not mean unimportance. Groundwater plays a central role in our daily lives.

Groundwater also is a source of conflict. Its invisibility begets overuse, and across the nation, many aquifers[9] are pumped at unsustainable rates.[10] Others have been effectively lost to pollution.[11] Fears of groundwater contamination remain at the center of major public controversies over natural gas drilling, oil pipelines, and nuclear waste disposal.[12] Globally,

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3. According to the United States Geological Survey, "[a]n estimated 42.9 million people in the United States . . . supplied their own water for domestic use in 2005. . . . Nearly all (98 percent) of these self-supplied withdrawals were from fresh groundwater." U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE UNITED STATES IN 2005 19 (2009).

4. EPA, FACTOIDS: DRINKING WATER AND GROUND WATER STATISTICS FOR 2009 4 (2009). The exact number is 40,025, and those systems serve just over 88 million people. *Id.*

5. *See* U.S. GEOLOGICAL SURVEY, *supra* note 3, at 43; NAT'L GROUNDWATER ASS'N, *supra* note 2, at 1. The exact number, based on 2009 data, is 97,690 farms. *Id.*

6. *See* U.S. GEOLOGICAL SURVEY, HIGH PLAINS REGIONAL GROUND-WATER STUDY 3 (2000) ("Water from the High Plains aquifer is the principal source of supply for irrigated agriculture . . . ."); Barton H. Thompson, Jr., *Tragically Difficult: The Obstacles to Governing the Commons*, 30 ENVTL. L. 241, 249 n.45 (2000) (providing statistics on the importance of groundwater to rural areas).

7. *See generally* THOMAS C. WINTER ET AL., GROUNDWATER AND SURFACE WATER: A SINGLE RESOURCE (1998).

8. *See* Daniel L. Dickerson et al., *Groundwater in Science Education*, 18 J. SCI. TEACHER EDUC. 45, 46 (2007) ("[F]ew students or science educators hold complete and appropriate understandings regarding the concept and apparently do not learn anything about it after high school."); *see also* DAVID KEITH TODD & LARRY W. MAYS, GROUNDWATER HYDROLOGY 3–4 (3d ed. 2005) (describing inaccurate theories that philosophers from Aristotle to Descartes offered to explain the origins of groundwater).

9. An aquifer is a subsurface formation through which groundwater flows, and from which it can be pumped at economically viable rates. *See infra* notes 46–53 and accompanying text (describing groundwater and aquifers in more detail).

10. *See* U.S. GEOLOGICAL SURVEY, GROUND-WATER DEPLETION ACROSS THE NATION (2003), *available at* http://pubs.usgs.gov/fs/fs-103-03/.

11. *See generally* JONATHAN HARR, A CIVIL ACTION (1995) (describing the terrible consequences of using water from a polluted aquifer).

12. *See* OFFICE OF RESEARCH AND DEV., EPA, PLAN TO STUDY THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER RESOURCES viii (2011) ("Many concerns about

aquifers are being depleted—that is, pumped at a rate greater than natural recharge—by an estimated 145 cubic kilometers per year, a rate high enough to measurably contribute to sea level rise.[13] Such extensive groundwater use generates tensions among competing users, and it also carries environmental consequences, including reduced streamflows and degraded surface water quality.[14] Sometimes groundwater pumping can literally make rivers disappear.[15]

The resulting conflicts implicate basic questions of statutory, common, and constitutional law. In the United States, most human groundwater use occurs under some sort of claimed property right, with groundwater users claiming either ownership interests in the groundwater beneath their land or usufructuary rights[16] to pump groundwater and put it to use.[17] Consequently, groundwater users often argue that they are protected from regulation by the Fifth Amendment of the United States Constitution and by similar provisions of state constitutional law.[18] In recent litigation, they have ratcheted up the ambition of their arguments, claiming that groundwater use rights (or water use rights more generally) should receive more takings protection than courts traditionally provide to other forms of property.[19] Yet the case for regulatory control of groundwater use seems compelling. Most aquifers span property boundaries, and one property owner's pumping can compromise or even dry out her neighbors' wells.[20]

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hydraulic fracturing center on potential risks to drinking water resources . . . ."); Paul Hammel, *Pipeline Tweaks Don't Tamp Skepticism*, OMAHA WORLD-HERALD, Sept. 6, 2012, at 1B; David Applegate, *The Mountain Matters*, *in* UNCERTAINTY UNDERGROUND: YUCCA MOUNTAIN AND THE NATION'S HIGH-LEVEL NUCLEAR WASTE 105, 108–12 (Allison M. Macfarlane & Rodney C. Ewing eds., 2006) (describing the uncertain relationship between groundwater flow and the ability of a spent nuclear fuel repository to contain the waste).

13. *See* Leonard F. Konikow, *Contribution of Global Groundwater Depletion Since 1900 to Sea-Level Rise*, 38 GEOPHYSICAL RES. LETTERS 17401, 17401 (2011).

14. *See, e.g.*, S. Zekster et al., *Environmental Impacts of Groundwater Overdraft: Selected Case Studies in the Southwestern United States*, 47 ENVTL. GEOLOGY 396 (2005); *see generally* WINTER ET AL., *supra* note 7. Of the many examples described by Zekster et al., the story of California's Cosumnes River, which once was a major salmon stream, is particularly stark: "between 8 and 16 km of the Cosumnes River dry up towards the end of California's dry season . . . . This decline is the result of groundwater extraction that has lengthened the period during which rivers in this region feature very low or negligible flow." Zekster et al., *supra*, at 400.

15. *See, e.g.*, U.S. GEOLOGICAL SURVEY, EFFECTS OF WATER WITHDRAWALS ON STREAMFLOW IN THE IPSWICH RIVER BASIN, MASSACHUSETTS (2001), *available at* http://pubs.usgs.gov/fs/fs-160-00/pdf/fs00160.pdf; ROBERT GLENNON, WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS 35–125 (2002) (describing multiple waterways at risk).

16. A usufruct is "[a] right for a certain period to use and enjoy the fruits of another's property without damaging or diminishing it, but allowing for any natural deterioration in the property over time." BLACK'S LAW DICTIONARY (9th ed. 2009).

17. *See infra* text accompanying notes 177–82.

18. *See infra* Part II (describing cases involving such claims).

19. *See infra* text accompanying notes 136–41 and 209–12.

20. *See* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR

That pumping also can strain ecological systems protected under a wide variety of environmental laws.[21] Consequently, groundwater use routinely activates the tension between a widely shared desire to protect private property rights from regulation and an equally widely recognized need to use regulation to curb problematic uses of property.[22] As many commentators have noted, resolving that tension forms one of the central challenges of American property and constitutional law.[23]

The inchoate nature of groundwater law exacerbates these tensions. Most states' groundwater laws evolved when unrestricted pumping was widely viewed as acceptable or even desirable, and when groundwater science was too undeveloped to support sophisticated regulatory schemes.[24] Consequently, landowners generally could pump without any constraint from competing private users or from public regulators.[25] On paper, at least, the law has evolved beyond its archaic roots. Almost every state has at some point produced legislation or judicial decisions, or both, proclaiming the importance of groundwater regulation.[26] The on-the ground reality in many places, however, still resembles the pre-regulatory regime, with uneven coverage, sparse monitoring, and little enforcement.[27] Efforts to resolve the tensions between property rights and environmental protection, and among competing property users, therefore remain in their nascent stages, and groundwater management offers a window into the

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COLLECTIVE ACTION 107 (1990) ("Water underlying any parcel of land . . . can be siphoned to a neighbor's land . . . .").

21. *See* Thompson, *supra* note 6, at 250 (discussing ecological consequences of groundwater pumping); Todd H. Votteler, *The Little Fish That Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Texas Edwards Aquifer*, 28 ENVTL. L. 845 (1998).

22. *See, e.g.*, Votteler, *supra* note 21 (describing how Texas' Edwards Aquifer became a key battleground in this conflict).

23. *See* Carol M. Rose, Mahon *Reconstructed: Why the Takings Issue Is Still a Muddle*, 57 S. CAL. L. REV. 561, 561 (1984) (describing this question as "[b]y far the most intractable constitutional property issue").

24. *See* BARTON H. THOMPSON, JR. ET AL., LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS 444–45 (5th ed. 2012); Antonio Rossmann & Michael J. Steel, *Forging the New Water Law: Public Regulation of "Proprietary" Groundwater Rights*, 33 HASTINGS L.J. 903, 906–07 (1982).

25. *See infra* text accompanying notes 93–103.

26. For example, while Texas holds a reputation as one of the laggards of groundwater law, its courts have endorsed groundwater regulation, and the state legislature has empowered groundwater management districts to exercise regulatory authority. *See, e.g.*, Barshop v. Medina Cnty. Underground Water Conservation Dist., 925 S.W.2d 618, 633 (Tex. 1996) (endorsing a legislative role in water use regulation).

27. *See* Barton H. Thompson, Jr., *Beyond Connections: Pursuing Multidimensional Conjunctive Management*, 47 IDAHO L. REV. 273, 274 (2011) (noting the prevalence of "lax legal rules and poor enforcement"); *infra* text accompanying notes 112–18.

application of the Fifth Amendment to a still-underdeveloped fringe of property law.[28]

This Article addresses how our legal systems are, and should be, responding to that challenge. In so doing, it offers three contributions to the existing legal literature. First, this Article provides the first comprehensive analysis of past groundwater/takings cases, as well as the first guide for courts considering such cases in the future. Second, that analysis advances a broader debate over the application of takings doctrine to water rights generally. That broader debate has received substantial attention, but commentators have focused almost exclusively on the law of surface water.[29] An inquiry into groundwater disputes can therefore shed new light on an old, but still heated, debate. Third, all of this discussion supports an argument directly relevant to litigation now working its way through the courts. That argument, in brief, is that neither judicial precedent nor legal theory provides any basis for granting groundwater use rights, or water rights more generally, special favoritism under the takings clause.[30]

This Article begins by explaining what groundwater is, how groundwater law has evolved, and why groundwater management continues to generate lawsuits. In Part II, I explore how the judicial system has responded to those challenges. The analysis begins in Texas, where a recent decision brought national attention to the intersection of

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28. *See, e.g.*, Thompson, *supra* note 6, at 252–53 (discussing the tendency toward belated and partial responses to groundwater overuse); Joseph L. Sax, *We Don't Do Groundwater: A Morsel of California Legal History*, 6 U. DENV. WATER L. REV. 269, 270 (2003) ("[California] groundwater is effectively unregulated.").

29. *See, e.g.*, John D. Leshy, *A Conversation about Takings and Water Rights*, 83 TEX. L. REV. 1985 (2005); Brian E. Gray, *The Property Right in Water*, 9 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 1 (2002); Melinda Harm Benson, *The* Tulare *Case: Water Rights, the Endangered Species Act, and the Fifth Amendment*, 32 ENVTL. L. 551 (2002); Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257 (1990); Josh Patashnik, Note, *Physical Takings, Regulatory Takings, and Water Rights*, 51 SANTA CLARA L. REV. 365 (2011).

The last few years have produced a few law review articles specifically focused on the Texas controversies. *See* Gerald Torres, *Liquid Assets: Groundwater in Texas*, 122 YALE L.J. ONLINE 143 (2012), http://yalelawjournal.org/2012/12/4/torres.html; Deborah Clarke Trejo, *Identifying and Valuing Groundwater Withdrawal Rights in the Context of Takings Claims—A Texas Case Study*, 23 TUL. ENVTL. L.J. 409 (2010); Gregory S. Friend, Note, *The Quick of the Matter: The Proposition of Takings Litigation under the Save Our Springs Ordinance*, 25 VT. L. REV. 545 (2001); Ashlie Newman, Note, Edwards Aquifer v. Day *and the Future of Groundwater Regulation in Texas*, 31 REV. LITIG. 403 (2012).

30. One contribution this Article does not endeavor to offer is a detailed exploration of the ways different groundwater law doctrines should influence takings analyses. While those questions are interesting, the core argument here implies that they should not be crucially important. Under multiple systems of groundwater law, and in periods of flux between systems, courts have allowed regulatory constraints while rarely finding takings, and I argue that those traditions are appropriate.

groundwater law and takings doctrine.[31] But takings cases involving groundwater are not new, and Part II therefore addresses the full set of published groundwater/takings decisions produced by American courts. It shows that American courts have traditionally treated groundwater rights as property rights subject to constitutional protection, but also have almost always allowed government to regulate groundwater use without paying compensation.[32] These conclusions undermine two dueling theories arguing that water rights should either be categorically excluded from, or categorically favored within, takings analyses.[33] What approach is normatively desirable is another question, but the groundwater cases provide powerful evidence that neither categorical approach has been a significant part of our water law tradition. Courts instead have favored a combination of property rights and deference to regulation.[34]

Part III turns to those normative questions. Although case law at the intersection of groundwater regulation and takings doctrine may seem somewhat settled, the partial consensus is fragile. In part, that fragility arises from a thin theoretical basis; the courts' conclusions rarely provide a deeper analysis of the relationship between groundwater regulation, takings doctrine, and property theory. If they do provide that deeper discussion, the reasoning is sometimes at odds with strands of the Supreme Court's more recent takings jurisprudence.[35] That leaves the decisions vulnerable to theoretical attacks, which libertarian-leaning judges, legislators, and property theorists are quite ready to supply, and which have gained at least moments of traction in other analogous contexts.[36] Part III therefore considers the implications of foundational

31. *See* Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012). For a more recent, and potentially even more controversial, decision, *see* Edwards Aquifer Auth. v. Bragg, No. 04-11-00018-CV, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013).

32. The recent *Bragg* decision is a significant exception to that tradition.

33. For arguments that water right restrictions should be subject to a categorical physical takings analysis, *see* Patashnik, *supra* note 29, at 404–15; Scott Andrew Shepard, *The Unbearable Cost of Skipping the Check: Property Rights, Takings Compensation & Ecological Protection in the Western Water Law Context*, 17 N.Y.U. ENVTL. L.J. 1063, 1111–14 (2009). For diametrically opposed arguments, except for the shared premise that water rights merit exceptional treatment, see, e.g., Sandra B. Zellmer & Jessica Harder, *Unbundling Property in Water*, 59 ALA. L. REV. 679, 687 (2008) ("[A]ppropriators do not have full takings property."); Shelley Ross Saxer, *The Fluid Nature of Property Rights in Water*, 21 DUKE ENVTL. L. & POL'Y F. 49, 50 (2010) ("[W]ater is too unlike land to be subject to private property holdings.").

34. *See, e.g.*, Sax, *supra* note 29, at 260 ("The constitutional law of water is the same as the constitutional law of potatoes and pork chops.").

35. *See infra* text accompanying notes 219–25.

36. *See, e.g.*, RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN (1985); Shepard, *supra* note 33; Tulare Lake Basin Water Storage Dist. v. United States, 49

property theories for the intersection of groundwater regulation and takings doctrine. My conclusion, in a nutshell, is that the courts have been getting things largely right, even if their explanations have often been sparse. Treating groundwater rights as property is consistent with, though perhaps not mandated by, our traditional approaches to property rights. And no property theory justifies subjecting groundwater regulations to heightened judicial scrutiny.

I. THE CHALLENGE OF GROUNDWATER LAW

Central Texas contains what might be the nation's highest-profile aquifer.[37] The Edwards Aquifer irrigates thousands of acres of crops and serves as the primary water supply for approximately 2.1 million people.[38] The aquifer also supports a unique set of ecosystems, some of which contain threatened and endangered species.[39] Use of Edwards Aquifer water is subject to a complex statutory and regulatory regime, which the Texas Legislature initiated in response to litigation brought under the Federal Endangered Species Act.[40] That litigation in return responded to unsustainable levels of groundwater use, which were depleting the aquifer and threatening the surface and subsurface ecosystems dependent upon it.[41] The Edwards Aquifer Authority, a regional administrative agency, now implements that regulatory scheme.[42] But it must do so against the backdrop of a common law groundwater regime that purports to allow unlimited pumping so long as water remains physically available, and amid a political culture characterized by skepticism of regulation.[43] One

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Fed. Cl. 313, 324 (2001) (holding that regulatory water use restrictions are compensable as physical takings).

37. The other candidate for this oxymoronic distinction would be the Ogallala Aquifer, which underlies significant parts of Texas, Oklahoma, Kansas, and Nebraska. *See* C.W. FETTER, APPLIED HYDROGEOLOGY 263 (4th ed. 2001).

38. EDWARDS AQUIFER AUTH., HYDROLOGIC DATA REPORT FOR 2010 3 (2011), *available at* http://www.edwardsaquifer.org/documents/2011_Hamilton-etal_2010HydrologicData.pdf; *see also* Todd H. Votteler, *Raiders of the Lost Aquifer? Or, the Beginning of the End to Fifty Years of Conflict over the Texas Edwards Aquifer*, 15 TULANE ENVTL. L.J. 257, 258–72 (2002) (describing the aquifer).

39. Votteler, *supra* note 38, at 271; *see also* Votteler, *supra* note 21, at 851.

40. *See* Votteler, *supra* note 21, at 856–60 (describing the genesis of the Edwards Aquifer Authority Act).

41. *Id.*; *see also* Zekster et al., *supra* note 14, at 398.

42. *See* Edwards Aquifer Authority, *available at* http://www.edwardsaquifer.org/index.php (last visited Dec. 19, 2013).

43. *See* Sipriano v. Great Spring Waters of Am., Inc., 1 S.W.3d 75, 75 (Tex. 1999) (declining to depart from the "rule of capture," a common law doctrine that allows landowners to pump without limit from beneath their lands); David M. Konisky, *Regulator Attitudes and the Environmental Race to the Bottom Argument*, 18 J. PUB. ADMIN. RES. & THEORY 321, 327 (2007) (noting that environmental managers perceive Texas to be one of the states with the weakest environmental enforcement efforts).

frequent result, particularly in the last several years, has been takings litigation.[44]

The Edwards Aquifer battles exemplify a broader struggle over groundwater regulation. This section describes how and why those conflicts come about. I begin with a groundwater primer, explaining where groundwater comes from, why it is economically and ecologically valuable, and how it can be so difficult to manage.[45] I then turn to the legal systems governing groundwater management and explain why they often generate uncertainty and conflicting expectations—or, in other words, why they create fertile ground for takings cases. Finally, I turn to the recent evolution of takings doctrine and water rights, and explain why persistent—albeit overstated—ambiguities about the application of takings doctrine to water rights regulation heighten the potential for legal claims. The basic point is that the Edwards Aquifer battles both continue an established conflict and foreshadow the future.

A. The Contested Resource

At some point in our education, almost all of us have learned about the water cycle.[46] We are taught how water evaporates from the ocean, precipitates over the land, and flows through streams and rivers back to the ocean, supporting human and ecological systems along the way.[47] What many people do not realize is that much of that cycle happens underground. Particularly in undeveloped landscapes, most precipitation evaporates, is transpired by plants, or infiltrates through the ground surface; only a small percentage travels to surface waterways as overland flow.[48] Water that infiltrates the surface then percolates downward until it hits the water table, which is the level below which all of the pore space[49]

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44. *See, e.g.*, Bragg v. Edwards Aquifer Auth., No. SA-06-CV-1129-XR, 2008 U.S. Dist. LEXIS 23380 (W.D. Tex. Mar. 25, 2008); Coates v. Hall, 512 F. Supp. 2d 770 (W.D. Tex. 2007); Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012); Bragg v. Edwards Aquifer Auth., 71 S.W.3d 729 (Tex. 2002); Barshop v. Medina Cnty. Underground Water Conservation Dist., 925 S.W.2d 618 (Tex. 1996); Edwards Aquifer Auth. v. Bragg, No. 04-11-00018-CV, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013).

45. For a more detailed groundwater primer, see THOMPSON ET AL., *supra* note 24, at 448–63.

46. *See* UNITED STATES GEOLOGICAL SURVEY, THE WATER CYCLE FOR KIDS, *available at* http://ga.water.usgs.gov/edu/watercycle-kids.html (last visited Dec. 23, 2013).

47. *See id*.

48. *See* COMM. ON REDUCING STORMWATER DISCHARGE CONTRIBUTIONS TO WATER POLLUTION, NAT'L RESEARCH COUNCIL, URBAN STORMWATER MGMT. IN THE UNITED STATES 156 (2009).

49. "Pore space" is the space between particles of silt, sand, gravel, or rock. *See* THOMPSON ET AL., *supra* note 24, at 449.

in the soil or rock is saturated with water.[50] Below the water table, groundwater tends to flow laterally, and much of that water will eventually discharge into surface waterways.[51] The rates of flow may be very slow—hydrogeologists would consider a meter per day to be a relatively fast flow rate—and water passing through clay or non-porous rock may barely move at all.[52] A saturated and relatively permeable subsurface layer through which water moves more quickly, and from which it can readily be pumped, is commonly referred to as an "aquifer."[53]

Aquifers contain a surprising percentage of freshwater resources. Globally, most freshwater is frozen in glaciers and icecaps.[54] Of the remaining freshwater, ninety-eight percent is beneath the ground.[55] Some of that groundwater is far below the surface, and therefore is difficult for humans to access and plays little role in sustaining surface water ecosystems.[56] But even at near-surface levels, the aggregate quantity of groundwater in many areas greatly exceeds the quantity in surface lakes, rivers, and streams.[57]

Beyond sheer abundance, several other characteristics make groundwater resources highly valuable to people. In many regions—particularly arid or semi-arid ones—groundwater is more geographically dispersed than surface water.[58] Consequently, while a farmer might need extensive pipes or irrigation ditches—as well as complex legal arrangements—to convey water from the nearest stream to her land, she can extract groundwater, with relatively minimal capital investments, from directly beneath her fields.[59] Groundwater's slow flow and evaporation rates also make it more steadily available.[60] Surface streams typically run

50. *See* FETTER, *supra* note 37, at 4–5, 37–42.

51. *See id.* at 5. Some of that water will evaporate and become moisture in the unsaturated vadose zone, and, depending upon the depth of groundwater, some will be absorbed by plants' roots. *Id.*

52. *See id.* at 85 (providing hydraulic conductivity ranges for a variety of subsurface materials); *see also id.* at 95 (describing "confining layers," which are geologic formations that retard water flow).

53. *Id.* at 95 ("An aquifer is a geologic unit that can store and transmit water at rates fast enough to supply reasonable amounts to wells.") (emphasis removed).

54. *Id.* at 4.

55. *Id.*

56. *See* THOMPSON ET AL., *supra* note 24, at 445 ("In some areas, physically available groundwater is so far below the surface that it is not cost-effective to pay for the pump 'lift' to the surface.").

57. A classic example is the Ogallala Aquifer, which lies beneath much of the High Plains, an area where surface streams are relatively rare. *See* FETTER, *supra* note 37, at 263.

58. *See* TODD & MAYS, *supra* note 8, at 15 ("The storage capacity of groundwater reservoirs combined with small flow rates provide large, extensively distributed sources of water supply.").

59. *See* Mark Giordano, *Global Groundwater? Issues and Solutions*, 34 ANN. REV. ENVTL. RES. 153, 155 (2009).

60. *See* FETTER, *supra* note 37, at 446 ("There are no evaporative losses from ground-water

low during summer and early fall, which are precisely the times when municipal and agricultural water demands tend to peak. Groundwater levels, however, remain relatively steady, unless an aquifer is being pumped faster that its rate of recharge.[61] Finally, groundwater is often cleaner than surface water. Surface waterways generally receive a significant portion of their inflows from stormwater runoff, which, as the Supreme Court recently noted, "is often heavily polluted."[62] Particularly during warm seasons, surface waterways also can become highly fecund breeding grounds for algae, bacteria, and other biological toxins.[63] Groundwater is vulnerable to human contamination, and it is by no means biologically inert.[64] But the level of pollution in groundwater, even in relatively urbanized areas, is often much lower than in adjacent surface water bodies.[65]

As a consequence, groundwater use is extensive. In 2005, according to the United States Geological Survey, the United States used approximately 82.6 billion gallons of groundwater per day.[66] Most of that groundwater supports irrigated agriculture, but municipal and industrial suppliers, mining operations, and even aquaculture businesses are also widely dependent upon groundwater, as is a multi-million dollar bottled water industry.[67] In some states—Florida is the most populous example—groundwater withdrawals exceed surface water withdrawals.[68] Aggregate groundwater use in the United States may actually be declining, and per capita groundwater use clearly is; the 2005 totals were five percent lower than those from 2000, when the United States' groundwater use hit an all-time peak.[69] But the overall numbers remain immense.

While the physical nature of groundwater presents certain advantages for human users, it also creates challenges. Perhaps the largest challenge is

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storage . . . .").

61. *See* Giordano, *supra* note 59, at 155.

62. L.A. Cnty. Flood Control Dist. v. Natural Res. Def. Council, 133 S. Ct. 710, 712 (2013); *see* Dave Owen, *Urbanization, Water Quality, and the Regulated Landscape*, 82 U. COLO. L. REV. 431, 441–42 (2011) (discussing sources of stormwater pollution).

63. *See* EPA, *Cyanobacterial Harmful Algal Blooms (CyanoHABs)*, *available at* www2.epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-cyanohabs (last visited Dec. 23, 2013).

64. *See* Thompson, *supra* note 27, at 289 (noting recent literature describing ecosystems within aquifers).

65. *See* Giordano, *supra* note 59, at 155.

66. *See* U.S. GEOLOGICAL SURVEY, *supra* note 3, at 6.

67. *See* NAT'L GROUNDWATER ASS'N, *supra* note 2 (stating that the bottled water industry used 5.34 billion gallons of groundwater in 2001).

68. *See generally* U.S. GEOLOGICAL SURVEY, *supra* note 3 (providing groundwater use statistics).

69. *Id.* at 43–44.

that aquifers typically span property boundaries, and groundwater moves in response to pumping.[70] Consequently, wells on one property, if pumped vigorously enough, can suck in water from adjacent lands, lowering the water table beneath those lands in the process.[71] If the drawdown is sufficiently large, wells will eventually run dry. The same problem can occur on a regional or even international scale, with one set of groundwater users' aggressive pumping interfering with others' ability to access the resource.[72] Managing any shared resource is generally easier if each user's consumption is easily monitored, but groundwater use can be difficult to track.[73] Unless one watches the sprinklers very closely, or unless users are subject to mandatory reporting requirements, it is hard to tell how much water your neighbor is using.[74] Subsurface groundwater flow also can be hard to measure, and determining the extent of interference among competing users can be difficult.[75] Groundwater therefore represents a classic example of a common-pool resource, with limited monitoring capacity exacerbating all the widely identified challenges associated with managing such commons.[76]

To complicate matters further, groundwater also plays a critical ecological role. Some of the groundwater that infiltrates into the subsurface never re-enters the surficial portion of the water cycle. But many shallow aquifers discharge water into wetlands, streams, and lakes, as well as providing sustenance to riparian vegetation alongside surface waterways.[77] That groundwater recharge tends to be steadier, cleaner, and less prone to temperature extremes than surface water inflows.[78] It therefore helps maintain streamflows and lake levels between rain events;

70. *See* OSTROM, *supra* note 20, at 107. For a detailed discussion of the effects of groundwater pumping, see TODD & MAYS, *supra* note 8, at 152–98.

71. *See* THOMPSON ET AL., *supra* note 24, at 454.

72. *See, e.g.*, FETTER, *supra* note 37, at 267 (showing declining water levels in the Ogallala Aquifer); MARQ DE VILLIERS, WATER: THE FATE OF OUR MOST PRECIOUS RESOURCE 200–03 (2000) (describing the role of aquifer depletion in the Israeli-Palestinian conflict).

73. *See* OSTROM, *supra* note 20, at 94–100 (explaining the importance of monitoring for management of common-pool resources).

74. *See* Carol M. Rose, *From H_2O to CO_2: Lessons of Water Rights for Carbon Trading*, 50 ARIZ. L. REV. 91, 99 (2008) ("Groundwater is invisible and elusive, and because it is relatively easy to tap from a great variety of locations, its use is hard to monitor."). *See also* M. RHEAD ENION, UNDER WATER: MONITORING AND REGULATING GROUNDWATER IN CALIFORNIA 9–12 (2011) (noting that California lacks any statewide system for monitoring groundwater use).

75. *See* THOMPSON ET AL., *supra* note 24, at 458–63 (describing informational challenges).

76. *See* Thompson, *supra* note 6, at 250 ("[G]roundwater is also a natural commons."); *id.* at 245 (explaining how "opacity of user behavior" makes common pool resources more difficult to manage).

77. *See generally* WINTER ET AL., *supra* note 7 (explaining interconnections between surface water and groundwater).

78. *See* Owen, *supra* note 62, at 441–42 (discussing stormwater pollution); FETTER, *supra* note 37, at 446 (describing how water quality can improve as water passes through the subsurface).

keeps temperatures within a range in which fish and other aquatic species can survive; dilutes pollution carried into surface waters by stormwater flows; and sustains riparian habitats.[79] Without groundwater, many of our waterways would be ecologically impoverished, and some would cease to be waterways at all.[80]

The ecological importance of groundwater opens up another front for potential conflict. Across the nation, examples abound of surface waterways drawn down, or even entirely dried out, by groundwater pumping.[81] The Edwards Aquifer provides a particularly salient example of the problem. There, pumping has lowered water levels in several major springs, placing human recreation and endangered species at risk.[82] Similar conflicts have arisen even in relatively well-watered places like northwestern California, where groundwater pumping along the Scott River—an important salmon stream—has generated ongoing litigation,[83] and eastern Massachusetts, where groundwater pumping helped dry out the Ipswich River and led to a series of legal battles.[84] These examples represent just the tip of an iceberg, and the iceberg may be growing. Because groundwater moves relatively slowly, there can be a significant time lag between the onset of pumping and the first evidence of ecological impact.[85] But those delayed impacts will eventually arrive, and with so many aquifers being overdrafted, present pumping practices are sowing the seeds for additional future conflicts.

As with conflicts among competing consumptive users, these ecological conflicts are not easy to resolve. To some extent, the problems are similar: monitoring challenges complicate efforts to determine when overall pumping levels are problematic and whose individual pumping is causing the problem.[86] Ecological problems also often result from the cumulative impact of many different wells, rather than from just a few

79. *See* Masaki Hayashi & Donald O. Rosenberry, *Effects of Ground Water Exchange on the Hydrology and Ecology of Surface Water*, 40 GROUND WATER 309 (2002).

80. *See* GLENNON, *supra* note 15, at 35–50 (describing the former Santa Cruz River).

81. *See generally id.* (providing multiple case studies of groundwater overuse).

82. *See id.* at 92.

83. *See* John Bowman, *Karuk Study Results Released*, SISKIYOUDAILY.COM (July 1, 2012, 10:33 AM), http://www.siskiyoudaily.com/article/20120604/NEWS/306049993/0/SEARCH (updating description of Karuk Tribe Report on the Scott River controversy).

84. *See* GLENNON, *supra* note 15, at 99–111.

85. Marios Sophocleous, *Groundwater Recharge and Sustainability in the High Plains Aquifer in Kansas, USA* 13 HYDROGEOLOGY J. 351, 354 (2005) ("[T]he current apparent health of an exploited aquifer and the ecosystems that depend upon it does not necessarily indicate that the situation will be sustainable in the longer term . . . .").

86. *See generally* THOMPSON ET AL., *supra* note 24, at 458–63 (discussing informational challenges).

discrete sources. In whatever context it arises, that sort of cumulative environmental problem is often quite difficult for regulators to resolve.[87] Finally, the combination of groundwater's relative invisibility and the time lags between pumping and its ecological consequences all increase the temptation to pump now and worry about the consequences later.[88] Quite often, that is exactly what we have done.[89]

B. Evolving and Uncertain Groundwater Law

The presence of a common-pool resource subject to diverse and competing demands clearly creates a legal challenge, but it need not generate takings claims. Some common-pool resources are managed without much legal conflict, or with the legal battles fought on other fronts.[90] Takings claims tend to arise where resource users can claim property interests in the contested resource and where the law governing the resource is transitioning toward more extensive regulatory control.[91] With groundwater, all of those conditions are present. In the legal systems of the United States, groundwater rights are widely understood as property rights.[92] And states' systems of common-law rights, while often ill-defined, frequently purport to allow extensive or even, in a few instances, nearly unlimited pumping, which places them in uncertain tension with emerging regulatory controls.[93]

These uncertainties and tensions have their historic roots in a mix of scientific misunderstanding, informational limitations, and laissez-faire common law.[94] For centuries, groundwater science, to the extent it existed,

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87. *See* J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 CALIF. L. REV. 59, 64–65 (2010) (summarizing the challenges of responding to such problems).

88. *See* Thompson, *supra* note 6, at 255–65 (explaining why common-pool resources are often poorly managed in contexts of uncertainty).

89. *See generally* GLENNON, *supra* note 15 (providing examples of groundwater overuse).

90. *See generally* OSTROM, *supra* note 20 (providing case studies of successfully managed common-pool resources).

91. *See* Holly Doremus, *Takings and Transitions*, 19 J. LAND USE & ENVTL. L. 1, 3 (2003). Perhaps the best example of such a transition involves wetlands, which once were widely viewed as nuisances that landowners could destroy at will and now are widely viewed as ecologically important and worthy of regulatory protection—and which often generate takings cases. *See, e.g.*, Just v. Marinette Cnty., 201 N.W.2d 761, 768 (Wis. 1972) (discussing this shift).

92. *See infra* text accompanying notes 177–82.

93. *See infra* text accompanying notes 112–18.

94. *See* MORTON J. HORWITZ, THE TRANSFORMATION OF AMERICAN LAW, 1780–1860 105 (1977) (attributing the pro-development orientation of groundwater law to its emergence at a time when "laissez-faire assumptions firmly took hold of the imaginations of American judges").

was founded upon colorful misconceptions.[95] Those misconceptions largely precluded states from developing private—or public—law systems for limiting overall consumption or for dividing aquifers into shares for competing users, and well into the nineteenth century, groundwater law represented a near-anarchic exception to the otherwise well-developed property regimes of the day. The traditional approach was perhaps best expressed in *Frazier v. Brown*, an 1861 Ohio Supreme Court decision that rejected any legal constraint on groundwater pumping.[96] The *Frazier* court offered two justifications for its rule. First:

> [b]ecause the existence, origin, movement and course of such waters, and the causes which govern and direct their movements, are so secret, occult and concealed . . . an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would be, therefore, practically impossible.[97]

Second, the court asserted that a rule protecting downstream landowners would inappropriately interfere with industrial progress.[98]

Frazier's "dark arts" holding, as one subsequent decision characterized it,[99] illustrates two principles that for years dominated groundwater law. The first is a principle of non-constraint. *Frazier*'s "absolute dominion" rule essentially allowed unrestrained pumping, encouraging aggressive groundwater use not only without public regulatory constraint, but also with hardly any possibility of a check under private common law.[100] The second principle is a legal divide between groundwater and surface waters.

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95. *See* TODD & MAYS, *supra* note 8, at 3–4 (describing groundwater theories, many wildly inaccurate, from Homer, Aristotle, Descartes, and other luminaries). In general, early thinkers believed groundwater moved in highly unpredictable and mysterious ways, and that attempting to regulate it therefore would be futile. *Id.*

96. Frazier v. Brown, 12 Ohio St. 294 (1861), *overruled by* Cline v. Am. Aggregates Corp., 15 Ohio St. 3d 384, 387 (1984). *Frazier* was not the first Anglo-American decision to so hold. *See, e.g.*, Acton v. Blundell, 12 Mees. & Wels. 324, 349–54 (Ex. 1843). It was, however, perhaps the most colorful in its chosen language.

97. *Frazier*, 12 Ohio St. at 311.

98. *Id.* ("[A]ny such recognition of correlative rights, would interfere, to the material detriment of the common wealth, with drainage and agriculture, mining, the construction of highways and railroads, with sanitary regulations, building and the general progress of improvement in works of embellishment and utility.").

99. McNamara v. City of Rittman, 838 N.E.2d 640, 646 (Ohio 2005).

100. *See Frazier*, 12 Ohio St. at 300, 311–12 (rejecting the possibility of even a private law claim against a competing groundwater user). For these reasons, some lawyers have argued that traditional groundwater law created no property rights at all, at least until the water was actually brought to the surface, for users lacked any control of the resource and could not exclude other competing users. This argument seems sensible, but courts in absolute dominion states have not yet been persuaded. *See infra* text accompanying notes 178–82.

By the nineteenth century, no court would have alleged that rivers moved in secret, occult ways, and the legal systems for allocating surface water were relatively sophisticated.[101] But even as scientists became increasingly cognizant of the close relationship between ground and surface water systems,[102] the legal system continued to insist that groundwater and surface water were separate, with the complex laws applicable to the latter unnecessary to the former.[103]

On paper, the primacy of these principles now is substantially diminished. The changes have occurred in several ways. First, absolute dominion remains the law of only a few states, and even those states now also have statutory and administrative laws that purport to regulate groundwater use.[104] Many states have moved toward common law systems that entitle each groundwater user only to a reasonable share of groundwater use, or toward prior appropriation systems, with groundwater rights allocated on a first-come, first-served basis.[105] Second, some states also now have, on paper at least, some integration between their systems of groundwater and surface water rights.[106] In prior appropriation states,[107] for example, later-developed groundwater rights are generally subordinate to previously established surface rights, and surface users can sometimes enjoin groundwater pumping.[108] Third, in many states, management authority over groundwater is moving toward administrative agencies and

101. By the early nineteenth century, American *surface* water law was sufficiently extensive to merit its own treatise. *See* JOSEPH K. ANGELL, A TREATISE ON THE LAW OF WATERCOURSES (7th ed. 1877) (1825).

102. *See* T.N. Narasimhan, *Hydrogeology in North America: Past and Future*, 13 HYDROGEOLOGY J. 7, 8 (2005) (describing the discovery of groundwater/surface water interactions).

103. *See* GLENNON, *supra* note 15, at 30. The sole exception to this general rule applied to groundwater flowing in known and definite channels. *See, e.g.*, N. Gualala Water Co. v. State Water Res. Control Bd., 43 Cal. Rptr. 3d 821, 823 (2006) (quoting Cal. Water Code § 1200 (West 2009)). States generally treat such water as part of the surface water system. *See, e.g.*, *id.* at 824. But discerning what groundwater meets that definition is not easy. Indeed, although I studied hydrogeology as an undergraduate and then worked as an environmental geologist, I never even heard the phrase "known and definite channels" before coming to law school.

104. *Compare, e.g.*, Maddocks v. Giles, 728 A.2d 150, 153 (Me. 1999) ("We decline to abandon the absolute dominion rule.") *with* An Act Concerning the Sustainable Use of and Planning for Water Resources, ch. 399, 2007 Me. Laws 975 (creating a permit process for new "significant groundwater wells" in Maine). Similarly, Texas's continued adherence to the rule of capture is balanced by legislation allowing the creation of groundwater management districts. *See* TEX. WATER CODE ANN. § 36.116(a)(2) (West 2011) (authorizing groundwater management districts to regulate pumping).

105. *See Maddocks*, 728 A.2d at 153 ("Most jurisdictions have adopted the reasonable use, or American, rule or some variation of it.") (footnote omitted).

106. *See, e.g.*, Kobobel v. Dep't of Natural Res., 249 P.3d 1127, 1135 (Colo. 2011) (en banc) (describing Colorado's integration of groundwater and surface water law).

107. Prior appropriation doctrine, which is the dominant legal system for water rights in the West, allocates water rights on a first-come, first-served basis. *See* THOMPSON ET AL., *supra* note 24, at 167–376.

108. *See, e.g.*, *Kobobel*, 249 P.3d at 1136–38.

away from the courts.[109] Fourth and finally, the 1970s brought the emergence of a broad superstructure of federal and state environmental laws.[110] While none of those laws directly targeted groundwater use, some could compel restraint where groundwater pumping was causing environmental degradation.[111]

Nevertheless, vestiges of the former era still permeate groundwater law. A few states still do adhere to the absolute dominion rule.[112] While legislatures in those states also have created administrative regulatory systems, their courts have not yet decided how to reconcile those administrative constraints with a common law regime that takes libertarianism to an extreme.[113] And while most states have empowered administrative agencies to manage groundwater, their management schemes are riddled with exemptions, and many groundwater users remain almost completely unregulated.[114] Some states also have not given their administrative agencies enough funding and support to prescribe limits on

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109. Both Texas and Maine have statutes that exemplify this trend. *See supra* text accompanying note 104. The Texas and Maine statutes both lodge authority in administrative agencies. *See also* GARY C. BRYNER & ELIZABETH PURCELL, GROUNDWATER LAW SOURCEBOOK OF THE WESTERN UNITED STATES (2003) (describing groundwater management in western states; almost all rely on statewide or local administrative agencies, and some use both).

110. *See generally* RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW (2004) (describing environmental law's emergence and evolution). For an extended saga involving the application of state environmental law to groundwater use, see Rossmann & Steel, *supra* note 24, at 91–25 (describing groundwater litigation in California's Owens Valley).

111. *See, e.g.*, GLENNON, *supra* note 15, at 92–93 (describing the role of Endangered Species Act litigation in Edwards Aquifer management).

112. *See* Maddocks v. Giles, 728 A.2d 150, 153 (Me. 1999) ("We decline to abandon the absolute dominion rule."); Sipriano v. Great Spring Waters of Am., Inc., 1 S.W.3d 75, 75 (Tex. 1999); *see also* Allstate Ins. Co. v. Dana Corp., 759 N.E.2d 1049, 1055 & n.5 (Ind. 2001). *See generally* A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 4:6 (2012) ("The absolute ownership rule is still followed in some eastern states and in Texas. Connecticut, Louisiana, Maine, and Rhode Island still purport to follow the absolute ownership rule . . . .") (footnotes omitted).

113. This basic question was raised, though not resolved, in Texas's *Day* litigation. In Maine, it has not yet come up. Other states have purported to address the issue, though not with a detailed legal analysis. *See, e.g.*, *Allstate Ins. Co.*, 759 N.E.2d at 1055 & n.5 (affirming the absolute dominion rule while also noting "that the legislature has placed further restraints on the use of groundwater . . . . [W]e do not view [these constraints] as having altered the common law property status of ground water.").

114. California is the most notorious example of a weak administrative system, but regulatory systems in several other states, including New York and West Virginia, are similarly minimal. *See* NAT'L CONFERENCE OF STATE LEGISLATURES, STATE WATER WITHDRAWAL REGULATIONS, *available at* http://www.ncsl.org/issues-research/env-res/state-water-withdrawal-regulations.aspx (last visited Dec. 26, 2013) ("California does not have a comprehensive permit process for regulation of groundwater use."). The NCIS summary page also lists several states, including Alabama, Arkansas, Illinois, Louisiana, Missouri, and Tennessee, that require reporting but not permitting of groundwater use. *Id.* Almost all states exempt some users—usually small or medium users; sometimes also agricultural users—from registration and permitting requirements, or only apply their requirements to portions of the state. *See id.*

use, monitor compliance with these limits, and bring enforcement actions against violators.[115] In theory, private litigation under common law theories might fill that gap, at least outside of absolute dominion states. But in reality, potential plaintiffs face daunting evidentiary challenges that can effectively preclude litigation. To prevail, they must demonstrate not only that they have been injured, but also by whom, and then must show that the competing users' groundwater withdrawals exceeded their reasonable shares.[116] Between the complexities of aquifer hydrogeology, the typical absence of information on groundwater withdrawals, and the inherent vagueness of common law standards, those showings can be difficult to make, and plaintiffs may not even try.[117] Finally, while some states have attempted to fully integrate groundwater and surface water regimes, others are still attempting to manage two resources as though interconnections do not exist.[118]

This fitful and uneven process of legal evolution creates conditions conducive to two types of takings claims. First, when legislatures or courts do attempt to reform groundwater laws—for example, by shifting from an absolute dominion standard to a permit-based system of administrative regulation—the changes necessarily involve altering an established system of property rights. Such shifts can easily generate takings claims, for many property owners believe their rights are immune to such political shifts.[119] Second, even when regulators apply existing law to particular groundwater users—perhaps by denying a permit to drill a well, or to pump it at the applicant's desired level—they still may interfere with landowners'

115. *See* CHARLES J. TAYLOR & WILLIAM M. ALLEY, GROUND-WATER-LEVEL MONITORING AND THE IMPORTANCE OF LONG-TERM WATER-LEVEL DATA 2 (2001) ("[W]ater-level monitoring in the United States is fragmented and largely subject to the vagaries of existing local projects."); Thompson, *supra* note 27 (describing the prevalence of lax enforcement).

116. *See* Michael P. Mallery, *Groundwater: A Call for a Comprehensive Management Program*, 14 PAC. L.J. 1279, 1290 (1983) (noting chronic uncertainty over the scope of groundwater use rights in non-adjudicated basins).

117. As an attorney representing groundwater users in California's Central Valley, I faced these challenges. Some may become surmountable in a general adjudication for an entire groundwater basin, but general adjudications are costly and time-consuming, and sometimes are not legally possible. *See, e.g.*, Wright v. Goleta Water Dist., 219 Cal. Rptr. 740, 748–50 (Cal. Ct. App. 1985) (declining to allow a general groundwater adjudication in the absence of a statutory authorization); THOMPSON ET AL., *supra* note 24, at 490 n.37 (compiling sources that cite cost and time as deterrents to general adjudications).

118. *See* BRYNER & PURCELL, *supra* note 109, at 7, 14 (noting the absence of integration in California and Arizona).

119. *See* Webb's Fabulous Pharmacies, Inc. v. Beckwith, 449 U.S. 155, 164 (1980) ("[A] State, by *ipse dixit*, may not transform private property into public property without compensation . . . ."); *see also* Doremus, *supra* note 91, at 3.

expectations.[120] Those expectations may be difficult to reconcile with the paper existence of common-law and regulatory limitations on groundwater use, but they may be quite consistent with historic practices.[121] That consistency then can easily create a sense, at least on the part of the landowner, that an established property right is being taken.

C. The Takings Doctrine Overlay

A final complicating ingredient in this recipe for takings claims is a set of uncertainties within takings doctrine itself. Takings doctrine remains contested territory, and in recent years, water rights litigation has become a major new front in that contest.[122] The doctrine is not entirely unsettled; indeed, some commentators have argued that existing takings case law is actually becoming more ordered and consistent.[123] Nevertheless, a competition among widely disparate conceptions of takings doctrine still continues, and that competition creates additional uncertainty about the relationship between takings doctrine and groundwater use regulation.

Despite the common characterizations of takings law as muddled,[124] the United States Supreme Court has seemed, at least at times, to be moving toward a relatively stable conception of takings doctrine. Under the standard approach, categorical takings tests, under which plaintiffs have a relatively high likelihood of prevailing, apply to physical invasions and direct appropriations of property and to complete wipeouts of value, even

120. *See, e.g.*, Cross-Appellants' Brief at 5-15, Edwards Aquifer Auth. v. Bragg, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013) (No. 04-11-00018-CV) (describing the conflict between the Bragg's expectation that they would have sufficient water to irrigate their pecan orchards and the regulatory restrictions imposed by the Edwards Aquifer Authority).

121. *See supra* text accompanying notes 112–18 (noting the prevalence of gaps and non-enforcement in groundwater management regimes).

122. *See, e.g.*, Estate of Hage v. United States, 687 F.3d 1281 (Fed. Cir. 2012) (evaluating a takings claim based on denial of grazing permit and alleged loss of access to water); Casitas Mun. Water Dist. v. United States, 543 F.3d 1276 (Fed. Cir. 2008) (evaluating takings claim based on species protection measures); Klamath Irrigation Dist. v. United States, 64 Fed. Cl. 328 (2005) (same); Tulare Lake Basin Water Storage Dist. v. United States, 49 Fed. Cl. 313 (2001) (same); *see also* Robin Kundis Craig, *Defining Riparian Rights as "Property" through Takings Litigation: Is there a Property Right to Environmental Quality?*, 42 ENVTL. L. 115, 125–44 (2012) (describing takings cases involving water rights).

123. *See, e.g.*, Mark Fenster, *The Stubborn Incoherence of Regulatory Takings*, 28 STAN. ENVTL. L.J. 525, 527 (2009) (stating that Lingle v. Chevron U.S.A. Inc., 544 U.S. 528 (2005), brought some measure of peace, though not complete coherence, to takings doctrine); Robert Meltz, *Takings Law Today: A Primer for the Perplexed*, 34 ECOLOGY L.Q. 307, 370 (2007) ("Close analysis reveals that contemporary courts issue more or less predictable rulings in several areas of takings law.").

124. *See, e.g.*, Rose, *supra* note 23; Jed Rubenfeld, *Usings*, 102 YALE L.J. 1077, 1078–97 (1993); Doremus, *supra* note 91, at 1.

if those wipeouts were caused solely by regulatory constraints.[125] All regulatory constraints that do not cause complete wipeouts are reviewed under the ad hoc analytical standard set forth in *Penn Central Transportation Company v. New York City*.[126] The *Penn Central* analysis is traditionally much friendlier to government defendants.[127] Wide agreement also exists on the deeper purposes of takings doctrine. One purpose, in the Supreme Court's oft-repeated words, is to "bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole."[128] But a competing purpose is to assure that government has some power to regulate property use, for "'government regulation—by definition—involves the adjustment of rights for the public good,' . . . [and] '[g]overnment hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law.'"[129] These tests and principles contain their ambiguities and internal tensions, but, at least as constitutional tests go, they do provide courts with enough guidance to render modern takings law a moderately predictable field.[130]

Nevertheless, the seemingly settled doctrine remains subject to a fundamental challenge, one that would substantially restrict the government's regulatory capacity. Over thirty years ago, Richard Epstein argued for a radically different version of takings doctrine, under which nearly any regulation that effectively transfers wealth would create government liability.[131] The United States Supreme Court has never overtly adopted this approach in its entirety, but some of the Justices' opinions, particularly in the late 1980s and early 1990s, suggested sympathy for this view.[132] Though less prevalent in recent decisions, such

125. *See* Meltz, *supra* note 123, at 329, 360–62.

126. 438 U.S. 104 (1978). *Penn Central* involved a takings challenge to New York City's landmark law, which the city had used to prevent Penn Central from building into the airspace above Grand Central Station. The Court rejected the challenge, and it articulated a three-part standard for evaluating regulatory takings claims: courts should consider "economic impact of the regulation on the claimant"; the extent of interference "with distinct investment-backed expectations"; and "the character of the governmental action." *Id.* at 124.

127. *See* F. Patrick Hubbard et al., *Do Owners Have a Fair Chance of Prevailing under the Ad Hoc Regulatory Takings Test of* Penn Central Transportation Company*?*, 14 DUKE ENVTL. L. & POL'Y F. 121, 141 (2003) (providing statistics showing that landowners usually lose *Penn Central* claims).

128. Armstrong v. United States, 364 U.S. 40, 49 (1960).

129. Lingle v. Chevron U.S.A. Inc., 544 U.S. 528, 538 (2005) (quoting Andrus v. Allard, 444 U.S. 51, 65 (1979) and Pa. Coal Co. v. Mahon, 260 U.S. 393, 413 (1922)).

130. *See* Meltz, *supra* note 123, at 370 (describing "more or less predictable rulings").

131. EPSTEIN, *supra* note 36.

132. *See* Laura S. Underkuffler, Tahoe*'s Requiem: The Death of the Scalian View of Property and Justice*, 21 CONST. COMMENT. 727, 731–32 (2004) (describing the influence of this view on a series of Supreme Court cases in the 1990s).

signs of sympathy continue to appear, most prominently in the Court's 2010 decision in *Stop the Beach Renourishment, Inc. v. Florida Department of Environmental Protection*.[133] Writing for a conservative plurality, Justice Scalia dismissed the possibility that states, either through judicial or legislative action, might "[allow] for incremental modifications to property law," and seemed to suggest that any such modification would constitute a taking.[134] No Court majority has ever gone that far, but that notion continues to influence litigants' positions. Perhaps even more importantly, similar notions provide the foundations for legislative takings initiatives and ballot measures across the country.[135]

One focal point of the property rights campaign has been the field of water rights, where litigants and some commentators have opined that courts should make much more extensive use of categorical takings tests.[136] Their campaign found its first major success twelve years ago. In *Tulare Lake Water Basin Storage District v. United States*,[137] the United States Court of Federal Claims determined that environmental restrictions on surface water use were compensable under a categorical *physical* takings analysis.[138] The primary reasons, according to the court, were: (1) because water rights are usufructuary, any use restriction effectively eviscerates the right; and (2) to a plaintiff, it made little difference whether the restraint followed from a regulatory constraint or from the government physically removing the water; the impact was the same.[139] Both reasons, if more widely adopted, would set water rights takings doctrine far apart

133. 130 S. Ct. 2592 (2010).

134. *Id.* at 2606 (responding to, and quoting, Justice Kennedy's concurrence); *see* J. Peter Byrne, *Stop the* Stop the Beach *Plurality!*, 38 ECOLOGY L.Q. 619, 619–20, 627 (2011) (describing and critiquing this view).

135. *See* Hannah Jacobs, Note, *Searching for Balance in the Aftermath of the 2006 Takings Initiatives*, 116 YALE L.J. 1518, 1520 (2007) ("This movement . . . seeks to extend current Fifth Amendment takings doctrine to give property owners a claim to compensation whenever government regulation causes even slight decreases in the value of their property.").

136. *See* Shepard, *supra* note 33; Patashnik, *supra* note 29; Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122, 129–32 (Ct. App. 2006) (considering, and rejecting, an argument that a restriction on water use constituted a physical taking); Cross-Appellants' Brief at 45-50, Edwards Aquifer Auth. v. Bragg, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013) (No. 04-11-00018-CV) (arguing that restrictions on groundwater use should be analyzed as physical takings).

137. 49 Fed. Cl. 313 (2001). *Tulare Lake* involved a challenge by agricultural interests in California's Central Valley to water use restrictions designed to protect two fish species that had been listed under the Federal Endangered Species Act. *Id.*

138. *Id.* at 318–20; 324.

139. *See id.* at 319 ("In the context of water rights, a mere restriction on use—the hallmark of a regulatory action—completely eviscerates the right itself since plaintiffs' sole entitlement is to the use of the water."); *id.* at 320 ("[W]hether the government decreased the water to which plaintiffs had access by means of a dam or by means of pumping restrictions amounts to a distinction without a difference.").

from traditional takings doctrine.[140] Twelve years later, the *Tulare Lake* decision stands almost entirely alone, save for one Federal Circuit decision involving some peculiar facts.[141] Criticism has been widespread; the *Tulare Lake* case itself lacks precedential value (and was later repudiated, albeit anemically, by the judge who wrote it[142]); and many more cases have rejected its analytical methodology than have followed it.[143] But the idea that water rights should be subject to a more plaintiff-friendly mode of takings analysis still continues to find moments of traction.[144] Adding to the potential uncertainty is conspicuous judicial silence. It has been fifty years since any takings case involving water allocation emerged from the United States Supreme Court.[145]

The push for heightened protection of consumptive water use rights also has inspired (and may partly be inspired by) countermovements. In articles and amicus briefs, advocates favoring greater government oversight over water resources have pressed very different versions of the law of water rights and takings. Under the most prevalent view, government should have broad discretion to regulate water use, and plaintiffs should hardly ever be able to prove a taking when a regulation restricts water use. That approach, according to its proponents, follows

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140. *See* Benson, *supra* note 29, at 584–86 (explaining how the *Tulare Lake* case's effect-on-the-plaintiff reasoning diverges from traditional takings analysis). In its land use cases, the Court has never suggested that use rights should enjoy higher status than ownership rights.

141. *See* Casitas Mun. Water Dist. v. United States, 543 F.3d 1276 (Fed. Cir. 2008) (also holding that a use restriction should be analyzed as a potential physical taking). *Casitas* involved a requirement that the plaintiffs take water out of their diversion ditch and redirect it to the river, and this fact seems to have been centrally important to the court's decision. *See id.* at 1290–93. The court did not endorse a more general principle that all regulatory restrictions on water use should be analyzed as physical takings. *See id.* The Federal Circuit later dismissed the case, finding that the plaintiff did not hold a property right to the water it claimed had been taken. Casitas Mun. Water Dist. v. United States, 708 F.3d 1340 (Fed. Cir. 2013).

142. *See* Casitas Mun. Water District v. United States, 76 Fed. Cl. 100, 106 (2007), *rev'd*, 543 F.3d 1276 (Fed. Cir. 2008).

143. *See, e.g.*, CRV Enters., Inc. v. United States, 626 F.3d 1241, 1247–48 (Fed. Cir. 2010) (declining to use a physical takings analysis); Washoe Cnty. v. United States, 319 F.3d 1320, 1326–27 (Fed. Cir. 2003) (also declining to use a physical takings analysis); Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122, 132 (Ct. App. 2006) ("[W]e disagree with *Tulare Lake's* conclusion that the government's imposition of pumping restrictions is no different than an actual physical diversion of water."). For sample academic critiques of the *Tulare Lake* decision, see Benson, *supra* note 29; Gray, *supra* note 29.

144. *See, e.g.*, Patashnik, *supra* note 29, at 404–15; Shepard, *supra* note 33. *See also* Craig, *supra* note 122, at 122 ("[I]f the core property right at issue *is* the right to use . . . any interference with that right to use begins to look more akin to a physical taking.") (footnotes omitted).

145. The Court has been actively involved in takings cases involving water resources. *See, e.g.*, Ark. Game & Fish Comm'n v. United States, 133 S. Ct. 511 (2012) (considering a takings claim arising from temporary but repeated flooding); Stop the Beach Renourishment, Inc. v. Fla. Dep't of Envtl. Prot., 130 S. Ct. 2592 (2010) (considering takings claims involving littoral rights). But the last Supreme Court case to directly address a takings issue involving water allocation was Dugan v. Rank, 372 U.S. 609 (1963).

from basic principles of water law.[146] They argue that water rights are inherently more limited and contingent than ownership interests in land or personal property, and that private use rights must coexist with, and often remain subordinate to, overriding public interests in waterways.[147] Consequently, to an even greater extent than land use rights, water use always remains subject to governmental oversight and control.[148] A smaller group of advocates would take this sort of argument several steps further, and claim that water rights lack key attributes of more traditional property rights and therefore are not constitutional property at all.[149]

The clash among these competing views has profound implications for takings cases involving groundwater regulation. If the *Stop the Beach Renourishment* plurality view becomes the law of the land, and state courts and legislatures effectively lose the ability to revise and update state property law, groundwater law will remain with one foot firmly cemented in the nineteenth century. The gradual movement toward increasing regulatory oversight could largely cease.[150] Similarly, the adoption of a categorical takings test—or even a less-than-categorical test that still involves heightened scrutiny of government actions—for groundwater rights restrictions would severely restrict the application of legal constraints, either existing or new, to groundwater use.[151] Either development would represent a boon to the traditional approach of unrestrained pumping, and a substantial burden to more modern legal approaches predicated upon regulatory balancing and constraint. Conversely, if courts decide that groundwater rights do not qualify as property, takings protection for groundwater use rights would diminish. Whether that would substantially change the level of restrictions on private users is not an easy question to answer; while such an outcome

146. *See generally* Gray, *supra* note 29 (arguing that the nature of water rights makes takings claims less viable than in a land-use context); Leshy, *supra* note 29 (same).

147. *See, e.g.*, Gray, *supra* note 29, at 4. That view does find ample support in surface water case law. *See, e.g.*, United States v. Willow River Power Co., 324 U.S. 499, 509 (1945) (quoting United States v. Chandler-Dunbar Water Power Co., 229 U.S. 53, 69 (1913) ("[T]hat the running water in a great navigable stream is capable of private ownership is inconceivable.")); Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983) (holding that private surface water rights are inherently limited by state public trust authority).

148. *See generally* Gray, *supra* note 29; Leshy, *supra* note 29.

149. *See, e.g.*, Zellmer & Harder, *supra* note 33.

150. *See* JOHN D. ECHEVERRIA, GEORGETOWN ENVTL. LAW & POLICY INST., PROPERTY VALUES AND OREGON MEASURE 37: EXPOSING THE FALSE PREMISE OF REGULATION'S HARM TO LANDOWNERS 5 (2007), *available at* http://www.vermontlaw.edu/Documents/102009propertyValuesAndOregonMeasure37.pdf (finding a pronounced tendency to waive or avoid regulations rather than pay compensation).

151. *See id.*

seems intuitively plausible, other countries that lack takings protection for water users still are often quite solicitous of private water use.[152] But at the very least, that shift would diminish the prevalence of takings claims.[153] Finally, if an intermediate position prevails, takings protection would remain available in rare instances, but almost all instances of groundwater use regulation would not lead to compensation requirements.

II. GROUNDWATER, TAKINGS, AND THE COURTS

In 1994, R. Burrell Day and Joel McDaniel bought 381.4 acres of agricultural land in Texas.[154] The Edwards Aquifer lies beneath their property, and Day and McDaniel hoped to tap the aquifer to irrigate oats, peanuts, and pastures.[155] However, to continue to use water from their one well, which was partially defunct, or to replace it with a new one, they needed authorization from the Edwards Aquifer Authority.[156] They applied for, and received, authorization for pumping, but they did not get nearly as much water as they wanted. The Edwards Aquifer Authority's permitting scheme favors users who were pumping prior to implementation of the Edwards Aquifer Authority Act, and Day and McDaniel did not fit into that category.[157] Consequently, their permit came with what they viewed as severe restrictions on the amount of groundwater they could pump.[158] Day and McDaniel sued, alleging a taking.[159] The litigation has not yet produced a final judgment. But in a February 2012 decision, the Texas Supreme Court concluded that Day and McDaniel have property rights in the water beneath their land, even prior to pumping, and that a regulatory scheme that limits the exercise of those rights could effect a taking.[160] Many property rights advocates and rural water users celebrated the

152. For example, New Zealand does not provide takings protection to water users, but the absence of such protection has not prevented aggressive industrial and agricultural exploitation of New Zealand's waterways. *See* WATER PROGRAMME OF ACTION INTER-DEPARTMENTAL WORKING GRP., N.Z. MINISTRY OF ENV'T, FRESHWATER FOR A SUSTAINABLE FUTURE: ISSUES AND OPTIONS 12–14 (2004) (describing New Zealand's system of "resource consents," which permit water use without creating ownership rights, as well as the demands placed upon New Zealand's waterways).

153. They probably would not disappear, for plaintiffs still could argue that restrictions on groundwater use effectively took their land. *See, e.g.*, Pratt Constr. Co. v. Cal. Coastal Comm'n, 76 Cal. Rptr. 3d 466 (Cal. Ct. App. 2008) (raising such a claim).

154. Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 818 (Tex. 2012).

155. *Id.*

156. *Id.* at 818–19.

157. *Id.* at 818–21 ("With few exceptions, water may not be withdrawn from the aquifer through wells drilled after June 1, 1993.") (footnote omitted).

158. *Id.* at 820–21.

159. *Id.* at 821.

160. *Id.* at 843 ("[A] landowner cannot be deprived of all beneficial use of the groundwater below his property merely because he did not use it during an historical period and supply is limited.").

decision as a landmark victory, while environmentalists and government water managers warned of a grave threat to sustainable groundwater use.[161]

Day is probably the nation's most prominent groundwater/takings case, and it already has begun to receive academic attention.[162] But it is not the only one. Over the past century, state and federal courts have decided at least[163] fifty cases involving alleged takings of groundwater.[164] This

161. *See, e.g.*, Mose Buchele, *What the State Supreme Court Ruling on Water Rights Means for Texas*, STATEIMPACT (Feb. 24, 2012, 3:01 PM), http://stateimpact.npr.org/texas/2012/02/24/what-does-the-supreme-court-ruling-on-water-rights-mean/; Bruce Wright, *A Victory for Property Rights: Texas Court Decision Affirms Right to Water*, FISCAL NOTES (May 7, 2012), http://www.window.state.tx.us/comptrol/fnotes/fn1204/water-rights.php; Gabriel Eckstein, *Texas Water Flowing Above Ground is Public but Below It's Private*, STAR-TELEGRAM (Mar. 10, 2012), http://www.star-telegram.com (archives access requires password) ("[T]he court has effectively undermined and jeopardized the state's ability to respond to water shortages and plan for its future.").

162. *See* Torres, *supra* note 29. The case already has begun appearing in water law casebooks. *See, e.g.*, THOMPSON ET AL., *supra* note 24, at 498–505.

163. This number includes only decisions available on Lexis or Westlaw's databases. Because not every case produces a decision, and because not every decision is published on Lexis and Westlaw, the total number of cases is probably higher. Nevertheless, a search of popular media databases did not reveal any additional cases.

164. *See* Hensley v. City of Columbus, 557 F.3d 693 (6th Cir. 2009); Washoe Cnty. v. United States, 319 F.3d 1320 (Fed Cir. 2003); Sierra Nevada SW Enters. v. King, No. 3:10-CV-579-RCJ-RAM, 2011 WL 3204737 (D. Nev. July 27, 2011); Bragg v. Edwards Aquifer Auth., No. SA-06-CV-1129-XR, 2008 U.S. Dist. LEXIS 23380 (W.D. Tex. Mar. 25, 2008); Coates v. Hall, 512 F. Supp. 2d 770 (W.D. Tex. 2007); Williamson v. Guadalupe Cnty. Groundwater Conservation Dist., 343 F. Supp. 2d 580, 598–99 (W.D. Tex. 2004); Knaust v. City of Kingston, 193 F. Supp. 2d 536 (N.D.N.Y. 2002); Fallini v. Hodel, 725 F. Supp. 1113, 1122–24 (D. Nev. 1989), *aff'd on other grounds*, Fallini v. Hodel, 963 F.2d 275 (9th Cir. 1992); Cherry v. Steiner, 543 F. Supp. 1270, 1277–78 (D. Ariz. 1982); Walker v. United States, 79 Fed. Cl. 685, 706–07 (2008); Fallini v. United States, 31 Fed. Cl. 53 (1994), *judgment vacated and remanded by* Fallini v. United States, 56 F.3d 1378 (Fed. Cir. 1995); Jensen v. United States, 17 Cl. Ct. 583 (1989); *In re* Gen. Adjudication of All Rights to Use Water in the Gila River Sys. and Source, 9 P.3d 1069, 1083 (Ariz. 2000); Town of Chino Valley v. City of Prescott, 638 P.2d 1324, 1326–30 (Ariz. 1981); Town of Chino Valley v. State Land Dep't, 580 P.2d 704, 705–07 (Ariz. 1978); Sw. Eng'g Co. v. Ernst, 291 P.2d 764, 768–70 (Ariz. 1955); Aikins v. Ariz. Dep't of Water Res., 743 P.2d 946, 951 (Ariz. Ct. App. 1987); Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122 (Ct. App. 2006); Acosta v. Big Bear Cmty. Servs. Dist., 2004 Cal. App. Unpub. LEXIS 2253 (Ct. App. Mar. 10, 2004); Kobobel v. State Dep't of Natural Res., 249 P.3d 1127 (Colo. 2011) (en banc); Cent. Colo. Water Conservancy Dist. v. Simpson, 877 P.2d 335, 347–48 (Colo. 1994); Vill. of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663 (Fla. 1979); *In re* Water Use Permit Applications, 9 P.3d 409, 492–95 (Haw. 2000); City Mill Co. v. Honolulu Sewer & Water Comm'n, 30 Haw. 912, 916–17 (1929); Natural Res. Comm'n of Ind. v. AMAX Coal Co., 638 N.E.2d 418, 429 (Ind. 1994); F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164 (Kan. 1981); Williams v. City of Wichita, 374 P.2d 578 (Kan. 1962); Md. Aggregates Ass'n v. State, 655 A.2d 886, 899-900 (Md. 1995); City of Gaylord v. Maple Manor Invs., L.L.C., No. 266954, 2006 WL 2270494 (Mich. Ct. App. Aug. 8, 2006); Jones v. East Lansing-Meridian Water & Sewer Auth., 296 N.W.2d 202 (Mich. Ct. App. 1980); Crookston Cattle Co. v. Minn. Dep't of Natural Res., 300 N.W.2d 769, 774–75 (Minn. 1980); Bamford v. Upper Republican Natural Res. Dist., 512 N.W.2d 642, 651–52 (Neb. 1994); *In re* Town of Nottingham, 904 A.2d 582 (N.H. 2006); Bounds v. State, 252 P.3d 708 (N.M. Ct. App. 2010), *aff'd on other grounds by* Bounds v. State *ex rel.* D'Antonio, 306 P.3d 457 (N.M. 2013); Baeth v. Hoisveen, 157 N.W.2d 728 (N.D. 1968); McNamara v. City of Rittman, 838 N.E.2d. 640 (Ohio 2005); Smith v. Summit Cnty.,

section reviews those cases.[165] It begins by providing a general description of the case law, focusing on when and where the cases have arisen and what sort of claims they involve. It then turns to an analysis of reasoning and outcomes. That discussion supports several important conclusions, each of which sheds light on ongoing debates about the proper application of takings doctrine to groundwater, and on larger discussions about the implications of takings doctrine for water rights.

A. The Increasing Frequency of Groundwater/Takings Cases

Groundwater/takings litigation is a growing phenomenon. Over the past sixty years, every decade has brought at least as many published groundwater/takings decisions as the decade before. The current decade is on pace to continue that trend. The overall numbers remain modest—fifty cases is by no means an avalanche of litigation—but with increasing stress on water resources and continued emphasis on property rights litigation, there is little reason to expect the growth to cease.

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721 N.E.2d 482 (Ohio Ct. App. 1998); State *ex. rel.* Hensley v. City of Columbus, No. 10AP-840, 2011 WL 2586353 (Ohio Ct. App. June 30, 2011); Jacobs Ranch, L.L.C. v. Smith, 148 P.3d 842 (Okla. 2006); Knight v. Grimes, 127 N.W.2d 708, 711 (S.D. 1964); Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012); Barshop v. Medina Cnty. Underground Water Conservation Dist., 925 S.W.2d 618 (Tex. 1996); Edwards Aquifer Auth. v. Bragg, No. 04-11-00018-CV, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013); Edwards Aquifer Auth. v. Horton, No. 04-09-00375-CV, 2010 Tex. App. LEXIS 736 (Feb. 3, 1010); Bingham v. Roosevelt City Corp., 235 P.3d 730 (Utah 2010); Weber Basin Water Conservancy Dist. v. Gailey, 328 P.2d 175 (Utah 1958); Peterson v. Dep't of Ecology, 596 P.2d 285 (Wash. 1979); Bostco LLC v. Milwaukee Metro. Sewerage Dist., 835 N.W.2d 160 (Wis. 2013); Lesaffre Yeast Corp. v. Milwaukee Metro. Sewerage Dist., 662 N.W.2d 678 (Wis. Ct. App. 2003) (unpublished).

165. The list of cases comes with a few additional caveats. First, I included cases where plaintiffs sought to enjoin some government action because it allegedly would cause a taking as well as cases where plaintiffs sought damages for alleged takings. Second, the boundaries of the set are not all crisp. In some older cases, courts mixed takings and due process arguments, and the cases' status as groundwater/takings decisions is ambiguous. *See, e.g.*, F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164, 1167, 1174 (Kan. 1981) (describing a complaint grounded exclusively in the equal protection provision of the Kansas Constitution, but ruling for the government defendant because "[t]he statute does not effect an unconstitutional taking of property"). More recent cases sometimes are ambiguous about whether the case concerns an alleged taking of groundwater use rights or whether groundwater regulation or protection was just a factor contributing to actions that allegedly took land use or surface water rights. *See, e.g.*, Bingham v. Roosevelt City Corp., 235 P.3d 730 (Utah 2010) (rejecting a claim alleging a taking of surface water and land use rights but premised on the diversion of groundwater from beneath the plaintiffs' land); Charles A. Pratt Constr. Co. v. Cal. Coastal Comm'n, 76 Cal. Rptr. 3d 466 (Cal. Ct. App. 2008) (denying a takings claim based on land use restrictions partially motivated by the unavailability of groundwater). For that reason, another researcher compiling a similar list might include a few more or less decisions. The differences, however, would likely be small.

TABLE 1: GROUNDWATER/TAKINGS CASES BY DECADE

Pre–1960	1960–69	1970–79	1980–89	1990–99	2000–09	2010–13
3	3	3	8	8	16	9

Those cases also arise from all over the country.[166] Not surprisingly, most come from relatively arid states, where water litigation traditionally has more of a prominent role. But cases arising out of relatively well-watered Midwestern and eastern states show that the emergence of groundwater/takings litigation represents a national trend.

TABLE 2: GROUNDWATER/TAKINGS CASES BY STATE OF ORIGIN

# Cases	1	2	3	4	5	6	7
State	Florida Indiana Maryland Minnesota Nebraska New Hampshire New York North Dakota Oklahoma South Dakota	California Colorado Hawaii Kansas Michigan New Mexico Utah Washington Wisconsin	none	Ohio	Nevada	Arizona	Texas

While the cases have arisen from a wide variety of fact patterns, two particular types of claims dominate the field. First, eighteen of the cases involve as-applied challenges to restrictions on a particular landowner's groundwater use.[167] *Day* typifies this type of litigation.[168] Second, nine of the cases challenge states' attempts to change groundwater laws. Typical of this second category is *Barshop v. Medina County Underground Water Conservation District*, another Texas case involving a facial challenge to the Edwards Aquifer Authority Act.[169] The remaining cases involve a wide

166. Because of the small sample size, one probably should not draw too many conclusions from the numbers from specific states. The relatively high number of Nevada cases, for example, may simply reflect a few litigious years for the Fallini family rather than some distinctive attribute of Nevada's law or hydrology. *See Fallini*, 725 F. Supp. 1113; *Fallini*, 31 Fed. Cl. 53; *Fallini*, 56 F.3d 1378. Similarly, three of the four Ohio decisions emerged from the same underlying dispute.

167. *See, e.g.*, *Allegretti & Co.*, 42 Cal. Rptr. 3d at 126–27 (describing how the case arose out of a dispute over a permit application for a new well).

168. 369 S.W.3d 814, 818 (Tex. 2012).

169. 925 S.W.2d 618 (Tex. 1996); *see also* Baeth v. Hoisveen, 157 N.W.2d 728 (N.D. 1968) (challenging North Dakota's establishment of a prior appropriation regime and declaration that

variety of circumstances. In a few, groundwater users sought compensation after government activities—construction projects, for example—allegedly depleted or polluted their aquifers.[170] In others, plaintiffs challenged restrictions on their ability to prevent wildlife from drinking pumped groundwater.[171] Nevertheless, across the field of cases, the most frequently recurring questions concern governments' ability to change groundwater law and to restrict individuals' groundwater use.

B. Key Lessons from the Cases

While the geographic distribution and growing number of groundwater/takings cases are both intriguing, the more important lessons from the cases arise from their reasoning and outcomes. Below, I describe several of the central themes.

1. Groundwater Use Rights as Property

One of the first lessons from the cases involves the status of groundwater use rights as constitutional property. In the American legal tradition, and particularly in the American west, water rights are commonly thought of as a subspecies of property rights, and lawyers commonly believe—or sometimes simply assume—that those rights are subject to constitutional protection.[172] Nevertheless, in recent years, a few commentators have questioned that assumption.[173] They raise a mix of assertions, arguing both that water rights are not uniformly established as constitutional property and that constitutionalized water rights are

groundwater not previously appropriated was state property); Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964) (challenging a similar change in South Dakota).

170. *See, e.g.*, Hensley v. City of Columbus, 557 F.3d 693, 695 (6th Cir. 2009) (alleging a taking after the city constructed a sewer pipeline, allegedly causing nearby wells to run dry); *In re* Town of Nottingham, 904 A.2d 582, 591–92 (N.H. 2006) (taking alleged by landowners after the state granted a groundwater withdrawal permit to a water bottling company); Knaust v. City of Kingston, 193 F. Supp. 2d 536, 539 (N.D.N.Y. 2002) (claiming a taking where stormwater runoff from an adjacent parcel allegedly contaminated groundwater beneath the plaintiffs' land).

171. *See, e.g.*, Fallini v. Hodel, 725 F. Supp. 1113, 1122–24 (D. Nev. 1989), *aff'd on other grounds*, Fallini v. Hodel, 963 F.2d 275 (9th Cir. 1992) (holding that such a restriction would effect a regulatory taking and therefore was invalid).

172. *See* Sax, *supra* note 29, at 260 ("Water rights *are* property.") (emphasis in original). My own past thinking exemplifies these assumptions. I drafted Imperial County's briefs in the *Allegretti & Co.* appellate litigation, but it never occurred to me to argue that Allegretti lacked any constitutionally protected right to use groundwater (we did argue that the right was less extensive than Allegretti claimed), even though that argument, if successful, would have won the case for my client.

173. *See, e.g.*, Zellmer & Harder, *supra* note 33, at 741 ("[A]ppropriators possess a right to preclude other appropriators from using water, as well as a procedural due process right against capricious government action, but this is not a full private property right entitled to compensation for a regulatory taking."); Saxer, *supra* note 33.

unjustified in theory and harmful in practice.[174] Similar claims sometimes emerge in litigators' briefs. In the *Day* litigation, for example, some amici argued that constitutionalizing a property right to in situ groundwater would sound the death knell for sensible regulation.[175] That view also finds some support from comparisons with the laws of other countries. Many have effectively rejected regulatory takings protection for groundwater use rights, or for property rights more generally, without losing their ability to support advanced resource-based and industrial economies.[176]

Nevertheless, the American groundwater/takings cases provide little support for arguments against treating water rights as constitutional property. Many cases clearly state that groundwater use rights qualify as constitutional property and are protected by the takings doctrine.[177] *Day* exemplifies these cases, as does *McNamara v. City of Rittman*, a recent Ohio Supreme Court case.[178] There, the court unequivocally concluded, "Ohio recognizes that landowners have a property interest in the groundwater underlying their land and that governmental interference with

174. Zellmer and Harder begin by emphasizing decisions suggesting some continued ambiguity about the constitutional status of water rights, and then conclude, based on a web-of-interests metaphor, that water rights should not receive constitutional protection. Zellmer & Harder, *supra* note 33, at 732–41. Saxer's argument is both doctrinal and functional. She cites the many traditional legal restrictions on water rights and the practical need to protect public interests in water as reasons against treating water rights as traditional property. *See generally* Saxer, *supra* note 33.

175. *See, e.g.*, Amicus Curiae Brief of Angela Garcia and Environmental Defense Fund at 9, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (No. 08-0964) ("[G]roundwater conservation districts, and particularly the EAA, would be rendered unworkable."). Similar rhetoric has accompanied groundwater litigation in other states. *See, e.g.*, Fiona Smith, *Courts Tackle Water Ownership: A Sacramento County Case Could Determine if River is 'Real Property'*, S.F. DAILY J., Aug. 2, 2011, at 1 (quoting an environmental attorney's warning that "[i]f water became real property, then potentially any limitation or control on the use of water for the public good would become a compensable taking").

176. *See* GREGORY S. ALEXANDER, THE GLOBAL DEBATE OVER CONSTITUTIONAL PROPERTY: LESSONS FOR AMERICAN TAKINGS JURISPRUDENCE 139–47 (2006) (discussing groundwater use litigation in Germany); Dr. Bryan P. Schwartz & Melanie R. Bueckert, *Regulatory Takings in Canada*, 5 WASH. U. GLOBAL STUD. L. REV. 477, 477 ("[P]roperty rights receive minimal protection under Canadian law."); Kevin Guerin, *Protection Against Government Takings: Compensation for Regulation?* 16–17 (New Zealand Treasury, Working Paper No. 02/18, 2002), *available at* http://www.treasury.govt.nz/publications/research-policy/wp/2002/02-18/twp02-18.pdf (discussing New Zealand's approach, which leaves compensation to the discretion of the legislature).

177. *See, e.g.*, City of San Bernardino v. City of Riverside, 198 P. 784, 792 (Cal. 1921) ("The water in all these lands, therefore, is private property, and will remain private property until it is taken from the owners of the land and devoted to public use."); Williams v. City of Wichita, 374 P.2d 578, 594 (Kan. 1962) ("The privilege of using water is unquestionably an element of the value of the land. To take away that right might be tantamount in a semi-arid country to confiscation of property."); City of Gaylord v. Maple Manor Invs., L.L.C., No. 266954, 2006 WL 2270494, at *3 (Mich. Ct. App. Aug. 8, 2006) ("We agree that the right to use groundwater is a valuable property right.").

178. McNamara v. City of Rittman, 838 N.E.2d 640, 643 (Ohio 2005).

that right can constitute an unconstitutional taking."[179] A few cases do not address the issue, some address it ambiguously,[180] and some have stressed that the constitutional protection for water rights is weak.[181] But I found only one decision that clearly rejected the idea of a property right in groundwater. In *Village of Tequesta v. Jupiter Inlet Corp.*, a 1979 decision, the Florida Supreme Court concluded a discussion of groundwater rights with the emphatic statement that "[t]his 'right to use' is not 'private property' as contemplated by article X, section 6, [of the] Florida Constitution requiring full compensation before taking for a public purpose."[182] That statement is entirely consistent with conceptions of water rights as sub-constitutional property. But within American groundwater jurisprudence, that statement also is unique.

Of course, even if groundwater use rights traditionally count as property rights, not every takings plaintiff will have a valid claim to hold such rights. In some states, the underlying right extends only to reasonable uses on overlying land, or to a reasonable share of the resource, and a plaintiff whose use exceeds those constraints lacks a colorable claim to own the property that forms the basis for her takings claim.[183] Similarly, in

179. *Id.*

180. *See, e.g.*, Spear T Ranch, Inc. v. Knaub, 691 N.W.2d 116, 127 (Neb. 2005) ("A right to appropriate surface water however, is not an ownership of property. Instead, the water is viewed as a public want and the appropriation is a right to use the water."). While this language seems consistent with the idea that water rights are not property at all, it also is consistent with the idea—which is present in most states' systems of water law—that constitutionally protected property interests in water exist, but those interests take the form of use rights rather than of direct ownership of the physical water. *See, e.g.*, Eddy v. Simpson, 3 Cal. 249, 252 (1853) ("It is laid down by our law writers, that the right of property in water is *usufructuary*, and consists not so much of the fluid itself as the advantage of its use.") (emphasis in original).

181. *See, e.g.*, *In re* Water Use Permit Applications, 9 P.3d 409, 493 (Haw. 2000) ("Usufructuary water rights, in sum, 'have always been incomplete property rights . . . .'") (quoting A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES 3-153 (2000)). One federal court decision from Arizona appears to conclude, albeit with some ambiguity, that Arizona landowners lack any constitutionally protected interest in the groundwater beneath their lands. *See* Cherry v. Steiner, 543 F. Supp. 1270, 1277 (D. Ariz. 1982) ("The only interpretation of Arizona law open to this Court is that a landowner has no interest in underlying groundwater prior to its capture.") *aff'd*, 716 F.2d 687 (9th Cir. 1983). But the Arizona case upon which this federal decision relied did not go quite that far. *See* Town of Chino Valley v. City of Prescott, 638 P.2d 1324 (Ariz. 1982). *Prescott* held (1) that overlying landowners did not have vested ownership of the physical water beneath their lands, and instead only held usufructuary rights to use that water; and (2) that those usufructuary rights were appropriately subject to regulation. *Id.* at 1328–29. That is not the same as holding that landowners had no constitutionally protected water right at all. A usufructuary right can be a constitutionally protected property right, and under American takings doctrine, most, if not all, constitutionally protected property rights are subject to regulation. Consequently, *Prescott* does not actually state the categorical rule that *Cherry* appears to have extracted from it.

182. 371 So. 2d 663, 670 (Fla. 1979).

183. *See* THOMPSON ET AL., *supra* note 24, at 467–85 (describing groundwater management doctrines). The presence of such "reasonable use" limitations provides an additional reason why takings claims in those jurisdictions should rarely prevail. Government restrictions will usually involve

western states that have integrated groundwater use rights into their prior appropriation systems, an overlying landowner may not have any property interest in the use of groundwater beneath his land, and a junior appropriator has no property right to uses that interfere with his seniors.[184] Consequently, a key litigation issue in several groundwater/takings cases has been whether the plaintiff actually owns the allegedly taken property.[185] But even when courts have answered that question in the negative, they generally have done so because that particular plaintiff lacked a property interest, not because the state excludes groundwater use rights from the realm of property.[186]

Obviously that finding is not fatal to the normative or theoretical arguments against constitutionalizing groundwater rights, or water rights more generally. Sometimes historical practices are misguided, and sometimes precedent should be overturned.[187] But the prevalence of constitutionally protected groundwater rights nevertheless creates two challenges for arguments against treating water rights as property. First, while sometimes property law traditions merely reflect the unjust power dynamics of an earlier age, on many other occasions they do reflect received wisdom and traditions born of experience.[188] Second, stability in property law, as in most areas of law, is valuable in its own right; change can disrupt expectations and plans.[189] For both of those reasons, the

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trying to strike a reasonable balance among competing uses. But, as discussed in more detail below and in Part III, there is little basis for granting groundwater use rights heightened takings protection even in jurisdictions that do not include a reasonable use element in their system of groundwater rights.

184. *See* THOMPSON ET AL., *supra* note 24, at 485–87 (describing the application of prior appropriation doctrine to groundwater).

185. *See, e.g.*, Baeth v. Hoisveen, 157 N.W.2d 728, 731–34 (N.D. 1968) (rejecting a constitutional challenge to state laws because the challenger lacked a vested right to groundwater beneath his land); *see also* Sierra Nevada SW Enters. v. King, No. 3:10-CV-579-RCJ-RAM, 2011 WL 3204737, at *10 (D. Nev. July 27, 2011) ("[T]he Court dismisses Plaintiff's takings claim because there is no taking for the denial of a permit for the approval of stand-alone water rights where such approval would be in derogation of other prior appropriated rights."); Kobobel v. State Dep't of Natural Res., 249 P.3d 1127, 1133–38 (Colo. 2011) (en banc) (rejecting a takings claim because the groundwater users lacked any property right to pump where that pumping would interfere with the rights of more senior appropriators).

186. *See, e.g.*, *Kobobel*, 249 P.3d. at 1137 n.9 ("[I]t is possible to assert a valid takings claim in a water rights context."); *Sierra Nevada S.W. Enterprises*, 2011 WL 3204737, at *10 ("Plaintiff does have a property right in his appropriated water rights.").

187. Historic laws allowing people to hold other people as property, whether as slaves or through marriage, provide obvious examples.

188. For example, many of our most commonplace property rights, like fee simple ownership or leaseholds, reflect a shared understanding that some certainty and transferability in property rights can facilitate individual security and economic growth.

189. *See* Carol M. Rose, *Property and Expropriation: Themes and Variations in American Law*, 2000 UTAH L. REV. 1, 2 ("There is a longstanding and very powerful argument that the stability of

prevalence of a legal practice therefore should create a presumption—albeit a weak and rebuttable one—that continuing the practice makes some sense.

2. Deference to Regulatory Authority

The tradition of treating water rights as constitutional property also allows us to consider whether the perceived dangers of constitutionally protected water rights have come to fruition. Among the commentators and litigants who have argued against constitutionalizing water rights, the primary fear has been that constitutional protection of water rights will inevitably lead to severe restrictions on governments' ability to regulate those rights. As one environmental group's amicus brief in the *Day* litigation direly put it, "[i]f this theory were to prevail in this Court, groundwater conservation in Texas would be finished."[190] In the *Day* litigation, those warnings led, somewhat ironically, to a counterargument from the plaintiffs' supporting amici, some of whom took pains to explain that property rights can be and routinely are subject to extensive regulatory oversight.[191] But in the broader property rights debate, the environmentalists' fears are almost exactly concordant with property rights advocates' hopes. For most property rights advocates, constitutional property rights are a means to anti-regulatory ends.[192] That debate raises the question: have past courts' treatment of groundwater use rights as constitutional property led to doctrinal restrictions on groundwater regulation?

There is little evidence that they have. In the pool of decisions available on Lexis and Westlaw, government defendants have done quite well, winning the vast majority of the cases.[193] Even where government

property is essential to economic well-being.").

190. Post-Submission Amicus Brief of the Texas Alliance of Groundwater Districts at 1, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (No. 08-0964).

191. *See, e.g.*, Brief of *Amicus Curiae* Mesa Water, L.P. at 26, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (No. 08-0964) ("But the fact remains that regulation and ownership are not mutually exclusive.").

192. *See* CHARLES FRIED, ORDER AND LAW: ARGUING THE REAGAN REVOLUTION—A FIRSTHAND ACCOUNT 183 (1991) (explaining how conservative activists hoped "to use the Takings Clause of the Fifth Amendment as a severe brake upon federal and state regulation of business and property"); Eduardo Moisès Peñalver, *Is Land Special? The Unjustified Preference for Landownership in Regulatory Takings Law*, 31 ECOLOGY L.Q. 227, 282 (2004) (discussing the close relationship between the property-rights movement and opposition to environmental regulation).

193. Government defendants lost the following cases: Williamson v. Guadalupe Cnty. Groundwater Conservation Dist., 343 F. Supp. 2d 580, 598–99 (W.D. Tex. 2004) (holding that the case was ripe, and denying a motion to dismiss); Fallini v. Hodel, 725 F. Supp. 1113 (D. Nev. 1989), *aff'd on other grounds*, Fallini v. Hodel, 963 F.2d 275 (9th Cir. 1992); City Mill Co. v. Honolulu Sewer & Water Comm'n, 30 Haw. 912, 947 (Haw. 1929); Jones v. East Lansing-Meridian Water &

defendants have lost, the loss has often been on a motion to dismiss or for summary judgment, and the case has continued onward.[194] Only four courts have found a taking.[195] In two of these cases, the court did not order payment of damages,[196] and in one controversy, a subsequent damages claim failed.[197] Only in *Bragg v. Edwards Aquifer Authority*, the most recent case out of Texas, has a court found a taking and concluded that compensation should be paid.[198] Case outcomes cannot reveal all the ways in which constitutionalized water rights are affecting water management, for fears of takings claims may affect regulatory approaches even if few takings claims actually prevail.[199] Nevertheless, case outcomes do offer at least some evidence of actual practices, and these outcomes therefore provide ample reason to think that constitutionalized groundwater rights can coexist with robust government regulation.

The reasoning of the decisions also supplies ample support for government regulatory authority. In decision after decision, courts have explained, often in great detail, the essential importance of groundwater

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Sewer Auth., 296 N.W.2d 202 (Mich. Ct. App. 1980); McNamara v. City of Rittman, 838 N.E.2d 640 (Ohio 2005) (finding that plaintiffs had a property interest in subterranean groundwater); Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (finding an ownership interest in subterranean groundwater); Edwards Aquifer Auth. v. Bragg, No. 04-11-00018-CV, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013) (finding a taking); and Lesaffre Yeast Corp. v. Milwaukee Metro. Sewerage Dist., 662 N.W.2d 678 (Wis. 2003) (unpublished opinion reversing summary judgment in favor of the government defendant).

194. *See, e.g.*, *Williamson*, 343 F. Supp. 2d at 598–99 (holding that the case was ripe, and denying a motion to dismiss); *McNamara*, 838 N.E. 2d. 640 (finding that plaintiffs had a property interest in subterranean groundwater); *Day*, 369 S.W.3d 814 (finding an ownership interest in subterranean groundwater); *Lesaffre Yeast Corp*., 662 N.W.2d 678 (unpublished opinion reversing summary judgment in favor of the government defendant)

195. *See Fallini*, 725 F. Supp. at 1113; *Bragg*, 2013 Tex. App. LEXIS 10838; *City Mill Co*., 30 Haw. at 947; *Jones*, 296 N.W.2d at 202. *Fallini* involved restrictions on a rancher's ability to keep wild animals from drinking from groundwater-fed troughs. The court held that the restrictions were arbitrary and capricious in part because they would create a taking. In *City Mill Co.*, the court set aside a restriction on new well construction, reasoning that to prohibit new construction while allowing continuation of existing pumping would take property rights. In *Jones*, the plaintiffs argued, successfully, that the defendant authority had taken their rights by pumping in excess of its own rights.

196. In *Jones*, the court did remand for determination of damages. 296 N.W.2d at 205. However, Jones involved government acting as a competing consumptive user of groundwater, not as a regulator. *Id.*

197. *See* Fallini v. United States, 31 Fed. Cl. 53 (1994), *vacated and remanded by* Fallini v. United States, 56 F.3d 1378 (Fed. Cir. 1995).

198. 2013 Tex. App. LEXIS 10838.

199. *See* ECHEVERRIA, *supra* note 150, at 5 (noting a tendency to react to potential takings claims by waiving regulations).

use regulation. For example, in *Southwest Engineering Co. v. Ernst*,[200] the Arizona Supreme Court observed:

> The supply of ground water within the territorial boundaries of the state, or any particular groundwater basin therein, is not unlimited and even though in some instances the limits thereof may be difficult to apprehend, ultimately and inevitably at one time or another it will become necessary to restrict the use merely because the available users and uses exceed the available supply.[201]

Similarly, in *Bamford v. Upper Republican Natural Resources District*,[202] the Nebraska Supreme Court succinctly summarized the prevailing view when it concluded "placing limitations upon withdrawals of ground water in times of shortage is a proper exercise of the State's police power."[203] Neither statement is at all exceptional.

In accordance with that view, courts have often affirmed the ability of state legislatures and local governments to change state groundwater law, even where the changes effectively infringe rights that previously were unlimited. That affirmation comes from old and new cases, from relatively conservative and relatively liberal states, and from states with all sorts of common-law groundwater doctrines.[204] For example, the Oklahoma Supreme Court recently rejected a challenge to regulatory legislation imposing new limits on groundwater use. It premised its decision largely on "[t]he general rule . . . that the Legislature may restrict the use and enjoyment of the state's water resources by exercise of its police power for the preservation of the public health, safety and welfare without compensating the property owner."[205] In *Ernst*, the 1955 Arizona Supreme Court case quoted above, the court stressed the same point, stating: "We do not doubt that it is the proper sphere of the legislature, in the interest of the general welfare, to say when that time [for groundwater use

200. 291 P.2d 764 (Ariz. 1955). *Ernst* involved a challenge to state laws that restricted the drilling of new wells in areas with groundwater shortages. *Id.*

201. *Id.* at 770. *See also* F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164, 1174 (Kan. 1981) (describing how demands placed upon the Ogallala Aquifer justify legislative intervention).

202. 512 N.W.2d 642 (Neb. 1994). *Bamford* involved a challenge to a water district's cease and desist order; the order had prohibited pumping from nine wells located within a "control area." *Id.*

203. *Id.* at 652.

204. *See, e.g.*, *In re* Water Use Permit Applications, 9 P.3d 409, 492–95 (Haw. 2000) (noting that such transitions have been found constitutional in many states); Natural Res. Comm'n v. Amax Coal Co., 638 N.E.2d 418, 429 (Ind. 1994) ("The State can regulate the use of property without destroying rights in that property."); City of Gaylord v. Maple Manor Invs., L.L.C., No. 266954, 2006 WL 2270494, at *3 (Mich. Ct. App. Aug. 8, 2006) (acknowledging that groundwater use rights are property rights, but adding: "we do not agree that home rule cities lack the authority to enact ordinances that affect property rights").

205. Jacobs Ranch, L.L.C. v. Smith, 148 P.3d 842, 855 (Okla. 2006) (emphasis omitted).

restrictions] has arrived . . . ."[206] Again, neither statement is anomalous.[207] Moreover, a contrary narrative, in which groundwater use regulation represents government run amok, makes rare appearances in groundwater decisions almost exclusively in dissents.[208]

Finally, the cases have either ignored or affirmatively rejected modes of takings analysis that would drastically limit governmental regulatory authority. The most prominent example of this rejection involves arguments that water use restrictions should be analyzed as potential physical takings. Those arguments have emerged most prominently in cases involving surface waters, and, as discussed above, they gained a narrow foothold in two recent decisions, one from the Federal Court of Claims and the other from the Federal Circuit.[209] Building on those successes, plaintiffs in groundwater/takings cases have argued that a physical takings analysis is the traditional and appropriate method for analyzing a regulatory restriction on groundwater use.[210] But they have never succeeded. In the full set of regulatory groundwater/takings cases available on Lexis and Westlaw, not one has used a physical takings analysis, or has endorsed any other sort of categorical takings test.[211] The cases that have addressed the issue have squarely rejected that approach.[212]

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206. Sw. Eng'g Co. v. Ernst, 291 P.2d 764, 770 (Ariz. 1955).

207. *See, e.g.*, Williams v. City of Wichita, 374 P.2d 578, 589 (Kan. 1962) (affirming "the basic power of the legislature to modify and change common-law rules with respect to water usage").

208. *See, e.g.*, *id.* at 596 (Schroeder, J., dissenting) ("If such *arbitrary* exercise of the *police power* of the state withstands the federal constitutional test of due process, the formula has been found, and the precedent is established, by which all private property within Kansas may be *communized* without cost to the state.") (emphasis in original); F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164, 1175 (Kan. 1981) (Schroeder, J., dissenting) ("Application of this rule under the Act for the purported purpose of preventing waste and conserving natural resources is, of course, nothing more than a redistribution of the wealth to the favored few after the initial confiscation of the landowner's vested rights to his property.").

209. *See supra* text accompanying notes 137–41 (discussing Tulare Lake Basin Water Storage Dist. v. United States, 49 Fed. Cl. 313 (2001), and Casitas Mun. Water Dist. v. United States, 543 F.3d 1276 (Fed. Cir. 2008)); *but see* CRV Enters., Inc. v. United States, 626 F.3d 1241, 1246–48 (Fed. Cir. 2010) (holding that a water use restriction did not qualify as a physical taking).

210. *See, e.g.*, Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122, 125, 129 (Ct. App. 2006); Brief Amicus Curiae of Pacific Legal Foundation in Support of Petitioners and Respondents Burrell Day and Joel McDaniel at 22–24, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (No. 08-0964).

211. In Lesaffre Yeast Corp. v. Milwaukee Metro. Sewerage Dist., 662 N.W.2d 678 (Wis. Ct. App. 2003) (unpublished opinion), a Wisconsin appellate court concluded that a plaintiffs claim should have been analyzed as a potential physical takings claim. *Id.* at *3. That case did not involve regulatory activity, however. The defendant government entity had allegedly contaminated the plaintiffs' groundwater by building a tunnel. *Id.* at *1.

212. *See* Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 839 (Tex. 2012) ("The first category—involving a physical invasion of property—does not apply to the present case."); Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122, 130–31 (Ct. App. 2006) ("County's action with respect to

The traditional judicial approach therefore creates challenges for those arguing that water rights should be categorically excluded from, or categorically favored in, takings law.[213] On the one hand, the cases show that constitutionalized property and regulation are compatible.[214] That should not be particularly surprising, for the status of land as constitutional property and the authority of government to regulate land use both have been largely beyond dispute throughout our nation's history.[215] The groundwater cases simply show that the same balancing act is possible—and, indeed, traditional—for water.[216] On the other hand, the cases demonstrate the absence of any historical basis or judicial precedent for analyzing regulatory restrictions on groundwater use as potential physical takings, or under any other sort of test that provides groundwater rights with more protection than other forms of property. Groundwater cases have presented courts with dozens of opportunities to take those approaches, and in the pool of decisions available on Lexis and Westlaw, the courts have uniformly declined them.[217]

Nevertheless, relative consistency of past practices does not ensure that future cases will use similar analytical methods or reach the same outcomes. Initially, an ambiguity generated by past groundwater/takings cases may afford future courts some flexibility to pursue different approaches.[218] In many cases, courts place heavy emphasis on what they

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Allegretti in the present case—imposition of a permit condition limiting the total quantity of groundwater available for Allegretti's use—cannot be characterized as or analogized to the kinds of permanent physical occupancies or invasions sufficient to constitute a categorical physical taking.").

213. The cases do *not* create any problem for, and indeed support, those who argue that water rights are constitutional property, but that a takings claim involving water rights should be quite difficult to prove. *See supra* text accompanying notes 146–48.

214. For a broader comparative argument in support of this point, see ALEXANDER, *supra* note 176, at 23–62.

215. *See* John F. Hart, *Colonial Land Use Law and its Significance for Modern Takings Doctrine*, 109 HARV. L. REV. 1252 (1996) (arguing that land use regulation has been pervasive since the colonial era).

216. Again, the cases do not undermine arguments that water rights, though constitutional property, should be the basis for successful takings claims less often than rights in land. The authors who put forth those arguments generally ground them in traditional takings doctrine. Their argument is that because water rights generally are subject to more factual and legal limitations than other forms of property, *Lucas* and *Penn Central* analyses should very rarely lead courts to conclude that takings have occurred.

217. For discussion of case outcomes, see *supra* text accompanying notes 193–97.

218. Another interesting uncertainty concerns the property interest the court should use when measuring the extent of a regulation's impact. Some courts have treated the groundwater use right as an independent right, *see, e.g.*, Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122 (Ct. App. 2006), while others have treated the groundwater use right as part of a landownership right. *See, e.g.*, City of Gaylord v. Maple Manor Invs. L.L.C., No. 266954, 2006 WL 2270494, at *7 (Mich. Ct. App. 2006). Though both of these cases denied takings claims, the difference could be crucially important. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1065–66 (1992) (Stevens, J. dissenting) (discussing the implications of this "denominator" problem).

describe as a compelling government interest in groundwater regulation.[219] For example, in *Southwest Engineering Company v. Ernst*, the Arizona Supreme Court justified its rejection of a takings claim by noting that "[w]here the public interest is thus significantly involved, the preferment of that interest over the property interest of the individual even to the extent of its destruction is a distinguishing characteristic of the exercise of the police power."[220] That emphasis is consistent with older Supreme Court takings cases that treat the government's police power to regulate harms as a powerful defense.[221] But more recently, the Supreme Court has seemed—at least sometimes—to back away from this sort of reasoning. In *Lucas*, for example, the Court reversed a South Carolina Supreme Court decision premised on the government's police power to prevent harm, and Justice Scalia pointedly argued that harm-based reasoning is too malleable to be workable.[222] Then, in *Lingle*, the entire court agreed that a takings analysis generally "presupposes that the government has acted in pursuit of a valid public purpose" and instead should focus on the impact to the plaintiff.[223] None of these recent cases clearly removes government interests from takings analysis, and indeed, many judges and commentators have argued that a coherent and just takings doctrine cannot possibly compel courts to ignore why the government did what it did.[224] But they do suggest a reduced, and perhaps somewhat ambiguous, role for government interests in the takings analysis.[225] Even that change might

219. *See, e.g.*, Knight v. Grimes, 127 N.W.2d 708, 711 (S.D. 1964); Peterson v. Dep't of Ecology, 596 P.2d 285, 290 (Wash. 1979) ("The relevant inquiry in such a challenge is whether the regulatory scheme is an exercise of police power rather than one of condemnation."); *supra* text accompanying notes 200–07 (discussing additional decisions affirming public regulatory authority).

220. 291 P.2d 764, 768 (Ariz. 1955); *Grimes*, 127 N.W.2d at 711 (quoting this language from *Ernst*). For a brief summary of the basic dispute in *Ernst*, *see supra* note 200.

221. *See, e.g.*, Hadacheck v. Sebastian, 239 U.S. 394, 409–10 (1915) (invoking the police power as grounds to sustain a regulation despite severe economic impacts).

222. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1020–27 (1992).

223. Lingle v. Chevron U.S.A. Inc., 544 U.S. 528, 543 (2005); *see* Fenster, *supra* note 123, at 535 ("*Lingle* clarifies that in all cases, courts considering a regulatory takings claim may consider only the challenged regulation's effects on property and the rights of ownership, and not the validity of the regulation and regulatory program itself.").

224. *E.g. Lucas*, 505 U.S. at 1075–76 (Stevens, J., dissenting) (arguing that the purpose of the regulation should be relevant); Thomas W. Merrill, *Why* Lingle *Is Half Right*, 11 VT. J. ENVTL. L. 421 (2010) (also arguing that the purposes of the government's action should be relevant to a takings analysis); Fenster, *supra* note 123, at 564–73 (arguing that the "character of the government action" analytical prong does and should allow for such analysis); John D. Echeverria, *Making Sense of* Penn Central, 23 UCLA J. ENVTL. L. & POL'Y 171, 175–76 (2005).

225. *See* Rubenfeld, *supra* note 124, at 1100 (describing the Court's "simultaneous attraction toward and repulsion from" harm-based analysis).

afford an opportunity for courts to revisit the basic compromise enshrined in past groundwater/takings decisions.

Heightening the temptation to change course may be the emergence in groundwater/takings cases of a new set of governmental interests. *Ernst* and its contemporary cases were not environmental law cases, at least as we now would understand the concept.[226] Instead, the regulatory schemes at issue simply shifted between alternative regimes for refereeing (or not refereeing) groundwater disputes among competing human users. But many of the more recent groundwater cases do have an environmental component.[227] Some involve the direct application of environmental regulations, and others involve three-way competitions among human users and environmental needs, but in either circumstance, government is limiting groundwater use partly to preserve environmental values.[228] To some judges and commentators, that shift may make no difference at all, but to others it may be quite important.[229] A distinct lack of sympathy for environmental regulation pervades many of the conservative Supreme Court justices' recent opinions, both within and outside the takings field, and the broader property rights movement is in large part a reaction to the emergence of environmental controls.[230] Consequently, judges who might

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226. *See supra* text accompanying notes 200–02 (describing the disputes in these cases). In *Ernst*, for example, the Arizona Supreme Court clearly explained that the main threat was to agriculture, not the natural environment:

> The legislative finding that the exhaustion of ground water by excessive withdrawals threatens to destroy one of the principal economic resources of the state to the consequential serious injury of all is not disputed. Such a conclusion is obviously justified because unrestrained use must inevitably result either in complete exhaustion of the state's ground water so that in the end the lands dependent thereon will revert to their desert state or in the lowering of water tables so that the increased cost of pumping will reduce these lands to a marginal or submarginal condition.

Sw. Eng'g Co. v. Ernst, 291 P.2d 764, 768 (Ariz. 1955) (footnote omitted).

227. For example, the dispute in Allegretti & Co. v. Cnty. of Imperial, 42 Cal. Rptr. 3d 122 (Ct. App. 2006) originated because the County asked the landowner to submit to environmental review of his new well. *See also supra* text accompanying notes 38–44 (describing how environmental restrictions led to the legislative scheme challenged in multiple Edwards Aquifer takings cases); Jacobs Ranch, L.L.C. v. Smith, 148 P.3d 842, 848 (Okla. 2006) (describing environmental impacts that helped create the need for the challenged regulations).

228. *See, e.g.*, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 818–19 (Tex. 2012) (summarizing the purposes of the regulatory scheme for the Edwards Aquifer).

229. *See* Joseph L. Sax, *Property Rights and the Economy of Nature: Understanding* Lucas v. South Carolina Coastal Council, 45 STAN. L. REV. 1433, 1438–39 (1993) (explaining *Lucas* as a direct reaction to the ideas of the environmental movement).

230. *See, e.g.*, Sackett v. EPA, 132 S. Ct. 1367, 1375 (2012) (Alito, J., concurring) ("The position taken in this case by the Federal Government . . . would have put the property rights of ordinary Americans entirely at the mercy of Environmental Protection Agency (EPA) employees."); Rapanos v. United States, 547 U.S. 715, 721 (2006) (lamenting "[t]he burden of federal regulation" of wetlands, and claiming that "the U.S. Army Corps of Engineers (Corps) exercises the discretion of an enlightened despot"); Palazzolo v. Rhode Island, 533 U.S. 606, 637 (2001) (Scalia, J., concurring)

have sympathized with governments' need to protect human consumptive users from each other may have very different reactions when the regulatory regime's purpose is wetlands preservation or endangered species protection.[231]

Of course, courts—and, perhaps more importantly, legislators—do not need doctrinal instability in order to move the law in a new direction. The fact that our legal and political culture has traditionally supported regulatory oversight of groundwater use rights does not mean it will be nearly so deferential in the future. Cultures change, skepticism of government regulation remains prevalent, and litigators and some judges already are vigorously advocating for a different future approach.[232] For that reason, the *Day* decision might someday turn out to be just as limiting for Texas groundwater regulation as its detractors currently fear, and copycat decisions might emerge across the American landscape. Indeed, there already are hints of such a transformation. In early 2011, apparently for the first time in American groundwater/takings jurisprudence, a court ordered a government defendant to pay compensation for a taking of groundwater use rights.[233] *Bragg v. Edwards Aquifer Authority* arose out of a fact pattern much like that in *Day*, or, for that matter, in a great many other groundwater/takings cases. Agricultural landowners challenged regulatory limits on their ability to pump, and those limits in turn derived from the well-documented shortages plaguing the aquifer.[234] This time, however, the result was different: the trial court found a taking,[235] and in August 2013, Texas' Fourth District Court of Appeal affirmed.[236] For the

(characterizing regulatory protection of wetlands as "malefaction"); Babbitt v. Sweet Home Chapter of Cmtys. for a Great Or., 515 U.S. 687, 714 (1995) (Scalia, J., dissenting) ("The Court's holding that the hunting and killing prohibition incidentally preserves habitat on private lands imposes unfairness to the point of financial ruin—not just upon the rich, but upon the simplest farmer who finds his land conscripted to national zoological use.").

231. *See* Peñalver, *supra* note 192, at 282 (discussing how this hostility to environmental regulation has shaped the "property rights" movement and affected the Court); Richard J. Lazarus, *Putting the Correct "Spin" on* Lucas, 45 STAN. L. REV. 1411, 1414–18 (1993) (discussing how conservative opposition to environmental regulation influenced the emergence of modern takings doctrine).

232. *See* Underkuffler, *supra* note 132, at 731–32 (describing Justice Scalia's vision of takings doctrine).

233. Second Amended Final Judgment, Bragg v. Edwards Aquifer Auth., Cause No. 06-11-18170 (Medina Cnty., Tex. Dist. Ct., filed Mar. 25, 2011).

234. *See* Cross-Appellants' Brief at 4-13, Edwards Aquifer Auth. v. Bragg, 2013 Tex. App. LEXIS 10838 (Aug. 28, 2013) (No. 04-11-00018-CV) (summarizing the factual basis for the Braggs' argument).

235. Second Amended Final Judgment, Bragg v. Edwards Aquifer Auth., Cause No. 06-11-18170 (Medina Cnty., Tex. Dist. Ct., filed Mar. 25, 2011).

236. Edwards Aquifer Auth. v. Bragg, No. 04-11-00018-CV, 2013 Tex. App. LEXIS 10838. The

plaintiffs, it was a dramatic win with a rather promising damages formula: the court held that the taken property was not some reasonable share of the aquifer's water but instead "the unlimited use of water to irrigate a commercial-grade pecan orchard."[237] As of this writing, the time for appeals has not run, and the Edwards Aquifer Authority may soon be back before the Texas Supreme Court.

III. GROUNDWATER, TAKINGS, AND PROPERTY THEORIES

The central conclusion of the preceding section is that traditional groundwater/takings jurisprudence tracks traditional takings law, and that such jurisprudence has allowed extensive government regulation of groundwater rights. Nevertheless, as the *Bragg* litigation signals, arguments for a different approach are still very much in play, and some judges and legislators may well be tempted to chart a different course. If lawmakers do entertain that possibility, they probably will seek guidance from broader principles of property law. For that reason, this section asks the basic question: in light of key theories of property law, what approach to takings cases involving groundwater makes sense?

The analysis that follows comes with a caveat. I do not base it on the premise that judges or legislators, let alone lay people, ground their approach to takings doctrine in any discrete property theory.[238] Even attorneys typically derive their notions of property as much from historical contingencies and habitual conventional wisdom as from theories, and they are more likely to use an amalgamation of multiple theories than a single construct.[239] Moreover, few, if any, property theorists can purport to have found a coherent and unified theory of property law, and many instead craft their concepts of property by drawing on multiple theoretical traditions.[240] Nevertheless, property theories underpin almost any lawyer's or judge's conceptualization of takings doctrine, even if those theories are often blended, underdeveloped, or indeterminate, and such theories certainly will influence the future development of groundwater law.[241] An

appellate court did remand the case for a new damages calculation.

237. *Id.* at *87.

238. *See* Laura S. Underkuffler-Freund, *Takings and the Nature of Property*, 9 CAN. J. L. & JURISPRUDENCE 161, 165 (1996) ("[F]inding any coherent, underlying understanding of constitutionally cognizable property in Supreme Court takings cases is a challenging task.").

239. *See generally* STUART BANNER, AMERICAN PROPERTY: A HISTORY OF HOW, WHY, AND WHAT WE OWN (2011) (describing the historic evolution of various property law concepts).

240. *See, e.g.*, EPSTEIN, *supra* note 36 (drawing on natural law, utilitarian, and originalist arguments to support a theory of takings); Underkuffler-Freund, *supra* note 238, at 193 (arguing that property is best understood "a bipartite entity" supported by two competing conceptual models).

241. *See* GREGORY S. ALEXANDER & EDUARDO M. PEÑALVER, AN INTRODUCTION TO PROPERTY

exploration of property theories' implications for groundwater management therefore can help inform those future developments.[242]

A. Natural Rights

For lawyers and judges seeking to resolve groundwater/takings controversies, one potential source of guidance is a natural rights theory of property. Such a theory posits that law should reflect "a prepolitical and prelegal conception of property," which derives not from the compromises of political bodies, the contingencies of history, or even calculations of economic utility, but instead from some deeper set of foundational premises.[243] Such theories are not presently in fashion among legal scholars, many of whom question the notion that any property right could exist prior to its endorsement by a political and legal community.[244] But the notion of natural property rights clearly is not absurd, for our society's concepts of political liberty and human rights draw upon similar ideas, with much less controversy.[245] At times in our nation's history, natural rights theories also dominated judges' conceptions of property law.[246]

THEORY xi (2012) ("At the base of every single property debate are competing theories of property—different understandings of what property is, why we have it, and what its proper limitations are."); *see, e.g.*, Underkuffler-Freund, *supra* note 238, at 194–202 (explaining how competing theories underlie the Court's analysis in *Lucas v. S.C. Coastal Council*).

242. Another caveat concerns the scope of the analysis. An extraordinary volume of writing considers the conceptual foundations of property law, and considering all of the permutations of theory within those articles and books would require much more than just a few pages of analysis in the final section of a law review article. The pages that follow therefore will focus only on the implications of a representative range of classic property theories.

243. Eric R. Claeys, *Takings, Regulations, and Natural Property Rights*, 88 CORNELL L. REV. 1549, 1560 (2003); *see* City of Norwood v. Horney, 853 N.E.2d 1115, 1128 (Ohio 2006) ("Believed to be derived fundamentally from a higher authority and natural law, property rights were so sacred that they could not be entrusted lightly to 'the uncertain virtue of those who govern.'") (quoting Parham v. Justices of Decatur Cnty. Inferior Court, 9 Ga. 341, 348 (Ga. 1851)). *See also* Paul J. Otterstedt, *A Natural Rights Approach to Regulatory Takings*, 7 TEX. REV. L. & POL. 25 (2002). For an argument that utility and natural law actually are closely intertwined, see Richard A. Epstein, *The Utilitarian Foundations of Natural Law*, 12 HARV. J.L. & PUB. POL'Y 713 (1989).

244. *See, e.g.*, ERIC T. FREYFOGLE, ON PRIVATE PROPERTY: FINDING COMMON GROUND ON THE OWNERSHIP OF LAND (2007) (arguing that property cannot exist without political and legal affirmation); Eduardo M. Peñalver, *Restoring the Right Constitution?*, 116 YALE L.J. 732, 763–64 (2007) (reviewing RANDY E. BARNETT, RESTORING THE LOST CONSTITUTION: THE PRESUMPTION OF LIBERTY (2004)) (discussing the widespread distrust of natural rights theories among left-leaning academics); William B. Stoebuck, *A General Theory of Eminent Domain*, 47 WASH. L. REV. 553, 573–74 (1972) (arguing that the term "natural law" is "an empty vessel into which one can pour almost anything").

245. *See, e.g.*, THE DECLARATION OF INDEPENDENCE para. 2 (U.S. 1776) ("We hold these truths to be self-evident . . . .").

246. *See, e.g.*, CASS R. SUNSTEIN, AFTER THE RIGHTS REVOLUTION: RECONCEIVING THE REGULATORY STATE 18 (1990) (describing how American judges in the late nineteenth century

Even today, those notions continue to exert a powerful hold on popular imaginations, litigators' rhetoric, and, sometimes, judicial decisions.[247] In short, natural rights theories, though often criticized, remain relevant.

Some natural rights theories also have clear implications for groundwater/takings debates. For example, many libertarian-leaning thinkers argue that a principle of first possession should transcend political affirmation.[248] Consequently, they argue, any regulatory restriction that does not protect the value held by all present property owners should be treated as a taking.[249] For groundwater use rights, the implications of that theory are fairly clear.[250] Such a conception of property rights would not preclude all regulation of groundwater, for sometimes regulation can enhance everyone's property values by precluding a tragedy of the commons.[251] But that conception of natural rights would place far greater limits on the ability of government to revise rights in ways that benefit some extractive users at the expense of others.[252] And, perhaps even more clearly, it would limit the ability of government to impose environmental

perceived many legal principles as "neutral and pre-political"); Claeys, *supra* note 243 (describing the influence of natural rights theories upon nineteenth century jurisprudence).

247. One passage from a brief in the Texas groundwater litigation captures particularly well the sense that property rights should transcend economic analysis. *See* Burrell Day and Joel McDaniel's Response to Petition for Review by the State of Texas at 6, Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) (No. 08-0964) ("It is disappointing to these Texans that the Executive Branch is taking an official position . . . that it will cost too much to recognize the right of private property. There is a trail of blood from the venerable Alamo to the San Jacinto Monument 200 miles away that resulted in our Texas Constitution. How much was that cost?") (emphasis omitted).

248. *See, e.g.*, Richard A. Epstein, *Possession as the Root of Title*, 13 GA. L. REV. 1221 (1979). While the links between libertarian property ideals and natural rights theory are close, not all libertarians derive their views from natural rights, and not all natural rights theorists are libertarian. For example, Epstein also draws heavily on utilitarianism and on arguments grounded in theories of constitutional interpretation. *See generally* EPSTEIN, *supra* note 36. Likewise, natural rights ideals also can support communitarian conceptions of property. *See* Peñalver, *supra* note 192, at 279.

249. *See generally* EPSTEIN, *supra* note 36. Claeys argues for a similar rule, though his argument is grounded partly in a labor-based natural rights theory. *See* Claeys, *supra* note 243, at 1572–73 (arguing that a regulatory restriction is a taking unless it "restricts the use rights of every person in order to enlarge both the personal rights and freedom of action of everyone regulated"). For discussion of the influence of such views on United States Supreme Court decisions, see *supra* notes 131–32 and *supra* text accompanying notes 133–34.

250. That theory would still raise questions about what steps are necessary to establish possession of a groundwater right. Is mere landownership sufficient, or must one actually use the groundwater? One possible answer to this question would be to look to the various ways state law defines groundwater rights, and to establish different first possession standards in states with correlative, appropriative, and rule-of-capture regimes. That approach, however, would rely on political and historical factors to set the bounds of a purportedly natural right, which seems paradoxical.

251. *See* Claeys, *supra* note 243, at 1572–73 (arguing that a regulation is not a taking "if it restricts the use rights of every person in order to enlarge both the personal rights and freedom of action of everyone regulated").

252. *See id.* at 1573 (arguing that traditional natural law theories would lead to a takings finding "if some individuals lose more than their equal share of use rights without gain").

restrictions upon groundwater use, unless those benefits brought offsetting benefits to the restricted users.[253]

Many advocates and commentators find that theory compelling, and similar notions seem to inform many prominent takings cases.[254] As anyone who teaches property-related subjects quickly learns, the idea that existing property rights should transcend political control also continues to exert a powerful hold on many Americans' conceptions of property law.[255] Nevertheless, there are two problems with applying this particular natural rights theory to groundwater use. The first problem is that this is not the only natural rights theory vying for attention, and the alternative theories would lead to very different outcomes. The second problem is the absence of any compelling basis for choosing this particular natural rights theory over its competitors.

One of those competing natural rights theories would ground property rights in the intuitive notion that people are entitled to the fruits of their own labor.[256] Unlike a theory of first possession, that theory implies only limited protection for groundwater rights. The reason, in a nutshell, is that very little of groundwater's value derives from the labor of the users who hope to exploit it. With rare exceptions, people do not create their own aquifers.[257] They exist because of natural processes, and they remain

253. *See id.*

254. *See* Underkuffler, *supra* note 132, at 731–32 (tracing the influence of similar views upon several Supreme Court takings decisions).

255. *See* Cherie Metcalf, *Property Rights and Attitudes toward Environmental Regulation: An Empirical Investigation* 26 (July 26, 2012) (unpublished manuscript), *available at* http://ssrn.com/abstract=1987028 (finding that an "overwhelming majority of respondents" to a survey administered in the United States and Canada "feel that compensation ought to be available" in a case where regulations diminished property values, "despite the fact that there is likely no legal basis to claim it in either country"); Janice Nadler et al., *Government Takings of Private Property*, *in* PUBLIC OPINION AND CONSTITUTIONAL CONTROVERSY 286, 286–309 (Nathaniel Persily et al. eds., 2008) (summarizing polls showing widespread opposition to uncompensated governmental restrictions on property use). However, polling also commonly finds widespread support for environmental regulation, which narrowly suggests that people's answers may reflect the framing of the question, and more broadly suggests some internal tensions in people's views on property and regulation. *See id.*; Kenrick Pierre, *The Susceptibility of Property Rights Heuristics to Framing in Public Opinion Polls and Voting: An Application to Wetlands Policy* (unpublished manuscript), *available at* https://www.msu.edu/user/schmid/pierre.htm.

256. *See* JOHN LOCKE, TWO TREATISES ON GOVERNMENT 134 (Thomas I. Cook ed., Hafner Publishing Co., 1947) (1689) ("The labour of his body and the work of his hands, we may say, are properly his.").

257. The exceptions are conjunctive use projects, in which water users pump surface water into the subsurface and use the resulting aquifers as a storage reservoir, and aquifers created through the infiltration of excess irrigation water or through leakage from irrigation ditches. *See* Thompson, *supra* note 27, at 308 (describing conjunctive use); David C. Sweigert, *Lining Canals in the Border Region: Can the U.S. Ignore Impacts on Mexico?*, ENVIRONS ENVTL. L. & POL'Y J., Jan. 1991, at 15, 17–18 (1991).

present in part because of the restraint of other potential users.[258] With similarly rare exceptions, individual landowners also are not responsible for the quality of the water in their aquifers. Unless a landowner owns the entire recharge zone for an aquifer, water quality again will depend upon natural processes and on the willingness of other landowners to preserve those processes.[259] Exploiting this natural and societal largesse does require some labor, for one must build and operate a well and obtain a permit (at least in some states and for some users).[260] But the role of individual labor in defining groundwater's value still is far less substantial than the role of individual labor in giving value to a piece of intellectual property like a book or a computer program, and the role of natural capital and community behavior is much greater. Indeed, and in stark contrast to works like books or computer programs, there is a partially inverse relationship between individual labor and value, for the value of any limited natural resource can be diminished by individual exploitation. Consequently, a natural rights theory grounded in a labor theory points only to limited protection of individual use rights.

For similar reasons, a third natural rights theory grounded in the public trust doctrine could fit groundwater, and it too would have implications rather different from those of a theory of individual first possession.[261] The essence of the public trust doctrine is a principle that certain resources have an inherently communal character and therefore cannot be entirely reduced to individual ownership.[262] Though courts have traditionally applied the public trust doctrine primarily to surface waterways and to wildlife,[263] some of the basic justifications for applying the doctrine to

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258. *See* ALEXANDER & PEÑALVER, *supra* note 241, at 49–50 (arguing that this objection undermines labor theory in many contexts).

259. *See supra* notes 70–72 and accompanying text (noting that many aquifers cross property boundaries).

260. *See generally* BRYNER & PURCELL, *supra* note 109 (summarizing state permitting requirements).

261. That would not be true if the public were viewed as the first possessor. But advocates of a first possession-based theory have sometimes resisted recognition of such collective rights. *See, e.g.*, Epstein, *supra* note 248, at 1238. *But see* Richard A. Epstein, *The Public Trust Doctrine*, 7 CATO J. 411 (1987) (arguing that public ownership does have a place in property law).

262. *See generally* Joseph L. Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970) (explaining the public trust doctrine and arguing for more extensive use of it); Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 452 (1892).

263. *See In re* Water Use Permit Applications, 9 P.3d 409, 492–95 (Haw. 2000) (extending a public trust analysis to groundwater, and noting that "[it] is generally recognized that *a simple private ownership model of property is conceptually incompatible with the actualities of natural watercourses*") (emphasis in original) (quoting Robinson v. Ariyoshi, 658 P.2d 287, 305–06 (Haw. 1982)). The application of the public trust doctrine to groundwater is now directly at issue in litigation involving California's Scott River. *See* Petition for Writ of Mandamus and Complaint for Declaratory and Injunctive Relief, Envtl. Law Found. v. State Water Res. Control Bd., No. 34-2010-80000583

those resources fit equally well with groundwater. Like surface water and wildlife, groundwater crosses physical property boundaries, and its availability and value depend upon collective action.[264] That suggests that a natural rights approach to groundwater should encompass collective, public rights, and these public rights should support, not limit, the ability of public entities to apply and occasionally redefine regulatory limits.[265] That outcome, though equally grounded in a conception of natural rights, is almost diametrically opposed to the limitations on regulation that libertarian-leaning natural rights theorists traditionally seek.[266]

Consequently, a natural rights property theory favors more categorical treatment of groundwater rights only if we exclusively adopt one particular version of natural rights theory, in which first *individual* possession enjoys exalted status.[267] And proponents of that approach have provided few compelling reasons why it should be adopted instead of its competitors.[268] For Richard Epstein, for example, the strongest affirmative argument justifying that approach seems to be that the first possessor took some initiative and therefore "did something to distinguish himself from the common mass."[269] For others, the primary justification seems to be that John Locke espoused these ideas, and that Locke also heavily influenced the thinking of the United States' Founders.[270] But the former justification makes sense only if we assume that the common mass did not itself have property rights in the thing, or that those property rights were somehow inferior to those developed by the individual. A public trust approach provides a powerful and natural rights-based rebuttal to that assumption. And the latter reasoning is difficult to reconcile with the ample evidence that the Founders did not view takings law in such a strict libertarian way.[271]

(Cal. Super. Ct., filed June 23, 2010) *available at* http://www.envirolaw.org/documents/WRIT PETITIONCOMPLAINT.pdf.

264. *See supra* notes 70–72 and accompanying text.

265. *See* ALEXANDER, *supra* note 176, at 141–46 (discussing German decisions employing this reasoning).

266. *See supra* notes 252–53 (describing conclusions that would follow from a typical libertarian conception of takings doctrine).

267. I am not arguing that these three variations of natural rights thinking are the only possibilities. Instead, my only point is that natural rights thinking does not lead to a particular outcome.

268. *See* ALEXANDER & PEÑALVER, *supra* note 241, at 169–72 (describing the challenges of grounding a theory of regulatory takings in natural rights).

269. Epstein, *supra* note 248, at 1238. There are also utilitarian arguments favoring a rule of first possession, including the idea that such a rule will facilitate clear and stable rights.

270. *See, e.g.*, Otterstedt, *supra* note 243, at 29–41.

271. *See* John F. Hart, *Fish, Dams, and James Madison: Eighteenth-Century Species Protection*

Despite these problems, libertarian-style natural rights theories still influence takings litigation, and groundwater litigation is no exception. To argue that one's rights transcend political control and, potentially, any analysis of their societal utility, and instead exist because of an uncontestable natural law foundation, is a powerful rhetorical move. But the theoretical foundations for that move are shaky at best. Natural rights theory provides little basis for preventing governments from changing groundwater law or regulating individual owners' groundwater use.

B. Utilitarian Theories

An alternative—and presently more popular, at least among academics—theory of property rights holds that protecting property makes sense because that protection increases social welfare.[272] While natural rights theories lead in conflicting directions, these utilitarian theories consistently undermine arguments for categorical treatment of groundwater takings claims—albeit through a somewhat more complicated argument than one might initially expect.

According to utilitarian theory, stable property rights encourage labor and long-term investment, promote social stability and participation, and generally provide the foundational conditions for a functional economy and political order.[273] Similarly, according to some utilitarians, a compensation requirement can improve efficiency by compelling government regulators to internalize the costs of the constraints they impose.[274] Consequently, several strands of utilitarian theory support takings protection for individual property rights.[275] However, utilitarian

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and the Original Understanding of the Takings Clause, 63 MD. L. REV. 287 (2004) (arguing that the Founders were familiar and comfortable with water-use regulations); William Michael Treanor, *The Original Understanding of the Takings Clause and the Political Process*, 95 COLUM. L. REV. 782 (1995). *See also* ALEXANDER & PEÑALVER, *supra* note 241, at 35–56 (arguing that Locke's thinking was actually at odds with some modern libertarian views).

272. *See* JESSE DUKEMINIER ET AL., PROPERTY 50 (7th ed. 2010) ("Utilitarian theory is, without doubt, the dominant view of property today, at least among lawyers."); ALEXANDER & PEÑALVER, *supra* note 241, at 11–14 (summarizing basic elements of utilitarian theory).

273. *See* Rose, *supra* note 189, at 2 (summarizing these arguments); Frank I. Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165, 1211–12 (1967). For an explanation of ways these dynamics can support environmental protection, see J. Peter Byrne, *Property and Environment: Thoughts on an Evolving Relationship*, 28 HARV. J.L. & PUB. POL'Y 679, 679–80 (2005).

274. *See* Michael A. Heller & James E. Krier, Commentary, *Deterrence and Distribution in the Law of Takings*, 112 HARV. L. REV. 997, 999 (1999). For a counterargument that government is not really sensitive to these incentives, see Daryl J. Levinson, *Making Government Pay: Markets, Politics, and the Allocation of Constitutional Costs*, 67 U. CHI. L. REV. 345 (2000).

275. For an overview of utilitarian property theory, see generally ALEXANDER & PEÑALVER, *supra* note 241, at 11–34.

theory does not support absolute protection of those property rights, for absolute protection might reify patterns of ownership that promote inefficient externalities or are otherwise inimical to innovation, progress, and economic growth.[276] Similarly, overly strong takings protection might create a moral hazard problem, for property owners, realizing that any regulatory limitation will result in compensation, will have incentives to use property in ways that are dangerous or inefficient.[277] Utilitarian theory therefore directly supports the core compromise of modern takings doctrine, for it suggests that the doctrine should balance the promotion of stable property rights against the need to allow some social evolution and change.[278]

That compromise appears equally appropriate with groundwater. On the one hand, the classic utilitarian arguments in favor of protecting property rights appear to apply. Groundwater use has significant social benefits, but realizing those benefits often requires sustained investment. An orchard is not worth growing, and a municipal water supply system is not worth building, if legal access to the water supply is likely to disappear. Consequently, stable property rights may provide a level of assurance that makes those sustained investments possible.[279] On the other hand, utilitarian theories also clearly support some governmental capacity for regulatory oversight and legal change. Initially, some legal intervention may be necessary to maximize the value of groundwater rights.[280] Absent regulation, individual users have little protection against other competing users, and the natural consequence is likely to be a classic tragedy of the

276. *See, e.g.*, Sax, *supra* note 229, at 1449 ("The noncompensation norm in circumstances of social change reflects a decision to encourage adaptive behavior by rewarding individuals who most adroitly adjust in the face of change.").

277. *See* Lawrence Blume et al., *The Taking of Land: When Should Compensation Be Paid?*, 99 Q.J. ECON. 71, 90–91 (1984).

278. How that balance should be struck is, of course, a subject of great debate among utilitarians. *See* ALEXANDER & PEÑALVER, *supra* note 241, at 161 ("[T]here is far less utilitarian consensus about whether (if ever) the government should compensate property owners when it merely regulates the use to which they may put their property.").

279. While this argument is intuitive, the willingness of groundwater users to make long-term investments even where the governing legal regime provides little protection suggests that other human characteristics—including, perhaps, an inherent excess of optimism—may sustain investment even where the law provides little protection. *See generally* Thompson, *supra* note 6, at 255–65 (exploring why people seem to overinvest in resources with uncertain availability).

280. *See* Terry L. Anderson & Pamela S. Snyder, *Georgia's Groundwater: Own it or Lose it*, SAVANNAH MORNING NEWS, May 19, 1996, *available at* http://www.perc.org/articles/article169.php (advocating a government role in defining groundwater rights); *see generally* Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347 (1967) (explaining how property rights often require delineation to hold value).

commons.[281] Similarly, legal intervention can prevent inefficient externalities, like rivers pumped dry to sustain the watering of suburban lawns.[282] For these reasons, courts have readily acknowledged a powerful utilitarian argument in favor of moving—without paying compensation—toward increased regulation of groundwater use.[283]

Of course, the primary test of a utilitarian argument need not be the intuitions of lawyers, for utilitarian arguments lend themselves to economic analysis.[284] And while the utilitarian arguments in favor of groundwater regulation have seemed obvious to jurists, the work of resource economists adds a surprising twist to the inquiry. In a series of studies, economists have compared the economic value generated by aquifers under regulated and non-regulated regimes.[285] In contravention of conventional wisdom and judicial rhetoric, they have found that the positive benefit of regulation is small and sometimes non-existent.[286]

There are several reasons why this "Gisser-Sánchez effect" might exist.[287] First, and most importantly, pumping happens sooner in an unregulated regime, and a regulated regime therefore produces delayed financial returns. According to standard economic theory, those delayed returns should be discounted; economists generally assume that capital produced earlier can be reinvested and can earn a positive return.[288] And a ten percent discount rate—which some of the key studies did actually use—can offset many of the economic benefits of sustainable pumping patterns.[289] Additionally, economists have generally found that as groundwater availability drops, agricultural users will shift to higher-value

281. *See* Thompson, *supra* note 6, at 250.

282. *See* GLENNON, *supra* note 15, at 99–111 (describing overuse of groundwater in Massachusetts' Ipswich River watershed).

283. *See* Sw. Eng'g Co. v. Ernst, 291 P.2d 764, 768 (Ariz. 1955) ("The legislative finding that the exhaustion of ground water by excessive withdrawals threatens to destroy one of the principal economic resources of the state to the consequential serious injury of all is not disputed. Such a conclusion is obviously justified . . . .") (footnote omitted).

284. There also are factors relevant to a utilitarian analysis that economic analysis cannot easily qualify.

285. *See* Phoebe Koundouri, *Current Issues in the Economics of Groundwater Resource Management*, 18 J. ECON. SURVS. 703, 706–16 (2004) (summarizing multiple studies).

286. *Id.*

287. The name derives from Micha Gisser & David A. Sánchez, *Competition Versus Optimal Control in Groundwater Pumping*, 16 WATER RESOURCES RES. 638 (1980).

288. *See generally* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 511 (8th ed. 2011) (discussing the use of discount rates in cost-benefit policy analyses).

289. *See* Koundouri, *supra* note 285, at 715 (documenting the sensitivity of the Gisser-Sánchez effect to discount rates).

crops, typically mitigating some of the economic impact of shortage.[290] These studies suggest that the utilitarian arguments in favor of groundwater regulation, and, accordingly, in favor of traditional takings doctrine, are weaker than courts have traditionally assumed.

Nevertheless, the courts' traditional assumptions still are probably right, though the analysis is a little bit more complex than those courts have acknowledged. The studies documenting the Gisser-Sánchez effect generally assumed the existence of a relatively homogenous set of groundwater users.[291] In many water conflicts, however, the earliest users also are the lowest value users, for agricultural users often predate urban competitors who put water to higher-value uses.[292] For that reason, a system that protects water availability for those urban users (or that provides agricultural users with stable and protected rights that may be sold to urban users) will often produce higher values. Second, the economists' discount rates may be unrealistic.[293] A ten percent return on investment may make sense in a developing economy, where early profits can be reinvested in capital that will allow huge improvements in farming practices.[294] In a mature agricultural economy, however, that rate of return seems quite optimistic.[295] Finally, and perhaps most importantly, the older studies finding the Gisser-Sánchez effect attributed no value to environmental protection.[296] But environmental protection does have economic value, which groundwater pumping often compromises.[297] In the

290. *See* Giordano, *supra* note 59, at 171 ("[G]roundwater users have consistently been shown to adapt to changing resource conditions by reducing pumping, adopting water-saving technologies, and changing cropping patterns . . . .").

291. *See* Koundouri, *supra* note 285, at 716 (noting that groundwater management may be more welfare-enhancing in areas with "heterogeneous land productivity").

292. *See* Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 TEX. L. REV. 1873, 1887–88 (2005) (describing value disparity between agricultural water use and use by the semiconductor industry). Because of different crop prices and water demands, disparities of value also can exist among agricultural users.

293. For a broad critique of the use of discount rates in policy analysis, see Douglas A. Kysar, *Discounting . . . on Stilts*, 74 U. CHI. L. REV. 119 (2007).

294. M.R. Llamas & P. Martínez-Santos, Editorial, *Intensive Groundwater Use: Silent Revolution and Potential Source of Social Conflicts*, 131 J. WATER RESOURCE PLAN. & MGMT. 337, 338 (2005) (describing how heavy groundwater use can facilitate capital reinvestment and economic growth).

295. *See* John J. Boland et al., *The Theory and Practice of Benefit-Cost Analysis*, *in* THE EVOLUTION OF WATER RESOURCE PLANNING AND DECISION MAKING 82 (Clifford S. Russell & Duane D. Baumann eds., 2009) (discussing the debate over appropriate discount rates; most recommendations are well below ten percent).

296. Encarna Esteban & José Albiac, *Groundwater and Ecosystems Damages: Questioning the Gisser-Sánchez Effect*, 70 ECOLOGICAL ECON. 2062, 2064 (2011) (noting that earlier studies focused only on whether farmers' welfare would be enhanced).

297. *See generally* GLENNON, *supra* note 15 (providing examples of the negative environmental effects of groundwater use); COMM. ON ASSESSING AND THE SERVS. OF AQUATIC AND RELATED

absence of regulatory restraints, individual pumpers have little incentive to preserve recharge into downstream surface waterways, even if society as a whole would derive great value from environmental protection.[298] The adverse environmental consequences of groundwater use therefore are a classic externality, and more recent studies that attempt to account for that externality have reached very different results.[299]

These utilitarian arguments do not argue for unfettered regulatory control. As many commentators have pointed out, some legal stability may be a necessary precondition to investment and sustained labor. But a utilitarian property theory clearly provides no compelling argument for freezing groundwater rights in their present and largely pre-regulatory state, for treating restrictions on individual users as potential categorical takings, or for carving out any other special set of takings laws that provide heightened protection to groundwater use rights. Instead, with groundwater, the existence of regulation and the potential for regulatory change both are necessary preconditions for social and economic value.

C. Theories of Personal and Societal Flourishing

A third set of property theories holds that we should define and protect property rights in ways that promote human flourishing. Holding property, according to Margaret Radin's famous theory, helps humans live personally fulfilling lives.[300] Similarly, as theorists dating back to Aristotle have pointed out, participation in a functioning polity also promotes human flourishing, and property ownership can encourage such participation.[301] If these premises are accurate, then protection against takings will sometimes be an important precursor to personal fulfillment. But these theories also imply some limitations upon property rights. According to Radin's personhood theory, some property rights are more connected to personal fulfillment than others—for example, a wedding ring or a home may be more personally important than an absentee-owned investment property—and takings doctrine need not provide so much protection to the latter type of right as it does to the former.[302] Human

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TERRESTRIAL ECOSYSTEMS, NAT'L RESEARCH COUNCIL, VALUING ECOSYSTEM SERVS.: TOWARD BETTER ENVIRONMENTAL DECISION-MAKING (2005).

298. *See* Esteban & Albiac, *supra* note 296, at 2064 (noting that these costs are externalized by farmers).

299. *Id.* ("[U]nder regulation, social welfare improves substantially over free market outcomes when ecosystem damages from depletion are important.").

300. Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 957 (1982).

301. *See* ALEXANDER & PEÑALVER, *supra* note 241, at 80–101.

302. *See* MARGARET JANE RADIN, REINTERPRETING PROPERTY 153–56 (1993).

flourishing theories suggest two additional bases for limiting property rights. First, because property rights exist through the consent of a community, that community should have the authority to attach responsibilities to property ownership and to ask owners to draw upon their property to support the common good.[303] Additionally, social and political participation will be less fruitful and fulfilling if the polity lacks any ability to consider, and revise, property rights, for the political realm then would be completely subordinated to the present structure of property law, even if that structure is inequitable or unwise.[304] These theories of personal and societal flourishing therefore necessitate a closer inquiry into the ways a particular type of property right relates to human fulfillment.

For groundwater rights, that inquiry leads to some interesting conclusions. The first is that groundwater rights on their own will rarely merit special protection.[305] Second, to the extent groundwater rights are closely linked to human flourishing, and therefore might merit heightened protection, those links are likely to be inextricably tied to the use of groundwater on land. That relationship in turn undermines any argument for takings doctrine protecting individual groundwater rights to any greater extent than it protects rights in land.[306] And third, there are powerful arguments in favor of a strong societal voice in decisions about groundwater use.[307]

The reasons why groundwater rarely will qualify as "personhood property" should be fairly obvious. Simply put, very few people have an emotional connection to groundwater. An aquifer is quite different from a wedding ring.[308] It is even different from a surface waterway or spring. People can and often do form profound personal connections to surface waterways.[309] But (with rare exceptions[310]) none of the activities that

303. *See* ALEXANDER & PEÑALVER, *supra* note 241, at 180–82; Eric T. Freyfogle, *Taking Property Seriously*, *in* PROPERTY RIGHTS AND SUSTAINABILITY: THE EVOLUTION OF PROPERTY RIGHTS TO MEET ECOLOGICAL CHALLENGES 43, 55 (David Grinlinton & Prue Taylor eds., 2011).

304. *See* Carol M. Rose, *Takings, Federalism, Norms*, 105 YALE L.J. 1121, 1149–50 (1996) (reviewing WILLIAM A. FISCHEL, REGULATORY TAKINGS: LAW, ECONOMICS, AND POLITICS (1995)).

305. *See infra* notes 308–09 and accompanying text.

306. *See infra* notes 313–15 and accompanying text.

307. *See infra* text accompanying notes 316–30.

308. *See* Radin, *supra* note 300, at 959 (listing examples of property that would hold special personhood status).

309. *See, e.g.*, NORMAN MACLEAN, A RIVER RUNS THROUGH IT 161 (1976) ("I am haunted by waters."). While MacLean's story evinces the profound connections that people feel to waterways, the fact that the waterways he loved were not private also raises questions about the reach of Radin's theory. Clearly people can form powerful connections to water and land—connections that are central to their identity—without holding any individual ownership interest.

310. *See* David Owen, *Notes from the Underground: Florida's Sinkhole Peril*, THE NEW YORKER,

emotionally attach us to rivers and streams are possible with groundwater, which we cannot swim in, fish in, travel upon, or even see.[311] For most people, groundwater is an economic resource or a means of sustenance, and beyond that we give it very little thought.[312]

Of course, when we put groundwater to use, the nature of that relationship changes. Many farmers' sense of self is defined by working their land, and working the land may not be possible without groundwater access.[313] Similarly, a rural home or a beloved cottage may be uninhabitable without a functioning well.[314] Groundwater and personhood, in short, can be closely connected. But in all of these circumstances, it is the mixture of groundwater use rights with land use rights that creates the value.[315] And it makes little sense for groundwater rights to have greater status under takings doctrine than the very land use rights from which groundwater derivatively takes its "personhood" value. Even if we accept all the premises of personhood theory, groundwater apart from land should have lesser, not more exalted, status than land in takings law.

Theories focused on the relationship between societal health and human flourishing provide even stronger arguments against heightened takings protection of groundwater rights. To put the point simply, groundwater use regulation can play a central role in helping a society thrive. In part, regulation can play that role by reducing conflict, for in the absence of regulatory control landowners would need some other means for resolving disputes over groundwater use.[316] They might succeed.[317] But

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Mar. 18, 2013, at 36, 38–40 (describing divers who explore Florida's subterranean caves).

311. This statement applies to groundwater as a hydrologist would define it. In some states—Texas is an example—water can retain its legal classification as groundwater long after it leaves the ground.

312. *See supra* notes 2–8 and accompanying text.

313. *See* WENDELL BERRY, BRINGING IT TO THE TABLE: ON FARMING AND FOOD 74–75 (2009) ("Why do farmers farm, given their economic adversities on top of the many frustrations and difficulties normal to farming? And always the answer is: 'Love. They must do it for love.' Farmers farm for the love of farming."); JOHN STEINBECK, THE GRAPES OF WRATH 50 (Robert J. DeMott ed., Penguin Books 1992) (1939) ("If he owns property only so he can walk on it and handle it and be sad when it isn't doing well, and feel fine when the rain falls on it, that property is him, and some way he's bigger because he owns it."); *supra* notes 5–6 and accompanying text (describing groundwater's importance to agriculture).

314. *See supra* note 3 and accompanying text (describing the extent to which rural America depends upon groundwater).

315. In fact, it really is the mixture of groundwater use rights with land use rights and personal property that allows this personal connection, for working the land requires tools and material as well as land and water. *See* Peñalver, *supra* note 192, at 261 (pointing out the necessity of personal property to realize the value of land).

316. *See supra* notes 9–15 and accompanying text (noting the frequency of groundwater use conflicts).

317. *See generally* ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991) (exploring the ability of property owners to resolve disputes without regulatory

where many users share the resource and individual activities are difficult to monitor, ample research suggests they will usually fail.[318] Moreover, if it can establish sustainable pumping regimes, regulation can help ensure that water remains present to support future farms, residents, and businesses. Without such intervention, communities—and, in extreme circumstances, countries—may be difficult to sustain.[319]

Regulatory intervention also can facilitate social stability in ways that transcend economics. As Carol Rose has pointed out, collective property interests sometimes can facilitate interactions that help communities thrive.[320] Water resources exemplify that potential. By providing access to shared resources like fish and wildlife, means of navigation, places of gathering, and sometimes, opportunities for solitude and escape, waterways can play a central role in supporting human communities. Consequently, many commentators have argued that water resources have a uniquely public dimension, which traditionally has formed the basis for legal restrictions on the extent of private exploitation.[321] Groundwater directly performs few of these functions, of course; no one goes to the aquifer to seek companionship or solace. But aquifers play a crucial role in sustaining the surface waterways that do perform these functions.[322] If, in Justice Holmes' often-quoted words, "[a] river is more than an amenity, it is a treasure," then groundwater quite often is the goose that lays the golden eggs.[323]

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intervention).

318. *See supra* notes 70–76 and accompanying text (explaining why groundwater resources are particularly ill-suited to non-legal management).

319. *See* Thomas L. Friedman, *Without Water, Revolution*, N.Y. TIMES, May 18, 2013, at SR1 (explaining how drought and groundwater overpumping exacerbated Syria's descent into war); Thomas L. Friedman, *Postcard from Yemen*, N.Y. TIMES, May 8, 2013, at A27 (quoting Abdul Rahman al-Eryani, Yemen's former minister of water and environment: "[W]herever in Yemen you see aquifers depleting, you have the worst conflicts."). Other stark examples of this phenomenon—though without warfare—come from India, where groundwater depletion presents even greater challenges than it does in the United States. *See* Anantha K.H. & K.V. Raju, *Groundwater Depletion and Coping Strategies of Farming Communities in Hard Rock Areas of Southern Peninsular India*, ASIA-PAC. DEV. J., Dec. 2010, at 119, 130, 139–40 (2010) (describing economic dislocation and human migration, and stating that "[t]he sustainability of communities in rural areas [is] in doubt if the conditions mentioned above persist for an extended period of time").

320. *See* Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711 (1986).

321. *See, e.g.*, Joseph L. Sax, *Proceedings of the 2001 Symposium on Managing Hawai'i's Public Trust Doctrine*, 24 U. HAW. L. REV. 21, 24–25 (2001).

322. *See* WINTER ET AL., *supra* note 7 (describing interconnections between surface water and groundwater).

323. New Jersey v. New York, 283 U.S. 336, 342 (1931).

Many places illustrate that value, and some of the best examples lie at the downgradient fringes of the Edwards Aquifer. There, the aquifer feeds many springs, and those springs in turn sustain rivers that flow to the Gulf of Mexico.[324] To say that the springs have helped define communities is an understatement. Archaeological evidence suggests that humans have lived by the San Marcos Springs, one of the most significant discharge points, for more than 10,000 years.[325] In modern times, they have become a tourist mecca. For years, kitschy underwater performances, complete with dancing humans and swimming pigs, drew huge crowds.[326] More recently, the pigs have been displaced by more ecologically sensitive forms of sightseeing.[327] The downstream rivers are of equal recreational value, with large crowds of people floating downstream on typical summer days.[328] Threatened or endangered species depend upon the aquifer's outflows, both in the springs themselves and miles downstream, where the rivers sustain some of North America's most important whooping crane habitat.[329] But the springs are under threat. Declining water levels in the springs were one of the key triggers for the litigation and political controversies that ultimately led to the creation of the Edwards Aquifer Authority, and, thus, to Texas's recent spate of groundwater/takings litigation.[330] And if that litigation undermines groundwater use regulation, the threat will likely emerge again.

CONCLUSION

The coming years probably will bring increased conflict over groundwater. Scientists expect that climate change will exacerbate stresses on surface water supplies, leading water users of all types to seek

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324. *See* Votteler, *supra* note 38, at 261; *Edwards Aquifer and the Guadalupe River*, GUADALUPE-BLANCO RIVER AUTHORITY, http://www.gbra.org/drought/edwardsaquifer.aspx (last visited Dec. 23, 2013).

325. *See* Joel L. Shiner, *Large Springs and Early American Indians*, 28 PLAINS ANTHROPOLOGIST 1, 6 (1983); Votteler, *supra* note 38, at 273.

326. Gregg Eckhart, *San Marcos Springs*, THE EDWARDS AQUIFER WEBSITE, http://www.edwardsaquifer.net/sanmarcos.html (chronicling the springs' colorful history) (last visited Dec. 23, 2013).

327. *Id.*

328. *See Guadalupe River State Park*, WILDTEXAS.COM, http://wildtexas.com/texas-parks/guadalupe-river-state-park (last visited Dec. 23, 2013) ("The Guadalupe River . . . is the state's most heavily utilized recreational river.").

329. *See* Votteler, *supra* note 38, at 270–71 ("The U.S. Fish and Wildlife Service . . . considers the Comal and San Marcos Springs ecosystems to contain one of the greatest known diversities of organisms of any aquatic ecosystem in the Southwest."); Aransas Project v. Shaw, No. 2:20-CV-075, 2013 WL 943780 (S.D. Tex. Mar. 11, 2013) (describing the relationship between flows in the Guadalupe and San Antonio Rivers and whooping crane survival).

330. *See* Votteler, *supra* note 21, at 851–53.

alternative water sources.[331] Development will continue, creating new demand. And while agricultural demand may remain steady or even decline, conflicts between agricultural use of water and environmental protection of aquatic resources show no signs of abating. The underlying tensions that generated takings litigation in Texas and in many other states are with us to stay.

One possible response to those challenges is to use constitutional takings clauses to provide existing groundwater users with greater protection against regulatory limitation. Already, in courtrooms across the country, litigants are arguing for that change.[332] It would be a mistake. Such heightened protection would mark a break from historic practices, and it lacks any supporting judicial precedent.[333] It also lacks any compelling justification in the theories that undergird our property law.[334] That does not mean that takings protection for groundwater rights is inappropriate. With both land and water, the United States has a long history of balancing constitutionalized property rights with regulatory authority, and that balancing act can continue even if courts declare groundwater rights to be constitutional property. But groundwater should enjoy no greater level of takings protection than any other form of property right.

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331. *See* THOMPSON ET AL., *supra* note 24, at 12–14.
332. *See supra* text accompanying note 210.
333. *See supra* text accompanying notes 193–212.
334. *See supra* Part III.