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Environmental and Economic Pitfalls of Interstate Water Transfers

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Micah Goodwin*

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INTRODUCTION

While our nation's population skyrockets to new heights, its fresh water supply is dwindling.¹ Aquifers are lower and rivers drier,² even in regions traditionally labeled as "water-rich."³ The United States depletes its aquifers by roughly 2.3 trillion gallons of groundwater every day,⁴ pushing many beyond their sustainable yield. As the population continues to grow, so will the demand for electricity generation,⁵ one of the largest water-consuming industries in the United States.⁶ Even ignoring the impacts of climate change on freshwater resources,⁷ many consider our

1. ROBERT GLENNON, UNQUENCHABLE: AMERICA'S WATER CRISIS AND WHAT TO DO ABOUT IT 16–17, 23–102 (2009); SANDRA COLBY ET AL., U.S. CENSUS BUREAU, PROJECTIONS OF THE SIZE AND COMPOSITION OF THE U.S. POPULATION: 2014 TO 2060 2 (Mar. 2015), available at <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf> [<https://perma.cc/7KT4-25CB>] (discussing population projections).

2. See, e.g., ROBERT GLENNON, WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS 45–50 (2002).

3. See LEONARD KONIKOW, U.S. GEOLOGICAL SURV., U.S. DEP'T OF INTER., GROUNDWATER DEPLETION IN THE UNITED STATES (1900–2008) (2013), available at <http://pubs.usgs.gov/sir/2013/5079/SIR2013-5079.pdf> [<https://perma.cc/A2N4-X49B>]; Kenneth Gould, *An Introduction to Water Rights in the Twenty-First Century: The Challenges Move East*, 25 U. ARK. LITTLE ROCK L. REV. 3, 4–5 (2002) (discussing Arkansas's diminishing aquifer dilemma).

4. This determination is based on groundwater withdrawal estimates from 2000 to 2008. See Leonard Konikow, *Contribution of Global Groundwater Depletion Since 1900 to Sea-Level Rise*, 38 GEOPH. RES. LETTERS L17401 (2011).

5. According to one estimate, the nationwide electricity demand will double between 2000 and 2050. Benjamin Sovacool & Kelly Sovacool, *Identifying Future Electricity-Water Tradeoffs in the United States*, 37 ENERGY POL'Y 2763, 2763 (2009). This may or may not occur because electricity demand years from now is difficult to predict, especially given advances in electricity efficiency technology.

6. MOLLY MAUPIN ET AL., U.S. GEOLOGICAL SURV., ESTIMATED USE OF WATER IN THE UNITED STATES IN 2010: CIRCULAR 1405 10 (2014), available at <http://pubs.usgs.gov/circ/1405/pdf/circ1405.pdf> [<https://perma.cc/9ZMW-T5UY>].

7. See Kathleen Miller, *Grappling with Uncertainty: Water Planning and Policy in a Changing Climate*, 5 ENVTL & ENERGY L. & POL'Y 395 (2011) (discussing the impact of climate change on water management and the difficulty of predicting precipitation pattern shifts).

supply reserves to be dire.⁸ We may not have yet come to a crossroads in our water consumption practices, but we are galloping toward it.

Those in the American West are well aware of the finite nature of our country's water resources. For generations, western water planners have attempted to manage what little water supplies are available.⁹ While states like California, Arizona, and Colorado have grown around a lack of water, water scarcity concerns have begun to creep eastward since the 1980s.¹⁰ In 2014, many Texan towns struggled with the reality of what to do when water was no longer available during droughts.¹¹ Their creative solutions, like recycling urine for drinking water,¹² made the country's water scarcity problems hit home in a jarring way.

Western water markets offer the opportunity to address scarcity problems through regulated free enterprise,¹³ yet nowhere does the pressure to capitalize on water exploitation punch harder than in those riparian jurisdictions bordering the Western Frontier: Minnesota, Iowa, Missouri, Arkansas, and Louisiana. Normally, each of these states is blessed with healthy rainfall and each enjoys the benefits of the Mississippi River rolling along their eastern borders. They also happen to be some of the historically poorest states in the country.

Their western sisters—in particular, Nebraska, Kansas, Oklahoma, and Texas—yearningly watch millions of gallons of water drain annually away from their state lines. The populations in all of these western states

8. See GLENNON, *supra* note 2, at 45–50; U.S. DEP'T OF INTER., WATER 2025: PREVENTING CRISES AND CONFLICT IN THE WEST (2005) (outlining regions in the western United States facing inadequate water supplies).

9. See NAT'L WATER COMM'N, WATER POLICIES FOR THE FUTURE: FINAL REPORT TO THE PRESIDENT AND TO THE CONGRESS OF THE UNITED STATES BY THE NATIONAL WATER COMMISSION (1973).

10. *Id.*; see also GLENNON, *supra* note 1, at 23–35 (discussing Atlanta, Georgia's water scarcity issues); Robert Abrams, *Interbasin Transfer in a Riparian Jurisdiction*, 24 WM. & MARY L. REV. 591, 591–92 (1983).

11. *Everything You Need to Know About the Texas Drought*, NPR.ORG, <https://stateimpact.npr.org/texas/tag/drought/> [<https://perma.cc/X26D-E3DL>] (last visited Dec. 4, 2018).

12. Megan Gibson, *Desperate Times, Desperate Measures: Drought-Stricken Texas Town to Recycle Urine*, TIME (Aug. 9, 2011), <http://newsfeed.time.com/2011/08/09/desperate-times-desperate-measures-drought-stricken-texas-town-to-recycle-urine> [<https://perma.cc/T56N-J7J2>]; Shelley Kofler, *Drought-Stricken Texas Town Turns to Toilets for Water*, NPR (May 6, 2014, 3:35 AM), <http://www.npr.org/2014/05/06/309101579/drought-stricken-texas-town-turns-to-toilets-for-water> [<https://perma.cc/2U6J-KC5D>].

13. See GLENNON, *supra* note 1, at 240, 307–08 (discussing Santa Fe's water bank and the impact of market forces on water use).

are anticipated to grow through 2050.¹⁴ The demand for water is also likely to rise in these agricultural hubs, which depend heavily on irrigation,¹⁵ placing additional strain on already limited water resources. The 100th meridian, slicing through the middle of these states, is the generally accepted marker for our country's water divide—the partition between the country's two major water law regimes of riparian and prior appropriation.¹⁶

Make no mistake, the water divide corridor between the 100th meridian and the Mississippi River will be the battleground for some of the most controversial interstate water transfer proposals of this century. Huge demand neighbors an area of obvious supply. Texas in particular is close to exhausting its water resources and has been for years.¹⁷ By incentivizing drilling for groundwater and allowing landowners to mine aquifers in excess of their supply,¹⁸ Texas has played a large part in lowering the Ogallala Aquifer, the largest aquifer in the country.¹⁹

14. See generally Lloyd Potter & Nazrul Hoque, *Texas Population Projections, 2010 to 2050*, OFF. OF ST. DEMOGRAPHER (2014), http://osd.texas.gov/Resources/Publications/2014/2014-11_ProjectionBrief.pdf [<https://perma.cc/8UHZ-82GS>]; Steve Barker, *2012 Demographics State of the State Report*, OKLA. DEP'T COM. 2 (2012), http://okcommerce.gov/wp-content/uploads/2015/06/Population_Projections_Report-2012.pdf [<https://perma.cc/HE3F-2B9K>]; *Kansas Population Projections, 2014-2064*, WICHITA ST. U. CTR. FOR ECON. DEV. & BUS. RES. (2016), http://www.cedbr.org/content/2016/eConnection/kansas_population_forecast_highlights.pdf [<https://perma.cc/L9YU-WL54>]; Lissette Linares et al., *Nebraska Population Projections to 2050 and Implications* 10, U. NEB. OMAHA CTR. FOR PUB. AFF. RES. (2013), <http://digitalcommons.unomaha.edu/cgi/viewcontent.cgi?article=1039&context=datausers> [<https://perma.cc/FU3K-8VFZ>].

15. PUBLIC-SUPPLY WATER USE, U.S. GEO. SURV. (Oct. 27, 2016 8:57 A.M.), <http://water.usgs.gov/edu/wups.html> [<https://perma.cc/8BPC-TUTF>] (comparing national population and water demand trends).

16. HERBERT YOUNG, *UNDERSTANDING WATER RIGHTS AND CONFLICTS* 42 (2d ed. 2006). For ease of discussion, this Article treats North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas as prior appropriation jurisdictions, even though their water laws are more appropriately categorized as a hybrid.

17. Nathan Weinert, *Solutions for Interstate Groundwater Allocation and the Implications of Day*, 44 TEX. ENVTL L.J. 105, 125–27 (2014); Ronald Kaiser, *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*, 27 TEX. TECH. L. REV. 181, 183 (1996).

18. See GLENNON, *supra* note 1, at 129.

19. Burke Griggs, *Beyond Drought: Water Rights in the Age of Permanent Depletion*, 62 KAN. L. REV. 1263, 1264–65 (2014) (noting that the Ogallala Aquifer has dropped by roughly a third of its total since 1900, an amount that

Researchers estimate that roughly 70% of the aquifer will be consumed by 2060.²⁰

Texas has always kept one eye on its neighbors' water resources as its municipalities, particularly Dallas and Fort Worth, continued to expand.²¹ During the 1990s, a few Texans pinpointed Louisianan water as a means of recharging the Ogallala.²² In 2012, Texas sued the state of Oklahoma in a bid to force the Sooner State into ceding some of its entirely intrastate water.²³ In August 2014, a Texas developer proposed building a pipeline across southern Arkansas that would transport over 750 million gallons of Mississippi River water per day to north Texas cities.²⁴ While Texas water

cannot be recharged). The Ogallala, which underlies eight states, supplies drinking water for around 80% of the population living above it. Weinert, *supra* note 17, at 107 (citing Jim Malewitz, *In Drought Ravaged Plains, Efforts to Save a Vital Aquifer*, PEW CHARITABLE TR. (Mar. 18, 2013), <http://www.pewstates.org/projects/stateline/headlines/in-drought-ravaged-plains-efforts-to-save-a-vital-aquifer-85899460061> [<https://perma.cc/K6V6-HXD7>]).

20. David Steward et al., *Tapping Unsustainable Groundwater Stores for Agricultural Production in the High Plains Aquifer of Kansas, Projections to 2110*, NAT'L ACAD. SCI. (Aug. 26, 2013), <http://www.pnas.org/content/110/37/E3477.full.pdf> [<https://perma.cc/P4NV-DTDE>].

21. See Robert Abrams, *Interstate Water Allocation: A Contemporary Primer for Eastern States*, 25 U. ARK. LITTLE ROCK L. REV. 155, 155 (2002); Theresa Schmidt, *Concerns Raised Over Toledo Bend Waters Sales to Texas*, KPLC.COM, <http://www.kplctv.com/story/16435687/concerns-over-proposed-toledo-bend-water-sales-to-texas> [<https://perma.cc/2GFN-DUG4>] (last updated Aug. 26, 2012, 11:50 PM); Terrence Henry, *The Louisiana-to-Texas Water Deal Is Off*, NPR (Jan. 16, 2012, 11:00 AM), <https://stateimpact.npr.org/texas/2012/01/16/the-louisiana-to-texas-water-deal-is-off/> [<https://perma.cc/5P2N-RV3M>].

22. See James Klebba, *Water Rights and Water Policy in Louisiana: Laissez Faire Riparianism, Market Based Approaches, or an New Managerialism?*, 53 LA. L. REV. 1779, 1781 (1993).

23. See *Tarrant Reg'l Water Dist. v. Herrmann*, 569 U.S. 614 (2013).

24. *BWG Corp. Application for Non-Riparian Water Use to Arkansas Natural Resources Commission* (submitted Aug. 20, 2014), available at http://www.law.tulane.edu/uploadedFiles/Institutes_and_Centers/Water_Resources_Law_and_Policy/Content/TXNonRipPermitApp.pdf. This bold proposal failed to outlive the planning and permitting stage.

demand seems destined to continue growing,²⁵ so does the temptation for Louisiana and Arkansas to cash in on their water reserves.²⁶

For centuries, we have looked to areas of abundant water to solve water scarcity issues.²⁷ The pressure to continue this approach will undoubtedly continue.²⁸ Despite the appeal that interstate water sales offer, states tend to resist interstate water transfers for practical, ecological, environmental, economic, and sociological reasons. For many, the short-term gains from moving water outside of its natural watershed and across state lines pale in comparison to the long-term impacts both to the area of origin and downstream states.

25. See *Water for Texas: 2017 State Water Plan*, TEX. WATER DEV. BD. (2017), http://www.twdb.texas.gov/waterplanning/swp/2017/doc/2017_SWP_Adopted.pdf [<https://perma.cc/77RL-DWM7>] (estimating that Texas will need to find 8.9 million acre-feet of water to meet the estimated statewide demand for water in 2070). Although water transfer debates can easily center on Texas alone, the demand for riparian water sources runs down the entire water divide corridor. Since the 1980s, rumors have swirled around a western demand for water from the Great Lakes region, which offers ambitious entrepreneurs the chance to tap into one-fifth of the world's surface water supply. See Irma Reinumagi, *Diverting Water from the Great Lakes: Pulling the Plug on Canada*, 20 VALPARAISO U. L. REV. 299, 300 (1986); Michael Donahue, Alicia Bixby, & David Siebert, *Great Lakes Diversion and Consumptive Use: The Issue in Perspective*, 18 CASE W. RES. J. OF ENVTL L. 19, 20–21 (1986).

26. See LA. REV. STAT. § 30:961(I) (2017) (allowing the state to sell and export running surface waters); ARK. CODE ANN. § 15-22-303 (2011). Thus far, Arkansas and Louisiana have resisted any interstate sales of water to Texas. Upon pressure to sell water from its allocated portion of Toledo Bend, a man-made reservoir on the state line, Louisiana actually increased restrictions for the sale of water outside of the state. See Henry, *supra* note 21; LA. REV. STAT. § 38:2325(A)(16) (2017). Arkansas also appears unlikely to offer Texas any hope. See ARK. CODE ANN. § 15-22-503 (2011) (“Any attempt to transport or export any of [state] waters against the best interests of the State of Arkansas and its inhabitants shall be strongly opposed.”). At least one authority believes that Arkansas’s “strongly opposed” statute is potentially unconstitutional. See 1 WATERS AND WATER RIGHTS (1st ed. 1991) at 9-176 (“[T]he validity of the Arkansas statute is suspect to say the least.”).

27. Christine Klein, *Water Transfers: The Case Against Transbasin Diversion in the Eastern States*, 25 UCLA J. ENVTL L. & POL’Y 249, 250 (2008).

28. See, e.g., Tristan Baurick, *Louisiana May Sell Water to Drought-Stricken Texas*, NOLA (Dec. 8, 2017, 6:50 PM), http://www.nola.com/environment/index.ssf/2017/12/louisiana_exploring_idea_of_se.html [<https://perma.cc/S82K-DAWC>].

Current United States Supreme Court jurisprudence prevents states from banning such massive water diversions outright.²⁹ States must manage their water resources while, at the same time, considering proposals to sell water across state lines. As a result, riparian jurisdictions bordering the country's water divide face intense scrutiny of their decisions to send, or not send, water into the American West.³⁰

A few have already addressed the riparian role in the interstate water transfer debate.³¹ In particular, Mark Davis and Michael Pappas considered the practicalities that riparian jurisdictions must deal with in protecting their waters, highlighting legal mechanisms that these states can utilize, such as water compacts, increased water supply monitoring, and generally applicable water restrictions.³² This Article comes to the same general conclusion—that water should typically stay where it naturally flows—but urges riparian jurisdictions to instead consider their place in the market as a means of conserving their water resources. Part I of this Article dissects contemporary water law and marketing. Part II addresses the myth of interstate water markets and highlights the impacts of interbasin water transfers. Part III tackles the problem of pricing and how riparian states can address interstate water transfers through their market role.

29. See *Sporhase v. Nebraska*, 458 U.S. 941 (1982).

30. See Letter from Harry Vorhoff, Duncan Kemp, & Ryan Seidemann, Assistant Att'ys Gen. of La., to Ken Brazil, Arkansas Nat. Res., (Dec. 3, 2015), available at http://dnr.louisiana.gov/assets/OC/env_div/gw_res/StateofLouisianaCommentLetters.pdf [<https://perma.cc/Q9KR-QWUT>]; Letter from Kyle Graham, Exec. Dir. of Coastal Prot. & Restoration Auth. of La., to Ken Brazil, (Nov. 24, 2015), available at http://www.dnr.louisiana.gov/assets/OC/env_div/gw_res/StateofLouisianaCommentLetters.pdf [<https://perma.cc/QLC8-4BSG>]; Letter from Tegan Treadaway, Assistant Sec'y of Office of Env'tl. Services for State of La., to Thomas Biersel, (Oct. 21, 2015), available at http://www.dnr.louisiana.gov/assets/OC/env_div/gw_res/StateofLouisianaCommentLetters.pdf [<https://perma.cc/HY59-7AMY>]; Letter from Robert Barham, Sec'y to La. Dept. of Wildlife & Fisheries, to Buddy Caldwell, La. Att'y Gen., (Nov. 3, 2015), available at http://www.dnr.louisiana.gov/assets/OC/env_div/gw_res/StateofLouisianaCommentLetters.pdf [<https://perma.cc/DQT6-3NGF>].

31. See, e.g., Abrams, *supra* note 21, at 255 (discussing the demand for interstate water transfers and mechanisms that states can use to prevent export post-*Sporhase*).

32. Mark Davis & Michael Pappas, *Escaping the Sporhase Maze: Protecting State Waters Within the Commerce Clause*, 73 LA. L. REV. 175, 180–82, 198 (2012).

I. THE BASIS FOR INTERSTATE WATER TRANSFERS

A. Surface Water Regimes

Regulation of water use in the United States today is almost entirely a matter of state law. In what is surely one of the largest victories ever for Tenth Amendment advocates, the federal government voluntarily ceded regulation of the nation's consumptive water use to states early in our country's history.³³ In the absence of federal control, the states developed their laws on surface water use into two main legal regimes: riparian ownership and prior appropriation.

Based in the English common law, riparianism found favor among water-rich jurisdictions along the East Coast.³⁴ Initially, riparianism allowed an individual owning land immediately adjacent to a waterbody to use water for whatever purposes he desired on his own land.³⁵ The system later developed to allow a riparian owner only "reasonable use" of a waterbody that does not harm or limit other riparian owners' use.³⁶ Today, some jurisdictions define interbasin water transfers to be an unreasonable use of water.³⁷ Most, however, allow for such transfers so long as they do not harm other riparian owners' use, and the transfers achieve this goal by allowing only "excess" or "surplus" water to be transferrable.³⁸

As the country grew, western states began rejecting riparianism in favor of prior appropriation. Today, prior appropriation regimes are employed in mostly arid regions of the country and operate, at least

33. See *Cal. Or. Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142 (1935) (describing such inaction as "silent acquiescence").

34. Jeremy Jungreis, "Permit" Me Another Drink: A Proposal for Safeguarding the Water Rights of Federal Lands in the Regulated Riparian East, 29 HARV. ENVTL. L. REV. 369, 372 (2005).

35. *Id.* at 374.

36. *Id.* at 374–75.

37. Abrams, *supra* note 10, at 599. An interbasin water transfer is the physical relocation of water from one watershed into an entirely separate area. "Basin" refers to the reach or watershed from which the water originates. The term is different than an "intra-basin water transfer," which relocates water from one waterbody to another within the same watershed. Under the *Sporhase* Court's rationale discussed *infra* at Section I.C, prohibitions of interbasin transfers may run afoul of the Dormant Commerce Clause.

38. See, e.g., Michael White & Charles Eddy, *Legal Planning for the Transfer of Water Between River Basins: A Proposal for the Establishment of the Interbasin Transfer Commission*, 55 CORNELL L. REV. 809, 813, 845 (1970).

theoretically, quite differently from riparian states.³⁹ Originating in federal mining law,⁴⁰ prior appropriation guarantees water rights to individuals putting water toward a beneficial use based on the time such a use actually occurs, with priority for earlier users over later ones.⁴¹ Operating on the mantra “first in time, first in right,” prior appropriation provides certainty of flow for senior diverters; as water resources experience drought or become over-appropriated, junior appropriators are cut off in favor of senior water rights.⁴² Contemporary prior appropriation jurisdictions heavily regulate any proposed use of water to prevent waste.⁴³

Although these two models differ in theory, they are similar in modern practice because both rely heavily on bureaucratic oversight.⁴⁴ The modern riparian model is often referred to as “regulated riparianism” because of the substantial state oversight of large water withdrawals.⁴⁵ In many ways, regulated riparianism has come to resemble prior appropriation, the most obvious of which is permitting water withdrawals that are prioritized by the reasonableness of use and date on non-appurtenant land.⁴⁶ Water rights are based upon a permit—no longer strictly upon the riparian nature of the land—and permitting agencies scrutinize the proposed use based on a hierarchical list of acceptable uses.⁴⁷

39. Jungreis, *supra* note 34, at 375–76.

40. See Irving v. Phillips, 5 Cal. 140 (1855).

41. Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 9, 23 (2002).

42. *Id.* at 22–24.

43. Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881, 881 (2000). Colorado is the notable holdout among modern prior appropriation systems, refusing to adhere to a permit system. In fact, the Colorado Supreme Court has held that its citizens have a state constitutional right to apply surface water to a beneficial use that cannot be controlled by permitting. See Coffin v. Left Hand Ditch, 6 Colo. 443 (1882); COLO. CONST. art. XVI, §§ 5–6.

44. Some note little practice difference between the modern versions of the two water paradigms. Reed Benson, *Alive But Irrelevant: The Prior Appropriation Doctrine in Today's Western Water Law*, 83 COLO. L. REV. 675, 675 (2012); J.W. Looney, *An Update on Arkansas Water Law: Is the Riparian Rights Doctrine Dead?*, 43 ARK. L. REV. 573 (1990).

45. See Joseph W. Dellapenna, *The Regulated Riparian Version of the ASCE Model Water Code: The Third Way to Allocate Water*, 30 J. OF AM. WATER RESOURCES ASSOC. 197 (1994).

46. Jungreis, *supra* note 34, at 380–83.

47. Dellapenna, *supra* note 41, at 34.

Texas, Oklahoma, Kansas, Nebraska, North Dakota, and South Dakota all operate hybrid water law regimes.⁴⁸ Although these states technically use riparianism as a base platform, they are, in reality, prior appropriation jurisdictions because their regimes limit riparian rights by date and function, just like prior appropriation states.⁴⁹ It is fitting that these states adopted a hybrid water regime because the 100th meridian runs through their centers like an axis, signifying the country's transition to aridity.

Experts have debated the merits of riparianism versus prior appropriation ad nauseam. Distinguishing between the two is important here because, both geographically and hydrologically, states fall into one of the two categories primarily based on one reason: the scarcity of water. The country's water divide between these two regimes provides a convenient, if overly simplistic, visual of water scarcity along state lines.⁵⁰ When discussing transfers across state lines, this boundary is critically important because it separates the country's main supply of fresh water from the area carrying the largest demand.

B. Groundwater Management

Although the water divide indicates a shift in our country's two main surface water regimes, it also highlights a transition from a preference for surface water use in the East to a heavy reliance on groundwater in the West.⁵¹ The importance of groundwater cannot be overstated—roughly 25% of the nation's consumed fresh water comes from aquifers.⁵² Most of this groundwater goes toward drinking water and irrigation.⁵³ Groundwater reliance is particularly heavy along the water divide corridor

48. TEX. WATER CODE §§ 11.001.561 (2018); *Franco-American Charolaise, Ltd. v. Okla. Water Res. Bd.*, 855 P.2d 568, 571 (Okla. 1990); OKLA. STAT. ANN. tit. 82, § 105.2A (West 2019); *City of Emporia v. Soden*, 25 Kan. 410 (1881); KAN. STAT. ANN. §§ 82a-701 et seq. (West 2019); *Beerline Canal Co. v. Dep't of Water Res.*, 482 N.W.2d 11 (Neb. 1991); *Spear T Ranch v. Knaub*, 691 N.W.2d 116 (Neb. 2005); N.D. CENT. CODE ANN. § 61-01-01 to -03 (West 2019); S.D. CODIFIED LAWS § 46-5-4 (2019).

49. See Dellapenna, *supra* note 41, at 29.

50. The U.S. Geological Survey also informally recognizes the divide described here for its water publications. See MAUPIN ET AL., *supra* note 6, at 27.

51. *Id.*

52. GLENNON, *supra* note 1, at 129–30.

53. Forty-two percent of the nation's total groundwater withdrawals are used for irrigation in California, Arkansas, Texas, and Nebraska. MAUPIN ET AL., *supra* note 6, at 7.

in agriculture-dominated states like Arkansas, Kansas, Nebraska, Oklahoma, and Texas.⁵⁴

Like surface water, groundwater regulation developed on a state-by-state basis but settled into a very different framework. It is not uncommon for a jurisdiction to use entirely different regimes for its surface water and groundwater despite the scientific community having uniformly recognized hydrologic continuity between the two.⁵⁵ Five legal groundwater regimes are at play in the country today: (1) absolute ownership; (2) correlative rights; (3) reasonable use; (4) appropriative rights; and (5) regulated riparianism.⁵⁶

Absolute ownership is based on the common law rule of capture and allows a landowner to utilize as much groundwater as he can withdraw from his land.⁵⁷ Because there is no limit on withdrawals, a landowner cannot be liable for harming his neighbor's property because of his water use.⁵⁸ Even though the system is routinely criticized as ignoring basic science,⁵⁹ absolute ownership is the model still used by Indiana,⁶⁰ Maine,⁶¹ Texas,⁶² and, arguably, Louisiana.⁶³

The correlative rights model allows a landowner to withdraw groundwater only in proportion to his landholding and only from a safe yield of the aquifer, which is the amount that may be recharged without mining the aquifer.⁶⁴ California is considered the leader of the correlative

54. *Id.*

55. See William Alley et al., *Flow and Storage in Groundwater Systems*, 296 SCIENCE 1985 (2002); RONALD GRIFFIN, *WATER RESOURCE ECONOMICS: THE ANALYSIS OF SCARCITY, POLICIES, AND PROJECTS* 137 (2006); Joseph W. Dellapenna, *A Primer on Groundwater Law*, 49 IDAHO L. REV. 265, 268 (2013).

56. Dellapenna, *supra* note 55, at 269–316 (analyzing the different regimes).

57. See Dellapenna, *supra* note 41, at 41–43.

58. Dean Baxtresser, *Antiques Roadshow: The Common Law and the Coming Age of Groundwater Marketing*, 108 MICH. L. REV. 773, 779 (2010).

59. See Joseph W. Dellapenna, *The Rise and the Demise of the Absolute Dominion Doctrine for Groundwater*, 35 U. ARK. LITTLE ROCK L. REV. 291 (2013) (analyzing the history and problems of the rule); Gerald Torres, *Liquid Assets: Groundwater in Texas*, 122 YALE L. J. F. 143 (2012) (discussing problems with Texas's absolute ownership rule).

60. Dellapenna, *supra* note 55, at 318.

61. *Id.*

62. *Id.*

63. Compare LA. CIV. CODE art. 490 (2010), with LA. CIV. CODE art. 667 (2010), and *Adams v. Grigsby*, 152 So. 2d 619 (La. Ct. App. 2d Cir. 1963).

64. When demand from an aquifer exceeds its recharge amounts, the withdrawers are said to be “mining.” See Dennis Dimick, *If You Think the Water Crisis Can't Get Worse, Wait Until the Aquifers are Drained*, NAT'L GEOGRAPHIC

rights model.⁶⁵ Of the states bordering the country's water divide, Oklahoma and Nebraska use a correlative rights regime.⁶⁶

The reasonable use model, as close to a majority rule as can be found among groundwater laws,⁶⁷ seeks to balance the utility of competing uses against each other. It allows unlimited withdrawals so long as the water is used on the appurtenant land overlying the aquifer and does not unreasonably harm others.⁶⁸ In some jurisdictions, states prioritize their uses and may curtail a landowner's withdrawals in times of shortage depending on the priority of use.⁶⁹ The Restatement (Second) of Torts generally advocates for the reasonable use standard and offers nine factors to consider when determining reasonableness.⁷⁰ Arkansas and Missouri are states within the water divide corridor that apply the reasonable use groundwater model.⁷¹

The appropriative rights model applies the same prior appropriation system used for surface water to groundwater withdrawals⁷² and is the only system that directly applies a surface water rule to groundwater.⁷³ North Dakota, South Dakota, and Kansas extend their prior appropriation rules to groundwater, although these states arguably use a hybrid system, much like their surface water laws.⁷⁴

(Aug. 21, 2014), <http://news.nationalgeographic.com/news/2014/08/140819-groundwater-california-drought-aquifers-hidden-crisis> [<https://perma.cc/R435-E8RW>]. Recharge is a two-way street; while rivers can refill an aquifer, aquifers can likewise feed streams or rivers nearby. Where aquifer mining occurs, nearby streams or springs can dry up completely, and well users will need to drill deeper wells to continue withdrawing. Subsidence is another unfortunate result of aquifer mining that can reduce property values and threaten public safety. J. David Aiken, *Ground Water Mining Law and Policy*, 53 U. COLO. L. REV. 505, 505–06 (1982).

65. See *City of Barstow v. Mojave Water Agency*, 5 P.3d 853 (Cal. 2000).

66. OKLA. STAT. ANN. tit. 82, §§ 1020.1 to -22 (West 2019); *Prather v. Eisenmann*, 261 N.W.2d 767 (Neb. 1978).

67. See Dellapenna, *supra* note 41, at 44.

68. *Id.*

69. See, e.g., ARK. CODE ANN. § 15-22-910(c) (2011).

70. See RESTATEMENT (SECOND) OF TORTS § 858 (1977). Unlike the common law reasonable use standard, the Restatement does not include the physical location of water as one of the factors in its reasonableness determination. *Id.*

71. See *Jones v. Oz-Ark-Val Poultry Co.*, 306 S.W.2d 111 (Ark. 1957); *Ripka v. Wansing*, 589 S.W.2d 333 (Mo. Ct. App. 1979).

72. See Dellapenna, *supra* note 41, at 45–46.

73. Baxtresser, *supra* note 58, at 783.

74. KAN. STAT. ANN. §§ 82a-701 to -707 (West 2019); N.D. CENT. CODE ANN. §§ 61-01-01 to -01-03 (West 2019); S.D. CODIFIED LAWS §§ 46-6-1 to -3 (West 2019).

The final groundwater model, regulated riparianism, requires landowners to obtain a groundwater permit prior to drilling.⁷⁵ The permitting agency determines the reasonableness of the proposed withdrawal based on a priority list of competing uses.⁷⁶ Of the states within the water divide corridor, Iowa and Minnesota use regulated riparianism for their groundwater controls.⁷⁷

C. *The Supremes Declare, “There Shalt Be Commerce”*

The clock is ticking on the West’s water shortage, but so far riparian states have refused to sell their water resources across the water divide. If riparian jurisdictions want to protect their resources from being used in other states, then why not simply ban interstate water transfers outright? Early in the 20th century, most states did precisely that.⁷⁸ In 1982, the Supreme Court halted this practice in *Sporhase v. Nebraska* by declaring water to be an article of commerce that cannot be quite so easily restricted.⁷⁹

Sporhase is a pivotal case for prospective water markets that centers on the Dormant Commerce Clause.⁸⁰ This judicially created doctrine limits states’ ability to favor their own citizens through prohibiting the sale of a resource outside of the state.⁸¹ The Court determined that because Congress has the constitutional power to regulate commerce “among the several States,”⁸² states themselves cannot legislate in a manner that creates an undue burden on interstate commerce, even in industries that Congress has yet to regulate.⁸³ As the argument goes, states should not be able to prevent the flow of interstate commerce in order to favor their own

75. See Dellapenna, *supra* note 41, at 46–47.

76. Christine A. Klein, Mary Jane Angelo & Richard Hamann, *Modernizing Water Law: The Example of Florida*, 61 FLA. L. REV. 403, 410–11 (2009).

77. IOWA CODE ANN. §§ 455B.264(1) to .269 (West 2019); MINN. STAT. ANN. § 103G.005(17), 271 (West 2019).

78. See, e.g., *Hudson Cty. Water Co. v. McCarter*, 209 U.S. 349 (1908) (New Jersey anti-export statute constitutional), *overruled in part by Sporhase v. Nebraska*, 458 U.S. 941 (1982).

79. *Sporhase*, 458 U.S. 941.

80. *Sporhase* reversed the natural resource protectionism that Justice Holmes, among others, had previously championed. See *Hudson Cty.*, 209 U.S. 349 (anti-water export); *Geer v. Connecticut*, 161 U.S. 519 (1896) (state ownership of wildlife).

81. See Christine A. Klein, *The Environmental Commerce Clause*, 27 HARV. ENVTL. L. REV. 1, 42–43 (2003).

82. See U.S. CONST. art. I, § 8, cl. 3.

83. See *Gibbons v. Ogden*, 22 U.S. 1 (1824).

citizens—regardless of whether Congress has actually begun regulating a particular commodity crossing state lines.⁸⁴

Under a Dormant Commerce Clause analysis, if state action unduly burdens interstate commerce through a direct prohibition or its practical effect, then courts are to review the state conduct under the strict scrutiny standard of review.⁸⁵ For the state action to survive strict scrutiny, the law must serve a “legitimate local purpose,” and there must be no reasonable nondiscriminatory alternative means of advancing the state interest,⁸⁶ which can be nearly impossible to satisfy.⁸⁷ If, instead, a state law merely burdens interstate commerce but does not discriminate against out-of-state commerce on its face or in practical effect, then courts apply a rational basis approach under the moniker of the *Pike* balancing test.⁸⁸ This rational basis analysis favors upholding the state action by presuming that state action is constitutional.⁸⁹

As many have thoroughly analyzed *Sporhase* elsewhere,⁹⁰ only a snapshot is necessary here. In *Sporhase*, the state of Nebraska passed a protectionist statute prohibiting the movement of groundwater outside of the state without a permit from the state.⁹¹ At issue was *Sporhase*’s proposed transport of groundwater across the Nebraska–Colorado state line, an area whose aquifer supplies the state designated as “critical.”⁹² In analyzing whether Nebraska’s prevention of a private individual from

84. See *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 531 (1949) (state regulations that act “solely [for] protection of local economic interests, such as supply for local consumption and limitation of competition” found unconstitutional).

85. *Hughes v. Oklahoma*, 441 U.S. 322, 336 (1979); *Hunt v. Wash. State Apple Advert. Comm’n*, 432 U.S. 333, 350–53 (1977).

86. *Maine v. Taylor*, 477 U.S. 131, 138 (1986); Klein, *supra* note 81, at 42–43.

87. See, e.g., *Hunt*, 432 U.S. at 353.

88. *Pike v. Bruce Church*, 397 U.S. 137, 142 (1970) (“Where the statute regulates even-handedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits.”).

89. *Id.*

90. See Alan D. Greenberg, *Sporhase v. Nebraska: The Muddying of Commerce Clause Waters*, 11 *ECOLOGY L.Q.* 215 (1983); Richard S. Harnsberger, Josephine R. Potuto & Norman W. Thorson, *Interstate Transfers of Water: State Options After Sporhase*, 70 *NEB. L. REV.* 754 (1991); Christine Klein, *The Dormant Commerce Clause and Water Export: Toward a New Analytical Paradigm*, 35 *HARV. ENVTL. L. REV.* 131 (2011).

91. *Sporhase v. Nebraska*, 458 U.S. 941, 944 (1982).

92. *Id.* at 954–55.

relocating out-of-state groundwater onto his own land ran afoul of Congress's power to regulate interstate commerce, the Court addressed the Nebraskan statute that required: (1) an exporter to apply for a permit to export; (2) the state Director of Water Resources to determine whether the request was reasonable and within the public interest; and (3) the water-receiving state to allow for reciprocal transfers into Nebraska before any transfer could take place.⁹³

The *Sporhase* Court identified three factors for consideration in its analysis: (1) the state's power to regulate water for the health of its citizens under its police power; (2) the relevance of state boundaries in allocating scarce resources; and (3) the ownership of water as a resource.⁹⁴ The Court judged that Nebraska's interests in conserving and protecting its groundwater resources were reasonable.⁹⁵ It also found persuasive the fact that the state of Nebraska held title to its groundwater under state law.⁹⁶ The Court, however, took issue with Nebraska's prohibition of exporting groundwater to jurisdictions that did not allow for reciprocal transfers, holding that the requirement ran afoul of the Dormant Commerce Clause and failed to pass a strict scrutiny analysis.⁹⁷

Sporhase has done little more than muddy the waters as to what states can and cannot do with their own resources. Some scholars feel that the majority's logic is flawed or the ruling was but a watershed moment in the Court's pro-Dormant Commerce Clause jurisprudence that has since shifted in the opposite direction.⁹⁸ Whatever its merits, *Sporhase* broadly proclaimed water as an article of commerce and, even though only groundwater was at issue, failed to distinguish between surface water and groundwater.⁹⁹

93. *Id.* at 944, 954–60.

94. *Id.* at 954–56.

95. *Id.* at 956. The majority noted that “[f]or Commerce Clause purposes, we have long recognized a difference between economic protectionism, on the one hand, and health and safety regulation, on the other.” *Id.*

96. *Id.* at 956–57.

97. *Id.* at 958 (“We . . . are not persuaded that the reciprocity requirement . . . significantly advances the State’s legitimate conservation and preservation interest; it surely is not narrowly tailored to serve that purpose.”).

98. See Klein, *supra* note 90, at 133; Klein, *supra* note 81, at 46.

99. See Bill Bronson, *The Future of State Regulation of Interstate Water Export After Sporhase v. Nebraska*, 4 PUB. LAND & RESOURCES L. REV. 89, 99 (1983) (“*Sporhase* was concerned solely with groundwater, but an extension of the reasoning to surface water follows *a fortiori*. Indeed, the majority opinion at one point states ‘that water is an article of commerce.’ Thus, the scope of the decision is all-encompassing.”).

The Court again discussed interstate water transfers in 2013 in *Tarrant Regional Water District v. Herrmann*, but only in passing.¹⁰⁰ There, the Court scrutinized river compact issues between Arkansas, Oklahoma, Louisiana, and Texas concerning quantity allocations of the Red River.¹⁰¹ Despite being presented with Dormant Commerce Clause arguments alternative to the compact issues—specifically, Oklahoma law prohibited any export of water without legislative approval¹⁰²—the Court punted the opportunity to expound on *Sporhase* while unanimously reaffirming the ruling.¹⁰³ It stated that “the power of States to control water within their borders may be subject to limits in certain circumstances. For example, those imposed by the Commerce Clause.”¹⁰⁴ Just as in *Sporhase*, the *Tarrant Regional* Court failed to distinguish between surface water and groundwater and, merely by citing *Sporhase*, implied that all waters are an item of commerce, even though only surface waters were at issue.

II. THE RELATIVE MYTH OF INTERSTATE WATER MARKETS

A. *What We Know About Interstate Water Marketing 30 Years Post-Sporhase*

Despite the fact that riparianism imposes land restrictions upon water use, periodic interstate water transfers in riparian states have occurred throughout our nation’s history.¹⁰⁵ The numerous canals dug for transport throughout the country are, after all, transfers of water and tend to cross state lines.¹⁰⁶ Although a relative hiatus has existed since the 1980s,

100. *Tarrant Reg’l Water Dist. v. Herrmann*, 569 U.S. 614 (2013).

101. *Id.* at 614–36.

102. *Id.* at 636–38. *Compare with Sporhase*, 458 U.S. at 957 (“[T]he continuing availability of groundwater in [a state] is not simply happenstance; the natural resource has some indicia of a good publicly produced and owned in which a State may favor its own citizens in times of shortage.”).

103. *Herrmann*, 569 U.S. at 632 n.11.

104. *Id.* That Justices Scalia or Thomas agreed to this language is surprising, as both have been outwardly dismissive of the Dormant Commerce Clause. *See Tyler Pipe Indus., Inc. v. Wash. Dep’t of Rev.*, 483 U.S. 232, 260–63 (1987) (Scalia, J., concurring in part and dissenting in part); *United Haulers Ass’n v. Oneida-Herkimer Solid Waste Mgmt. Auth.*, 550 U.S. 330, 349 (2007) (Thomas, J., concurring).

105. *Abrams*, *supra* note 10, at 591–92; *Klein*, *supra* note 27, at 249–50.

106. Two such examples are the Chesapeake and Delaware Canal (Delaware–Maryland) and the Tennessee–Tombigbee Waterway (Mississippi–Alabama).

drought and municipal demand have recently reinvigorated the cry for interstate water transfers in the East.¹⁰⁷

Immediately post-*Sporhase*, scholars began discussing the possibility of interstate water markets under the assumption that the ruling kept protectionist states from hindering markets from naturally forming.¹⁰⁸ Such prediction was premised on the logical postulation that commerce equated markets. These interstate markets would theoretically facilitate sales from state or private actors to those willing to pay, sending water to areas of higher demand and achieving a socially optimal outcome regardless of state lines.¹⁰⁹

No such markets have actually developed since *Sporhase*, at least not in the widespread manner that many predicted.¹¹⁰ Since 1982, only six states west of the Mississippi River—where demand should be the highest and intrastate water marketing has a long history—have approved water transfers into another jurisdiction.¹¹¹ Of those six, only three have authorized more than a single water transfer. What water has been moved across state lines appears to be limited to individual water projects that

107. Joseph W. Dellapenna, *Special Challenges to Water Markets in Riparian States*, 21 GA. ST. U. L. REV. 305, 305–08, 321–27 (2004).

108. See, e.g., Bronson, *supra* note 99, at 111.

109. See, e.g., Victor Brajer et al., *The Strengths and Weaknesses of Water Markets as They Affect Water Scarcity and Sovereignty Interests in the West*, 29 NAT. RESOURCES J. 489 (1989); Charles W. Howe, *Economic, Legal, and Hydrologic Dimensions of Potential Interstate Water Markets*, 67 AM. J. AGRIC. ECON. 1226, 1227 (1985).

110. See Brian Singleterry, *Marketing Interstate Harmony: Interstate Water Markets as an Alternative to Resolving Water Conflicts*, 2 TEX. A&M L. REV. 527 (2015) (“Water markets within states have grown in popularity, but their use in interstate allocation has not been significantly explored.”).

111. After contacting every state water authority west of the Mississippi River, the author found that only the following states allowed one or more post-*Sporhase* transfers of intra-state waters into a different jurisdiction: Iowa, Kansas, Nebraska, Nevada, South Dakota, and Wyoming. Three states—Wyoming, Nebraska, and Nevada—stuck out as having authorized more than just one or two small-scale transfers in that time. South Dakota has reauthorized its single interstate transfer multiple times. Although this finding must be taken with a huge grain of salt—many jurisdictions only require permits for surface water transfers, and perfect information is severely lacking—it does show an overwhelming trend to keep water at its current location. Some water authorities went so far as to state that they “would never allow” water exportation to occur.

serve: (1) agriculture on farms crossing state lines, à la *Sporhase*; (2) rural water systems; or (3) major projects in rural areas like casinos.¹¹²

The outliers here are the states of Wyoming, Nevada, and Nebraska, all of which commonly transfer their waters out of state. These water transfers do not necessarily mean that these three states have thriving interstate water markets, however, and it is important to recognize the limitations of permitting data.¹¹³ These jurisdictions impose a few contingencies to ensure that these transfers are as limited as possible. Wyoming draws the line at large-scale interstate transfers and keeps transfer permits to a maximum of two years.¹¹⁴ Water transfers out of Nebraska tend to utilize only a few acre–feet of groundwater for time-limited projects, and the state has no interstate surface water transfers on record.¹¹⁵

Whatever can be gleaned from this snapshot of western water transfers—and it is a very imperfect snapshot—no one can claim with a straight face that interstate water markets are thriving. Interstate transfers do not exist beyond a few states, if they even exist there at all. The vast majority of states strongly disfavor transferring away their own waters,¹¹⁶

112. The Southwest Pipeline is one such transfer from North Dakota that services rural customers in South Dakota. See *Background of the Southwest Pipeline Project*, SOUTHWEST WATER AUTHORITY, <http://www.legis.nd.gov/assembly/61-2009/docs/pdf/wr120909appendix0.pdf> [https://perma.cc/X2WE-APS9] (last visited Feb. 15, 2017).

113. Several of these transfers did not involve water sales and included water “transfers” as small as center pivot irrigation systems that happen to circle into a neighboring state. See, e.g., Neb. Groundw. Per. No. G-126300 (approved Nov. 12, 2002), available at <http://nednr.nebraska.gov/Dynamic/Wells/Wells/OtherInfo?WellId=144620> [https://perma.cc/VK4Q-NVJE].

114. WYO. STAT. ANN. §§ 41-3-110 to -115 (West 2019) (requiring legislative approval for transfers involving 1,000 acre–feet or more annually); Ben Neary, *Wyoming State Engineer Rejects Permits for Pipeline to Draw from Green River for Colorado*, ASSOCIATED PRESS (Jun. 8, 2015), http://trib.com/news/state-andregional/wyoming-state-engineer-rejects-permits-for-pipeline-to-draw-from/article_2343e916-1d52-5462-831a-aed1fcfa86e3.html [https://perma.cc/5NUP-UBLM].

115. Phone call with Nebraska Dep’t of Nat. Res. (Nov. 2016).

116. The riparian jurisdictions sitting along the water divide corridor clearly express this policy through statute or regulation. See LA CIV. CODE art. 658 (2010); MO. REV. STAT. ANN. § 640.409, .412 (West 2019); MINN. STAT. ANN. 6115.0670–.0710 (2016); ARK. NAT’L RES. COMM’N., ARKANSAS WATER PLAN 24–25 (2014); IOWA DEP’T NAT’L RES., IOWA WATER PLAN: WATER RIGHTS AND ALLOCATION 6 (2010).

including prior appropriation jurisdictions.¹¹⁷ The reasons for this are obvious—political, social, and environmental forces likely defeat most proposals early on before any real time or money is thrown into a project. Moreover, intrastate demand remains incredibly high, as evinced by the large amount of over-appropriated water supplies in western states.¹¹⁸

B. Major Problems Confronting Interstate Water Transfers

Interstate water markets have failed to live up to their promise largely due to four reasons: (1) the return flow problem; (2) a disconnect between water utility and costs; (3) imperfect information; and (4) externalities.¹¹⁹ Any one of these alone would be enough to discourage large-scale water sales, but interstate water transfers need to simultaneously overcome all of these issues. That is a big ask.

Perhaps the most fundamental issue plaguing these transfers is the absence of return flow.¹²⁰ Modern riparianism and prior appropriation assume that some percentage of water withdrawn from a waterbody will reenter that watershed through return flows.¹²¹ This assumption allows for nearby users to have a limited impact on the waterbody as a whole. Some

117. See COLO. REV. STAT. ANN. § 37-81-101 (West 2019) (requiring legislative approval for interbasin transfers); OR. REV. STAT. ANN. § 537.810 (West 2019) (same); *City of Hugo v. Nichols*, 656 F.3d 1251 (10th Cir. 2011) (Oklahoma rejecting interstate sale of appropriated waters).

118. See Christine A. Klein, *Water Bankruptcy*, 97 MINN. L. REV. 560, 569–71 (2012) (discussing overappropriation).

119. Although these are broken into distinct categories, they all tend to tie into one another. A loss of return flow, for example, will have known externalities, which may themselves be difficult to measure because of imperfect information.

120. See TERRY ANDERSON & PETER HILL, *WATER MARKETING, THE NEXT GENERATION* 108 (1997) (discussing return flow); J. David Aiken, *Selling Nebraska's Water: Water Sales, Transfers and Exports*, in *CTR. FOR PUB. AFF. RES.* 89, 99 (Russell L. Smith ed., 1988).

121. See Robert E. Beck, *The Regulated Riparian Model Water Code: Blueprint for Twenty-First Century Water Management*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 113, 136 (2000); H. Stuart Burness & James P. Quirk, *Water Law, Water Transfers, and Economic Efficiency: The Colorado River*, 23 J.L. & ECON. 111, 124 (1980); see also DAVID LEWIS FELDMAN, *WATER POLICY FOR SUSTAINABLE DEVELOPMENT* 201 (2007) (“Generally, diverting water from the drainage area of a stream without return flow, a practice harmful to instream flow, is deemed unreasonable and, if a downstream riparian complains, is forbidden.”).

prior appropriation jurisdictions even label users that fail to facilitate return flows as wasteful and impose penalties.¹²²

The classic interstate water transfer proposal, a pipeline from one state into another, would wholly remove water from the hydrologic processes of the basin of origin, thereby eliminating all return flows. It is almost a truism that any interstate water transfers would also be interbasin water transfers because water transferred across state lines would usually leave its natural watershed.¹²³ The results of zero return flow are extremely harmful to basins of origin and are precisely why prior appropriation jurisdictions try to facilitate return flows.¹²⁴ It would be a difficult task, from an economic and environmental standpoint, to convince any jurisdiction to negotiate water transfers where there is a guarantee of no return flows.

The second problem involves a disconnect between utility and cost. Basic microeconomics suggest that a commodity's utility will exhibit a decline curve as demand increases.¹²⁵ Water is no exception.¹²⁶ While water's utility should only marginally increase with each unit consumed, the opportunity cost for selling jurisdictions is prohibitively high.¹²⁷ Left untouched, water still provides innumerable benefits to its basin of origin, including existing utility, in-stream benefits like recreation and habitat, and opportunity for new uses.¹²⁸ For their waters to be transferred, selling jurisdictions would have to willingly forego using that water, sacrificing whatever functions the water would have normally served.¹²⁹ In order for

122. See *Basin Elec. Power Coop. v. State Bd. of Control*, 578 P.2d 557 (Wyo. 1978) (appropriator's "duty of water" breached by waste of return flows).

123. This will, of course, depend on the particular characteristics of the proposal. It would be largely unnecessary to sell water downstream within the same watershed—most states already compact their allocated portions of upstream rivers—and too cost-prohibitive to pump water back up to upper reaches.

124. See *infra*, Section II.A; see also Phil King, *Return Flow Efficiency*, N.M. WATER RES. INST. (Oct. 2008), <http://www.wrri.nmsu.edu/publish/watcon/proc53/king.pdf> [<https://perma.cc/DD3V-72ME>] (discussing return flow engineering).

125. GRIFFIN, *supra* note 55, at 23–28.

126. *Id.* at 34. Marginal utility will vary among regions and consumers due to relativity.

127. *Id.* at 41–43 (defining opportunity cost as "the value of the next best selection that could have been undertaken.").

128. See Notie Lansford & Lonnie Jones, *Recreational and Aesthetic Value of Water Using Hedonic Price Analysis*, 20 J. AGRIC. & RES. ECON. 341 (1995) (discussing a willingness to pay more for waterfront property values).

129. That water might be sold from an individual is immaterial to this principle. The exporting individual must still obtain approval from the state.

an interstate water transfer to actually come to fruition, the purchasing jurisdiction's perceived increase in utility must be high enough to push demand far enough to compensate the selling jurisdiction's actual and opportunity costs.¹³⁰

The third issue, imperfect information, goes hand in hand with water marketing.¹³¹ The lack of good data requires broad engineering, hydrologic, and environmental estimates for water transfers proposals—a factor that surely creates skeptics of even the most willing sellers. Further complicating these issues is the fact that problems caused by transferring water out of its watershed can be extremely difficult to track. Even basic groundwater monitoring can be difficult, as wells often show evidence of change only after years of competent data collection.

Interstate water transfer proposals tend to downplay externalities, the fourth major issue confronting such transfers.¹³² The focus is on how to get more water to satisfy demand and rarely, if ever, on whether taking water from a location places that situs at an increased risk of harm.¹³³ This kind of reasoning is short-sighted; the real question is whether taking the water from its natural location is the right thing to do.¹³⁴

Watersheds develop because they act as a natural funnel for water.¹³⁵ They do not exist to hold the minimum or “normal” streamflow. Rather, watersheds are formed by millennia of flooding.¹³⁶ Annually removing a

130. This is the “marginal net benefit.” See GRIFFIN, *supra* note 55, at 36 (defining marginal net benefit as the marginal benefit minus marginal costs).

131. See Bonnie Saliba et al., *Do Water Market Prices Appropriately Measure Water Values?*, 27 NAT. RES. J. 617, 645 (1987) (discussing imperfect information in markets).

132. See, e.g., Singletery, *supra* note 110; Max Michon-Rollens, *Turning Off the Valves: Why Tarrant v. Herrmann Unnecessarily Threatens Interstate Water Markets*, 41 ECOLOGY. L.Q. 403, 414 (2014).

133. See DAVID GRINLINTON & PRUE TAYLOR, PROPERTY RIGHTS AND SUSTAINABILITY: THE EVOLUTION OF PROPERTY RIGHTS TO MEET ECOLOGICAL CHALLENGES 190–191 (2011).

134. I pass no judgment on what would be the “right” thing to do because that would depend on the mores and realities of a given jurisdiction. Economics demands that any proposed transfer at least be the socially optimal choice in that society derives the greatest overall benefit from such a transfer. See TERRY ANDERSON & PETER HILL, WATER MARKETING, THE NEXT GENERATION 108 (1997) (discussing externalities in the context of interstate water transfers).

135. Geologically speaking, water carves its own path.

136. See, e.g., 2 PETER CALOW & GEOFFREY E. PETTS, RIVERS HANDBOOK: HYDROLOGICAL AND ECOLOGICAL PRINCIPLES 405–13 (1994); Abrams, *supra* note 10, at 595 n.29; Brian Thomas, et al., *Precipitation Intensity Effects on*

portion of that water will, over time, stifle a watershed's natural evolution.¹³⁷ A given jurisdiction could decide that the benefits of a water transfer outweigh externalities or that the externalities can be addressed; in order to do that, however, it would need to properly identify the impacts of such a transfer.

Although there is a lack of reliable information about interstate water transfers, interbasin water transfers within a single jurisdiction have created well-documented externalities.¹³⁸ These externalities include: (1) a loss of dilution power for environmental permitting,¹³⁹ (2) harm to deltas;¹⁴⁰ (3) coastline loss;¹⁴¹ (4) saltwater intrusion;¹⁴² (5) destruction of

Groundwater Recharge in the Southwestern United States, 8 WATER 90 (2016) (analyzing the impact of high intensity precipitation events on aquifer recharge).

137. Davis & Pappas, *supra* note 32, at 180–81 (“The logic is so simple as to be obvious: water-based environments require water to survive. . . . In fact, because . . . eastern ecosystems have evolved around a greater abundance of water, they frequently require a greater quantity of water than do those in the West.”).

138. Charles Howe, *Innovative Approaches to Water Allocation: The Potential for Water Markets* 6, WESTERN WATER: EXPANDING USES/FINITE SUPPLIES (summer conference) (Jun. 2–4, 1986), available at <http://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1013&context=western-water-expanding-uses-finite-supplies> [<https://perma.cc/76P2-5RAS>]; see also George A. Gould, *A Westerner Looks at Eastern Water Law: Reconsideration of Prior Appropriation in the East*, 25 U. ARK. LITTLE ROCK L. REV. 89, 112–13 (2002) (discussing “third party effects” and indirect externalities created by water transfers).

139. See Clean Water Act, 33 U.S.C. § 1251–1387 (2012).

140. See NAT'L WATER COMM'N, WATER POLICIES FOR THE FUTURE: FINAL REPORT TO THE PRESIDENT AND TO THE CONGRESS OF THE UNITED STATES 28–29 (1973); DAVID GETCHES, WATER CONSERVATION, REUSE, AND RECYCLING: PROCEEDINGS OF AN IRANIAN-AMERICAN WORKSHOP 238–39 (2005) (discussing the cumulative impact of interbasin water transfers on the Colorado River delta); WILLIAM L. WANT, LAW OF WETLANDS REGULATION §§ 2:2–2:3 (2009) (discussing the importance of wetlands). Water transfer advocates face their toughest opponents in endangered species, as approximately 20% of all endangered species heavily depend on wetlands for food or habitat. *Id.* at §2:3.

141. Richard Kesel, *The Role of the Mississippi River in Wetland Loss in Southeastern Louisiana, U.S.A.*, 13 ENVTL. GEOLOGY & WATER SCI. 183 (1989) (discussing reduced sediment flows); Emma Marris, *Natural Disasters: The Vanishing Coast*, 438 NATURE 908, 908–09 (2005).

142. Salinization issues are not limited to coastal regions because many deep aquifers in the United States contain saline that can intrude into shallower aquifers due to withdrawals, pressure difference, and gradient difference. WILLIAM M. ALLEY ET AL., U.S. DEPT. OF INTERIOR, SUSTAINABILITY OF GROUND-WATER RESOURCES: U.S. GEOLOGICAL SURVEY CIRCULAR 1186 (1999).

wildlife habitats;¹⁴³ (6) economic hits to rural communities;¹⁴⁴ (7) reduced recharge for drinking water aquifers;¹⁴⁵ and (8) loss of a state-owned resource.¹⁴⁶ In jurisdictions that recognize a public trust in water,¹⁴⁷ these externalities present multigenerational legal conundrums.¹⁴⁸ There are third-party externalities to consider as well, because increased strain on a waterbody is likely to impact downstream states.¹⁴⁹ The few externalities highlighted here show that interstate water transfer proposals could serve to unify a wide range of politically diverse interest groups in opposition.

143. Bryan Davies et al., *An Assessment of the Ecological Impacts of Interbasin Water Transfers, and Their Threats to River Basin Integrity and Conservation*, 2 AQUATIC CONSERVATION: MARINE AND FRESHWATER ECOSYSTEMS 325, 345–46 (1992).

144. See Shiney Varghese, *Water Governance in the 21st Century: Lessons from Water Trading in the U.S. and Australia*, INST. FOR AGRIC. & TRADE POL'Y 2 (2013); GRIFFIN, *supra* note 55, at 230–31.

145. See FLUID MECHANICS OF ENVIRONMENTAL INTERFACES 256–57 (Carlo Gualtieri & Drugtin T. Mihailovic eds., CRC Press 2d ed. 2012); G.C. Poole et al., *Hydrologic Spiraling: The Role of Multiple Interactive Flow Paths in Stream Ecosystems*, 24 RIVER RES. & APPLICATIONS 1018 (2007), http://data.umatilla.nsn.us/staff/downloads/Poole_et_al_2008.pdf [<https://perma.cc/CUF2-NCVB>]; Andrew Boulton et al., *Ecology and Management of the Hyporheic Zone: Stream-Groundwater Interactions of Running Waters and Their Floodplains*, 29 J. N. AM. BENTHOLOGICAL SOC'Y 26, 36 (2010) (“Large river floodplains and their aquifers and hyporheic zones are the most endangered landscapes on the planet.”).

146. States typically claim fee title ownership of intrastate surface waters. See, e.g., LA. REV. STAT. § 9:1101 (2018).

147. See Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970) (outlining the doctrine); see, e.g., LA. CONST. art. IX, § 1; see also *Louisiana Seafood Mgmt. Council v. Louisiana Wildlife & Fisheries Comm'n*, 719 So. 2d 119, 124 (La. Ct. App. 1st Cir. 1998); ARK CODE ANN. § 15-20-302.

148. See Amelia Frenkel, *Interstate Water Rights: Take No Drop for Granted*, 40 HARV. ENVTL. L. REV. 253, 266 (2016); *Hudson Cty. Water Co. v. McCarter*, 209 U.S. 349 (1908).

[F]ew public interests are more obvious, indisputable and independent of particular theory than the interest of the public of a State to maintain the rivers that are wholly within it substantially undiminished, except by such drafts upon them as the guardian of the public welfare may permit for the purpose of turning them to a more perfect use. This public interest is omnipresent wherever there is a State, and grows more pressing as population grows.

Hudson Cty. Water Co., 209 U.S. at 356.

149. See *Florida v. Georgia*, 138 U.S. 2502 (2018).

Considering that the typical purchaser faces a burden of showing that the transfer is within the public interest of the basin of origin,¹⁵⁰ that weight appears nearly impossible to overcome, as shown by the lack of developed markets throughout the country.

III. DEALING WITH (AND IN) INTERSTATE WATER MARKETS

A few things are clear under current Supreme Court jurisprudence. Express limitations on interstate water transfers, or those that burden the markets in practical effect, must pass strict scrutiny because they are facially discriminatory and burden an item of commerce.¹⁵¹ Prohibitions that are not facially discriminatory, such as bans on interbasin water transfers, are still subject to the *Pike* balancing test.¹⁵² Public health and safety are compelling government interests that may be invoked to prohibit such transfers but are most appropriate in times of drought or other emergency.¹⁵³ Even during times of such an emergency, however, transfer prohibitions must be narrowly tailored to achieve these interests.¹⁵⁴

The contemporary issue is not whether states can outright prohibit interstate water transfers—*Sporhase* quite audibly answered that question—but how states can manage their resources without offending Congress's commerce powers. Although it seems unlikely that any individual purchaser will ever be able to satisfy the numerous burdens required to move a large amount of water across state lines, ours is a land of opportunity and optimism. New interstate water transfer proposals seem

150. See, e.g., NEB. CONST. art. XV, § 6 (West 2019) (“The right to divert unappropriated waters of every natural stream for beneficial use shall never be denied except when such denial is demanded by the public interest.”).

151. *Sporhase v. Nebraska*, 458 U.S. 941, 954–57 (1982); see also Bronson, *supra* note 99, at 102 (“The unconditional embargo invites almost immediate suspicion because of its facially discriminatory nature.”).

152. *Pike v. Bruce Church*, 397 U.S. 137, 142 (1970) (“Where the statute regulates even-handedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits.”).

153. The Supreme Court notably failed to list environmental health among the acceptable compelling governmental issues in *Sporhase*. *Sporhase*, 458 U.S. at 956. *But see* *Maine v. Taylor*, 477 U.S. 131, 148 (1986) (states are not required “to sit idly by and wait until potentially irreversible environmental damage has occurred or until the scientific community agrees on what . . . [is or is] not dangerous before it acts to avoid such consequences.”).

154. *Sporhase*, 458 U.S. at 957–58.

to pop up almost annually.¹⁵⁵ Should the entrepreneurial spirit carry a potential purchaser beyond the common pitfalls, riparian jurisdictions are stuck between a proposal they would clearly disfavor and the implied limit of their power. Moreover, the *Sporhase* framework actually creates the potential for the prior appropriation regime to creep into riparianism through the guise of interstate water markets,¹⁵⁶ undermining the important policy divisions between the two regimes. These diversions would not have to fight any seniority battle because they would be another “reasonable use” within the transferring riparian jurisdiction, which may not necessarily use timing as a priority. One solution to riparian jurisdictions’ plight lies, ironically, in the auspices of the market.

A. *The Players*

Interstate water transfers do not really operate within a market. Such proposals are typically one-time offers between two geographically adjacent actors, one of whom will almost always be a governmental actor or heavily regulated entity.¹⁵⁷ There is no free market where potential buyers could go and shop for a better price,¹⁵⁸ the proposal occurs in a vacuum bound by geography and cost-of-transport restraints. The term “market,” although used extensively in the literature, is thus a misnomer because such highly regulated sales in no way resemble a free market.¹⁵⁹

155. See James O’Neill, *N.J. Water: Plan to Sell to N.Y. Raises Concerns*, NORTHJERSEY.COM (Nov. 15, 2016, 2:46 PM), <http://www.northjersey.com/story/news/environment/2016/11/14/new-jersey-water-plan-sell-ny-raises-concerns/93793876/> [<https://perma.cc/Q964-WJJY>] (discussing a 2016 interstate water transfer proposal from a New Jersey reservoir to New York); Tristan Baurick, *Louisiana May Sell Water to Drought-Stricken Texas*, TIMES-PICAYUNE (Dec. 8, 2017, 6:50 PM), https://www.nola.com/news/environment/article_f1538766-d95-5314-b48d-2785d541dad1.html [<https://perma.cc/S82K-DAWC>] (discussing a potential 2018 sale of Louisiana water to Texas).

156. Prior appropriation literally facilitates water diversion, while riparianism largely does not. Since nearly all water transferred across state lines will also leave its natural watershed, these interstate water sales are, by definition, a diversion put to beneficial use. See Abrams, *supra* note 10, at 592–93.

157. Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myths of Markets for Water*, 25 WM. & MARY ENVTL L. & POL’Y REV. 317, 324–26 (2000).

158. The Supreme Court has noted that the free market is a key principle to the Dormant Commerce Clause. See *Hunt v. Wash. State Apple Advert. Comm’n*, 432 U.S. 333, 351–52 (1977). It is logical, then, that the Dormant Commerce Clause should not hamstring circumstances that lack a meaningful market setting.

159. GRIFFIN, *supra* note 55, at 240.

Realistically, the only entities that possess enough surface water to justify the expense of interstate water sales are riparian states. Purchasing entities will want to reduce their investment risks, which will almost certainly lead them to state actors.¹⁶⁰ These jurisdictions grant their riparian landowners certain property rights to waterbodies, but those rights are usufructuary in nature.¹⁶¹ They are typically rights to use water, not to actually own the water itself.¹⁶² These states hold title to their water,¹⁶³ except for minor exemptions like artificial lakes.¹⁶⁴

Groundwater, however, is a completely different playing field. Groundwater rights are generally less usufructuary and more real property-based.¹⁶⁵ All of the groundwater regimes, save the reasonable use rule,¹⁶⁶ theoretically allow for groundwater to be sold across state lines.¹⁶⁷ These

160. It is unlikely that there will be any individual landowners that possess a private reservoir large enough to tempt water purchasers. *See* GRIFFIN, *supra* note 55, at 240 (“Agents involved in such risk-averse activities want an ensured water supply.”).

161. *See* JOSHUA GETZLER, A HISTORY OF WATER RIGHTS AT COMMON LAW 308, 329–30 (2004).

162. *Id.* at 330 (“[T]he right to use and enjoy without diminishing the underlying corpus of property . . .”).

163. LA CONST. art IX, § 1; Ark. River Rights Comm. v. Echubby Lake Hunting Club, 126 S.W.2d 738, 743 (Ark. 2003) (citing State v. McIlroy, 595 S.W.2d 659 (Ark. 1980)); Larman v. State, 552 N.W.2d 158, 161 (Iowa 1996) (citing State v. Sorenson, 436 N.W.2d 358, 361 (Iowa 1989)); Louisiana Seafood Mgmt. Council v. Louisiana Wildlife & Fisheries Comm’n, 719 So. 2d 119, 124 (La. Ct. App. 1 Cir. 1998); Lamphrey v. Metcalf, 53 N.W. 1139, 1143 (Minn. 1893); Pratt v. State Dep’t of Nat. Res., 309 N.W.2d 767, 771 (Minn. 1981); Bollinger v. Henry, 375 S.W.2d 161, 165 (Mo. 1964); City of Springfield, Mo. v. Mecum, 320 S.W.2d 742, 744 (Mo. Ct. App. 1959). It should be noted that reasonable minds can disagree on this point. Some advocate that surface waters are not owned by any one entity but are instead subject to the rule of capture. The author thanks G. Alan Perkins for this golden nugget.

164. *See, e.g.*, ARK. CODE ANN. §22-5-404 (2019).

165. As states began writing their water laws, groundwater was nearly impossible to track, while surface water flows could be easily observed.

166. *See* Baxtresser, *supra* note 58, at 780–81 (discussing the reasonable use restriction on groundwater exports).

167. It remains to be seen whether a prohibition of groundwater sales away from the tract immediately above an aquifer is an impermissible burden on interstate commerce. The *Sporhase* majority appears to indicate that the reasonable use’s appurtenance requirement would run afoul of Congress’s commerce power. *See* *Sporhase v. Nebraska*, 458 U.S. 941, 959–60 (1982) (“The negative implications of the Commerce Clause, like the mandates of the Fourteenth Amendment, are ingredients of the *valid* state law to which Congress

frameworks were not designed to sustain interstate groundwater markets, and states would likely need to update their groundwater laws in the event that such transfers loom.¹⁶⁸

Even the low-hanging fruit poses significant hurdles to interstate water purchasers. Reservoirs bordering two states should have a unique appeal to purchasers because they offer reduced transportation and infrastructure costs, yet compacts, treaties, or the Supreme Court have apportioned all such waters in this country.¹⁶⁹ Although states could reapportion or, more likely, lease some of their apportioned interstate waters to a neighboring jurisdiction, such reallocation would require congressional approval.¹⁷⁰ This red tape means that states have entered into only five new compacts since 1980.¹⁷¹

B. If They Must Exist...

The key to achieving the balance between prior appropriation states' demand and riparian jurisdictions' desire to conserve their waters is effective pricing. Riparian states contemplating interstate water proposals have the upper hand; they hold a valuable resource—which many consider invaluable—during a period of rising demand. A sale of this resource will create both direct and indirect losses to their citizens and wildlife, not to mention downriver states. The price of water needs to reflect these realities

has deferred. Neither the fact that Congress has chosen not to create a federal water law to govern water rights involved in federal projects, nor the fact that Congress has been willing to let the States settle their differences over water rights through mutual agreement, constitutes persuasive evidence that Congress consented to the unilateral imposition of unreasonable burdens on commerce.”) (citations omitted).

168. See Baxtresser, *supra* note 58, at 778–86 (2010); GRIFFIN, *supra* note 55, at 234.

169. One quick but important caveat is necessary. Many surface waterbodies border two states and often form state boundaries. Those waters are allocated to adjacent states under a unique body of law that is not addressed here, primarily because no transfers occur and the law is so well-defined. See Abrams, *supra* note 21, at 155. Rest assured that although this Article might seem to implicate sales from those “interstate waters,” that scenario is outside of the scope of transfers addressed here.

170. See U.S. CONST. art I, § 10, cl. 3.

171. Joseph W. Dellapenna, *Interstate Struggles Over Rivers: The Southeastern States and the Struggles over the 'Hooch*, 12 N.Y.U. ENVTL. L.J. 828, 836 (2005).

and, quite frankly, act as a deterrent to interstate water transfers that encourages better consumption practices within the area of demand.¹⁷²

Interstate water market problems arise under the Dormant Commerce Clause, so it is appropriate for states to take advantage of another Court-created doctrine to effectively conserve their resources: the market participant exception.¹⁷³ The Supreme Court has recognized that even though Congress has authority over interstate commerce, a state may favor its own citizens where it is an actor within a market.¹⁷⁴ The Court has continually expanded the market participant doctrine since its creation,¹⁷⁵ and it has also held that the exception expressly circumvents the Dormant Commerce Clause.¹⁷⁶

The quintessential example of the market participant exception is college tuition, where state colleges charge higher tuition to out-of-state students than to their own citizens.¹⁷⁷ Higher water prices for interstate transfers function in much the same manner, allowing states to provide their own citizens with the benefit of water, at little to no cost, while pricing out most out-of-state buyers. Only those out-of-state actors with the means and desire can buy into the market. This is appropriate because the market participant exception allows a state to act as “guardian and trustee for its people” in choosing its trade partners and contract terms—mirroring a state’s role in conserving its water resources.¹⁷⁸

High water rates in interstate transfers accomplish many desirable outcomes through the natural forces of a market. They force arid regions

172. See GRIFFIN, *supra* note 55, at 150–51, 256 (discussing the benefits of increased water rates).

173. See *Reeves, Inc. v. Stake*, 447 U.S. 429 (1980); *Hughes v. Alexandria Scrap Corp.*, 426 U.S. 794, 810 (1976) (“Nothing in the purposes animating the Commerce Clause prohibits a State, in the absence of congressional action, from participating in the market and exercising the right to favor its own citizens over others.”). Not all agree with this reading of the market participant doctrine. See 9 WATERS AND WATER RIGHTS (1st ed. 1991) at 710–22.

174. See *White v. Mass. Council of Constr. Emp’rs*, 460 U.S. 204, 208 (1983).

175. Compare *Hughes*, 426 U.S. 794 (first recognizing the exception in dicta), with *White*, 460 U.S. 204 (city can require all private construction companies and subcontractors to hire at least half of city residents for public city construction projects). But see *Wisconsin Dept. of Ind. v. Gould, Inc.*, 475 U.S. 282 (1986) (government’s regulation of market not a participant in the market itself).

176. See *South Cent. Timber Dev., Inc. v. Wunnicke*, 467 U.S. 82, 93 (1984) (Dormant Commerce Clause places no limitation on state acting as a market participant, as opposed to a market regulator).

177. See *Martinez v. Bynum*, 461 U.S. 321, 327 (1983); *Sturgis v. Washington*, 368 F. Supp. 38, 41 (W.D. Wash 1973), *aff’d*, 414 U.S. 1057 (1973).

178. *Reeves*, 447 U.S. at 438 (internal quotations omitted).

to first look at conservation methods and ways to reduce demand. They educate consumers about water scarcity, who should then respond to higher water prices by reducing their individual demand or finding more effective means to consume water.¹⁷⁹ These high rates also promote the conservation of fish, wildlife, and ecosystems in water-rich areas that require large amounts of water.¹⁸⁰ They theoretically compensate citizens in selling jurisdictions for their losses. Additionally, they reimburse riparian states themselves for the lost public resource, who can then reinvest the revenues into their states. This is not the “economic protectionism” that the *Sporhase* Court admonished¹⁸¹ but is instead sound governance achieved through economics—if enough attention is focused on calculating cost and price.

Riparian jurisdictions have some power to regulate private groundwater sales under their police power.¹⁸² Not only can these jurisdictions prohibit transfers for public health and safety reasons,¹⁸³ but they can also impose fees or taxes on water purchasers that are cost estimates of the mitigation efforts necessary to combat interstate water transfer externalities.¹⁸⁴ Groundwater sellers would pass these costs onto their buyers, resulting in the same high water valuation that riparian jurisdictions would demand for their surface waters. These fees can act as a general deterrent to keep opportunistic buyers from making a quick buck

179. Nelson D. Schwartz, *Water Pricing in Two Thirsty Cities: In One, Guzzlers Pay More, and Use Less*, N.Y. TIMES (May 6, 2015), <https://www.nytimes.com/2015/05/07/business/energy-environment/water-pricing-in-two-thirsty-cities.html> [<https://perma.cc/E34Y-FG3X>].

180. The Supreme Court has noted that the national interest “tends to coincide” with this conservation in water-rich states. *Sporhase v. Nebraska*, 458 U.S. 941, 954 n.16 (1981) (quoting *Cities Serv. Gas Co. v. Peerless Oil & Gas Co.*, 340 U.S. 179, 188 (1950)). See also Davis & Pappas, *supra* note 32, at 180 (“The logic is so simple as to be obvious: water-based environments require water to survive. Thus, unsurprisingly, when rivers and streams are deprived of adequate supplies of flowing water, the effects on wildlife are often devastating.”) (internal citations omitted).

181. *Sporhase*, 458 U.S. at 956.

182. *Id.* at 956–57.

183. *Id.* at 954–56.

184. These water tariffs allow for authorizing jurisdictions to combat the evils of groundwater sales. GRIFFIN, *supra* note 55, at 240 (distinguishing between water tariffs and rates). This tax would be akin to the severance tax that states routinely imposed on natural resource exploitation. See, e.g., ARK. CODE ANN. § 26-58-107 (2019). At least one leading water law scholar felt that a state should use its sovereign power to tax in order to combat a loss of tax revenue from exported waters. See 9 WATERS AND WATER RIGHTS 726–738 (1st ed. 1991).

off of landowners who may not foresee or care about the long-term problems. It will also move the true cost of water loss onto areas of demand, achieving a more equitable outcome.¹⁸⁵ Although these fees could be subject to a Dormant Commerce Clause analysis, they would likely pass muster if constructed to limit interbasin transfers.¹⁸⁶

C. *What Is Water Worth?*

Interstate water sales are much like a potential home buyer knocking on the front door of a house that he likes. Upon meeting the owner, he asks to buy the house for a sum certain. The homeowner has no incentive to accept this initial amount if he is satisfied with his home and had not planned on moving. If the homeowner is rational, he will counter with an amount that is much higher than the buyer's initial proposal. His position is a win-win: Either the potential buyer will accept the high price, or he will not. If he does not, the homeowner continues on as if nothing happened, satisfied with his home and happy to retain it. If he does, then he has turned himself into a willing seller by demanding a price so high that he could no longer justify ignoring it.

Riparian jurisdictions are in the same enviable position. They have no pressure to sell, and they certainly have no incentive to sell at the initial asking price.¹⁸⁷ If riparian jurisdictions act rationally,¹⁸⁸ they should demand a premium price in order to compensate their citizens for a lack of water and to turn a conceptual profit of some kind.¹⁸⁹ This way, selling

185. Saliba et al., *supra* note 131, at 620 (“A measure of value should fully reflect potential beneficiaries’ willingness to pay for incremental increases in water supply, as well as any positive or negative side effects (externalities) associated with the supply increase.”).

186. See *Pike v. Bruce Church*, 397 U.S. 137, 142 (1970); *Sporhase*, 458 U.S. at 956–58; *Maine v. Taylor*, 477 U.S. 131, 148 (1986).

187. See Richard Posner, *One-Sided Contracts in Competitive Consumer Markets*, 104 MICH. L. REV. 827 (2006) (“The existence of a one-sided contract does not imply that the *transaction* will be one-sided, but only that the seller will have discretion with respect to how to treat the consumer.”).

188. The assumption of rational actors is foundational to economics. See Richard Posner, *The Economic Approach to Law*, 53 TEX. L. REV. 757, 761 (1975) (“The basis of an economic approach to law is the assumption that the people involved with the legal system act as rational maximizers of their satisfactions.”).

189. States clearly have the power to do this under the Dormant Commerce Clause. *Hunt v. Wash. State Apple Advert. Comm’n*, 432 U.S. 333, 350 (1977) (“[I]n the absence of conflicting legislation by Congress, there is a residuum of power in the state to make laws governing matters of local concern which

states may either: (1) hold onto their water resources by pricing out potential suitors; or (2) turn themselves into willing sellers that can combat the detriments of the sale while still maximizing social value.¹⁹⁰ In order to do that, however, potential sellers must have some idea how to price their commodity.

Fair market value is traditionally defined as the price point that a willing buyer will pay to a willing seller—a divergence of two competing interests.¹⁹¹ For interstate water transfers, one would expect that price to be extremely high.¹⁹² Within these sales, there is a limited resource and a natural competition for that resource between the seller and the purchaser. Water-rich jurisdictions hold the market power. They have thus far wielded that power to keep any interstate water markets from forming because the offering price has not been attractive enough to overcome the obvious detriments. Even so, it is not unforeseeable that a cash-strapped riparian state might be tempted by the lure of a large payout. Should the country's population continue to increase, as projections indicate, then it is probable that demand will likewise increase as existing resources are strained.

High water prices for interstate transfers are necessary to cover the costs of large water sales.¹⁹³ Such prices are nothing more than a selling

nevertheless in some measure affect interstate commerce or even, to some extent, regulate it.”)

190. Net social benefit may shift in favor of water transfers if the price is high enough. GRIFFIN, *supra* note 55, at 370.

191. See *United States v. Cartwright*, 411 U.S. 546, 551 (1973) (discussing the fair market value test).

192. TERRY ANDERSON & PAMELA SNYDER, *WATER MARKETS: PRIMING THE INVISIBLE PUMP* 19 (1997); Saliba et al., *supra* note 131, at 621 (discussing factors affecting prices in existing water markets); Abrams, *supra* note 10, at 608 (“Absent payment of a substantial purchase price, out-of-state diversions offer relatively little benefit to the originating state.”); Bruce McCarl & Yongxia Cai, *Economic, Hydrologic and Environmental Appraisal of Texas Inter-basin Water Transfers: Model Development and Initial Appraisal* 3, TEX. WATER RES. INST. (2007), <http://texaseden.org/disaster-resources/wp-content/uploads/2011/06/economic-hydrologic-environ-appraisal-texas-inter-basin-water-transfers.pdf> [<https://perma.cc/B69S-GSSH>] (“Economic theory indicates that water should be allocated to the highest valued users in order to achieve economic efficiency An interbasin transfer can involve significant costs to the basin of origin along with the benefits to the receiving basin. One cost can involve the opportunity cost to the basin of origin of potentially reduced future economic growth and prosperity.”) (internal citations omitted).

193. See *WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT* 10, NAT'L RES. COUNCIL (1992) (“Water transfer law and policies

jurisdiction's cost-benefit analysis, based on the best available information, that seeks to determine the point where the benefits outweigh determinable costs.¹⁹⁴ Because the costs—both actual and opportunity—to a selling state would be high, the tipping point would logically need to be even higher.¹⁹⁵

Can a selling state truly monetize all of the costs and externalities that interstate water sales create and incorporate their cumulative effect into the selling price? It is debatable, particularly in light of the fact that water's value and opportunity costs accrue over time.¹⁹⁶ Moreover, downstream states in these sales would be left with no representation in negotiations and no ability to demand remediation financing from the purchasing jurisdictions.¹⁹⁷ In interstate water markets, the third party externalities may be minimized somewhat by limiting marketable water only to the "tradeable margin,"¹⁹⁸ recognized in some states as "excess" water.¹⁹⁹

should be designed to consider the interests of the trading partners, third parties, and the environment in a cost-effective manner. The costs of mitigating third party effects should be internalized as a cost of the transfer—that is, the beneficiaries or proponents of the transfer should bear the mitigation costs as a matter of law and equity. Therefore, the cost of the transfer should include sufficient funds to help mitigate third party effects, in the form of water, money, or other compensation.”).

194. ANDERSON & SNYDER, *supra* note 192, at 21–29 (1997) (analyzing such cost-benefit analyses).

195. As Professor Glennon explains, “Economics suggest that the real cost of water is the *replacement* value of the water.” GLENNON, *supra* note 1, at 225.

196. See ANDERSON & SNYDER, *supra* note 192, at 19; Saliba et al., *supra* note 131, at 621 (“If water transfers positively or negatively affect third parties and these effects (externalities) are not taken into account in market transactions, prices will not reflect full social values.”).

197. ANDERSON & SNYDER, *supra* note 192, at 19 (discussing third-party externalities); *Letter from Harry Vorhoff, Duncan Kemp, and Ryan Seidemann*, *supra* note 30. It is easy to see that downstream states would consider injunctive relief in such instances, which would conceivably be tried at the U.S. Supreme Court. See U.S. Const. art III, § 2.

198. Gary D. Lynne & Phyllis Saarinent, *Melding Private and Public Interests in Water Rights Markets*, 25 J. AGRIC. & APPLIED ECONS. 69, 75 (1993) (discussing such a “tradeable margin”).

199. See, e.g., ARK. CODE ANN. § 15-22-304 (2011); ARK. NAT’L RES. COMM’N., ARKANSAS WATER PLAN, at 24–25 (2014). As explained above, this is a misnomer because it mischaracterizes the importance of flooding by relying upon an anthropocentric viewpoint.

In existing intrastate markets, water has proven to be a particularly difficult commodity to price.²⁰⁰ It is seriously undervalued in the American West,²⁰¹ an area that should be sending compelling price signals to consumers.²⁰² Hopefully, high water prices would “alter [western states’] consumption patterns in response to price increases.”²⁰³ Interstate purchasers would theoretically disburse their high costs onto the ultimate consumers,²⁰⁴ which would increase public awareness about water scarcity in areas that often take their cheap water rates for granted.²⁰⁵ This approach, hopefully, would challenge water consumers to reduce waste and increase efficiency in arid areas.²⁰⁶

Exactly how should a riparian jurisdiction price water sales? First, the price must reflect a best estimate of the public’s actual and opportunity costs (already a large number),²⁰⁷ *plus* mitigation measures for known externalities (also an incredibly large number), all administrative costs (including studies on potential detriments and consistent monitoring), and some additional amount to incentivize the selling jurisdiction to part with

200. See NICHOLAS SPULBER ET AL., *ECONOMICS OF WATER RESOURCES: FROM REGULATION TO PRIVATIZATION* xvii (1998).

201. See Amy Hardberger, *Water Is a Girl’s Best Friend: Examining the Water Valuation Dilemma*, 62 KAN. L. REV. 893, 912–15 (2014).

202. *Water: The World’s Most Valuable Stuff*, ECONOMIST (May 22, 2010), <https://www.economist.com/leaders/2010/05/20/the-worlds-most-valuable-stuff> [<https://perma.cc/A9Z3-BK4S>] (“As for the market, when it approaches water it meets all sorts of obstacles: water is difficult to move, difficult to measure, difficult to price and often difficult to charge for, since many people think it should be free. Even in arid market economies where every drop is precious, the price of water seldom reflects scarcity.”); ANDERSON & SNYDER, *supra* note 192, at 18 (“When scarcity drives up the price of a resource, users . . . are motivated to find alternative sources of supply In the case of water, such price signals are often lacking, but where they do exist, efficiency gains from marginal adjustments are significant.”).

203. GLENNON, *supra* note 2, at 220.

204. Lynne & Saarinent, *supra* note 198, at 71 (“[M]arket transmits all relevant value information through prices back to the resource users.”).

205. Dellapenna, *supra* note 157, at 335 (“Economic incentives should be introduced for those who use water so they will more realistically evaluate the social consequences of their conduct.”) (citations omitted); ANDERSON & SNYDER, *supra* note 192, at 10 (“What is seen as waste or inefficient water use in rural and urban areas is simply the users’ rational response to low water prices But users can afford to be wasteful only when water is cheap.”).

206. GRIFFIN, *supra* note 55, at 243 (discussing pricing’s role in demand management strategy).

207. *Id.* at 371 (“Achieving efficient water use is fundamentally about recognizing water’s opportunity costs.”).

its water (conceptually, the profit).²⁰⁸ This is the most equitable manner of determining water price because it shifts the true cost of water transfers onto the purchasing basin.²⁰⁹

Second, interstate water transfers need to use tiered block pricing.²¹⁰ Because interstate water transfers should probably be a last means of water management, they must reflect a desire to curb demand. Tiered pricing operates by charging higher amounts once demand reaches certain quantity thresholds.²¹¹ Water transfers should work in the same manner: x for the first 10,000 acre–feet, $3x$ for the second 10,000 acre–feet, $9x$ for the third 10,000 acre–feet, and so on. Such a pricing structure provides a clear understanding of the price of water—as each additional unit of water is consumed and the marginal utility to individual consumers drops,²¹² this structure prices out the water uses that offer only marginal utility to society. Research shows that tiered block pricing is an effective means of reducing excess consumption among consumers.²¹³

From an economic perspective, a selling state should avoid setting a quantity of water at a specific rate per gallon or charging a flat fee.²¹⁴ This approach provides no incentive for the purchasing state to look at water conservation methods, would increase a purchasing state’s dependency on out-of-state water, and would do nothing to solve the long-term water scarcity issue. In contrast, tiered pricing sends collective price signals to consumers—through purchasing entities who disburse their costs and educate consumers—that it is in their best interest to demand less water where possible.

208. *See id.* at 36, 110, 118.

209. WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT, *supra* note 193.

210. Water markets in California already use this pricing incentive. *See* Bourree Lam, *Finding the Right Price for Water*, ATLANTIC (Mar. 24, 2015), <http://www.theatlantic.com/business/archive/2015/03/finding-the-right-price-for-water/388246/> [<https://perma.cc/Z9RQ-QU65>].

211. GRIFFIN, *supra* note 55, at 245–48.

212. *See* Saliba et al., *supra* note 131, at 619–20 (discussing diminishing margin utility in a hypothetical water market).

213. *See* Ariel Dinar et al., *Allocation-Based Water Pricing Promotes Conservation While Keeping User Costs Low*, 17 AGRIC. & RESOURCE ECONS. UPDATE 1 (2014).

214. For a comparison of flat, fixed, and block pricing rates in the context of California water markets, *see* Kristina Donnelly & Juliet Christian-Smith, *An Overview of the “New Normal” and Water Rate Basics* 7–13, PAC. INST. (June 2013), <http://pacinst.org/app/uploads/2013/06/pacinst-new-normal-and-water-rate-basics.pdf> [<https://perma.cc/53P4-PDM3>].

The length of sale is also pertinent. Selling jurisdictions would probably prefer only short-term water sales.²¹⁵ A small window for these water transfer experiments allows actors to correct their mistakes where they undervalue the price of water or overestimate their ability to compensate for the water that is sold. This is particularly important because hydrologic uncertainty in the purchasing or selling jurisdiction can drastically impact the true value of water.²¹⁶ Short-term sales keep selling jurisdictions from being held hostage by deals that commit water to other jurisdictions.

Additionally, selling jurisdictions will likely require certain contingencies before water can be transferred, such as the ability to terminate water transfers because of unforeseeable drought, natural disasters, or health emergencies like the recent COVID-19 pandemic.²¹⁷ Selling states may want to know how the purchasing states will use their water and might agree to sales so long as the water is used to satisfy only certain types of demand—for example, municipal supply or health care—or so long as the purchaser educates its consumers about best consumption practices.²¹⁸ Seasonal rates may also have their place.²¹⁹

Could these contingencies be a potential deal-killer? Absolutely. These contingencies are some of the many options, however, available to selling states to keep them from the brunt of a bad deal. These contingencies will also require demand for water to reach such a point that purchasing states are willing to accept the risks.

D. The Morality of Selling Water

One of the foundational problems surrounding new water transfers is whether water should actually be sold. The resource is essential to life. In most communities, consumers primarily pay for transportation and

215. See Peter W. Culp, Robert Glennon, & Gary Libecap, *Shopping for Water: How the Market Can Mitigate Water Shortages in the American West*, STANFORD WOODS INST. FOR ENV'T 13–15 (2014) (listing the benefits of intrastate short-term water right sales or leases).

216. Saliba et al., *supra* note 131, at 646–47.

217. GRIFFIN, *supra* note 55, at 205 (discussing dry-year options and leasing). This has strong support in the common law of contracts, where a party may be excused from performance when actions beyond its control render performance futile or impossible. RESTATEMENT (SECOND) OF CONTRACTS § 261 (AM. LAW INST. 1981).

218. See IOWA DEP'T NAT. RES., *supra* note 116, at 21.

219. See GRIFFIN, *supra* note 55, at 248.

administration costs of the delivery system, not for the actual water.²²⁰ In water marketing literature, there is often a philosophical desire to keep this resource as cheap as possible. These arguments often center on the need for progress as a society and harmony among the states.²²¹ The reasoning goes that in order to solve the water scarcity “problem,” everyone should play their part because transfers “promote the public interest by allowing established uses to change with evolving values and needs.”²²²

The humanitarian argument for cheap water transfers can appear tempting to buy into, but riparian jurisdictions must steer clear of the lure. It is nothing more than a misunderstanding of water economics. Water transported across state lines does not function along the inelastic demand curve that economists associate with typical municipal drinking water supplies. Rather, this water functions with far more elasticity because this water is for “wants,” not “needs.”²²³ Price has to reflect that reality.

If a region intends to pry water away from its neighbor, it must create a willing seller. The best way to do that is through a price that compensates the seller for costs, direct and indirect impacts, and third-party spillover effects. If that sum is so high that it discourages sales, then so be it.²²⁴ All selling states will incur some harm by selling their water, even those waters considered to be “excess.”²²⁵ It makes no sense to “solve” a water scarcity issue in one location by creating a new one elsewhere.

220. See GLENNON, *supra* note 1, at 224–25. Property rights mirror this by taking the form of a usufruct rather than a pure personal property right.

221. See Singleterry, *supra* note 110, at 534, 544; William Staudenmaier, *Interstate Water Compacts: The Supreme Court Once Again Endorses State Sovereignty over Water Resources*, BLOOMBERG BNA NEWS (June 26, 2013), <http://www.bna.com/interstate-water-compacts-n17179874750/> [<https://perma.cc/48BH-N6RD>].

222. D. Craig Bell & Norman Johnson, *State Water Laws and Federal Water Uses: The History of Conflict, the Prospects for Accommodation*, 21 ENVTL. L. 1, 14–15 (1991).

223. GRIFFIN, *supra* note 55, at 36 (“[H]eighted costs are relevant to the maximization of social net benefits, so it is a good thing that attention to [] costs results in less water being employed in more costly applications.”).

224. See STEVEN SHAVELL, FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW 55 (2004) (“If the sale of property would result, directly or indirectly, in harm to people not involved in the transaction itself, then discouraging sales may be socially beneficial.”).

225. See ARK. CODE ANN. § 15-22-301 (2011) (charging the Arkansas Natural Resources Commission to determine whether excess surface water exists that might be put to beneficial use); *id.* § 15-22-304 (2011) (defining “excess surface water” to be calculated from average annual basin yield, existing use, instream flow, and future water demand).

Most of the country's water use issues can be addressed by better consumption and conservation management at the local level—that is, dealing with demand.²²⁶ Addressing the demand for water is a more effective manner of dealing with scarcity than simply increasing the supply,²²⁷ as making more water available only provides a false sense of security that will likely fail to communicate supply issues.²²⁸

Prior appropriation jurisdictions are in the best position to know which water management practices will and will not work for their states.²²⁹ They are in an undesirable position, but they do have tools. Many states and municipalities already focus on what they can do to mitigate their water shortage problems without new sources of supply.²³⁰ The solution to water shortages will not come from solely turning on a new spigot—particularly such an expensive one.

CONCLUSION

As the country's water demand increases and aquifers cannot sufficiently recharge, the temptation of interstate water transfers will only grow. Riparian jurisdictions must balance the desire to exploit their water resources with the short- and long-term issues they face from a voluntary loss of water. They have stewardship responsibilities to their citizens and downstream states that would feel an impact from water sales without representation or compensation. Riparian states can and should use a high price shield to fend off nearly all interstate water market proposals—except those that can properly compensate them. By using effective pricing as one of their many tools for water conservation, riparian states can effectively balance their trustee responsibility within the limits of their federalism roles.

226. See GLENNON, *supra* note 1, at 315–25.

227. See GRIFFIN, *supra* note 55, at 4 (discussing demand management versus supply enhancement strategies); Olen Pease, *The Commerce Clause, Interstate Compacts, and Marketing Water Across State Boundaries*, 46 NAT. RESOURCES J. 601, 602–03 (2006) (“[I]n many instances, the real issue is not inadequate supply, but inefficient uses such as failing to conserve water or using water to produce low value goods.”).

228. Klein, *supra* note 27, at 249–50.

229. See, e.g., McCarl & Cai, *supra* note 192 (implementing an “economic, hydrological model” to calculate and maximize the net benefits of interbasin water transfers within Texas); Ronald Kaiser, *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*, 27 TEX. TECH. L. REV. 181 (1996) (analyzing the Texas water shortage).

230. See, e.g., GLENNON, *supra* note 1, at 174–76 (describing San Antonio's water conservation program).