# Amoral Water Markets?

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*Severe water scarcity in the western United States is prompting legitimate questions about the best way to decide which places, people, industries, and species need it most. Water markets, which allow for trading water like a commodity, are perennial proposals during times of scarcity. Water markets have an innate allure: promising to efficiently reallocate water to the highest value uses, minimize risk, and preserve the environment, while relying on the invisible hand to brush aside politically painful values-based questions. This view portrays markets as an amoral arbiter of the best use of water. But water markets are not amoral; they express the historic value judgments baked into the existing western water law system, and layering market approaches over the existing system will both exacerbate the negative impacts of those values and further entrench existing law. In this Article, we show that the West is not ready for water markets.*

*We rely on institutional economics, environmental justice, and commons scholarship to identify three core faults of water markets. First, an institutional economics perspective removes the veil of neutrality and efficiency of markets. Markets are embedded in a political economy and physical geography that makes market failure inherent. Markets depend on legal institutions (property rights, courts, etc.) for their existence and cannot be separated from the value judgments embodied by those institutions. Ultimately, water markets do not determine values—they express them.*

*Second, drawing from environmental justice literature, we argue that markets impede equity and fairness. Markets express the antiquated values baked into the initial distribution of property rights, with lasting consequences for justice today. Markets also displace the participatory governance environmental justice requires.*

*Third, applying commons literature to water markets, we conclude that markets impede reinvigorated water governance by both decreasing*

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*current governance and creating incentives and concentrating political power in a way that frustrates future governance.*

*Market advocates argue that water markets maximize social welfare by maximizing economic efficiency, but our analysis shows that this fails in our current institutional setting. Our analysis also suggests a way forward that everyone who wants a better water future could agree on, market advocates and market skeptics alike. Improved water governance, either as an end in and of itself or as a first step toward deployment of markets, should be the priority for anyone seeking to address water scarcity in the western United States.*

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## INTRODUCTION

We begin with two stories about water rights and water markets. In both cases, water right holders initially obtained their rights to use the public's water for free, as is usually the case.[1] In the first story, a company in Washington that no longer needs its right is selling it back to the public at a rate of $2,750 per acre-foot (AF),[2] ultimately offering it via craigslist.[3] In the second, a water right holder in California lost its water right by failing to use it, and the newly available water is being redistributed to existing junior right holders.

In 1999, TransAlta, a Canadian power company, bought a coal fired power plant in Centralia, Washington.[4] The purchase included a usufructuary right to take 51.6 cubic feet per second (CFS)[5] of water, up to a maximum of 28,033 AF

1. Typically, no one pays the state for the right to use water. *E.g.*, Robert Glennon, *The Price of Water*, 24 J. LAND, RES. & ENV'T L. 337, 340 (2004). Irrigation districts or other providers charge users for infrastructure, energy, treatment, and administrative costs associated, but the state does not charge the right holder for the water itself. *See id.* Those who purchase water from other water right holders pay for it, but the public is not paid for the water use. W.M. Hanemann, *The Economic Conception of Water*, *in* WATER CRISIS: MYTH OR REALITY? 61, 76–77 (Peter P. Rogers et al. eds., 2006).

2. *Water Bank Overview*, TRANSALTA, https://static1.squarespace.com/static/5de6de886324a36663a8cdee/t/5f7e1a6a1247d326375e2d25/1602099848007/TransAltaWaterBank_FAQ_10-2020.pdf [https://perma.cc/JQ77-LDCY] (last visited May 1, 2023). An acre-foot is a volume of water that would cover one acre of land one foot deep and is typically considered enough water for two households for one year in the arid West. *See Acre Foot*, WATER EDUC. FOUND., https://www.watereducation.org/aquapedia/acre-foot [https://perma.cc/SA42-HS5G] (last visited May 1, 2023).

3. *TransAlta Skookumchuck/Chehalis River Water Bank*, CRAIGSLIST (on file with authors).

4. Bloomberg News, *Canadian Utility to Buy U.S. Power Plant*, N.Y. TIMES, May 11, 1999, at C10, https://www.nytimes.com/1999/05/11/business/canadian-utility-to-buy-us-power-plant.html.

5. One CFS is a rate of flow equivalent to one cubic foot of water passing by a given point each second; it is roughly 7.5 gallons per second. *See Glossary*, WATER F., https://perma.cc/HYE8-VB7Y (last visited May 1, 2023).

per year,[6] from the Skookumchuck River for "[p]ower generation and supporting uses."[7] The right dates to 1966,[8] making it one of the oldest on the Skookumchuck, and it is by far the largest; in some months, 51.6 CFS is most of the flow of the river.[9] After a Clean Air Act lawsuit in 2009,[10] TransAlta agreed to shut down one of the plant's two boilers in 2020, with the other to follow in 2025.[11]

With the looming plant closure, TransAlta had a problem. Washington's use-it-or-lose-it approach to water rights meant that TransAlta would forfeit the right if it went unused for five years.[12] In a complicated and creative administrative fix, TransAlta used the right to create a new water bank on the river,[13] which allows TransAlta to sell that water back to other users without worrying about forfeiture.[14] While the water right awaits sale, it provides some environmental benefit by keeping more water in the river. Ultimately, the TransAlta Water Bank will allow TransAlta to sell the full rights to 28,000 AF of water per year at an anticipated profit of up to $77 million.[15]

Summer streamflow on the Skookumchuck River regularly drops below the level required to protect instream water uses, such as ecosystem health or fisheries protection, and new water right holders must reduce their use to protect the

6. *Water Bank Overview*, *supra* note 2; TRANSALTA CENTRALIA GENERATION, TRANSALTA WATER BANK: WATER MARKETING STRATEGY 2 (2021), https://www.usbr.gov/watersmart/watermarketing/docs/applications/2021/fy21wmsg_007_transalta_centralia_generation_llc_508_final.pdf [https://perma.cc/4R86-AK3N].

7. STATE OF WASH., DEP'T OF ECOLOGY, CERTIFICATE OF WATER RIGHT, NO. S2-14966C (Sept. 1, 2009) [hereinafter TRANSALTA CERTIFICATE NO. S2-14966C], https://appswr.ecology.wa.gov/docs/WaterRights/ScanToWRTS/HQ7/pdf/HQ700003041.pdf [https://perma.cc/6BSN-9WNY]. In Washington, a *permit* is only a preliminary award of a water right, which enables the holder to build the project and begin using the water; proof of use is required to finalize the water right through a *certificate*. *See* STATE OF WASH., DEP'T OF ECOLOGY, WATER RIGHTS IN WASHINGTON (2013), https://apps.ecology.wa.gov/publications/documents/961804swr.pdf [https://perma.cc/5W4Z-W4GD].

8. TRANSALTA CERTIFICATE NO. S2-14966C, *supra* note 7.

9. *See Skookumchuck River BL Bldy Run CR NR Centralia, WA*, U.S. GEOLOGICAL SURV., https://waterdata.usgs.gov/monitoring-location/12026150/#parameterCode=00060&period=P365D [https://perma.cc/B2D2-2BAZ] (last visited May 1, 2023). The long-term average flow is roughly 100 CFS in July and August, and it normally remains under 200 CFS from roughly June through mid-November. *Id.*

10. *See* Notice of Appeal, Sierra Club v. Sw. Wash. Clean Air Agency, No. P09-108 (Wash. Pollution Control Hearings Bd. Sept. 28, 2009), https://earthjustice.org/wp-content/uploads/transalta-notice-of-appeal-9-28-09.pdf; *Centralia Coal Plant*, W. GRID (2019), http://westerngrid.net/wcea/wp-content/uploads/2019/03/JET-Case-Studies-Centralia1.pdf [https://perma.cc/CN5P-WRUD].

11. *Centralia Coal Plant*, *supra* note 10. TransAlta also agreed to provide $55 million in funding to soften impacts on the community from the closure. *Id.*

12. WASH. REV. CODE § 90.14.160 (2022); *see also* TROUT UNLIMITED, LANDOWNER'S GUIDE TO WASHINGTON WATER RIGHTS 10, 16 (2019), https://appswr.ecology.wa.gov/docs/WaterRights/wrwebpdf/landownerguide-2019.pdf [https://perma.cc/AQE6-X2LJ].

13. TRANSALTA CENTRALIA GENERATION, *supra* note 6, at 2–3. Water banks allow a right holder to temporarily transfer their right to in-stream use before they eventually sell the right. For details on the water bank operation, see *Water Bank Overview*, *supra* note 2.

14. *Cf.* TROUT UNLIMITED, *supra* note 12; WASH. REV. CODE § 90.14.160.

15. *See Water Bank Overview*, *supra* note 2 (projecting "a rate of $2,750 per [AF] as a one-time cost" for purchasing these water rights).

river.[16] But TransAlta's water rights are so old they predate Washington's minimum instream-flow rules for the Skookumchuck;[17] buyers would be able to use these rights to withdraw water without complying with modern instream flow requirements, in spite of the impacts to the river.[18]

TransAlta's first buyers were the cities of Centralia and Chehalis, which agreed to purchase 6,720 AF.[19] The rest of the rights have not yet been sold, although the Washington Department of Ecology awarded the Quinault Indian Nation a grant of roughly $150,000 for a study to consider purchasing some of the rights for long-term protection of trout and salmon in the river.[20] As of February 2022, TransAlta was listing the water rights in the "For Sale" section of the Seattle craigslist.[21]

In sum, then, after fifty-six years of free use, a company that no longer needs its water right is selling it back to the public at a rate of up to $2,750 per acre-foot.[22] TransAlta bought the plant, which presumably was more valuable because it included the water right, but the water itself is a public resource, and both TransAlta and its predecessor have been free to use the water without paying the public for it. It is not breaking any laws; Washington allows water banks and water transfers to facilitate sales like this one.[23]

This story is a Rorschach test for those interested in water rights. Is TransAlta's water bank, as their consultant described it, "a textbook example of how pre-planning saved a significant block of valid water rights from relinquishment for non-use,"[24] which allows TransAlta to profit from its assets while the market determines the economically highest value uses for the available water? Or is this a perverse outcome, allowing TransAlta to make millions off the sale of the public's water back to the public while the river ecosystems suffer?[25]

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16. *See* TRANSALTA CENTRALIA GENERATION, *supra* note 6, at 8.

17. STATE OF WASH., DEP'T OF ECOLOGY, FINAL REPORT OF EXAMINATION FOR WATER RIGHT CHANGE 26 (2021), https://appswr.ecology.wa.gov/docs/WaterRights/ScanToWRTS/SWRO/pdf/6803112_6_0917202139236.pdf [https://perma.cc/VGC9-339M].

18. *See id.* at 25–26.

19. CHEHALIS CITY COUNCIL, REGULAR MEETING OF MONDAY, DECEMBER 12, 2022, at 119–28 (2022), https://www.ci.chehalis.wa.us/sites/default/files/fileattachments/city_council/page/6602/12.12.2022_agenda_packet.pdf [https://perma.cc/M7UE-428R]. Note that the purchase price was $1,500 per AF, *id.*, less than the asking price of $2,750 per AF, *supra* note 15.

20. STATE OF WASH., DEP'T OF ECOLOGY, FOCUS ON: 2020 GRANT ROUND APPLICATION SUMMARY 17 (2020), https://apps.ecology.wa.gov/publications/documents/2011082.pdf [https://perma.cc/MT9B-X8KW]; Eric Rosane, *Projects Tour Highlights Efforts Benefiting Streamflow Restoration Efforts in Chehalis Basin*, CHRONICLE (Oct. 1, 2021, 4:12 PM), https://www.chronline.com/stories/projects-tour-highlights-efforts-benefiting-streamflow-restoration-efforts-in-chehalis-basin,274108 [https://perma.cc/68QG-EHEQ].

21. *TransAlta Skookumchuck/Chehalis River Water Bank*, *supra* note 3.

22. *Water Bank Overview*, *supra* note 2.

23. *See* WASH. REV. CODE §§ 90.42.100–.170.

24. *Building the Biggest Water Bank in Washington State*, ASPECT CONSULTING (May 12, 2021), https://www.aspectconsulting.com/blog/2021/5/12/biggest-water-bank-in-washington [https://perma.cc/WKW9-EDHW].

25. *See infra* Part II.

The second story comes from the Kern River in California. The Kern starts in California's Sequoia National Park,[26] but by the time the river reaches Bakersfield, California, irrigators and other water users have taken all the water, leaving a dry riverbed.[27] Long ago, water fights over the river[28] led to two agreements, the 1888 Miller-Haggin Agreement and the 1901 Shaw Decree, which divided up every drop in the river.[29] The agreements predate most of California and federal environmental and water laws,[30] and they leave no water in the riverbed most of the time.[31] The rights have never been evaluated under modern environmental or instream flows laws.

Well over a century later, a 2007 California appellate court decision determined that Kern Delta Water District, holder of some of the most valuable old water rights on the river, had forfeited a significant portion of its water rights under California's use-it-or-lose-it water laws.[32] Although the district could have sold the water it was not using prior to the forfeiture,[33] it failed to do so and thus forfeited the right. After the forfeiture, the parties disputed what ought to happen with any excess water. The court held that, under California's first-in-time, first-in-right water law, any water that became available due to the forfeiture went first to existing historic right holders on the river, not new right claimants.[34] The California State Water Resources Control Board is currently considering whether any water is left after fulfilling the historic rights; the Board has declined to apply existing environmental laws to those historic rights as part of the process, putting the public interest behind historic water right holders.[35] Thus the water right will be reallocated based on decisions made over 100 years ago, when the state faced

26. *See Kern River, California*, NAT'L WILD & SCENIC RIVERS SYS., https://www.rivers.gov/rivers/kern.php [https://perma.cc/TVT4-6T38] (last visited May 15, 2023).

27. *See* Ian James, *In Bakersfield, Many Push for Bringing Back the Flow of the Long-Dry Kern River*, L.A. TIMES (Dec. 9, 2021, 5:00 AM), https://www.latimes.com/environment/story/2021-12-09/in-bakersfield-many-push-for-bringing-back-the-flow-of-the-long-dry-kern-river.

28. *See, e.g.*, Lux v. Haggin, 10 P. 674, 675 (Cal. 1886).

29. N. Kern Water Storage Dist. v. Kern Delta Water Dist., No. F033370, 2003 WL 215821, at *2–4 (Cal. Ct. App. Jan. 31, 2003), *as modified on denial of reh'g* (Mar. 3, 2003). *See generally* M. Catherine Miller, *Riparian Rights and the Control of Water in California, 1879-1928: The Relationship Between an Agricultural Enterprise and Legal Change*, 59 AGRIC. HIST. 1 (1985) (describing early conflicts over water rights in California, including rights to the Kern River).

30. *See* Miller, *supra* note 29, at 10–11; *Summary of the Clean Water Act*, EPA, https://www.epa.gov/laws-regulations/summary-clean-water-act [https://perma.cc/5UL3-RUQC] (last visited May 15, 2023) (Clean Water Act's (CWA) predecessor, the Federal Water Pollution Control Act, enacted in 1948); Sarah E. Boslaugh, *National Environmental Policy Act*, BRITANNICA (May 11, 2023), https://www.britannica.com/topic/National-Environmental-Policy-Act [https://perma.cc/6CXE-W5M6] (National Environmental Policy Act (NEPA) enacted in 1969).

31. James, *supra* note 27.

32. N. Kern Water Storage Dist. v. Kern Delta Water Dist., 54 Cal. Rptr. 3d 578, 601 (Ct. App. 2007).

33. *See id.* at 599; CAL. WATER CODE § 1706.

34. *See N. Kern Water Storage Dist.*, 54 Cal. Rptr. 3d at 599–600.

35. *See* Letter from Nicole L. Kuenzi, Hearing Officer, Cal. State Water Res. Control Bd., to All Parties 2–5 (Nov. 3, 2021) (available at https://www.waterboards.ca.gov/water_issues/programs/administrative_hearings_office/docs/2022/2021-11-03-ruling-letter_kern.pdf [https://perma.cc/V4GJ-EBJY]).

an entirely different set of water priorities, based on an entirely different set of human values.

This story is a second Rorschach test. Is dispersal of Kern Delta's lost water among other historic rights a failure because there was no market to allow redistribution and reallocation based on modern needs, as signaled by market prices? Or is it a failure of governance[36] because California should have long ago exercised its considerable supervisory power over water rights to put water back in the river? Or is it an example of the water rights system working as it should, moving water from those who don't use it to those who will?

These are compelling questions about water rights and their commodification. Water in the West is owned by the public,[37] and right holders are granted a usufructuary right to use the water, not to own it.[38] Water rights are, in theory, subject to a litany of tests, designed by state courts and state governments to ensure that the rights serve the needs of the public. Laws vary by state but include tests for reasonableness,[39] for beneficial use,[40] to avoid waste,[41] for public interest,[42] and to protect the public trust.[43] Unlike property rights in land, water rights are conditional rights to use common pool public resources, granted for a particular amount, for use in a specific place, and for a specific purpose.[44] But what does that mean for a company like TransAlta, which views its water rights like any other asset and wants to dispose of those rights as market commodities? And, although the Kern River rights are subject to California's regulatory control, in practice the state has done little to apply existing modern law to them. How can

36. We take our understanding of "governance" in this Article from Rogers and Hall's early work on global water governance. *See* PETER ROGERS & ALAN W HALL, GLOBAL WATER P'SHIP, EFFECTIVE WATER GOVERNANCE 4 (2003), https://www.gwp.org/globalassets/global/toolbox/publications/background-papers/07-effective-water-governance-2003-english.pdf [https://perma.cc/4DEQ-45ET] ("The concept of governance of course encompasses laws, regulations, and institutions but it also relates to government policies and actions, to domestic activities, and to networks of influence . . . ."). Our use of "water governance" is more specific and relies on Carl Bauer's definition: "[W]ater governance means the legal and political processes and institutions for *resolving conflicts* over water, especially conflicts among multiple water rights, uses, and values." Carl J. Bauer, *Water Conflicts and Entrenched Governance Problems in Chile's Market Model*, 8 WATER ALTS. 147, 149 (2015). Of course, water markets can be considered part of water governance. But for purposes of this paper, we explicitly mean *nonmarket* forms of water governance.

37. *See* Christine A. Klein, *Water Bankruptcy*, 97 MINN. L. REV. 560, 562–63, 566–67 (2012).

38. *Id.* at 566.

39. *See, e.g.*, Bernadette R. Nelson, Note, *Muddy Water Blues: How the Murky Doctrine of Equitable Apportionment Should Be Refined*, 105 IOWA L. REV. 1827, 1833–34 (2020).

40. *See, e.g.*, *id.* at 1835–37.

41. *See, e.g.*, Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENV'T L. 919, 928–29, 933–46 (1998).

42. *See, e.g.*, Mark Squillace, *Restoring the Public Interest in Western Water Law*, 2020 UTAH L. REV. 627, 638–39.

43. *See, e.g.*, Robin Kundis Craig, *A Comparative Guide to the Western States' Public Trust Doctrines: Public Values, Private Rights, and the Evolution Toward an Ecological Public Trust*, 37 ECOLOGY L.Q. 53, 56 (2010).

44. *See* Chad O. Dorr, Comment, *"Unless and Until It Proves to Be Necessary": Applying Water Interest to Prevent Unjust Enrichment in Interstate Water Disputes*, 101 CALIF. L. REV. 1763, 1774 (2013); Rhett B. Larson, *Water Security*, 112 NW. U. L. REV. 139, 177 (2017).

states effectively regulate these historic rights to ensure that they are still meeting the needs of the public?

These two stories also present compelling questions about water markets. Water managers, water scholars, and even some western politicians broadly agree that existing water allocations already do not align well with modern water needs.[45] We focus here on two prominent failings of water rights systems. First, they do a poor job of protecting instream water uses, such as providing sufficient water to support ecosystems and the services they provide, supplying sufficient habitat and other needs for threatened and endangered species, providing healthy rivers for recreation and navigation, and other instream benefits. Second, they do a poor job of meeting the water needs of disadvantaged communities, particularly in rural and tribal communities.[46] This is particularly true given the ways that climate change aggravates existing water scarcity.[47] Both the TransAlta and the Kern River examples illustrate these problems and are emblematic of the water crisis gripping the West.

At the outset, we note the exact definition of a "market" for water is contentious.[48] Although scholars of economics and of law regularly apply the term "market" haphazardly to various administrative processes for water allocation and distribution where there is some kind of private property right to water quantity or use,[49] we define "water markets" for this Article in the broadest possible sense to mean institutional arrangements in which water is treated, at least in part, like a commodity—bought, sold, and leased by public or private entities, who negotiate price.[50]

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45. *See* Adam Beam, *California Lawmakers Mull Buying Out Farmers to Save Water*, NBC BAY AREA (June 7, 2022, 11:35 AM), https://www.nbcbayarea.com/news/california/california-lawmakers-mull-buying-out-farmers-to-save-water/2911831/ [https://perma.cc/XY2C-6L5Y]; *infra* Section II.B.

46. *See infra* Section II.B.1.

47. *See* Jesse Reiblich & Christine A. Klein, *Climate Change and Water Transfers*, 41 PEPP. L. REV. 439, 441 (2014).

48. Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myth of Markets for Water*, 25 WM. & MARY ENV'T L. & POL'Y REV. 317, 320–21 (2000) (noting that many "confuse the administrative use of economic incentives for markets"); Reiblich & Klein, *supra* note 47, at 449 (creating a typology of water transfers because "many [states] . . . do not use the terminology consistently").

49. The trouble is that "[a]mbiguous terms blur analytical and prescriptive clarity." Edella Schlager & Elinor Ostrom, *Property-Rights Regimes and Natural Resources: A Conceptual Analysis*, 68 LAND ECON. 249, 249 (1992). If we don't all agree on what we are talking about, we tend to talk past each other. *See* Dellapenna, *supra* note 48, at 318–20 (identifying different understandings of term "market" as applied to water). *See generally* Carl Bauer, *Bringing Water Markets Down to Earth: The Political Economy of Water Rights in Chile, 1976–95*, 25 WORLD DEV. 639 (1997) (exploring water markets as applied to Chile); Federico Aguilera-Klink & Juan Sánchez-García, *Water Markets in Tenerife: The Conflict Between Instrumental and Ceremonial Functions of the Institutions*, 3 INT'L J. WATER 166 (2005) (as applied to Tenerife); Vanessa Casado-Pérez, *Missing Water Markets: A Cautionary Tale of Governmental Failure*, 23 N.Y.U. ENV'T L.J. 157 (2015) (as applied to California and Spain).

50. This definition is consistent with that of water economist Bonnie Colby. *See* Bonnie G. Colby, *Economic Impacts of Water Law—State Law and Water Market Development in the Southwest*, 28 NAT. RES. J. 721, 723 (1988). We exclude privatization of water supply systems, bottled water markets, and other water-market-adjacent topics that are sometimes included.

Many scholars and policy makers push for the widespread adoption of water markets to address these problems.[51] Indeed, for the past fifty years in the West and around the world, inflection points in water scarcity—including drought and competition across uses—have brought calls for expanded water markets as the solution, or at least a solution.[52] The water-market literature is wide and varied.[53] For our purposes, one might divide the literature into three camps: the free-market evangelists,[54] who advocate markets with limits or no regulatory restraints, based on the view that properly functioning markets can deliver both public and private goods at appropriate levels;[55] the market pragmatists, who argue that water markets are limited by their institutions, initial distribution of rights, market failures, and other complications, and so require government regulation to function well;[56] and the market skeptics, who distrust markets and argue private transactions are unlikely to produce a reallocation of water that serves the public interest.[57]

Free-market evangelists argue that markets lead to economically efficient outcomes because actors who want to acquire water for higher valued economic uses will buy it from users who value it less, until the market arrives at a dynamic, economically efficient outcome.[58] In their view, market forces, by replacing human value with economic value, let governments step back from making hard judgments about water allocation among various uses, instead turning the decisions over to the amoral invisible hand of the market. Or, as former congressional leader Richard Armey (R-TX) tells it, "markets are smart, government is

51. This Article focuses on water markets in the western United States defined as those states in the continental United States on or west of the 100th meridian, a traditional line of demarcation. Land west of the line is often unable to grow crops without supplemental irrigation. Gregory J. Hobbs, Jr., *Snake River Basin Adjudication and John Wesley Powell's Much-Misunderstood Water Commonwealth Governance Proposal*, 52 IDAHO L. REV. 1, 9 (2016) (citing J.W. POWELL, REPORT ON THE LANDS OF THE ARID REGION OF THE UNITED STATES 3–5 (1879)). Eastern states have very few water markets and face a different set of water issues. *See* Christine A. Klein, *Water Transfers: The Case Against Transbasin Diversions in the Eastern States*, 25 UCLA J. ENV'T L. & POL'Y 249, 252 (2007). We use the terms "American West," "the West," "western United States," and "western states" interchangeably to denote this region.

52. *See infra* Sections I.A.4, I.B. For a collection of pro-market citations, see Klein, *supra* note 51, at 254 n.17.

53. *See* VANESSA CASADO PÉREZ, THE ROLE OF GOVERNMENT IN WATER MARKETS 30–37 (2017).

54. Professor Michael Blumm refers to the free-market evangelists as privateers. Michael C. Blumm, *The Fallacies of Free Market Environmentalism*, 15 HARV. J.L. & PUB. POL'Y 371, 371 (1992).

55. For a review of the free-market evangelist water market literature, see generally *id.*

56. *See, e.g.*, Vanessa Casado Perez, *Liquid Business*, 47 FLA. ST. U. L. REV. 201, 203 (2019); Barton H. Thompson, Jr., *Water as a Public Commodity*, 95 MARQ. L. REV. 17, 17–19 (2011).

57. *See, e.g.*, Helen Ingram, John M. Whiteley & Richard Perry, *The Importance of Equity and the Limits of Efficiency in Water Resources*, *in* WATER, PLACE, AND EQUITY 1, 7–8 (John M. Whiteley et al. eds., 2008); Bauer, *supra* note 36, at 148, 167. For a general overview of the history of market advocacy, see Dustin E. Garrick & Jesper Svensson, *The Political Economy of Water Markets: 40 Years of Debates, Experiments and Lessons Learned*, *in* THE OXFORD HANDBOOK OF WATER POLITICS AND POLICY 376, 379–80 (Ken Conca & Erika Weinthal eds., 2018).

58. *See infra* Section I.B.2.

dumb."[59] But this view misunderstands water markets, and following its prescriptions would make water scarcity problems worse.

Market pragmatists also portray water markets as an alternative to government reallocation that lets the public determine the best use for water through private water transactions, but they stress the government's continuing role in addressing market failures, ensuring adequate protection of public goods, and other market interventions.[60]

In this Article, we argue that western water law is not ready for widespread water markets. This argument sits in opposition to the water evangelist position but in dialogue with the water pragmatists. In brief, our argument proceeds as follows. Part I begins with the basics of water rights and then describes the theoretical benefits of water markets, based on recent legal literature, to show what makes them so attractive. Part II presents three core critiques of water markets. First, an institutional economics perspective removes the veil of neutrality and presumption of efficiency from the theory of water markets. Markets are embedded in a political economy and physical geography that makes market failure inherent. Markets are not amoral. They depend on legal institutions (property rights, courts, etc.) for their existence and cannot be separated from the value judgments embodied by those institutions. Thus, Section II.A rebuts many of the assumptions of the market evangelists. Second, drawing from environmental justice literature, we argue that markets impede modern principles of equity and fairness. They exist as reflections of antiquated values, embedded in the initial distribution of property rights with lasting consequences for distribution of rights today, and they crowd out the participatory governance necessary for meaningful environmental justice. Section II.B thus highlights water-market impacts that have been underappreciated by market advocates and market skeptics alike. Third, relying on commons literature, we conclude that water markets can be obstacles to reinvigorated water governance because they decrease *active* governance in the present while creating incentives and concentrating political power in a way that frustrates future governance. Market advocates suggest firmer water rights are required for water markets, but many advocates want to firm up water rights by reducing existing public protections rather than by enforcing existing laws—an approach unlikely to serve the public good. Section II.C accordingly raises challenges that market pragmatists must address before widescale markets are deployed. We conclude that reinvigorated water governance is a precondition to significant markets that serve the public interest. Finally, Part III suggests a

59. LAWRENCE D. BROWN & LAWRENCE R. JACOBS, THE PRIVATE ABUSE OF THE PUBLIC INTEREST: MARKET MYTHS AND POLICY MUDDLES 1 (2008). This was a favored line for Representative Dick Armey, who sometimes varied it as, "The market is rational; the government's dumb." Jake Tapper, *Retiring, Not Shy: Questions for Dick Armey*, N.Y. TIMES MAG., Sept. 1, 2002, at 25.

60. *See supra* note 56 and accompanying text. The third group, markets skeptics, can be hard to differentiate from the market pragmatists, in part because relatively few scholars suggest that markets have no role in the reallocation of water. The differences may be most evident in the quantity and distance (inter- versus intra-basin transfers) of water transfers the two groups consider acceptable even with adequate water governance. *See, e.g.*, Klein, *supra* note 51, at 250–52.

way forward for market advocates and market skeptics alike: improved water governance, either as an end in and of itself or as a first step toward deployment of markets that have a chance of success, should be the top priority for anyone seeking to address water scarcity in the western United States.[61]

## I. WATER RIGHTS AND WATER MARKETS

Property rights in water serve human values.[62] These values have changed over time, from nation-building to trust-busting to individual autonomy to environmental protection, across varied landscapes with differing hydrologies.[63] Theoretically, through legislation and court decisions, private property rights in water are repeatedly balanced against public interests to ensure that the rights serve public needs. In practice, however, the existing western water law regimes predominantly reflect the mid-nineteenth century demand for widespread economic growth at all costs.[64] The many doctrines and statutes designed to cabin this economic pressure are honored mostly in the breach, with limited use to actually constrain water rights. Part I begins with the history of the creation and maintenance of private property rights in water, as seen through a value-driven utilitarian lens, and concludes by explaining the ways that our current water rights system is failing to meet the needs of modern society.

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61. Before diving into water rights and our core argument about the mismatch between water markets and western water, we want to briefly address the specter of the nirvana fallacy. Our focus in this Article is to warn against the "siren song" of markets to solve existing water crises, which climate impacts will exacerbate in the coming months, years, and decades. We borrow the use of this phrase to describe the innate appeal of water markets from CARL J. BAUER, SIREN SONG: CHILEAN WATER LAW AS A MODEL FOR INTERNATIONAL REFORM (2004). In choosing this focus, we are nonetheless painfully aware of the shortcomings of water law and water governance. As water governance scholars Wilder and Ingram note, water conflict is inevitable, and water governance will always be difficult. *See* Margaret Wilder & Helen Ingram, *Knowing Equity When We See It: Water Equity in Contemporary Global Contexts*, *in* THE OXFORD HANDBOOK OF WATER POLITICS AND POLICY 49, 58 (Ken Conca & Erika Weinthal eds., 2015). There is a deep literature on water governance at multiple scales, ranging from Nobel Prize-winning economist Elinor Ostrom's discussion of local governance of common pool resources to Claudia Pahl-Wostl's work on global water governance. *See* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 106–10 (1990); Claudia Pahl-Wostl, Ken Conca, Annika Kramer, Josefina Maestu & Falk Schmidt, *Missing Links in Global Water Governance: A Processes-Oriented Analysis*, ECOLOGY & SOC'Y, June 2013, at 1, 1–9. We engage with only a fraction of this literature in this Article, and only as it relates to water markets. The work of water governance is too broad to address holistically in this paper alongside our discussion on water markets.

62. *See* State v. Shack, 277 A.2d 369, 372 (N.J. 1971); Chance v. BP Chems., Inc., 670 N.E.2d 985, 992 (Ohio 1996) (explaining property rights "var[y] with our varying needs"). Like "cleave" or "dust," "value" is a contranym, encompassing two conflicting meanings. It can mean both economic value (exchange value or use value) or value in a noneconomic sense (that is, "'dearly held beliefs' or guiding principles"). Sonya F. P. Ziaja, *Rules and Values in Virtual Optimization of California Hydropower*, 57 NAT. RES. J. 329, 332 (2017). In this paper we have tried to clarify this distinction by using the terms "economic value" as opposed to "value" in the sociological sense. The terms "human values" or "value-laden judgments" likewise indicate the sociological sense of "value."

63. *See, e.g.*, MORTON HORWITZ, THE TRANSFORMATION OF AMERICAN LAW, 1780-1860, at 31–56 (1977); David B. Schorr, *Appropriation as Agrarianism: Distributive Justice in the Creation of Property Rights*, 32 ECOLOGY L.Q. 3, 14–15 (2005).

64. *See* HORWITZ, *supra* note 63, at 31–53.

The second half of Part I discusses the allure of water markets as a solution to these problems based on the recent water-market literature.[65] As advocates argue, markets can incentivize conservation and shift water use to higher-economic-value uses, and the atomistic choices of water markets seem to offer a way out of politically difficult conversations about water rights. This discussion sets up a discussion of the weaknesses of the market approach in Part II.

### A. EVOLUTION OF WATER RIGHTS

Water law is predominately state law, and states embrace a wide variety of water rights and water allocation systems.[66] States tend to recognize two primary kinds of surface water rights.[67] Eastern states typically focus on riparian water rights, derived from ownership of riparian land,[68] although many eastern states are increasingly using regulated riparianism, a permitting approach that blends riparian rights with state-issued permits.[69] Western states, particularly in the drier areas between the Sierra Nevada and the Rockies, focus on appropriative rights, which derive from the beneficial use of the water.[70] Many states along the East/West margin and along the West Coast use blended systems and have historically recognized both types of rights.[71] The pattern of state approaches to water rights over time reflects changing rights to meet social goals and adapt to local conditions.[72] Historically, goals focused primarily on development and use of water, and in practice, many water users ignored the statutes and doctrines that sought to balance the demand for water against the public interest.[73] Today, inadequate water governance means that water rights have failed to keep pace with changes in social priorities.

#### 1. The Adoption and Transformation of Riparian Rights

In the early United States, eastern state courts facing water use conflicts relied on a loose version of riparian rights, the English common law water right. England, with its ample water supplies and low water demands, presented a human geography and climate that mirrored the eastern United States; English

65. *See, e.g.*, Bryan Leonard, Christopher Costello & Gary D. Libecap, *Expanding Water Markets in the Western United States: Barriers and Lessons from Other Natural Resource Markets*, 13 REV. ENV'T ECON. & POL'Y 43, 56–58 (2019) (arguing for expansion of western water markets).

66. Klein, *supra* note 37, at 566–67.

67. Groundwater laws follow many of the same patterns of development over time discussed here, but that history is beyond the scope of this discussion. For more detail, see Dave Owen, *Taking Groundwater*, 91 WASH. U. L. REV. 253, 266–71 (2013).

68. Dave Owen, *Water and Taxes*, 50 U.C. DAVIS L. REV. 1559, 1566 (2017). Riparian land is land that abuts a water source.

69. *See infra* Section I.A.1.

70. *See infra* Section I.A.1.

71. *See infra* Section I.A.1.

72. *See* Joseph W. Dellapenna, *United States: The Allocation of Surface Waters*, *in* THE EVOLUTION OF THE LAW AND POLITICS OF WATER 189, 189 (Joseph W. Dellapenna & Joyeeta Gupta eds., 2008).

73. *See, e.g.*, Karrigan S. Börk, Joseph F. Krovoza, Jacob V. Katz & Peter B. Moyle, *The Rebirth of California Fish & Game Code Section 5937: Water for Fish*, 45 U.C. DAVIS L. REV. 809, 829–30 (2012).

water rights seemed a logical transplant.[74] In cases of conflicting claims, courts focused in part on the natural flow doctrine, an English doctrine that "entitled each riparian-rights owner to 'have the water flow across, or lie upon, the land in its natural condition, without alteration by others of the rate of flow or the quantity or quality of the water.'"[75] The doctrine, applied strictly, prohibits any use by a riparian that reduced the natural flow of the river reaching downstream riparians, making it a de facto bar on significant riparian uses. Courts rapidly moved toward a more permissive approach: the reasonable use doctrine.[76] By the mid-1800s, population growth and increased industrial water use killed the natural flow doctrine.[77] Later social changes have continued to challenge riparian rights, and in turn the contours of those rights have continued to shift in response to "a complex interplay between climate, stages of economic development, and inherited legal theory."[78]

The doctrine of riparian rights is foundational to understanding the development of appropriative rights and arguments in the rest of this Article, so we conclude this Section with a high-level overview of current riparian/regulated riparianism law. Like all water rights, riparian rights are usufructuary, granting a right to use water, not to own it;[79] the water itself belongs to the public. Riparian rights are correlative, meaning that any reductions due to shortages are often shared equally across all users.[80] As a result, the rights do not allocate a fixed

74. Vanessa Casado Pérez & Yael R. Lifshitz, *Natural Transplants*, 97 N.Y.U. L. REV. 933, 959 n.110 (2022).

75. Nelson, *supra* note 39, at 1833 (quoting Joseph W. Dellapenna, *Riparianism*, *in* 1 WATERS AND WATER RIGHTS § 7.02(c) (Robert E. Beck & Amy K. Kelley eds., 1991)).

76. *See* Tyler v. Wilkinson, 24 F. Cas. 472, 474 (C.C.D.R.I. 1827) (No. 14,312). Justice Story begins with a rigid proclamation of the natural flow doctrine but concludes with an embrace of reasonable use; this pattern seems to be the standard for most of the early cases in eastern water law. *See id.*; Joseph W. Dellapenna, *The Evolution of Riparianism in the United States*, 95 MARQ. L. REV. 53, 65–66 (2011) ("[T]he received wisdom is that courts originally applied riparian rights as a rather rigid theory of protecting natural flows—a theory that allowed a riparian landowner to enjoin any water uses that materially altered the quantity or quality of the natural flow without proof of actual injury—and then shifted to a 'reasonable use' theory that balanced competing uses against each other to determine which use was more socially beneficial." (footnote omitted)); HORWITZ, *supra* note 63, at 38–39. The story is more complicated than this sketch suggests. For example, many courts purported to apply a natural flow approach but actually applied a reasonable use approach. Dellapenna, a renowned water scholar, argues that reasonableness has always been the rule, with natural use confined to "occasional dicta." Dellapenna, *supra*, at 69. Dellapenna's article gives a thorough overview of this history and suggests that even the purported reliance on natural flow by courts faded over time, giving way to language focused on reasonable use.

77. Nelson, *supra* note 39, at 1833; *see also* Shelley Ross Saxer, *The Fluid Nature of Property Rights in Water*, 21 DUKE ENV'T L. & POL'Y F. 49, 62 (2010) ("The reasonable use doctrine addressed the East's shift from an agricultural society to an industrialized economy by changing common law water rights to accommodate community needs.").

78. Dellapenna, *supra* note 76, at 85.

79. *See* Richard A. Epstein, *How Spontaneous? How Regulated?: The Evolution of Property Rights Systems*, 100 IOWA L. REV. 2341, 2351 (2015).

80. Joseph W. Dellapenna, *Special Challenges to Water Markets in Riparian States*, 21 GA. ST. U. L. REV. 305, 316 (2004) ("When *pro rata* sharing among competing users is possible, courts, under the reasonable use rule, have preferred it as the fairest resolution when there is a limited amount of water.").

amount of water, with available water varying both by year and by the amount of water used by other riparians.[81] Traditional riparian use is limited to the riparian lands within the watershed of origin, with very limited storage or transportation rights.[82] Private riparian rights are subject to "[a] continuing sovereign interest in the appropriate exercise of [the] riparian right[],"[83] particularly in navigable waters, including interests like fisheries or navigation, as the U.S. Supreme Court has noted.[84] Under traditional approaches, the strength of the riparian right lies in a riparian's ability to begin using or to change use of water at any time, even after a long period of disuse, without permission from any regulatory body; this contrasts with the appropriative rights approach discussed below.

Legislatures and courts have stretched riparian rights to guarantee water for human needs in situations that would otherwise be incompatible with riparian rights, like water for off-stream industrial purposes or municipal needs.[85] In many cases, riparianism "has evolved to allow consumptive use of water, the transference of water rights, and even transbasin water use in some cases."[86]

Most recently, eighteen of the thirty-one riparian states have continued this transformation by adopting a new water rights system: regulated riparianism.[87] Regulated riparianism builds on the core ideas of riparianism but adds permitting requirements, time limits on rights, and increased regulatory oversight to harmonize riparian rights with modern water use priorities.[88] This evolutionary history of riparian rights, from natural flow limits to regulated permits, is quite literally a textbook case of water rights evolving to serve human needs.[89]

2. The Creation and Spread of Appropriative Rights

Riparianism's storage and transportation prohibitions made riparianism a mismatch for western lands, where precipitation was seasonal, spotty, and in short supply—most farmland in the West was worthless without summer irrigation

81. *See* BARTON H. THOMPSON, JR., JOHN D. LESHY, ROBERT H. ABRAMS & SANDRA B. ZELLMER, LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS 28–29 (6th ed. 2018).

82. *Id.*

83. James H. Davenport & Craig Bell, *Governmental Interference with the Use of Water: When Do Unconstitutional "Takings" Occur?*, 9 U. DENV. WATER L. REV. 1, 24 (2005); *see* Virginia v. Maryland, 540 U.S. 56, 67 (2003) ("[D]ominion over navigable waters . . . [is] so identified with the exercise of the sovereign powers of government that a presumption against their separation from sovereignty must be indulged." (first alteration in original) (quoting Massachusetts v. New York, 271 U.S. 65, 89 (1926))).

84. *See* Holyoke Co. v. Lyman, 82 U.S. (15 Wall.) 500, 506 (1872).

85. *See* 141 A.L.R. 639 (noting that some jurisdictions have stretched the riparian rights to allow municipalities to use riparian rights for public water supplies); *cf.* THOMPSON, JR. ET AL., *supra* note 81 (defining characteristics of riparian rights systems).

86. Christopher L. Len, *Synthesis - A Brand New Water Law*, 8 U. DENV. WATER L. REV. 55, 64 (2004) (footnote omitted).

87. Dellapenna, *supra* note 80, at 327–28 (explaining that out of Hawaii and the 31 states east of Kansas City, "one can identify about 18 states that have enacted a regulated riparian system"); *see* Dellapenna, *supra* note 75, at § 9.03.

88. *See* ASCE/EWRI 40-03 REGULATED RIPARIAN MODEL WATER CODE ix (AM. SOC'Y OF CIV. ENG'RS 2004).

89. *See* THOMPSON, JR. ET AL., *supra* note 81, at 53–54; *see also* Dellapenna, *supra* note 76, at 85–87 (discussing transformation of riparianism to address varying public interests).

with stored water.[90] Moreover, the land ownership requirement for riparian rights meant that miners and cattle ranchers had difficulty securing rights, because they often used public land they did not own.[91]

New law evolved in the gold camps of California's Sierra Nevada, a novel hydrological and geographical environment.[92] The camps were a lawless place; California was a nascent state, with extremely limited regulatory and judicial powers, and did little to help resolve disputes in the miners' remote mountain camps. As noted water scholar Joseph Dellapenna describes it, "The miners quickly sought to bring order to their lives through 'vigilance committees,' applying vigilante law based on the most elementary notion of justice: the first to grab it owns it . . . ."[93] Early state governments and courts across the West typically acquiesced or actively ratified these claims, adopting the now well-known "first in time, first in right" western water law.[94]

These appropriative water rights accrued based not on land ownership but on taking available water and putting it to beneficial use. In times of shortage, the oldest rights got their full share before more junior rights got any water. This provided a measure of certainty lacking in riparian rights and enabled development of larger and more expensive water infrastructure projects. These rights responded to societal needs by dropping riparianism's restrictions on water storage and transport.[95]

As courts and legislatures caught up to the mining camp customs, they refined the new appropriative rights. For example, virtually every state imposed additional conditions on water rights to counter water monopolies.[96] Professor Johnson notes that prior appropriation law

> reflects several fundamental principles: (1) maximum utilization of water resources, because water is necessary for settlement and progress; (2) prevention of speculation as a non-welfare producing, wasteful activity; (3) prevention of monopolistic control over water resources and protection of the small farmer; and (4) recognition that water is fundamentally public in character, belonging to the citizens of the state.[97]

90. Nelson, *supra* note 39, at 1834; Nicole L. Johnson, *Property Without Possession*, 24 YALE J. ON REGUL. 205, 219 (2007).

91. *See, e.g.*, Irwin v. Phillips, 5 Cal. 140, 147 (1855).

92. *See* Joseph W. Dellapenna, *A Primer on Groundwater Law*, 49 IDAHO L. REV. 265, 297–98 (2013); Nelson, *supra* note 39, at 1834 & n.42.

93. Dellapenna, *supra* note 76, at 79. *See generally* DAVID SCHORR, THE COLORADO DOCTRINE: WATER RIGHTS, CORPORATIONS, AND DISTRIBUTIVE JUSTICE ON THE AMERICAN FRONTIER (2012) (concluding the early history of prior appropriation was animated by ideology and anti-monopoly distributive justice).

94. *See* Nelson, *supra* note 39, at 1835; Dellapenna, *supra* note 92, at 298–99.

95. *See* Nelson, *supra* note 39, at 1835.

96. *See generally* SCHORR, *supra* note 93.

97. Johnson, *supra* note 90, at 220 (footnotes omitted).

"Like acreage limits on Preemption and Homestead Act claims, public ownership of water was a vehicle in the struggle against monopolies, speculation, and concentrated wealth."[98] By the same token, all western states limit water rights to the amount of water that can be beneficially used, without waste, in order "to curb speculation, avoid concentrated wealth, and encourage widespread use."[99] Similarly, western states require that water rights be used or else lost,[100] that water uses be in the public interest,[101] and often that water use be reasonable.[102] From the modification and development of Americanized riparian rights and regulated riparianism, to the birth of appropriative rights and their gradual evolution, the history of the ever-changing American water right is a story of evolution in pursuit of better service to human values.

But what values? Although many of the dominant values driving the evolution of water rights focused on maximum use of water and economic development by the broadest number of people,[103] other values also shaped the contours of water rights. Consider the value of instream water use for ecosystems, recreation, and navigation. Traditional prior-appropriation rights required physical diversion of water, so appropriative rights could not protect water for instream use.[104] Nevertheless, many western states have sought to protect instream uses since the very beginning of water development.[105] For

98. Michael C. Blumm, *Antimonopoly and the Radical Lockean Origins of Western Water Law*, 20 HASTINGS W.-NW. J. ENV'T L. & POL'Y 377, 385–86 (2014) (reviewing SCHORR, *supra* note 93).

99. *Id.* at 386.

100. Neuman, *supra* note 41, at 920, 928–29.

101. Squillace, *supra* note 42.

102. The relationship between beneficial use (that the water be used for a purpose recognized by the state as beneficial) and reasonable use (that the water be used in a way that is reasonable, considering all the circumstances) is complicated. In some states, a use is only beneficial if it is reasonable. *See, e.g.*, State *ex rel.* Erickson v. McLean, 308 P.2d 983, 987 (N.M. 1957) (holding that "[a]n excessive diversion of water, through waste, cannot be regarded as a diversion to beneficial use, within the meaning of the [New Mexico] Constitution"); Glenn Dale Ranches, Inc. v. Shaub, 494 P.2d 1029, 1031 (Idaho 1972) (holding that water diverted to compensate for unreasonable loss in transmission is not beneficially used). Other states make reasonable use a separate, stand-alone requirement. *See, e.g.*, Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972, 1007 (Cal. 1935) ("We are also of the opinion that the evidence does not entirely support the findings that *all* the water that was used in the winter period (whatever the amount may have been) was put to beneficial uses. Preliminarily, it should be stated that, whatever quantity an appropriator has actually diverted in the past, he gains no right thereto unless such water is actually put to a reasonable beneficial use."). The Second Restatement of Torts goes the opposite direction to arrive at the same conclusion, weighing the purpose of a use in determining whether it is reasonable: "A reasonable use must be one that is beneficial and that fulfills some significant or worthwhile human need or desire." RESTATEMENT (SECOND) OF TORTS § 850A cmt. b (AM. L. INST. 1979). Regardless of the fineries, it seems safe to say, echoing the Ninth Circuit, that a beneficial use cannot be a use that is "'unreasonable' considering alternative uses of the water." United States v. Alpine Land & Reservoir Co., 697 F.2d 851, 854 (9th Cir. 1983); *see also* Neuman, *supra* note 41, at 925 (noting state laws and constitutions limiting beneficial uses with a reasonableness requirement and that "there seems to be little significant variation among the states in the general interpretation and application of the beneficial use doctrine").

103. As we discuss in Section II.B.1, this was often limited to white people and excluded many minority groups.

104. Reiblich & Klein, *supra* note 47, at 472.

105. *See* Börk et al., *supra* note 73.

example, California,[106] Oregon,[107] and Washington[108] have all had laws purporting to restrict water development to protect fish passage since at or before statehood. Many states began to explicitly consider flow protection in the 1950s and 1960s.[109] In the 1960s and 1970s, federal and state wild and scenic river acts[110] and the burgeoning modern public trust doctrine directly protected instream uses in some states.[111] Under more modern approaches, many states now allow instream appropriative rights, although little water remains for instream rights.[112] At its strongest, the public trust reshapes water rights and reorders existing priorities to protect newer instream uses first.[113] Other interests were related to different human uses of water. Domestic use has long enjoyed special protection under both riparian and prior appropriation law, ensuring drinking water supply.[114] California has recently recognized a human right to water.[115] Regulators and courts have also recently protected water in recognition of its spiritual value to federally recognized tribes.[116] The historic and growing

106. An Act to Prohibit the Erection of Weirs, or Other Obstructions, to the Run of Salmon, 1852 Cal. Stat. 135.

107. An Act to Establish the Territorial Government of Oregon, Pub. L. No. 30-177, 9 Stat. 323 (1848).

108. An Act to Prevent the Destruction of Fish in Any Fresh Water Streams, Creeks or Lakes in Washington Territory, 1871 Wash. Sess. Laws 93. Nevada added a fishway requirement in 1929, roughly sixty-five years after statehood. Act of Mar. 29, 1929, ch. 178, § 32, 1929 Nev. Stat. 300, 308–09.

109. *See* Johnson, *supra* note 90, at 232.

110. Wild and Scenic Rivers Act, Pub. L. No. 90-542, 82 Stat. 906 (1968) (codified as amended at 16 U.S.C. §§ 1271–1287); California Wild and Scenic Rivers Act, 1972 Cal. Stat. 2510 (codified at CAL. PUB. RES. CODE § 5093.50).

111. *See* Johnson, *supra* note 90, at 232. *See generally* John D. Echeverria, *The Public Trust Doctrine as a Background Principles Defense in Takings Litigation*, 45 U.C. DAVIS L. REV. 931 (2012) (discussing whether public trust doctrine should be a defense against Takings Clause claims due to regulatory restrictions on water use designed to protect fish). For background on the public trust doctrine and its relation to water rights, see generally Craig, *supra* note 43, and Robin Kundis Craig, *A Comparative Guide to the Eastern Public Trust Doctrines: Classifications of States, Property Rights, and State Summaries*, 16 PENN ST. ENV'T L. REV. 1 (2007).

112. *See* Johnson, *supra* note 90, at 231 ("Many states now recognize ecological preservation, fisheries, or recreation as beneficial uses . . . .").

113. *See, e.g.*, El Dorado Irrigation Dist. v. State Water Res. Control Bd., 48 Cal. Rptr. 3d 468, 490 (Ct. App. 2006) ("[W]hen the public trust doctrine clashes with the rule of priority, the rule of priority must yield.").

114. *See* Reed D. Benson, *Alive but Irrelevant: The Prior Appropriation Doctrine in Today's Western Water Law*, 83 U. COLO. L. REV. 675, 708 (2012) ("Municipal water rights and domestic wells are two areas in which the states have long been willing to deviate from [prior appropriation] in order to accommodate other important goals."). *See generally* Robert E. Beck, *Use Preferences for Water*, 76 N.D. L. REV. 753 (2000) (discussing the purposes, extent, and future of water use preferences).

115. Act of Sept. 25, 2012, ch. 524, 2012 Cal. Stat. 4779, 4780 (codified at CAL. WATER CODE § 106.3) ("[E]very human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.").

116. *See In re* Gen. Adjudication of All Rts. to Use Water in Gila River Sys. & Source, 35 P.3d 68, 79–80 (Ariz. 2001) (explaining that "the court should consider tribal culture when quantifying federally reserved rights" and that "[w]ater uses that have particular cultural significance should be respected, where possible"); Allison M. Dussias, *Friend, Foe, Frenemy: The United States and American Indian Religious Freedom*, 90 DENV. U. L. REV. 347, 386–88 (2012) (discussing a 2005 lawsuit in which a

protection afforded to domestic and instream uses of water shows another way water rights serve human values.

In spite of these official rules about water rights, in *practice* most of the nondevelopment water values receive short shrift. Most states sought to protect these values through several iterations of state water right permitting agencies,[117] but these agencies were created after many water rights had already been claimed under the common law. In California, for example, the Water Board began issuing permits in 1914,[118] well after many waters had been fully appropriated under common law rights.[119] Even after the creation of the permitting agencies, state laws and other doctrines restricting the over-exploitation of water resources went underenforced or unenforced. For example, until the emergence of the modern environmental movement in the 1970s, California's Water Board saw itself as purely ministerial, required to grant water rights with virtually no consideration on instream impacts or other public values.[120]

Thus most state water right systems are an uncomfortable combination of three tranches of water rights: the first tranche is relatively undocumented rights that predate permitting requirements and were simply taken by users with no regulatory oversight whatsoever; the second is older permitted water rights that were granted with little oversight and sometimes in direct contravention of existing laws;[121] and the third tranche is newer permitted rights constrained by environmental laws.[122] Under the western seniority approach, the oldest tranche is paramount, taking its water before the newer rights.[123]

In many states, most water use comes from rights in the first two essentially unregulated tranches. In California, for example, the first tranche rights (which predate the state's permitting system entirely) and the riparian rights (which do not require state permits) together account for most agricultural and urban water use.[124] In Arizona, where most reliable water was appropriated by 1919, almost

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forest supervisor determined that the effects of proposed usage of sewage effluent on a nearby ski resort were "significant and irreconcilable" with the Yavapai-Apache Nation's "traditional values"); Allison M. Dussias, *Spirit Food and Sovereignty: Pathways for Protecting Indigenous Peoples' Subsistence Rights*, 58 CLEV. ST. L. REV. 273, 320–21 (2010) (discussing an EPA determination that the Lac du Flambeau Band's rice gathering, which is deeply dependent on water resources, "is a cultural complex of family connections, traditions, history, and spirituality").

117. Squillace, *supra* note 42, at 650. Colorado is unusual in that its water rights are administered by a specialized water court. *Id.*; *see* GEORGE VRANESH, VRANESH'S COLORADO WATER LAW 162 (James N. Corbridge Jr. & Teresa A. Rice eds., rev. ed. 1999).

118. *See* Water Commission Act, 1913 Cal. Stat. 1012, 1021; People v. Murrison, 124 Cal. Rptr. 2d 68, 75 nn.6 & 7, 77 (Ct. App. 2002).

119. *See, e.g.*, N. Kern Water Storage Dist. v. Kern Delta Water Dist., No. F033370, 2003 WL 215821, at *4 (Cal. Ct. App. Jan. 31, 2003), *as modified on denial of reh'g* (Mar. 3, 2003).

120. *See* Nat'l Audubon Soc'y v. Super. Ct., 658 P.2d 709, 725, 728 n.27 (Cal. 1983).

121. *See* Börk et al., *supra* note 73, at 828–29, 833–34.

122. *See* Squillace, *supra* note 42, at 648–49.

123. Klein, *supra* note 37, at 562–63.

124. *See* ELLEN HANAK, JAY LUND, ARIEL DINAR, BRIAN GRAY, RICHARD HOWITT, JEFFREY MOUNT, PETER MOYLE & BARTON "BUZZ" THOMPSON, PUB. POL'Y INST. OF CAL., MANAGING CALIFORNIA'S WATER: FROM CONFLICT TO RECONCILIATION 38 (2011), http://www.ppic.org/content/pubs/report/R_211EHR.pdf [https://perma.cc/E3KF-SNED].

all the large rights come from the first tranche.[125] Ultimately, then, modern water systems primarily reflect the extractive, development-focused values of the late 1800s and early 1900s, frozen in time through the creation of durable private rights and ineffective efforts to protect public interests. Perhaps predictably, this has resulted in extensive negative impacts throughout the West.

3. Failures of Water Rights Systems

The Skookumchuck and Kern River stories illustrate some of these negative impacts. The Chehalis Basin, home of the Skookumchuck, drops below the minimum flow required to support wildlife, fish, and environmental values up to 42% of the time.[126] Climate change is expected to decrease summer flows by an additional 11 to 16%.[127] The Skookumchuck River is home to spring-run Chinook salmon, fall-run Chinook salmon, Coho Salmon, coastal cutthroat trout, and steelhead,[128] but low stream flows limit the river's ability to support these fish.[129] With adequate flows, the restoration potential for these fish species is high.[130] Beyond ecosystem impacts, shortages also frustrate out-of-river water uses; for the past fifty years, the Skookumchuck itself has been closed to new diversions due to insufficient flow, making it difficult to find new water supplies for cities and farms in the watershed.[131]

The Kern River once supported a flourishing fishery and wetland complex in California's southern Central Valley.[132] It filled Kern Lake even in low water years, and in high water years it linked Kern Lake and other regional lakes into the great Tulare Lake, once the largest body of freshwater west of the Mississippi.[133] Water withdrawals and wetland conversion have destroyed the lakes, leaving desiccated farmland.[134] Gone are the inland commercial fisheries, the great flocks of birds, the gray wolf and bear, the elk and antelope.[135] The Kern

125. Jack Sterne, *Instream Rights & Invisible Hands: Prospects for Private Instream Water Rights in the Northwest*, 27 ENV'T L. 203, 227 (1997).

126. STATE OF WASH., DEP'T OF ECOLOGY, CHEHALIS BASIN STRATEGY: DRAFT PROGRAMMATIC EIS 86 (2016), https://www.chehalisbasinstrategy.com/wp-content/uploads/2016/10/Chehalis-Basin-Strategy-Draft-Programmatic-EIS-DIGITAL-Vol-1-1.pdf [https://perma.cc/7WUA-NUGX].

127. Memorandum from Adam Hill, PE, Anchor QEA & Larry Karpack, PE, Watershed Sci. & Eng'g, to Andrea McNamara Doyle and Chrissy Bailey, Off. of Chehalis Basin 2 (May 6, 2019) (available at https://chehalisbasinstrategy.com/wp-content/uploads/2019/05/Climate_Change_Flows_Flooding05062019.pdf [https://perma.cc/J3D7-ATGE]).

128. STATE OF WASH., DEP'T OF ECOLOGY, *supra* note 126, at 141–46.

129. *See* AQUATIC SPECIES ENHANCEMENT PLAN TECH. COMM., CHEHALIS BASIN STRATEGY: REDUCING FLOOD DAMAGE AND ENHANCING AQUATIC SPECIES: AQUATIC SPECIES ENHANCEMENT PLAN, at ES-4 tbl.ES-2, 58 (2014), https://chehalisbasinstrategy.com/wp-content/uploads/2015/09/Aquatic-Species-Restoration-Program-Report_Final.pdf [https://perma.cc/Q5US-GJ46].

130. *See id*. at 80.

131. *See* STANLEY E. MAHLUM, STATE OF WASH., DEP'T OF ECOLOGY, WATER RES. MGMT. PROGRAM, CHEHALIS RIVER BASIN 7, 13 tbl.2 (reprt. 1980) (1975), https://apps.ecology.wa.gov/publications/documents/7511001.pdf [https://perma.cc/M442-NABN].

132. *See* James, *supra* note 27.

133. Gerald Haslam, *The Lake that Will Not Die*, 72 CAL. HIST. 256, 256–58 (1993).

134. *See id*. at 260.

135. *Id*. at 263–64.

"is the primary physical, ecological, and recreational landscape feature in the City [of Bakersfield],"[136] but diversions upstream leave only "a mostly dry river bed through Bakersfield."[137]

These vignettes are emblematic of broader water problems in the western United States, where increasing conflict and decreasing (and decreasingly reliable) supplies are devastating both economies and ecosystems.[138] The West is dry, with a regional average of 21 inches of precipitation per year, far below the eastern average of 46 inches and the national average of 37 inches.[139] The West is also marked by highly variable precipitation, across regions, seasons, and years, resulting in frequent local water shortages and periodic regional short- and long-term droughts.[140] Roughly 12% of water withdrawn from water systems is dedicated to public water supplies (household, industrial, and other municipal uses); agriculture (mostly irrigation, with some livestock and aquaculture uses) accounts for 69% of withdrawals; thermoelectric power constitutes 15%; and other industrial uses comprise the remaining 4%.[141] This excludes water left instream for ecological, recreational, ecosystem services, and other uses.

Although total water withdrawals have decreased markedly since 1980,[142] consumptive use of water "continues to deplete many natural water sources to near exhaustion, posing ongoing water shortage risks for both people and ecosystems."[143] Human consumption now exceeds natural replenishment in many areas.[144] In the Colorado River Basin, for example, "annual consumption

136. CITY OF BAKERSFIELD, WATER RES. DEP'T, KERN RIVER FLOW AND MUNICIPAL WATER PROGRAM: RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT 2-1 (2016), https://docs.bakersfieldcity.us/weblink/0/edoc/1290053/Kern%20River%20Flow_RDEIR.pdf [https://perma.cc/UHV9-ARCH].

137. *Id*. at 2-2.

138. K. Hansen, *Meeting the Challenge of Water Scarcity in the Western United States*, *in* COMPETITION FOR WATER RESOURCES: EXPERIENCES AND MANAGEMENT APPROACHES IN THE US AND EUROPE 2, 2 (Jadwiga R. Ziolkowska & Jeffrey M. Peterson eds., 2017).

139. *Id*. at 3–4, 4 n.2.

140. *See id*. at 2–4. The Western Governors Association "recognizes drought as a foremost concern." *Id*. at 2–3.

141. *Id*. at 4–5. Considering only consumptive uses (water that is withdrawn and not returned to a waterway), irrigated agriculture accounts for 80% of water use in the West. *Id*. at 5.

142. Landon T Marston, Gambhir Lamsal, Zachary H Ancona, Peter Caldwell, Brian D Richter, Benjamin L Ruddell, Richard R Rushforth & Kyle Frankel Davis, *Reducing Water Scarcity by Improving Water Productivity in the United States*, ENV'T RSCH. LETTERS, Aug. 2020, at 1, 1 ("[F]rom 1980–2015, total water withdrawals decreased 27% even while the country's population grew by 42% and GDP expanded more than five-fold." (footnote omitted)).

143. *Id*. at 1–2.

144. K Averyt, J Meldrum, P Caldwell, G Sun, S McNulty, A Huber-Lee & N Madden, *Sectoral Contributions to Surface Water Stress in the Coterminous United States*, ENV'T RSCH. LETTERS, Sept. 2013, at 1, 8 (noting that "[s]urface water stress is predominant throughout the western half of the US, where natural surface water supplies are insufficient to meet demands"); Brian D. Richter, Dominique Bartak, Peter Caldwell, Kyle Frankel Davis, Peter Debaere, Arjen Y. Hoekstra, Tianshu Li, Landon Marston, Ryan McManamay, Mesfin M. Mekonnen, Benjamin L. Ruddell, Richard R. Rushforth & Tara J. Troy, *Water Scarcity and Fish Imperilment Driven by Beef Production*, 3 NATURE SUSTAINABILITY 319, 319 (2020).

exceeded total river flows in 75% of years from 2000–2015."[145] A 2014 Government Accountability Office (GAO) report found that western water managers in nearly every western state except Utah expected water shortages in the next decade.[146]

Summer "flows in more than half of all rivers in the western U.S. are now depleted by more than 50%, and one-fourth have lost more than 75% of their original flows."[147] This has significant ecosystem impacts; depleted river flows have endangered the survival of at least one imperiled species in 62% of subwatersheds in the western United States.[148] Lack of flow is the single leading cause of fish endangerment.[149] Human impacts include lost agricultural productivity; loss of drinking water, particularly in disadvantaged communities; industrial impacts; and impacts on hydropower and thermoelectric power production.[150] Indirect impacts include increases in particulate matter and other air pollutants due to exposed lake beds, with significant health impacts to nearby communities.[151] Across the West, water scarcity is the new normal.[152]

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145. Richter et al., *supra* note 144, at 320 fig.1.

146. U.S. GOV'T ACCOUNTABILITY OFF., GAO-14-430, FRESHWATER: SUPPLY CONCERNS CONTINUE, AND UNCERTAINTIES COMPLICATE PLANNING 29 fig.7 (2014), https://www.gao.gov/assets/gao-14-430.pdf [https://perma.cc/V3F6-LXC3].

147. Eloise Kendy, Bruce Aylward, Laura S. Ziemer, Brian D. Richter, Bonnie G. Colby, Theodore E. Grantham, Leslie Sanchez, Will B. Dicharry, Emily M. Powell, Season Martin, Peter W. Culp, Leon F. Szeptycki & Carrie V. Kappel, *Water Transactions for Streamflow Restoration, Water Supply Reliability, and Rural Economic Vitality in the Western United States*, 54 J. AM. WATER RES. ASS'N 487, 488 (2018).

148. Brian D. Richter, Emily Maynard Powell, Tyler Lystash & Michelle Faggert, *Protection and Restoration of Freshwater Ecosystems*, *in* WATER POLICY AND PLANNING IN A VARIABLE AND CHANGING CLIMATE: INSIGHTS FROM THE WESTERN UNITED STATES 81, 89 (Kathleen A. Miller et al. eds., 2016).

149. *Id.* (noting that flow depletion "affect[s] nearly three-quarters of all fish species listed under the Endangered Species Act (ESA)").

150. *See* MELISSA S. KEARNEY, BENJAMIN H. HARRIS, BRAD HERSHBEIN, ELISA JÁCOME & GREGORY NANTZ, HAMILTON PROJECT, IN TIMES OF DROUGHT: NINE ECONOMIC FACTS ABOUT WATER IN THE UNITED STATES 1–2, 10 (2014), https://www.brookings.edu/wp-content/uploads/2016/06/nineeconomicfactsaboutuswaterkearneyharris.pdf [https://perma.cc/8VGY-GW6R]; Louis Martin, *Report Finds Race Is Strongest Predictor of Safe Water Access*, RURAL CMTY. ASSISTANCE CORP. (Nov. 19, 2019), https://www.rcac.org/featured-news/report-finds-race-is-strongest-predictor-of-safe-water-access/ [https://perma.cc/V2PY-6ZTN] (citing U.S. WATER ALL. & DIG DEEP, CLOSING THE WATER ACCESS GAP IN THE UNITED STATES: A NATIONAL ACTION PLAN (2020), https://uswateralliance.org/sites/uswateralliance.org/files/publications/Closing%20the%20Water%20Access%20Gap%20in%20the%20United%20States_DIGITAL.pdf [https://perma.cc/E94A-FFZR]).

151. *See, e.g.*, Amrita Singh, Jean-Daniel Saphores & Tim Bruckner, *A Spatial Hedonic Analysis of the Housing Market Around a Large, Failing Desert Lake: The Case of the Salton Sea in California*, 61 J. ENV'T PLAN. & MGMT. 2549, 2549, 2554 (2018).

152. *See generally* John L. Sabo, Tushar Sinha, Laura C. Bowling, Gerrit H. W. Schoups, Wesley W. Wallender, Michael E. Campana, Keith A. Cherkauer, Pam L. Fuller, William L. Graf, Jan W. Hopmans, John S. Kominoski, Carissa Taylor, Stanley W. Trimble, Robert H. Webb & Ellen E. Wohl, *Reclaiming Freshwater Sustainability in the Cadillac Desert*, 107 PROC. NAT'L ACAD. SCIS. U.S. AM. 21263 (2010) (discussing impacts of human water use in western United States). Scarcity exists when water supplies are inadequate to meet society's preferred levels of water use, for uses ranging from agriculture to drinking water to ecosystem health. W. K. Jaeger, A. J. Plantinga, H. Chang, K. Dello, G. Grant, D. Hulse, J. J. McDonnell, S. Lancaster, H. Moradkhani, A. T. Morzillo, P. Mote, A. Nolin,

Existing problems will become much worse under projected climate change. Across the West, broader water scarcity will be ever present.[153] Snowpacks may decrease by roughly 40%, aggravating existing seasonal water shortages.[154] Based on current trends, half of California's freshwater species face extinction due to water scarcity in the next generation's lifetimes.[155] The Colorado River basin faces a particularly dire future with massive shortages.[156] Even more broadly, the world "simply cannot manage water in the future as [it] ha[s] in the past or the economic web will collapse."[157] There is already not enough water for all of the existing human uses to continue at their present rates while maintaining healthy ecosystems and increasing access to water; climate change will make the situation worse.

A prior appropriation system can amplify scarcity's consequences. Under a strict prior appropriation system, in times of scarcity, the oldest water rights are paramount and get their water first, with junior water rights getting water depending on availability.[158] These older rights tend to be agricultural, for relatively low-economic-value uses, especially compared to more recent rights belonging to cities or industrial users or dedicated to instream flow protections. Priority in times of scarcity, then, protects agricultural production to the detriment of regional economies and ecosystems. In theory, the low-economic-value rights should be constrained or forced to reallocate by the exercise of other public values in the water—through reasonable or beneficial use requirements or the public trust doctrine—but in practice these protections get short shrift.[159]

Reallocation of water among users can mitigate the impacts of scarcity by moving water from less important uses to more important uses; the current

M. Santelmann & J. Wu, *Toward a Formal Definition of Water Scarcity in Natural-Human Systems*, 49 WATER RES. RSCH. 4506, 4507–08, 4511–12 (2013).

153. *See* U.S. GLOB. CHANGE RSCH. PROG., CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 11 (Jerry M. Melillo et al. eds., 2014), https://nca2014.globalchange.gov/downloads/high/NCA3_Climate_Change_Impacts_in_the_United%20States_HighRes.pdf [https://perma.cc/NUB8-HRTN].

154. Erica R. Siirila-Woodburn, Alan M. Rhoades, Benjamin J. Hatchett, Laurie S. Huning, Julia Szinai, Christina Tague, Peter S. Nico, Daniel R. Feldman, Andrew D. Jones, William D. Collins & Laurna Kaatz, *A Low-to-No Snow Future and Its Impacts on Water Resources in the Western United States*, 2 NATURE REVS. EARTH & ENV'T 800, 801–02, 808 (2021).

155. *Water is Life*, NATURE CONSERVANCY (Apr. 5, 2022), https://www.nature.org/en-us/about-us/where-we-work/united-states/california/stories-in-california/water-future/ [https://perma.cc/47BV-KHH9].

156. *See, e.g.*, Olivia L. Miller, Annie L. Putman, Jay Alder, Matthew Miller, Daniel K. Jones & Daniel R. Wise, *Changing Climate Drives Future Streamflow Declines and Challenges in Meeting Water Demand Across the Southwestern United States*, J. HYDROLOGY X, May 2021, at 1–2.

157. WORLD ECON. F. WATER INITIATIVE, THE BUBBLE IS CLOSE TO BURSTING: A FORECAST OF THE MAIN ECONOMIC AND GEOPOLITICAL WATER ISSUES LIKELY TO ARISE IN THE WORLD DURING THE NEXT TWO DECADES 5 (Draft for Discussion at World Economic Forum Annual Meeting 2009), https://www3.weforum.org/docs/WEF_WI_FutureWaterNeeds_2009.pdf [https://perma.cc/37QJ-335R].

158. *See* Klein, *supra* note 37, at 563 (noting that "oldest water rights, dating back to the mid-nineteenth century in some watersheds, lock up a significant portion of the water supply in perpetuity" (footnote omitted)).

159. *See* A. Dan Tarlock, *The Future of Prior Appropriation in the New West*, 41 NAT. RES. J. 769, 770–72 (2001).

distribution of water rights and water uses is an accident of history, not a logical distribution of water based on the value society puts on a particular use.[160] Scholars and managers typically agree that reallocation will be a key solution to the West's scarcity problems.[161] There is much less agreement about how this reallocation should happen—possibilities include regulation, narrow or basin-wide water right adjudications, condemnation, voluntary agreements, and markets.[162] At least since the 1970s, the legal literature reveal a strong push for reallocation through water markets as a solution for western water scarcity issues, divided, as we outlined above, among evangelists and a more recent shift toward pragmatism.[163]

4. A Brief History of Water Markets

Scholars trace the idea of water markets to the "great 'enclosure movement' that took shape first in England and Western Europe [in the fourteenth century] and then extended overseas to the New World, bringing survey lines, fences, and legal rules fostering exclusive access and transferability."[164] The idea of enclosure was contagious—Professor James Boyle describes this effect of the enclosure movement as "the relentless power of market logic to migrate to new areas, disrupting traditional social relationships and perhaps even views of the self or the relationship of human beings to the environment."[165] According to historian Allan Greer:

> A pro-colonialist, pro-enclosure variant can be traced from Locke and his predecessors through the Scottish Enlightenment, where the idea took root that private property was the very hallmark of civilization (and the justification for European rule over "rude" societies lacking that institution), to the modern notion that "property rights," in the sense of strong and exclusive individual claims to land, are essential to economic development.[166]

Markets build on the idea of property as a commodity to be bought and sold, so much of the enclosure movement was about reducing common property to commodity status through enclosure, often trampling community rights and norms in

160. *See, e.g.*, Jaeger et al., *supra* note 152, at 4510–11 (describing relationship between institutions in the western United States and water scarcity).

161. Klein, *supra* note 37, at 563.

162. For detailed lists of methods of accomplishing water transfers, see Hansen, *supra* note 138, at 9–11 and Klein, *supra* note 37, at 582–96.

163. *See supra* Introduction. In California, there has also been a relatively steady increase in the size of water markets since the 1980s. ELLEN HANAK & ELIZABETH STRYJEWSKI, PUB. POL'Y INST. OF CAL., CALIFORNIA'S WATER MARKET, BY THE NUMBERS: UPDATE 2012, at 19 (2012), https://www.ppic.org/wp-content/uploads/content/pubs/report/R_1112EHR.pdf [https://perma.cc/C229-6A2N].

164. Allan Greer, *Commons and Enclosure in the Colonization of North America*, 117 AM. HIST. REV. 365, 365 (2012). For a detailed account of the enclosure movement, see Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1391–92 (1993).

165. James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 LAW & CONTEMP. PROBS. 33, 35 (2003).

166. Greer, *supra* note 164, at 385–86.

the process.[167] Professor Lynda Butler traces the commodity view of property through the colonization and enclosure of North America, following it into the growth of the neoliberal law and economics movement.[168]

Appropriative rights have always been about enclosure too, about walling off some chunk of the water in a stream for private use and sale as a commodity.[169] More than riparian rights, which limited water use to the local watershed, appropriative rights treated water as a fungible good divorced from its social, physical, and ecological context.[170] As in the enclosure movement, appropriative rights often took public property with little or no attention to public use rights, public values, and the laws established to protect them.[171] Even so, some western states resisted complete commodification of water; historically "nine prior appropriation states prohibited or severely restricted an appropriator's ability to sever appropriation rights from the land upon which the water was used."[172] Even as these restrictions were loosened, protective measures like the no-harm rule served to restrict transfers.[173] As late as "the late 1980s, all western states combined experienced fewer than 100 water transfers each year."[174] This began to change as part of the broader law and economics push in the 1970s and 1980s, and by the late 1980s many water experts and policy makers viewed "water as an economic commodity, to be priced, traded, and managed by the private sector."[175] Just as in the enclosure movement, this continued trend toward commodification of water

167. Something is "completely commodified" when it is "deemed suitable for trade in a laissez-faire market." Margaret Jane Radin, *Market-Inalienability*, 100 HARV. L. REV. 1849, 1855 (1987).

168. Lynda L. Butler, *The Pathology of Property Norms: Living Within Nature's Boundaries*, 73 S. CAL. L. REV. 927, 935 (2000). She notes that "[a]dherence to the market view of property has meant the development of market-oriented policies of property law . . . in ways that undermine ecological integrity." *Id.*; *accord* Gail Osherenko, *New Discourses on Ocean Governance: Understanding Property Rights and the Public Trust*, 21 J. ENV'T. L. & LITIG. 317, 329–30 (2006); Andrew Curley, *Unsettling Indian Water Settlements: The Little Colorado River, the San Juan River, and Colonial Enclosures*, 53 ANTIPODE 705, 719 (2021) (arguing that water settlements involving tribal water claims "are forms of colonial enclosures, built on a lineage of law that replicates and perpetuates edicts of dispossession and colonialism" and "enclose upon unquantified Indigenous rights").

169. *See* Michael Pappas & Victor B. Flatt, *The Costs of Creating Environmental Markets: A Commodification Primer*, 9 U.C. IRVINE L. REV. 731, 755 (2019).

170. *See* Curley, *supra* note 168, at 706 ("Enclosures . . . fundamentally change a people's relationship with their environment and ecology."); A. Dan Tarlock, *Reconnecting Property Rights to Watersheds*, 25 WM. & MARY ENV'T L. & POL'Y REV. 69, 78–79 (2000) ("Water law treats rivers as commodities separate and apart from land . . . .").

171. *See generally* Börk et al., *supra* note 73 (discussing the long history of water right holders ignoring statutory requirements for protection of the public trust).

172. THOMPSON, JR. ET AL., *supra* note 81, at 306.

173. The no-harm rule bars transactions that would impose harms on other water users, if those water users object. *See infra* Section II.A.2.

174. THOMPSON, JR. ET AL., *supra* note 81, at 306.

175. Thompson, Jr., *supra* note 56, at 17 (emphasis omitted). Globally, the World Bank has at times strongly supported and encouraged the development of water markets as a core water governance institution. *See, e.g.*, BAUER, *supra* note 61; Bauer, *supra* note 36, at 147–48, 150; Aguilera-Klink & Sánchez-García, *supra* note 49, at 167.

has often come at the expense of the public protections that inhere in water rights.[176]

Market transfers are typically either permanent sales of water rights—granting the buyer the seller's whole right with many of its original characteristics, such as type and age of right—or leases.[177] Leases may be short-term, of a year or less, or long-term, spanning more than one year, and may be current transfers, future contracts, or dry-year options that only become effective under certain hydrologic conditions.[178] A study of water transfers in active regions across eight western states from 2002 to 2019 offers interesting data on transfers. More water was leased than purchased outright, by an order of magnitude, although more transactions were sales than leases.[179] Transfers were concentrated across water volumes, with a large number of transactions for small quantities of water (0–20 AF) and for very large quantities (180 AF or more).[180] By volume, California dominated (based on a small number of large volume transfers), and Texas had the highest number of transactions.[181] Suppliers for urban use purchased or leased most of the water by volume (81% of water sold and 49% of water leased), followed by agricultural users and then by purchasers for environmental protection.[182] Agricultural users executed most leases, while municipal suppliers executed most purchases.[183] Other research suggests that most transfers come from irrigators of lower-economic-value crops.[184] Prices vary extensively by region, season, and end of the transferred water, and it can be difficult to establish clear price trends.[185]

Beyond the study cited above, other research also offers illuminating information. "[M]ost of the surface water transferred in the U.S. West was contract water moving within supply system boundaries and incurring little or no water rights review."[186] Seven western states had minimal trading (Kansas, Montana, Nebraska, North Dakota, South Dakota, Oklahoma, and Wyoming).[187] Even in states with active markets, the total volume of water transferred remains a low

176. *See infra* Section II.C.

177. Kristiana Hansen, Richard Howitt & Jeffrey Williams, *An Econometric Test of Water Market Structure in the Western United States*, 55 NAT. RES. J. 127, 128 (2014).

178. *Id.*

179. J. Beau Burns, Matthew Payne, Mark Griffin Smith & Clay Landry, *Measuring Trends in Western Water Prices*, 58 J. AM. WATER RES. ASS'N 203, 207, 208 tbl.1 (2022) (noting that "more than 7.6 million acre-feet (AF) were conveyed through leases vs. <700,000 AF in sales"). Note, however, that sales and long-term leases are only counted once, in their year of origination, while short term leases that are re-executed each year count multiple times. *See* Hansen et al., *supra* note 177, at 131.

180. Burns et al., *supra* note 179, at 207 fig.1.

181. *Id.* at 207.

182. *Id.* at 208 tbl.1.

183. *Id.*

184. *See, e.g.*, Hansen et al., *supra* note 177, at 135.

185. *See* Burns et al., *supra* note 179, at 205, 216.

186. Michael Hanemann, *The Problem of Water Markets*, *in* OXFORD RESEARCH ENCYCLOPEDIA OF ENVIRONMENTAL SCIENCE (2022), https://oxfordre.com/environmentalscience/view/10.1093/acrefore/9780199389414.001.0001/acrefore-9780199389414-e-711.

187. Hansen et al., *supra* note 177, at 137; Burns et al., *supra* note 179, at 204.

percentage of total water use, averaging 4% of annual consumptive water use in Arizona, 2% in California, and less than 2% in Texas.[188] Nevertheless, transfers can be very important in some areas. Southern California cities, for example, currently obtain nearly 15% of their annual water needs from transferred water.[189] Transfers may also reduce the costs associated with decreasing water use; the Public Policy Institute of California found that "[l]ocal trading of both groundwater and surface water within basins can reduce the costs of adjustment [to new California groundwater management laws] by about 40 percent, and expanding surface water trading across basins within the region can reduce costs by about 60 percent."[190] The differences in the economic values of water to irrigators, cities, industrial users, and the public, coupled with the way historical use drives the current water right distribution, suggests that markets could increase efficiency dramatically.[191] For instance, even in the middle of a water crisis in the Colorado River basin, vegetable and cattle feed farmers in Imperial County, California, use more water from the Colorado River than the entire states of Arizona and Nevada combined.[192] The farmers appear willing to surrender some of this water to cities and other users, if the price is high enough.[193]

As this history suggests, markets offer an enduring appeal to water managers.

### B. WHY WATER MARKETS?

There is an innate appeal to the simple promise of water markets. Indeed, they have been and will continue to be useful institutional additions to existing water law. Weighing water markets requires understanding the arguments in their favor. Market enthusiasts usually cite four closely related and somewhat overlapping reasons why water markets should be the preferred mechanism to solve water problems: (1) they drive efficient outcomes;[194] (2) they reallocate water from lower-economic-value uses to higher-economic-value uses;[195] (3) in doing so,

188. Kurt Schwabe, Mehdi Nemati, Clay Landry & Grant Zimmerman, *Water Markets in the Western United States: Trends and Opportunities*, WATER, Jan. 2020, at 1, 9. Other estimates put California closer to 4%. *See* ELLEN HANAK, GOKCE SENCAN & ANDREW AYRES, CALIFORNIA'S WATER MARKET, PUB. POL'Y INST. CAL. (2021), https://www.ppic.org/wp-content/uploads/jtf-water-market.pdf [https://perma.cc/DM2P-STJJ].

189. HANAK ET AL., *supra* note 188.

190. ELLEN HANAK, JELENA JEZDIMIROVIC, ALVAR ESCRIVA-BOU & ANDREW AYRES, PUB. POL'Y INST. OF CAL., A REVIEW OF GROUNDWATER SUSTAINABILITY PLANS IN THE SAN JOAQUIN VALLEY: PUBLIC COMMENTS SUBMITTED TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES 1–2 (2020), https://www.ppic.org/wp-content/uploads/ppic-review-of-groundwater-sustainability-plans-in-the-san-joaquin-valley.pdf [https://perma.cc/8ZLH-76NN].

191. *See* PETER W. CULP, ROBERT GLENNON & GARY LIBECAP, HAMILTON PROJECT, SHOPPING FOR WATER: HOW THE MARKET CAN MITIGATE WATER SHORTAGES IN THE AMERICAN WEST 10–12 (2014), https://www.hamiltonproject.org/assets/files/how_the_market_can_mitigate_water_shortage_in_west.pdf [https://perma.cc/XW9U-TJ7C].

192. Dan Charles, *Meet the California Farmers Awash in Colorado River Water, Even in a Drought*, NPR (Oct. 4, 2022, 5:00 AM), https://www.npr.org/2022/10/04/1126240060/meet-the-california-farmers-awash-in-colorado-river-water-even-in-a-drought [https://perma.cc/9SWT-9AR4].

193. *See id.*

194. *See infra* Section I.B.1.

195. *See infra* Section I.B.2; *see, e.g.*, Charles, *supra* note 192.

they redistribute water to minimize risk;[196] and (4) they help preserve water, by ensuring water does not go to lower value uses.[197] Finally, markets also get significant attention because (5) they are politically palatable.[198] Of course, not every market advocate embraces every argument, but these encapsulate most arguments developed in the literature. We discuss each in turn below.

1. Economic and Policy Efficiency

According to economic theory, a well-functioning market produces economically optimal outcomes.[199] In neoclassical economics, Pareto Optimality exists when resources are allocated such that making one person better off necessarily makes at least one person worse off, assuming no compensation changes hands.[200] Building off of this concept of efficiency, Ronald Coase, in his 1960 article, *The Problem of Social Cost*, theorized that, given sufficient property rights and no transaction costs, parties motivated by self-interest would bargain to arrive at "an efficient and invariant outcome regardless of the initial specification of rights."[201] While the initial distribution does matter with respect to who profits and who pays in the transaction, Coase argued that the initial distribution would not drive the final allocation.[202] In a water setting, for example, agricultural water right holders who use those rights to grow crops with very low profits would instead sell those rights to urban centers that would be willing to pay more for the

196. *See infra* Section I.B.3.

197. *See infra* Section I.B.4. *See generally* Mark Squillace, *Water Transfers for a Changing Climate*, 53 NAT. RES. J. 55 (2013) (exploring ways for water markets to increase efficiency while protecting the environment and minimizing impact on communities outside of water basins).

198. *See infra* Section I.B.5; Thompson, Jr., *supra* note 56, at 23.

199. *See, e.g.*, Daniel B. Kelly, *Strategic Spillovers*, 111 COLUM. L. REV. 1641, 1650 n.28 (2011) (explaining an economist's general approach to studying policies based on their impact on social welfare); Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1094–95 (1972).

200. *See, e.g.*, Calabresi & Melamed, *supra* note 199. For an introduction to the economic concept of efficiency, see NICHOLAS MERCURO & STEVEN G. MEDEMA, ECONOMICS AND THE LAW: FROM POSNER TO POST-MODERNISM AND BEYOND 20–27 (2d ed. 2006). Some scholars use a different metric of optimality, Kaldor-Hicks optimality, which "considers a change efficient if it produces more benefits than it does costs, even if the change leaves some parties worse off." Michael Pappas, *Prevention and Cure*, 54 LOY. L.A. L. REV. 1067, 1079 (2021). A Kaldor-Hicks optimum is always a Pareto Optimum, but a Pareto optimum need not be a Kaldor-Hicks optimum. A theoretical free market moves to the Pareto Optimum, but it will not necessarily move to the Kaldor-Hicks optimum. We use the Pareto measure here, because it is the primary efficiency metric used in most of the legal literature, but we note that Kaldor-Hicks may be a better conceptual fit in many cases, given that it more easily accommodates remedial government actions in imperfect markets, a common focus in the legal literature. For an additional discussion of how "Kaldor-Hicks extends normative law and economics to a wide range of situations in which externalities and transaction costs prevent markets from reaching Pareto-efficient outcomes," see Lawrence Solum, *Legal Theory Lexicon: Efficiency, Pareto, and Kaldor-Hicks*, LEGAL THEORY BLOG (Mar. 27, 2022), https://lsolum.typepad.com/legaltheory/2022/03/legal-theory-lexicon-efficiency-pareto-and-kaldor-hicks.html [https://perma.cc/X3GJ-9ZHF].

201. MERCURO & MEDEMA, *supra* note 200, at 110; R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 2–6 (1960). The Coase Theorem has been stated in many ways. *See* MERCURO & MEDEMA, *supra* note 200, at 110 & n.33.

202. *See* Coase, *supra* note 201, at 8.

water.[203] "[B]oth sellers and buyers may profit, and society benefits from increased efficiency."[204]

For most market proponents, improving economic efficiency is a normatively good outcome and is thus itself the primary justification for implementing market reforms.[205] But this is not a lay definition of efficiency; the key requirement for these normative prescriptions is that economic efficiency maximizes overall social welfare (sometimes termed utility or well-being).[206] To get there, advocates define social welfare as the aggregate of individual welfare. "Individual welfare is defined in terms of preference satisfaction, and preferences are measured in terms of consumer willingness to pay as expressed in markets. Accordingly, the concept of consumer 'willingness to pay' forms the measure of value by which welfare economics gauges overall social welfare."[207] Under this view, a functioning water market determines both how much water should be used and where it should be used. At an economically efficient equilibrium, "the net 'utility' or welfare (or level of preference satisfaction) in society as a whole will be maximized."[208] Further, because parties can freely buy or sell the water, it moves between willing buyers and sellers to settle in its most economically valued use.[209] This normative economic-efficiency approach underlies the market evangelist legal scholarship favoring western water markets; many market pragmatists also tend to emphasize this normative view, but with more nuance, recognizing that governments will have to ensure the protection of values that private decisions may underprotect.[210]

A corollary to this theory is that making these allocation decisions via a market rather than through democratic bodies produces better overall outcomes and does it faster. This reasoning argues that using politics to allocate resources is "contentious, costly, and slow,"[211] relies on worse information than private markets actors can obtain, and encourages consideration of factors theoretically unrelated

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203. *See* Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 TEX. L. REV. 1873, 1887–88 (2005).

204. ROBERT GLENNON, UNQUENCHABLE: AMERICA'S WATER CRISIS AND WHAT TO DO ABOUT IT 308 (2009).

205. *See, e.g.*, Jonathan S. Masur & Eric A. Posner, *Toward a Pigouvian State*, 164 U. PA. L. REV. 93, 100–01 (2015) (arguing for government intervention in markets as necessary to maximize social welfare). *See generally* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW (3d ed. 1986) (discussing efficiency as a goal of common law).

206. *See* Eric A. Posner, *The Boundaries of Normative Law and Economics*, 38 YALE J. ON REGUL. 657, 676 (2021) (arguing normative legal economics assumes "unrestricted preferences are sufficiently correlated with the morally proper understanding of well-being").

207. Amy Sinden, *The Tragedy of the Commons and the Myth of a Private Property Solution*, 78 U. COLO. L. REV. 533, 543 (2007).

208. *Id.* at 542.

209. *See id.*

210. *See, e.g.*, Squillace, *supra* note 197, at 72–73; Gary D. Libecap, *Transaction Costs, Property Rights, and the Tools of the New Institutional Economics: Water Rights and Water Markets* 4 (Jan. 24, 2006) (unpublished manuscript) (on file with authors); Barton H. Thompson, Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CALIF. L. REV. 671, 701 (1993).

211. Libecap, *supra* note 210.

to economic value, such as political influence. These failures mean that political allocation reduces overall social welfare.[212] Markets allow for a speedier path, disaggregating power of government and transferring it to individuals with a clear stake in the allocation.[213] Professor Andrew Morriss argues, for example, "that markets provide the *only* way to value resources, including water, which enables their use without provoking conflicts among those who compete for their use."[214] The markets "provid[e] important signals to others about the value of various uses of water," which "help water flow to the uses where it produces the largest net benefit for water users" and encourage more efficient use of water in order to free up water for sale.[215] This view favorably regards markets as structures that generate and aggregate data in a way that traditional governance struggles to do.[216] Beyond the informational aspects, markets may also avoid some of the expensive, slow, and acrimonious disputes that invariably plague governmental natural resource allocation decisions.[217] If markets maximize social welfare, the argument goes, then the best political choice is to get out of the way of markets.

2. (Re) Allocation

As market participants trade water rights, they reallocate water from "low"-economic-value uses to "high" ones. With the help of water infrastructure, such as pumps, canals, and aquifers, water markets can move water to where it is most needed to maximize social welfare. While physical geography determines where water flows and history determines who has the right to use the water, markets can create an end run around both.

This is a significant benefit of water markets, touted by evangelists and pragmatists alike. Even most market skeptics recognize the power of markets to achieve reallocation. While governments can also reallocate water through regulation and other mechanisms, regulatory entities are often loath to do so, and markets offer an alternative mechanism to achieve reallocation.[218] And it is certainly

212. *See id.*

213. Andrew P. Morriss, *Real People, Real Resources, and Real Choices: The Case for Market Valuation of Water*, 38 TEX. TECH L. REV. 973, 988 (2006) ("Market prices respond to events quickly, sending market participants signals about the impact of events on the goods and services sold in markets. . . . Markets are thus institutions that encourage individuals to adapt to changed circumstances.").

214. *Id.* at 974.

215. *Id.*

216. *See* Pappas & Flatt, *supra* note 169, at 743 (citing F.A. HAYEK, THE FATAL CONCEIT: THE ERRORS OF SOCIALISM (1988), *reprinted in* 1 THE COLLECTED WORKS OF FRIEDRICH AUGUST HAYEK 66–88 (W. W. Bartley III ed., 1988)).

217. *See* Ronald A. Kaiser & Michael McFarland, *A Bibliographic Pathfinder on Water Marketing*, 37 NAT. RES. J. 881, 882 (1997) (suggesting water markets are "a means to promote political and social harmony").

218. *See* Brian E. Gray, *The Shape of Transfers to Come: A Model Water Transfer Act for California*, 4 HASTINGS W.-NW. J. ENV'T L. & POL'Y 23, 29 (1996) ("[T]he enactment and implementation of the modern water transfer statutes is an acknowledgment that agencies such as the [California] State Water Resources Control Board and the Department of Water Resources alone cannot adequately supervise the administration of California's water rights system to ensure that the state's water resources are used in accordance with the reasonable and beneficial use requirements . . . . The transfer laws ease the state's

true that reallocation must be a key part of addressing water scarcity in the West. As noted, the vast majority of water is used under old agricultural water rights, while increasing (and increasingly urban) populations, environmental needs, and recreational uses demand a growing portion of the shrinking water supply.[219] Reallocation will be essential.

Reallocation is related to, but distinct from, the efficiency argument above; reallocation is getting water to move. When a market for water exists, it makes those who use water for lower-economic-value purposes, such as agriculture, face the opportunity costs of continuing their lower-economic-value use instead of selling the water right to a higher-economic-value user.[220] Market advocates suggest that holders of the oldest water rights, who fiercely resist efforts to reallocate those rights through regulation or other nonmarket means, may be more willing to give up some of their water when they are making a voluntary and profitable choice to sell it—markets as liquidity enhancement.

3. Redistribution to Minimize Risk

Markets create a mechanism for junior rights holders, who under the law would be the first to lose water, to purchase and secure additional water to backfill potential losses. Who bears the risk of water scarcity is primarily determined by the strength of water rights and the initial distribution of those rights. In prior appropriation systems, for example, the older the rights held, the less risk borne. In her article on western water markets, Bonnie Colby notes that "[m]arket transactions allow water users to buy more protection against supply shortfalls than provided by their current water rights holdings."[221]

Advocates of water markets tend to assume that economic efficiency will drive this redistribution in an automatic way. As Culp, Glennon, and Libecap describe it in their water-market report for the Hamilton Project at the Brookings Institution, "Once basic mechanisms for the lease and transfer of water rights are in place, creative transactions to manage the risk of water fluctuations can evolve organically through private-market mechanisms."[222] Cities economically value water far more than farmers in low water years, so "[c]reatively structured water transfers such as dry-year options, interruptible leases, and water banks" can guarantee cities water when they need it most.[223] Markets allow users with more profitable water uses and less secure rights to mitigate their risk.

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regulatory burden by creating market incentives to use water efficiently—and hence reasonably—without the threat of reallocation by government fiat.").

219. *See, e.g.*, Jedidiah Brewer, Michael A. Fleishman, Robert Glennon, Alan Ker & Gary Libecap, *Law and the New Institutional Economics: Water Markets and Legal Change in California, 1987–2005*, 26 WASH. U. J.L. & POL'Y 183, 184 (2008); *see also* Thompson, Jr., *supra* note 56, at 17–18.

220. *See* Casado Perez, *supra* note 56, at 204.

221. Colby, *supra* note 50, at 728.

222. CULP ET AL., *supra* note 191, at 21.

223. Hansen, *supra* note 138, at 11.

4. Environmental Preservation

Markets can be used to secure water for environmental uses.[224] As noted, existing systems have underprotected instream uses, and the water needed instream is already claimed under existing water rights. Markets can mitigate these past decisions by allowing states or private entities to purchase water from a right holder and then dedicate that water to instream use, increasing flows in the water system.[225] "[H]umans [who] truly prefer to have the water used in this way . . . will express this preference by paying money to buy the right to use the water in this way."[226] Purchasing water for environmental preservation tends to evoke schisms between the evangelists, pragmatists, and skeptics. Evangelists argue that purchases by private and public groups are by definition likely to arrive at an optimum level of environmental protection, because such purchases are based on individual or aggregated preferences for environmental protection. Pragmatists argue that purchases can supplement other efforts to protect instream flow and may achieve environmental goals more quickly or more cheaply than more traditional approaches. Skeptics tend to balk at the idea that the public should have to purchase water that is already subject to the public's police power to regulate the nuisance-like impacts of insufficient instream flows.

Water transfers could also keep water instream by allowing purchased rights to supply new out-of-stream uses, even from other basins, thus avoiding the need for a new water withdrawal.[227] In essence, reallocation replaces new supply. This does not put new water instream, but it stops the bleeding.

Finally, markets can also be coupled with caps on water withdrawals.[228] In this case, the market is not producing the preservation function but rather minimizing the economic losses associated with reduced water use. Drawing on these approaches, markets have kept water in or returned water to rivers when no other existing institution was functionally protecting aquatic habitat.[229]

5. Political Palatability

Water markets are also attractive because they promise minimal work for legislators and water managers, allowing them to wash their hands of gnarly value problems and instead rely on market participants to drive "correct" outcomes.[230] Arguments presenting water markets as a single popular tool that can produce efficiency, reallocation, redistribution, and environmental preservation are seductive.

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224. *See, e.g.*, Jonathan H. Adler, *Water Rights, Markets, and Changing Ecological Conditions*, 42 ENV'T L. 93, 103 (2012).

225. *Id.*

226. Matt Clifford, Comment, *Preserving Stream Flows in Montana Through the Constitutional Public Trust Doctrine: An Underrated Solution*, 16 PUB. LAND & RES. L. REV. 117, 133 (1995).

227. Gray, *supra* note 218 ("[R]eallocation of developed supplies through market transactions should reduce the pressure to build new water projects.").

228. *See infra* Section II.A.2.

229. *See Water Is Life*, *supra* note 155.

230. *See* Sonya Ziaja, *How Algorithm-Assisted Decision Making Is Influencing Environmental Law and Climate Adaptation*, 48 ECOLOGY L.Q. 899, 909–12 (2021) (discussing the allure of algorithm-assisted decisionmaking in water governance for similar reasons).

Markets carry an impression that they are "simple, automatic, or self-maintaining."[231] Advocates argue that "[w]hen you allow water to be bought and sold more freely, . . . the West's water problems begin to solve themselves."[232] Conversely, changing property rights can be politically terrifying, or at least risky. Buying rights from willing sellers is much more politically feasible than regulating powerful water right holders,[233] and markets are less likely to produce political and legal conflicts that can drag on for years, delaying vital water reallocation.

Market advocates argue that, compared with government regulation, "[w]ater markets provide a flexible, effective, and more equitable way of adapting to a dynamic world of changing human demands for water and uncertain supplies of it."[234] Because "the market is the premier allocator, and prices measure value," even "[i]f markets are not purely competitive, prices will generally be superior to other measures of value."[235] The idea of letting Adam Smith's invisible hand guide water allocation can be appealing to politicians—willing buyers, willing sellers, and a hands-off government.[236] Why not let markets address western water woes?

Water markets will play a continuing role in water management—the way they drive increased water use efficiency and reallocate water has been difficult to achieve through more traditional water governance, and the speed with which they operate makes them an attractive choice in a crisis. But too often, those weighing the choice to use water markets ignore concerns on the other side of the scale.

## II. WHY NOT WATER MARKETS?

Part II presents three core critiques of water markets. We begin with the failures of water markets themselves, building on extensive institutional economics literature, as an answer to market evangelists and a reminder to market pragmatists. Water markets are embedded in a political economy and physical geography

231. Bauer, *supra* note 49, at 639; *see also* Abrahm Lustgarten & ProPublica, *A Free-Market Plan to Save the American West from Drought*, ATL. (Mar. 2016), https://www.theatlantic.com/magazine/archive/2016/03/a-plan-to-save-the-american-west-from-drought/426846/ ("Where government has failed, . . . capitalism offers an elegant solution.").

232. Lustgarten & ProPublica, *supra* note 231.

233. *See* Sarah P. Hollinshead, *Water Is Not Liquid: Securitization, Transactions Costs, and California's Water Market*, 33 COLUM. J. ENV'T L. 323, 327 (2008) ("[M]any state regulators and nongovernmental advocates have embraced markets as both an efficient and conflict-reducing means to achieve environmental ends . . . .").

234. Gary D. Libecap, *The West Needs Water Markets*, HOOVER INST. (Feb. 7, 2018), https://www.hoover.org/research/west-needs-water-markets [https://perma.cc/PSV5-ATAD].

235. James A. Swaney, *Trading Water: Market Extension, Social Improvement, or What?*, 22 J. ECON. ISSUES 33, 35 (1988).

236. *See* Karrigan Börk, Andrew L. Rypel, Sarah Yarnell, Ann Willis, Peter B. Moyle, Josué Medellín-Azuara, Jay Lund & Robert Lusardi, *Considerations for Developing an Environmental Water Right in California*, CAL. WATERBLOG (June 12, 2022, 6:00 AM), https://californiawaterblog.com/2022/06/12/considerations-for-developing-an-environmental-water-right-in-california/ [https://perma.cc/G6UQ-22SH] (discussing proposals by California's Senate to purchase, rather than regulate, existing water rights to provide stronger environmental protection).

that makes pure water markets impossible and at least some level of market failure inevitable. This means that the supposedly efficient, welfare-maximizing outcomes of water-market transactions are fundamentally biased by the institutions, starting conditions, and physical characteristics of the western water landscape. Next, because initial allocations drive market outcomes, we continue by identifying ways historic water right allocations reflect systemic exclusion of many minority groups and argue that water markets and socioeconomic barriers to water-market participation perpetuate this injustice. This is a novel critique and one that market advocates of all stripes must address if water markets are to truly benefit the public good. Finally, we explore ways markets can change our relationship to water and water rights. Insights from the commons literature demonstrate that water markets can "[b]ind[] environmental policymaking discretion through the creation of durable private rights in public commons."[237] Market advocates agree that markets require firm property rights, but both evangelists and too many pragmatists seek to firm up water rights by stripping away public restraints rather than applying existing law to uncover a smaller but firmer water right.

In sum, water markets in the current legal setting have a distinct morality that does not align with the goals of modern water management. Markets facilitate water management changes that are otherwise hard to accomplish. Water markets certainly have a role to play in future water management, but reinvigorated water governance is a precondition to markets that serve the public's interests.

### A. MARKETS ARE NOT VALUE-NEUTRAL TOOLS THAT IMPROVE WATER MANAGEMENT

We turn first to institutional economics' critiques of water markets. Institutional economics and new institutional economics are schools of economic thought that have variously been used both to critique and support water markets.[238] Institutional economists study "how institutions influence the

237. Erin Ryan, *Privatization, Public Commons, and the Takingsification of Environmental Law*, 171 U. PA. L. REV. (forthcoming 2023) (manuscript at 1–2), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4102183 [https://perma.cc/YX3R-9A7G].

238. For comparisons of Institutional Economics, New Institutional Economics, and traditional Law and Economics, see MERCURO & MEDEMA, *supra* note 200, at 1–17; Lyubomira Gramcheva, *Comparative Institutional Law and Economics: Reclaiming Economics for Socio-Legal Research*, 26 MAASTRICHT J. EUR. & COMPAR. L. 372, 373 (2019); Ronald Coase, *The New Institutional Economics*, 88 AM. ECON. REV. 72, 73 (1998); Terry L. Anderson, *Introduction: The Water Crisis and the New Resource Economics*, *in* WATER RIGHTS: SCARCE RESOURCE ALLOCATION, BUREAUCRACY, AND THE ENVIRONMENT 1, 3–9 (Terry L. Anderson ed., 1983); Brewer et al., *supra* note 219, at 183–84; Philip R. Wandschneider, *Neoclassical and Institutionalist Explanations of Changes in Northwest Water Institutions*, 20 J. ECON. ISSUES 87, 91 (1986); S.V. Ciriacy-Wantrup, *Natural Resources in Economic Growth: The Role of Institutions and Policies*, 51 AM. J. AGRIC. ECON. 1314, 1317–20 (1969); Daniel W. Bromley, *Land and Water Problems: An Institutional Perspective*, 64 AM. J. AGRIC. ECON. 834, 836 (1982) [hereinafter Bromley, *Land and Water Problems*]; Daniel W. Bromley, *Institutional Change and Economic Efficiency*, 23 J. ECON. ISSUES 735, 735–36 (1989) [hereinafter Bromley, *Institutional Change*]; Carl J. Bauer, *Slippery Property Rights: Multiple Water Uses and the Neoliberal Model in Chile, 1981-1995*, 38 NAT. RES. J. 109, 110, 112–13 (1998); BAUER, *supra* note 61; Aguilera-Klink & Sánchez-García, *supra* note 49, at 167–68; Manuel Prieto, *Equity vs. Efficiency and the Human Right to Water*, 13 WATER, Jan. 2021, at 2, 2; Sonya F. P. Ziaja, *Rules and Values in Virtual Optimization of California Hydropower*, 57 NAT. RES. J. 329, 333–35 (2017); Marie Leigh Livingston, *Normative and*

functioning, performance, and development of the economy and, in turn, how changes in the economy influence the institutions."[239] In the water-market setting, institutional economists consider the institutional setting integral to understanding the market, because the institutions create and shape markets and are, in turn, reshaped by market actors. After briefly questioning the core assumptions of economic efficiency, we discuss two related critiques from institutional economics: markets cannot be separated from the value judgments made in the institutions that create them, and market failures are inevitable in water markets.

1. Economic Efficiency of Water Use May Not Maximize Social Welfare

Before diving into the institutional critiques, we pause to note our deep skepticism with the key assumption that economic efficiency universally maximizes overall social welfare, particularly in the water context.[240] Our other criticisms below address the question of whether, due to institutional factors and market failures, water markets actually maximize economic efficiency, but this first criticism is focused on the idea that aggregated consumer willingness to pay, as expressed in water markets, does not actually maximize social welfare. Other scholars have addressed this argument in detail,[241] so we discuss it only briefly as necessary background.

First, the actual social-welfare-maximizing distribution of water rights likely diverges from the distribution that results from private transactions.

The welfare-economics approach is inherently biased by the existing distribution of wealth. People with more money are willing to pay more for all kinds of goods and services: education, free time, organic foods, and the like.[242] Likewise, richer water users will be willing to spend more to buy water rights, even where the water use is not essential. Large urban water districts can afford to spend more for water, with less relative hardship, than low-income water districts, even where the low-income water districts cannot provide drinking water.[243] Impoverished communities do not value water less than wealthy ones; they simply do not have money to express how much they value it. The willingness-to-pay model is thus inherently biased in ways that give rich interests much more power over water allocation.[244] Alternative approaches, such as determining

*Positive Aspects of Institutional Economics: The Implications for Water Policy*, 29 WATER RES. RSCH. 815, 819 (1993); Casado-Pérez, *supra* note 49, at 171–75; and Dellapenna, *supra* note 48, at 327 n.21 (collecting sources).

239. Ringa Raudla, *Institutional Economics*, *in* ENCYCLOPEDIA OF LAW AND ECONOMICS (Jürgen Backhaus ed., 2014), https://doi.org/10.1007/978-1-4614-7883-6_56-1.

240. Note that improving efficiency in water use is often good; here we are discussing the market argument based on maximizing economic efficiency, a different thing entirely.

241. *See, e.g.*, Blumm, *supra* note 54, at 371–72; MARK SAGOFF, THE ECONOMY OF THE EARTH: PHILOSOPHY, LAW, AND THE ENVIRONMENT 92–95 (1988). *See generally* C. Edwin Baker, *The Ideology of the Economic Analysis of Law*, 5 PHIL. & PUB. AFFS. 3 (1975) (reviewing RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW (1972)).

242. *See* Baker, *supra* note 241, at 14.

243. *See* DEBORAH A. SIVAS, MOLLY LOUGHNEY MELIUS, LINDA SHEEHAN, JOHN UGAI & HEATHER KRYCZKA, CALIFORNIA WATER GOVERNANCE FOR THE 21ST CENTURY 6 (2017).

244. *See* Baker, *supra* note 241, at 31.

economic value of a resource based on the price required to *induce* its sale, give very different answers to questions of value; this shows the initial assignment of a right is key to understanding ability to pay and other determinants of "value" in a market-based approach.[245] The economic-efficiency approach's failure to address these distributive-justice concerns[246] means that unadorned market approaches will not actually maximize social welfare[247] and produce unjust outcomes.[248]

People also make different decisions when acting as market participants than when acting as citizens seeking to maximize welfare. Professor Mark Sagoff argues that measuring political will by consumer willingness to pay is a mistake because it ignores this difference.[249] In sum, the free-market approach "fails to acknowledge potential divergences between preferences and actual welfare"[250] and "is (1) not unambiguously related to increasing satisfaction or welfare and (2) has no clear or consistent claim to be the economic goal of law."[251]

Second, aggregated individual exchange decisions ignore key water values. In a market approach, "all non-market values are subordinated to those the market recognizes."[252] The market will not adequately protect values that are not readily commensurable or that cannot accurately be captured in terms of exchange value.[253] There is good reason to suspect the idea "that value is a totally subjective notion and that it must mean solely the satisfaction of present individual desires."[254] Although there are many values that are likely to be ignored in this approach,[255] we focus on communitarian or collective values and ethical or moral imperatives.

Water has multiple values to communities that may not be expressed through individual decisions.[256] For example, "[a]n individual farmer or farm company selling water might not have communitarian preferences and may not consider the broader present and future effects on the community. The local community may have a long-term view of the needs of the members, encompassing both

245. *See id*. at 12.

246. Johnson, *supra* note 90, at 229–30.

247. *See* Baker, *supra* note 241, at 47.

248. Blumm, *supra* note 54, at 376 ("Efficiency's 'willingness to pay' criterion is objectionable to those who do not believe that the existing distribution of wealth is fair. Transforming dollars into votes ensures a monopoly by the wealthy and the few.").

249. *See* SAGOFF, *supra* note 241.

250. Sinden, *supra* note 207, at 544.

251. Baker, *supra* note 241, at 31 (emphasis omitted).

252. Norman W. Spaulding III, *Commodification and Its Discontents: Environmentalism and the Promise of Market Incentives*, 16 STAN. ENV'T L.J. 293, 315 (1997).

253. *Id*.

254. Baker, *supra* note 241, at 8.

255. For example, "existence" or "intrinsic" values are often omitted from natural resource valuations. Spaulding III, *supra* note 252, at 316. Suffice it to say that "both internalize costs of environmental degradation that are ignored in market driven contingent valuation methods." *Id*. at 317. Also consider future interests, which present decisions are likely to undervalue. *See* Blumm, *supra* note 54, at 376.

256. Vanessa Casado Perez, *Whose Water? Corporatization of a Common Good*, *in* ENVIRONMENTAL LAW, DISRUPTED. 79, 79–83 (Keith Hirokawa & Jessica Owley eds., 2021).

current and future generations."[257] Water also supports ecosystem services that are vital to community survival, and individual choices are notorious for undervaluing these public benefits. Building on the distributional criticism of the willingness-to-pay approach, a community may be unable to muster resources to secure adequate market water to protect these services, even if it would not sell the water if it were the first owner—"measures to use taxpayer funds to support water for waterways generally fail to achieve their laudable goals."[258] Other community values include recreational uses, aesthetic enjoyment, and identity. The Kern River, even as a dry riverbed, is a core part of Bakersfield's identity—consider music star Merle Haggard's album *Kern River*, itself emblematic of the famous Bakersfield Sound branch of country music.[259] Even beyond ecosystem services, communities value water in ways that individual purchase decisions do not reflect.[260]

Third and finally, aggregated consumer willingness to pay is also unlikely to adequately address broader ethical concerns.[261] These include, of course, distributional concerns such as assuring an adequate supply of water for all people.[262] They also include decisions to protect species and ecosystems due to a belief in the moral importance of letting extant species continue to exist. Private approaches can protect these interests in some cases, but protection through other mechanisms can protect ethical concerns across the board, not just in those cases that catch public attention, and can "reflect the public's reasoned collective expression of what rights ought to be, rather than simply a measure of the shifting whim of consumer demand."[263] There is also value in water policy that expresses "a formal acknowledgment by the state government that it considers its waters to be more than mere spoils to be divided up among private parties."[264] Such an acknowledgement sets a particular tone for water users, communities, and environmental advocates alike.

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257. *Id*. at 90 (footnote omitted).

258. SIVAS ET AL., *supra* note 243, at 15.

259. *See Listen to "Kern River Blues," The Last Song Merle Haggard Ever Wrote and Recorded*, COUNTRY THANG DAILY (Dec. 25, 2020), https://www.countrythangdaily.com/kern-river-blues-merle-haggard/ [https://perma.cc/ETQ5-E3TG]; *Bakersfield Sound*, PBS, https://www.pbs.org/kenburns/country-music/bakersfield-sound-branches-of-country-music [https://perma.cc/ZQV8-MGDU] (last visited May 17, 2023).

260. *See* Margaret V. du Bray, Rhian Stotts, Melissa Beresford, Amber Wutich & Alexandra Brewis, *Does Ecosystem Services Valuation Reflect Local Cultural Valuations? Comparative Analysis of Resident Perspectives in Four Major Urban River Ecosystems*, 6 ECON. ANTHROPOLOGY 21, 22–23, 29–30 (2019).

261. *See* Sinden, *supra* note 207, at 543–44 (describing how critics of willingness-to-pay approach argue that it "privileges consumer preferences over aspirational ideals and values"); Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 ENV'T L. 27, 35 (1996) ("A sound water law would embody and transmit sensitive, ethical messages about the multiple values of water.").

262. *See, e.g.*, Craig Anthony (Tony) Arnold, *Water Privatization Trends in the United States: Human Rights, National Security, and Public Stewardship*, 33 WM. & MARY ENV'T L. & POL'Y REV. 785, 830–31 (2009).

263. Clifford, *supra* note 226, at 133–34.

264. *Id*. at 134.

In this Section, we have discussed the biases that result from assuming that social welfare can be maximized through aggregated private transactions. This does not mean that markets have no use in improving water management, but it does mean that water management "present[s] problems properly answered in the public or political realm."[265] It is also good reason to reject the strongest forms of free-market evangelism. Water involves complex normative standards, and so "every judgment becomes an all-things-considered exercise, one involving introspection, debate, and consensus-building."[266] To return to the theme, water governance that focuses solely or primarily on the economic efficiency of water markets assumes a particular moral view of the world; it is not an amoral, value-neutral water policy.[267]

2. Water Markets Do Not Determine Values; They Express Them

Market advocates, particularly in the political arena, paint markets as an alternative to government interference. Remember, "markets are smart, government is dumb."[268] But markets do not exist in a vacuum.[269] Institutional economists note that government (and private) law and policy create water markets by establishing "the rules of the game."[270] That is, they create the institutions that establish the market and allow for its maintenance.[271] Aguilera-Klink and Sánchez-García note in their empirical institutional economics study of water markets in Tenerife (in Spain's Canary Islands), contrary to the custom of economists to paint a dichotomy of "free market or state intervention,"[272] markets "take place under a continuously evolving institutional structure which we call rules, legislation, agreements and collective regulations which establish acceptable norms of individual and group behaviour."[273] This instructional structure "determines which costs will be reckoned by which decision makers, and hence . . . which outcomes appear to be efficient."[274] For example, decisions will be notably different in a water market where free alienability of water rights is prioritized, as

265. Baker, *supra* note 241, at 47.

266. Posner, *supra* note 206, at 677.

267. *See* Baker, *supra* note 241, at 47–48. There are some values which may not be achieved or expressed through markets.

268. BROWN & JACOBS, *supra* note 59.

269. *See* Bromley, *Institutional Change*, *supra* note 238, at 740–41.

270. DOUGLASS C. NORTH, INSTITUTIONS, INSTITUTIONAL CHANGE AND ECONOMIC PERFORMANCE 3–4 (1990) (including both formal rules—for example, law—and informal rules—for example, norms, conventions, codes of conduct). These are sometimes termed "working rules for going concern." Daniel W. Bromley, *Resources and Economic Development: An Institutionalist Perspective*, 19 J. ECON. ISSUES, 779, 786–87 (1985) (citing JOHN R. COMMONS, INSTITUTIONAL ECONOMICS: ITS PLACE IN POLITICAL ECONOMY (1961)).

271. *See* Ziaja, *supra* note 238, at 333. Economists use "institution" in a broad sense to mean a social decision system for creating, maintaining, and constraining the market through both informal and formal rules. *E.g.*, Ciriacy-Wantrup, *supra* note 238, at 1319. This should not be confused with the more colloquial use of the term "institution" to mean only organizations.

272. Aguilera-Klink & Sánchez-García, *supra* note 49, at 168.

273. *Id.* at 170.

274. Bromley, *Land and Water Problems*, *supra* note 238.

compared to a market that internalizes the external costs of water transfers. Markets do not necessarily move toward the most economically efficient outcomes but rather toward outcomes determined in part by the value-driven institutions that create them.

Theorists suggest that *functional* water markets require "at least three institutional choices: a cap [on how much water is available], an initial allocation of property rights, and trading rules."[275] These choices create the context for market participants to make decisions, and so the institutional choices and the participant choices *together* determine market outcomes. For water markets in the western United States, laws and norms set the operating rules for the markets; history sets the initial positions of market participants, and courts or administrative agencies set the cap and the trading rules for the market. These initial institutional arrangements are tied to their historical and geographic context.[276] Examining these three requirements in the western water context illustrates the way that institutional choices about values drive market outcomes.

First consider the cap requirement. A cap establishes a total limit of water withdrawals, across a nested scale, from limits for small watersheds to limits for the larger watersheds they inhabit.[277] The levels of these caps are value determinations.[278] Caps determine how much water remains instream, which in turn depends on what ecosystem conditions society desires in the water system, which in turn depends on the species society desires to protect or the other ecosystem services that society chooses to value in the stream system, weighed against competing uses. Caps could be established through instream flow requirements, through state or federal species protection or river preservation laws, or through more informal measures such as the public trust doctrine; but in the institutional setting of the American West, caps are often absent. As the history of water rights in the West tells us, the first two tranches of water rights were established without consideration of limits of water withdrawals, under a priority system that rewarded those who sought water rights for every drop of water in the system.[279] State and federal laws have sought to balance this history with laws that protect instream flows, but enforcement has been spotty and has not resulted in sufficient

275. Garrick & Svensson, *supra* note 57, at 379.

276. *See* Ziaja, *supra* note 238, at 334 ("Institutions cannot be divorced from history."); *see also id.* at 335–44 (describing the historical and geographical foundations of California's hydropower system). For a lovely and concise history of the related Columbia River, see RICHARD WHITE, THE ORGANIC MACHINE: THE REMAKING OF THE COLUMBIA RIVER (1995).

277. Garrick & Svensson, *supra* note 57, at 379. The cap question in the West is complicated by the tremendous intra-annual and inter-annual variation in flows, which frustrates efforts to recognize set-quantity water rights above minimum base flows. *See* Rui Cheng, Lenka Novak & Tapio Schneider, *Predicting the Interannual Variability of California's Total Annual Precipitation*, GEOPHYSICAL RSCH. LETTERS, Apr. 2021, at 1, 1.

278. *See* Garrick & Svensson, *supra* note 57, at 379.

279. *See supra* text accompanying notes 90–125.

streamflow in most areas.[280] Consider the Skookumchuck River, where TransAlta's water bank is exempt from the instream-flow rule established in 1976,[281] and the Kern, where all of the water rights were established before any entity put a cap on water diversions.[282] In many cases, the de facto cap is the quantity of water physically available for appropriation, and the de jure cap is nonexistent. These are the values-based, institutional choices about withdrawal limits in western water law. Because the institutional choices underlying western water law do not value maintenance of instream flow, the market will not achieve it.[283]

Next, consider the initial allocation of water rights, which sets the stage for the market. As this history explains, most rights were obtained either by purchasing riparian lands or by diverting water and putting it to productive use. This history creates serious fairness and justice concerns about the distribution of water rights, explained more fully below.[284] But the requirements also meant that water law "was written for diverters" and thus "ignored instream uses such as fish and wildlife habitat and hydropower."[285] The values-based institutional choices about who could obtain a right to western water, often made over a hundred years ago, favored diversion and use over instream flow and favored agricultural interests over inchoate urban uses. In many cases, instream uses like fish protection or recreation were not even considered beneficial uses of water until the mid-twentieth century. Water left instream was often considered available for other users. Attempts to provide water for cities came later, and their rights tend to be junior to agricultural rights.[286] These are the institutional choices about the initial allocation of water rights in western water law. This is particularly important in the water-market context, because the initial distribution of rights and wealth are sticky in markets, determining who can participate, which values can be reflected in the market, and who must purchase water.[287] Water markets can transfer rights among market participants, but the costs and benefits to market participants are determined in part by this initial distribution.[288] Allowing agricultural interest to

280. In a funny twist, the brokenness of the systems designed to protect instream flows both serve as evidence of the water crisis in the West that inspires calls for water markets, and as evidence that the preconditions for water markets that might solve the problem have not been met.

281. MAHLUM, *supra* note 131, at 13 tbl.2; STATE OF WASH., *supra* note 17 and accompanying text.

282. N. Kern Water Storage Dist. v. Kern Delta Water Dist., No. F033370, 2003 WL 215821, at *2–4 (Cal. Ct. App. Jan. 31, 2003), *as modified on denial of reh'g* (Mar. 3, 2003).

283. In some cases, private parties use markets to try to establish caps themselves by buying water, as discussed above. For a critique of this approach, at least as deployed on a broad scale, see generally Johnson, *supra* note 90. The effect of these purchases is primarily at the margins. *See* SIVAS ET AL., *supra* note 243. Some scholars have argued that forcing the state or private parties to buy back the public's water, when its use results in unreasonable impacts to public resources, risks delegitimizing the law. *See* Freyfogle, *supra* note 261, at 40–41.

284. *See infra* Section II.B.

285. Wandschneider, *supra* note 238, at 89.

286. *See* Thompson, Jr., *supra* note 56, at 23.

287. *See supra* Section II.A.

288. *See* Bonnie Colby, *Acquiring Environmental Flows: Ecological Economics of Policy Development in Western U.S.*, ECOLOGICAL ECON., July 2020, at 1, 1–2 (2020) (noting "the centrality of

claim most water rights is a values-based decision that will affect the amount of instream flows that markets protect.

Finally, consider the trading rules. Ideally, "trading rules allow voluntary reallocation to enhance efficiency, subject to rules to limit negative social, economic, and environmental impacts of water trading."[289] Most jurisdictions in the West, for example, impose a no-injury rule on transfers, which lets other water users or the state stop a water transfer if the transfer would hurt their interests or the public's interest in the source watershed.[290] Trading rules are particularly important because they are sometimes offered up as a way to fix the cap issue; many states make trades subject to a public-interest test or other requirements that might keep some of the traded water instream. But only four states (California, Wyoming, New Mexico, and Utah) consider impacts beyond effects on other water right holders when reviewing water transfers.[291] Analysis of permitting for groundwater transfers suggests that, in practice, most transfer rules focus on impacts to other water right holders.[292] Robust transfer rules are often identified as a significant impediment to more active water markets in the West,[293] but easing transfer rules would aggravate the negative impacts of water transfers and make the markets less likely to deliver instream flow benefits.[294] The extent of protections in trading rules is a values-based determination, and the function and outcomes of water markets depend to a great extent on those rules.[295]

Changing the relative weights of competing values in water is a matter of institutional change, not just market exchanges. Say a community, or even a state, needed to decide whether it was preferable for water to remain in a particular river to support life, or if it were preferable for water to be withdrawn and used for agriculture. A water market for water rights on that river cannot make these decisions for the community. The market works within existing conditions that influence the relative value of competing choices. This is recognized even by economists whose conceptions of economics are more focused on efficiency than

policy in determining how the costs and benefits of water trading are distributed across stakeholders"); Ziaja, *supra* note 238, at 334 ("Existing power relations constituted an initial distribution that conditioned what outcomes were possible.").

289. Garrick & Svensson, *supra* note 57, at 379. We discuss externalities more fully in the next Section; for now, it suffices to say that water transfers can impose significant costs on those not involved in the transfer itself, absent protective trading rules.

290. *See* Klein, *supra* note 37, at 594. These policies are sometimes called no-harm rules.

291. Charles W. Howe, *Protecting Public Values in a Water Market Setting: Improving Water Markets to Increase Economic Efficiency and Equity*, 3 U. DENV. WATER L. REV. 357, 369 (2000).

292. Rebecca Nelson, *Paying Back the River: A First Analysis of Western Groundwater Offset Rules and Lessons for Other Natural Resources*, 34 STAN. ENV'T L.J. 129, 133–34 (2015).

293. *See* Bonnie G. Colby, *Transactions Costs and Efficiency in Western Water Allocation*, 72 AM. J. AGRIC. ECON. 1184, 1186 (1990).

294. *See* Thompson, Jr., *supra* note 56, at 51.

295. *See* Colby, *supra* note 50, at 722 ("[P]olicies which restrict market activities and make transactions more costly are not necessarily wasteful or inefficient. They are an expression of the concerns that members of society and policy makers have about reallocating water through market processes . . . .").

institutional and historical context. Demsetz, in line with Coase,[296] suggests that institutional change in property rights occurs "when it becomes economic for those affected by externalities to internalize benefits and costs."[297] Yet other economists who favor deep consideration of law and social context—"old" institutional economics—add that although markets do not explain institutional change, neither does efficiency, because existing and legacy institutions heavily influence the weight of the economic values in the efficiency calculus.[298]

Therefore, what markets do shift—for example, from apparently lower- to higher-economic-value uses for water—is "an artifact of prevailing property arrangements, technical conditions, and the wealth position of buyers and sellers."[299] For a community struggling to decide how much water should remain in its river, the outcome of a market would reflect any preexisting cap on withdrawals, the initial distribution of rights to the water in the river, the relative economic power of those seeking to use the water, and the trading rules for the rights themselves. The outcome would tell us little about what the community actually prefers right now, as opposed to these artifacts of history. Market outcomes more accurately reflect market forces and initial conditions rather than community preferences. The market cannot answer the community's governance challenge—only the hard work of governance can do that.

The institutions of western water law are rules that express particular values: a preference for development over preservation, for agricultural rights over urban and instream uses, and for long-term security of rights. The trading rules are insufficient to manage the impacts of the markets. Under these conditions, markets are unlikely to deliver the benefits that advocates seek. And, just as importantly, markets will not necessarily result in realignment of these values.

Can, then, markets improve economic efficiency through atomistic choices and redistribution? Institutional economics answers yes *but* only within the boundaries of the existing institutional context—institutions determine a great deal about the efficiency markets produce. And institutional boundaries determine which groups and individuals can participate and who benefits.[300] Water markets do not determine values, they just express them. As discussed further in Section II.B,

296. Coase, *supra* note 201 (arguing that property rights change only when the profits resulting exceed the transaction costs).

297. Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 354 (1967).

298. *E.g.*, Aguilera-Klink & Sánchez-García, *supra* note 49, at 171 (noting Demsetz and Coase's "reasoning is tautological because it omits that transaction costs – costs shielding the impossibility of institutional change – are defined by the institutional framework in force, that is, by the interests favoured by the maintenance of the status quo").

299. Bromley, *Land and Water Problems*, *supra* note 238, at 837.

300. *See* Wandschneider, *supra* note 238, at 101–02 (discussing Marc Tool, *A Social Value Theory in Neoinstitutional Economics*, 11 J. ECON. ISSUES 823 (1977), MARC R. TOOL, THE DISCRETIONARY ECONOMY: A NORMATIVE THEORY OF POLITICAL ECONOMY (1979), and A. ALLAN SCHMID, PROPERTY, POWER, AND PUBLIC CHOICE: AN INQUIRY INTO LAW AND ECONOMICS (1978)).

below, this is a problem when the values markets express are based on institutions serving society's values from a century ago, not the values we hold today.[301]

3. Market Failure Is Inevitable in Water Markets

Even in a well-designed water market, the characteristics of water make market failures inevitable,[302] which stymies the efficiency-maximizing benefits of markets.[303] Marie Livingston lays out the physical and social characteristics of water that make market failure "endemic" to water markets: "water is fugitive, lumpy and rife with externalities. Moreover, water use is often nonrival, entails substantial transactions costs and suffers from information deficiencies."[304] In other words, geography prevents water from behaving like a "normal" commodity. That sets up a "market" in which negative externalities are inevitable, necessarily troubling markets. Here is how that works in practice.

The inherent uncertainties in the timing, location, quality, and quantity of water sources make water markets less efficient than normal commodities.[305] Precipitation and climatic conditions determine how much and how quickly water flows into rivers like the Skookumchuck. Like many rivers in the West, the flow of the Skookumchuck is fed by higher elevation tributaries, which in turn are fed by rain and slow melting of accumulated snow.[306] The quantity and timing of flow in the Skookumchuck depends on precipitation type, timing, and temperature upstream, which change seasonally and from year to year.[307] Kern flows are similar, though subject to California's wild pattern of inter-annual precipitation variability.[308] Many markets successfully face uncertainties, but uncertainties do reduce the benefits from markets; these uncertainties make water markets less efficient, slower to adjust,[309] and less likely to maximize the short-term economic

301. To a degree, this is true of all marketable property rights. But water rights are different; water is a usufructuary right, and the corpus of the water belongs to the public. *Supra* note 79 and accompanying text. The police powers of the state are at their strongest in the realm of water law. This control and ownership have allowed the public to reshape water rights in the past, and the public can continue to do so in ways that are more difficult with less malleable property rights.

302. We follow Casado-Pérez here in our definition of market failure as including potentially any one of the following: "the existence of a natural monopoly; undersupply of public goods; imperfect information; and uncompensated externalities." Casado-Pérez, *supra* note 49, at 165.

303. Governance is also imperfect, but it is necessary to point out these inevitable market failures as a response to free-market evangelists.

304. Marie Leigh Livingston, *Designing Water Institutions: Market Failures and Institutional Response* 3 (World Bank, Agric. and Nat. Res. Dep't, Working Paper No. 1227, 1993).

305. The massive development of water infrastructure in the West (reservoirs, aqueducts, ditches, and canals) are all attempts to mitigate some of this uncertainty. The addition of seasonal and inter-annual weather forecasts into algorithms for water management likewise have helped to manage water resources. *See, e.g.*, Ziaja, *supra* note 230, at 923–24 (discussing the use of INFORM on the Sacramento River). However, the nature of water persists.

306. Maps and hydrology data for the Skookumchuck are publicly available through the United States Geologic Service's website. *See Skookumchuck River at Centralia, WA*, U.S. GEOLOGICAL SURV.: WATER DATA, https://waterdata.usgs.gov/monitoring-location/12026600/#period=P1Y.

307. *See id.*

308. *See* Cheng et al., *supra* note 277.

309. *See generally* Pappas, *supra* note 200 (discussing patterns of "prevention and cure" in policy issues).

value of water use.[310] Because the existence and quality of water is so highly variable, it is unlike "normal" commodities. These uncertainties are exacerbated by the unacceptably high price of "getting it wrong" with water predictions. The variable nature of water means that water markets will always suffer from inefficiencies.[311]

Beyond supply uncertainties, water is unevenly distributed across the landscape—it is "lumpy"[312]—and redistributing water requires significant infrastructure. This makes for very high transaction costs. Moreover, the expense of infrastructure and the geographic distribution of agriculture create economies of scale for irrigators, encouraging group decisions and actions. "[M]anagement becomes a problem for the group as a whole, rather than for specific individuals."[313] This can cause market failure because it leads to power pooling among certain groups and not others, such as the kinds of monopolistic behavior seen in the early days of the Kern River. Sheer physical separation prevents willing buyers and willing sellers from connecting in a water marketplace, which limits the efficiencies that can result from water markets.

Water use also creates many externalities, both because some water use is rival and because of the interconnected nature of waterways. Use by one individual affects the availability and use for a whole lot of other people who may not be anywhere near the water. That is to say, in economics jargon, concentration of water makes independent production and consumption functions for water impossible.[314] For example, on the Kern, if one irrigator withdraws water and applies it to fields of almonds, not only is some of *that* water not available for other uses, but it also affects the quality and availability of the remaining water supply in the river. Even where water is used for nonconsumptive purposes, such as hydropower, the same problem exists; stored water is returned to the riverbed but with different temperature and quality attributes than if it had not been dammed or diverted.[315] Beyond other water users, society suffers many externalities from water use, such as loss of sediment, loss of riparian species, and infrastructure impacts.[316] In both cases, the "costs imposed by water users are not necessarily born by the users themselves."[317] This means that costs and benefits to the private parties in a water market are vastly different from the costs and benefits to society;[318] "[i]n many settings, the external impacts of a water use are greater than the

310. *See* Livingston, *supra* note 304, at 20–21; Bauer, *supra* note 49, at 640.

311. *See generally* Hollinshead, *supra* note 233 (discussing potential for "securitization" to address market inefficiencies resulting from unpredictable water supplies).

312. Livingston, *supra* note 304.

313. *Id*. at 4.

314. *Id*.

315. *See generally* SANDRA POSTEL & BRIAN RICHTER, RIVERS FOR LIFE: MANAGING WATER FOR PEOPLE AND NATURE (2003) (discussing how hydropower dams and reservoirs disrupt the flow and ecology of rivers).

316. *See* Karrigan Börk, *Water Right Exactions*, 47 HARV. ENV'T L. REV. 63, 77–80 (2023).

317. Livingston, *supra* note 304, at 4.

318. *See id*.; Jamison E. Colburn, *Don't Go in the Water: On Pathological Jurisdiction Splitting*, 39 STAN. ENV'T L.J. 3, 10 (2019) (suggesting "one party, place, or state's reach for water will almost surely

internal ones."[319] Regardless of whether water is diverted from the river, multiple competing uses for that water necessarily means that some uses create costly externalities for other uses.

Once externalities emerge, the *only* possibility for redress comes from institutional change—for example, new law or other collective action governance mechanisms—not from markets themselves. Market failures, in which costs are externalized to increase profit, are a feature of water markets for market participants. They increase profits. Governance is always needed to determine how externalities are managed and whether they are incorporated back into the market as transaction costs. The economic-efficiency endpoint that a market might get to depends in large part on how many externalities are internalized in the market. And, because "[g]overnance is inherently political,"[320] the market failures inherent in water markets belie their putative amoral nature.

These three arguments—efficiency alone is inadequate water policy, markets express the values inherent in the institutions that create them, and the inevitable market failures in water markets—show that markets do not offer an escape from the difficult decisions facing society over the use of water in the West; laying widespread markets over the existing western water law framework will not solve the problems it has created. Markets cannot substitute for governance and politics. This is not to say that water markets should not exist but rather that they should play a role that is predicated on and constrained by strong water governance.

### B. MARKETS IMPEDE MODERN PRINCIPLES OF EQUITY AND FAIRNESS

We return now to questions about how markets impede equity and fairness. There is significant literature on societal values lost through quantification and commodification.[321] Our critique adds two other dimensions, frequently overlooked in legal scholarship of water markets. First, markets impede fairness and equity because they are reflections of the historic injustices in the initial formation and distribution of water rights.[322] While this is true for many property right regimes, water is unique because it is essential for life and because the state's substantial, continuing police power over water rights allows it to redress some of

threaten someone, somewhere else"); Dustin E. Garrick & Robert W. Hahn, *An Economic Perspective on Water Security*, 15 REV. ENV'T ECON. & POL'Y 45, 49–52 (2021) (discussing the "pervasive externalities" associated with water use).

319. Freyfogle, *supra* note 261, at 31.

320. Bauer, *supra* note 36 (first citing KEN CONCA, GOVERNING WATER: CONTENTIOUS TRANSNATIONAL POLITICS AND GLOBAL INSTITUTION BUILDING (2006); then citing KAREN BAKKER, PRIVATIZING WATER: GOVERNANCE FAILURE AND THE WORLD'S URBAN WATER CRISIS (2010); and then citing Jonathan Lautze, Sanjiv de Silva, Mark Giordano & Luke Sanford, *Putting the Cart Before the Horse: Water Governance and IWRM*, 35 NAT. RES. F. 1 (2011)).

321. Frank Ackerman and Lisa Heinzerling's book, *Priceless*, is emblematic of this literature and a superb, accessible survey of the core arguments against quantification. FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004).

322. *See infra* Section II.B.1.

this historic injustice. Second, markets frustrate equity and fairness by subverting participatory governance.[323] These justice concerns are aggravated by the ways that markets tend to enhance the strength of water rights, limiting the public's ability to reallocate those rights now or in the future.

1. Unjust Historic Water Right Allocations Thwart Equity and Fairness in Water Markets

As we have discussed, the initial allocation of water rights sets the stage for the market outcomes. "[M]arkets can only reflect a prior underlying structure of entitlements that indicate who has rights, duties, privileges, no rights, power, liability, immunity, and no power."[324] In other words, the initial distribution of rights and the content of those rights affect who can participate, who benefits, and who loses in later markets where resources based on those rights are traded.[325] Western water rights were designed to be sticky.[326] Credible commitments to secure water rights were needed to facilitate the development value of that time. If a rights holder was not sure the right would be long-lasting, that holder would be disincentivized to invest in putting the water to beneficial use. The context in which those rights were allocated, combined with a focus on markets for reallocation, has lasting implications for fairness and equity.[327]

It is little wonder that core doctrines of riparian rights and prior appropriation were developed alongside the rise of agricultural industrialists and large landowning firms—leaving out the poorer classes and non-"white" ethnicities from

323. *See infra* Section II.B.2. These two arguments mirror the primary concerns of equity and fairness in environmental law scholarship: whether distribution of costs and benefits across demographic groups and geography was equitable and whether procedure leading to a decision or action was fair. This literature is closely linked with the environmental justice movement. *See, e.g.*, Robert R. Kuehn, *A Taxonomy of Environmental Justice*, 30 ENV'T L. REP. 10681, 10682 (2000); Jonathan Skinner-Thompson, *Procedural Environmental Justice*, 97 WASH. L. REV. 399, 406 (2022) (describing "two pillars of environmental justice" as "fair treatment and meaningful involvement" with an excellent overview of the public participation models); Sonya Ziaja, *Lessons on Race and Place-Based Participation from Environmental Justice and Geography*, YALE J. ON REGUL.: NOTICE & COMMENT BLOG (Aug. 16, 2020), https://www.yalejreg.com/nc/lessons-on-race-and-place-based-participation-from-environmental-justice-and-geography-by-sonya-ziaja/ [https://perma.cc/7ALG-U6QE] (discussing the fundamental role of public participation and geography in procedural environmental justice). *See generally* Derek Bell & Jayne Carrick, *Procedural Environmental Justice*, *in* THE ROUTLEDGE HANDBOOK OF ENVIRONMENTAL JUSTICE 101 (Ryan Holifield et al. eds., 2018) (highlighting importance of equality, proportionality, and plurality in environmental justice); Wilder & Ingram, *supra* note 61, at 49–50, 53–57 (discussing variable components of water equity, including a strong emphasis on meaningful participation in decisionmaking). The water governance literature adds attention to the development of knowledge networks and value pluralism in water as core indicators of equity, beyond process and distribution.

324. Bromley, *supra* note 270, at 781.

325. *See supra* Section II.A.2.

326. *See supra* Section II.A.2.

327. This is not dissimilar to the lasting impacts of the distribution of housing benefits, discussed in RICHARD ROTHSTEIN, THE COLOR OF LAW: A FORGOTTEN HISTORY OF HOW OUR GOVERNMENT SEGREGATED AMERICA (2017).

early development of water institutions.[328] Consider first the requirements for securing a water right in fledging western states. Riparian water rights required land ownership, and appropriative rights required a beneficial use of the water, again typically on land. The mythos of the West focuses on the widespread availability of land, based on the Homestead Act, the Desert Land Act, and other efforts by the federal government to pass land along to yeoman farmers cheaply and quickly.[329] Indeed, "[b]etween 1863 and 1939, about one and [a] half million households received titles to 246 million acres of land. Overall, approximately 20% of U.S. land was given away to nearly 2 million households,"[330] but these offerings were primarily to white settlers.[331] Professor Gabriel J. Chin provides a detailed and disturbing account of restrictions in state and federal law that barred nonwhites, particularly people of Chinese descent and other East Asians, from acquiring public land and, in some cases, from even owning land acquired in other ways.[332] Idaho law, for example, stated that "all noncitizens were allowed to 'take, hold and dispose of mining claims and mining property . . . *Provided*, That Chinese, or persons of Mongolian descent not born in the United States, are not permitted to acquire title to land or any real property.'"[333] At the federal level, the Homestead Act of 1862 deliberately and carefully excluded the Chinese while allowing other races and other noncitizens to acquire land.[334] The Homestead Act also barred Native Americans, freed slaves, and descendants of slaves from acquiring land.[335] The state and federal racial restrictions on land acquisition and ownership prevented many racial groups from participating in the great giveaway of federal lands that drove much of the West's economic prosperity.

Other laws and circumstances also excluded particular racial or ethnic groups—such as Native Americans, former Mexican citizens, and Black people—from acquiring land.[336] Beginning in the 1840s, Native Americans faced active and ongoing genocide in California,[337] including state-funded cash bounties for dead

328. What "white" meant to people at the time is less inclusive than the current understanding, with many European groups and immigrants excluded from the earlier meaning. *See* Matthew J. Lindsay, *The Right to Migrate*, 27 LEWIS & CLARK L. REV. 95, 109–10, 116 (2023).

329. *See, e.g.*, Ellickson, *supra* note 164, at 1317; Karl S. Landstrom, *Reclamation under the Desert-Land Act*, 36 J. FARM ECON. 500, 500–01 (1954).

330. Megan Horst & Amy Marion, *Racial, Ethnic and Gender Inequities in Farmland Ownership and Farming in the U.S.*, AGRIC. & HUM. VALUES, Oct. 2018, at 1, 3 (citation omitted).

331. *See* Gabriel J. Chin, *A Nation of White Immigrants: State and Federal Racial Preferences for White Noncitizens*, 100 B.U. L. REV. 1271, 1296 (2020).

332. *See id.* at 1291–99.

333. *Id.* at 1294 (quoting IDAHO CODE § 1-2610 (1908)).

334. *Id.* at 1279, 1297.

335. Horst & Marion, *supra* note 330.

336. *See id.* at 3–4.

337. *See, e.g.*, State Water Res. Control Bd., Res. No. 2021-0050, ¶ 7 (Cal. 2021), https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2021/rs2021-0050.pdf [https://perma.cc/8W28-M2EB]. *See generally* Benjamin Madley, *Understanding Genocide in California Under United States Rule, 1846–1873*, 47 W. HIST. Q. 449 (2016) (examining history of Native American genocide in California).

Native Americans.[338] This was on top of massive dispossession of Native American lands by the state and federal governments,[339] and the treatment of Native American uses of water as inchoate and undeserving of protection in the water right system.[340] Many of the existing water rights in former Mexican citizens' property rights were extinguished in the western lands that joined the Union in 1848 under the Treaty of Guadalupe Hidalgo.[341] Slavery was not abolished until 1865, well after the land rush had begun in many parts of the West, and newly freed "slaves did not have the land or resources to become independent farmers."[342] After abolition, beginning in the 1890s, "sundown town" laws prevented Black people from inhabiting, let alone owning, lands in most incorporated areas.[343] The systemic exclusion of minorities did not end at the start of the twentieth century. Black land ownership fell 90% from 1910 to 1997, a loss presently valued at roughly $326 billion, due in large part to racist USDA lending practices and forced sales of co-owned land.[344] Federal water projects both excluded Native American water needs and targeted dormant Native American water rights.[345] This overview only scratches the surface of the systemic racism that virtually barred many minority groups from acquiring land that could support water rights,[346] and it ignores the "subsidies and giveaways of the public's water to create the current water wealth inequality we have today."[347] As the California Water Board has noted, "the Water Boards' programs were established over a

338. *See, e.g.*, Chris Clarke, *Untold History: The Survival of California's Indians*, KCET (Sept. 26, 2016), https://www.kcet.org/shows/tending-the-wild/untold-history-the-survival-of-californias-indians [https://perma.cc/3AR3-MY9S].

339. *See generally* DANIEL MCCOOL, COMMAND OF THE WATERS: IRON TRIANGLES, FEDERAL WATER DEVELOPMENT, AND INDIAN WATER (1987) (exploring the impact of federal water programs on Native Americans' access to water).

340. *See* Curley, *supra* note 168, at 710 ("In the western states, water was turned into a commodity in ways that are similar to how land was made accessible to settler-colonists and denied to Native peoples."). *See generally* Deborah Curran, *Indigenous Processes of Consent: Repoliticizing Water Governance Through Legal Pluralism*, WATER, Mar. 2019 (discussing how Indigenous communities are attempting to shift jurisdiction towards their traditional processes "that institutionalize responsibilities for and relationships with water" given the failure of federal environmental governance).

341. *See* John Schelhas, *Race, Ethnicity, and Natural Resources in the United States: A Review*, 42 NAT. RES. J. 723, 731–32 (2002).

342. Horst & Marion, *supra* note 330, at 3.

343. JAMES W. LOEWEN, SUNDOWN TOWNS: A HIDDEN DIMENSION OF AMERICAN RACISM 4 (2005).

344. Dania V. Francis, Darrick Hamilton, Thomas W. Mitchell, Nathan A. Rosenberg & Bryce Wilson Stucki, *Black Land Loss: 1920–1977*, 112 AM. ECON. REV. (PAPERS & PROC.) 38, 38–39 (2022).

345. Kaylee Ann Newell, *Federal Water Projects, Native Americans and Environmental Justice: The Bureau of Reclamation's History of Discrimination*, 20 ENVIRONS: ENV'T L. & POL'Y J. 40, 44–45 (1997).

346. *See* Application by Winnemem Wintu Tribe et al. for Leave to File Amicus Curiae Brief and [Proposed] Brief in Support of State Water Resources Control Board at 16, *In re* Cal. Water Curtailment Cases, Nos. H047270 & H047927 (Cal. Ct. App. Mar. 10, 2022), 2022 WL 983241, at *16 ("Among the communities excluded from water rights claims are the original Indigenous inhabitants of the state, whose inherent water rights have been largely erased since white settlers arrived on their ancestral lands. Also excluded are many people of color, who were effectively barred from water rights through the first half of the twentieth century by the state's discriminatory property laws, as well as discrimination in civil rights, employment, education, and housing, which segregated and impoverished them.").

347. SIVAS ET AL., *supra* note 243, at 14.

structural framework that perpetuated inequities based on race. These inequities persist . . . ."[348] In sum, water rights were simply harder to obtain for nonwhites, and this inequity forms an unjust basis for modern water allocation.[349] Water markets built on these allocations will perpetuate these inequities and frustrate other attempts to reallocate water rights.

Owning land and capital were not just vital for obtaining and exploiting water rights; they were also crucial to being able to influence the form water law took in the West. As legal historian Catherine Miller painstakingly demonstrates, one of the largest business corporations of the late-nineteenth-century, West, Miller & Lux, shaped water law in California, Oregon, and Nevada to ensure their cattle empire had access to water.[350] Co-owner Henry Miller bought up land with direct access to water and then used the courts to ensure that California adopted the riparian doctrine to prevent competitors from appropriating and diverting water from his lands.[351] When the courts became less reliable, Miller & Lux lobbied the California legislature, and later the Water Commission, for changes to water law that would benefit his holdings.[352] As Miller & Lux's wealth decreased, so did its influence, but the contours of California water law still reflect its formative role.[353]

Initial rights have been stubbornly persistent, and the effects of accumulation of water rights and associated wealth for white settlers to the exclusion of minority groups have lasting impacts[354] that can be seen in water markets today. This is particularly true when many minority groups continue to have less power and money than their white counterparts. Market participation requires water rights or money, and starting without either places disadvantaged groups in an impossible situation with unsurprising results: "uneven power relations in water governance and politics play a critical role in shaping water insecurity and well-being."[355] Market "[a]llocation based solely on efficiency also fails to address distributive justice concerns. Those who are initially able to obtain the largest water rights reap the benefits of future trades to more beneficial uses."[356] A 2021 California Water Board resolution condemning racism states that the water insecurity of

348. State Water Res. Control Bd., *supra* note 337.

349. *See* Kate A. Berry & Sue Jackson, *The Making of White Water Citizens in Australia and the Western United States: Racialization as a Transnational Project of Irrigation Governance*, 108 ANNALS AM. ASS'N GEOGRAPHERS 1354, 1354 (2018).

350. *See generally* M. CATHERINE MILLER, FLOODING THE COURTROOMS: LAW AND WATER IN THE FAR WEST (1993) (exploring history of western water conflicts by examining the history of Miller & Lux).

351. Miller, *supra* note 29, at 3–6.

352. *Id.* at 10–15.

353. *See generally* MILLER, *supra* note 350.

354. Although federally recognized tribes have reserved water rights under the 1908 Winters Doctrine, that has not translated into tribes having access to water or to their participation in water markets. *See* Newell, *supra* note 345, at 43–45.

355. Nicole J. Wilson, Teresa Montoya, Rachel Arseneault & Andrew Curley, *Governing Water Insecurity: Navigating Indigenous Water Rights and Regulatory Politics in Settler Colonial States*, 46 WATER INT'L 783, 784 (2021).

356. Johnson, *supra* note 90, at 229–30 (footnote omitted).

Native Americans cannot be separated from the history of displacement and genocide, such that "California Native American Tribes continue to face barriers to defining, quantifying, accessing, protecting, and controlling their ancestral lands, water rights, instream flows, cultural resources, and beneficial uses."[357] Water insecurity continues to plague the Indigenous communities of the West.[358]

Many large metropolitan areas, particularly in southern California, purchase water and supply water to poor communities. Service in these communities is a success story, but focusing on these successes masks the direct links between poverty and lack of access to water. Many communities, particularly tribal communities, "California's Central Valley, . . . the Texas *colonias*, [and] rural areas in the South," suffer extensive Safe Drinking Water Act violations.[359] Tribal areas also suffer from a lack of infrastructure for water deliveries, both at a large scale and in users' homes.[360] Frequently, "race is the strongest indicator of water and sanitation access, and . . . poverty [is] the key obstacle to water access."[361] Water access is complex, requiring both a source of clean water and infrastructure, so drawing a causal line between historical exclusion from water rights and current water insecurity is difficult. Nevertheless, it is possible in some cases.

> For example, the allocation of water rights and development of water resources in the [San Joaquin] Valley have played a direct role in determining drinking water quality. Government financing of large-scale water projects historically enabled the storage and conveyance of vast quantities of snowmelt from the Sierra Nevada Mountains and the California Delta to farmlands. Farmers received nearly unlimited surface water rights for agriculture, but 95% of the Valley's residents were left to rely on groundwater for drinking.[362]

Further, in many cases, Native American tribes have been able to trade water rights for infrastructure development, particularly in the American Southwest.[363] But this exchange only works if tribes have significant water rights in the first place, and it requires them to give up significant water rights in exchange for

357. State Water Res. Control Bd., *supra* note 337, ¶ 7(c). Also note that the state-issued water rights are a form of wealth, and allowing the sale of these rights will enrich the right holders. A case study of water markets in Hawaii shows that, under these conditions, "large economic rents would be recouped by a few private landowners, with little commensurate offsetting increases in wealth or efficiency." Richard L. Bowen, James E. T. Moncur & Richard L. Pollock, *Rent Seeking, Wealth Transfers and Water Rights: The Hawaii Case*, 31 NAT. RES. J. 429, 429 (1991). To mitigate this, the authors conclude that "[g]ood policy and institutional design require that this choice be made explicitly with both efficiency and equity (distributional) goals and constraints in mind." *Id.* at 438. *But see, e.g.*, Glennon, *supra* note 203, at 1901 ("Given a choice between making a few farmers rich off [water] contracts or continuing the practice of using huge amounts of water to grow cotton, I think the choice is easy.").

358. *See* Wilson et al., *supra* note 355.

359. U.S. WATER ALL. & DIG DEEP, *supra* note 150, at 28. *See generally id.* (discussing problems of water access for vulnerable communities and reviewing possible and attempted solutions).

360. *See id.* at 24–25.

361. Martin, *supra* note 150.

362. Carolina L. Balazs & Isha Ray, *The Drinking Water Disparities Framework: On the Origins and Persistence of Inequities in Exposure*, 104 AM. J. PUB. HEALTH 603, 606 (2014) (footnote omitted).

363. *See* Curley, *supra* note 168, at 705–07.

access, which is deeply problematic. For tribes without reservations or who have otherwise lost their water rights,[364] this inducement simply is not available. It is clear that many communities face problems that relate to inchoate water rights or a lack of water rights entirely; far more face the impossible challenge of competing in water markets without adequate resources due to poverty and low land values resulting from a history of oppression. Water markets do not address and can even perpetuate the distributional inequities resulting from historic injustices in water allocation.

Of course, it is not just drinking water supply at issue; this dynamic is at play in the TransAlta example. In 1966, a little more than one hundred years after the Treaty of Olympia created the Quinault Indian Reservation on Washington's Pacific Coast,[365] while the State of Washington gave away water on the Skookumchuck to new coal power plants, the Quinault Tribe sued the state to enforce its territorial sovereignty within its reservation.[366] The Quinault Reservation is rare among reservations in the United States in that it contains ancestral lands of the Quinault.[367] The culture, health, and beliefs of the Quinault Indian Nation are deeply intertwined with the health of salmon populations, and so the continued survival of the Quinault as a cohesive people is dependent on sufficient instream flows to maintain the salmon.[368] The Quinault have maintained a physical and cultural connection with the rivers beyond the Quinault Indian Reservation.[369]

In the 1970s, the Quinault Nation challenged the state of Washington's regulation of fishing rights, arguing that the state's practices broke multiple treaties. The resulting case, *United States v. Washington*,[370] made the Quinault, along with other Tribes, co-managers of the fish population in Washington State.[371] In

364. *See, e.g.*, Jeanine Pfeiffer, *Honoring a Water Warrior: How Harry Williams Fought for Paiute Water Rights in Owens Valley*, KCET (July 8, 2021), https://www.kcet.org/news-community/honoring-a-water-warrior-how-harry-williams-fought-for-paiute-water-rights-in-owens-valley [https://perma.cc/F42G-JURU].

365. Treaty Between the United States and the Qui-nai-elt and Quil-leh-ute Indians (*Treaty of Olympia*), *signed* July 1, 1855 & Jan. 25, 1856, 12 Stat. 971 (ratified Mar. 8, 1859).

366. Quinault Tribe of Indians v. Gallagher, 368 F.2d 648, 651 (9th Cir. 1966) (considering whether the Quinault or the State had the power to prosecute an enrolled member of a different federally recognized tribe living in the Quinault Reservation).

367. *People of the Quinault*, QUINAULT INDIAN NATION, https://www.quinaultindiannation.com/index.htm [https://perma.cc/KK2G-FALX] (last visited May 17, 2023).

368. *See* Sophia Amberson, Kelly Biedenweg, Justine James & Patrick Christie, *"The Heartbeat of Our People": Identifying and Measuring How Salmon Influences Quinault Tribal Well-Being*, 29 SOC'Y & NAT. RES. 1389, 1391, 1402 (2016).

369. *See* Rosane, *supra* note 20; Meeting Summary, Chehalis Basin P'ship (Nov. 17, 2020), https://chehalisbasinpartnership.org/wp-content/uploads/2021/02/CBP_2020_11_17_Minutes.pdf [https://perma.cc/RD4T-CWCY] (including a discussion from Lauren McFarland, representative of the Quinault, discussing the importance of adequate protections for instream flows); Amberson et al., *supra* note 368, at 1390–91.

370. 384 F. Supp. 312 (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (9th Cir. 1975).

371. *Id.* at 333; Amberson et al., *supra* note 368, at 1391. For an example of cooperative fisheries management, see generally NW. FISHERIES SCI. CTR., FISH MATTERS (1999), https://www.webapps.nwfsc.noaa.gov/assets/32/5520_06162004_101516_nov1999.pdf [https://perma.cc/P9NY-ERF3].

2020, when TransAlta put up its permitted rights for sale, the Quinault Nation did not purchase the rights. However, the Quinault did seek and obtain funds to study whether purchasing would be feasible, at what price, for what amounts, and with what consequences for aquatic ecosystems.[372] The Quinault Nation is working through the Chehalis Basin Partnership to secure instream flows for Western rivers in Washington.[373] As the fish habitat section lead at the Quinault Nation put it, "We'd love to purchase as much as TransAlta will give us."[374] But this puts the Quinault Nation at a disadvantage, having to secure water rather than simply holding on to existing rights. This puts the costs of salmon protection on the tribe, an expensive proposition, and is likely to result in less protection than if the Quinault held sufficient historic water rights to protect their salmon. Without action and financing from the state, the Quinault could not participate in bidding for TransAlta's water rights. The lasting effects of the dead hand of history are not undone by the invisible hand of the market.[375]

2. Markets Frustrate Meaningful Participation in Water Governance

As discussed above, in markets, the initial distribution of rights is sticky and can influence who gets to participate in the atomistic bargaining that determines access and withdrawal of water—in other words, historic rights influence who benefits from markets. Relatedly, as markets take hold as a (or the) main mechanism for deciding disputes among competing values for water resources, markets can crowd out other forms of governance. There are two steps in this process. First, who can and should participate in decisions becomes weighted in favor of market participants. This empowers a constrained set of sellers and buyers to make decisions about water rather than the whole population of a community, river basin, or state. Moreover, as noted, the pool of market participants is often not representative of the broader community.[376] Second, when in place, markets can subsume glaring inequities that may have otherwise prompted deliberation and collective action, discouraging nonmarket participants from engaging in collective decisionmaking.

The equity concern raised by this shift in who participates is different from the distributional equity concern raised above.[377] There, the question was who *benefits*. Here, the question is who *participates* in governance. Systems that determine who can and should participate in decisions about access and withdrawal of resources are known as "second level" decision systems.[378] They have a "critical

372. *See* STATE OF WASH., *supra* note 20; Rosane, *supra* note 20.

373. *See* Meeting Summary, *supra* note 369.

374. Rosane, *supra* note 20.

375. This distributional challenge is an especially significant problem for free-market evangelists; pragmatists are more likely to recognize these problems and seek to address them through market and nonmarket interventions.

376. *See supra* notes 328–64 and accompanying text.

377. *See supra* Section II.B.1.

378. S. V. Ciriacy-Wantrup & Richard C. Bishop, *"Common Property" as a Concept in Natural Resources Policy*, 15 NAT. RES. J. 713, 716 (1975); *see also* Schlager & Ostrom, *supra* note 49, at 251 (distinguishing between exercising a right and deciding who gets to exercise it).

influence on the possibility of generating equitable and efficient solutions to conflicts, or increasing confusion, rigidity, inefficiency and inequity."[379] Helen Ingram, in her political science studies of water access, stresses the importance of equitable processes and procedures that determine participation in second-level decisionmaking to creating equitable and acceptable rules for water resources.[380] More broadly, "where there are substantial power differences in the private sector, power differences that call for democratic engagement, then democratically driven state control of that power is appropriate."[381] This contrasts with the view of some market advocates, who "advocate marketplace exchanges, measured by willingness to pay money, as the best barometer of the social will."[382] Simply allowing these power differences to play out through the market perpetuates existing power differentials and subverts the public good. Certainly, political solutions are also susceptible to power differentials tied to money and other mechanisms of influence, but politics also offers more opportunities to overcome these barriers than does a market, which by definition requires either something to sell or the means to buy.

Water markets can seem to "work" while hiding important matters of fairness, which may ultimately undermine the existence of the market.[383] The ability of markets to mask conflicts over competing values with a veneer of efficiency can delay and prevent public input and debate. One might reasonably see this dynamic in the history and failure of the Environmental Water Account program. The joint federal and state Environmental Water Account program and the United States Bureau of Reclamation's Water Acquisition Program in the 1990s and early 2000s both created mechanisms for government entities to purchase water from private contractors to make sure there was water for instream environmental

379. Ruth S. Meinzen-Dick & Bryan Randolph Bruns, *Negotiating Water Rights: Introduction*, *in* NEGOTIATING WATER RIGHTS 23, 33 (Bryan Randolph Bruns & Ruth S. Meinzen-Dick eds., 2000).

380. Helen Ingram, *Water as a Multi-Dimensional Value: Implications for Participation and Transparency*, 6 INT'L ENV'T AGREEMENTS: POL., L. & ECON. 429, 431–32 (2006). S*ee generally* F. LEE BROWN & HELEN M. INGRAM, WATER AND POVERTY IN THE SOUTHWEST (1987) (arguing for community influence on allocation of water rights); Susan Christopher Nunn & Helen M. Ingram, *Information, the Decision Forum and Third-Party Effects in Water Transfers*, 24 WATER RES. RSCH. 473 (1988) (assessing methods of water rights allocation and determining community involvement decreases bias); Ingram et al., *supra* note 57; Tom Perrault, *What Kind of Governance for What Kind of Equity? Towards a Theorization of Justice in Water Governance*, 39 WATER INT'L 233 (2014) (discussing the importance of procedure to determining equitable outcomes).

381. Joshua Ulan Galperin, *Environmental Governance at the Edge of Democracy*, 39 VA. ENV'T L.J. 70, 88 (2021).

382. Blumm, *supra* note 54.

383. *See* KARL POLANYI, THE GREAT TRANSFORMATION: THE POLITICAL AND ECONOMIC ORIGINS OF OUR TIME 263–64 (2d Beacon paperback ed. 2001). Polyani was concerned with broader issues of fairness ("peace and freedom") than we are here. *See id.* He notes that these are not embodied in the purposes of markets ("profits and welfare") and that society will act to protect itself from the carelessness of the market, though those self-protective actions can lead to violence and unfreedom. *See id.*

uses.[384] Both of these market mechanisms used public infrastructure to physically reallocate water. The Environmental Water Account was created to help preserve endangered species, which depend on water in the Sacramento-San Joaquin Delta, while reducing conflicts with other water users.[385] To accomplish this, the Water Account used up to $50 million per year from bond proceeds[386] to purchase water from willing private water contractors, who had paid for water from the Central Valley Project and State Water Project.[387] That program provided 380,000 acre-feet of water annually for instream uses[388] and was somewhat successful in preserving water for species protection.[389] But the market mechanism also exacerbated social concerns—unfair enrichment of the already quite rich. It was functionally terminated by the legislature after an investigation found that the program was being gamed by a single individual and the Kern County Water Agency.[390] While it existed, the California legislature did not act to add protections for species. The market's existence seems to have pacified lawmakers.

From a classical economics perspective, it is not obvious whether the Environmental Water Account was being "gamed," or if it so happened that one individual had the bulk of the initial distribution of water rights and so had more to sell. Regardless, the history of the Account suggests that it crowded out other potential solutions such as water quality regulations or state assertion of the public trust doctrine, both of which have ultimately been used to restore additional flows to the ailing Delta ecosystems, perhaps much later than they would otherwise have been deployed.[391] And, importantly, it closed out opportunities for participation and deliberation, so much so that for years there were no eyes on the equity issue of a single entity or person garnering most of the profit from the market.

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384. *See* HANAK & STRYJEWSKI, *supra* note 163, at 16, 21, 32–33; Deirdre Des Jardins, *The Disappearance of the CALFED Environmental Water Budget*, CAL. WATER RSCH. (Feb. 11, 2020), https://cah2oresearch.com/2020/02/11/the-disappearance-of-the-calfed-environmental-water-budget/ [https://perma.cc/354X-VWZD]; Larry R. Brown, Wim Kimmerer & Randall Brown, *Managing Water to Protect Fish: A Review of California's Environmental Water Account, 2001–2005*, 43 ENV'T MGMT. 357, 357–58 (2009).

385. Brown et al., *supra* note 384, at 358.

386. Michael Kiparsky, Kathleen Miller, Phoebe Goulden, Anita Milman & Dave Owen, *Groundwater Recharge for a Regional Water Bank: Kern Water Bank, Kern County, California*, 5 CASE STUD. ENV'T 1, 9 (2021); Jardins, *supra* note 384.

387. Kiparsky et al., *supra* note 386.

388. Jardins, *supra* note 384.

389. *See* Brown et al., *supra* note 384, at 357 (noting "EWA was successful in reducing uncertainty in water supply; however, its contribution to the recovery of listed fishes was unclear").

390. *See* Mike Taugher, *Gaming the Water System*, E. BAY TIMES (Aug. 15, 2016, 5:16 PM), https://www.eastbaytimes.com/2009/05/24/gaming-the-water-system/ ("Roughly one-fifth of all the money spent to buy water for the program went to companies owned or controlled by [Stewart] Resnick, one of the state's largest farmers.").

391. *See generally* STATE WATER RES. CONTROL BD., WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY (2018), https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf [https://perma.cc/N7D9-DAB5].

### C. MARKETS HINDER WATER GOVERNANCE

In Part II thus far, we have explained (1) why water markets are not amoral machines but rather reflect the value judgment inherent in the institutions that create them and (2) the ways that using water markets without the hard work of modernizing water governance can perpetuate inequity. In this final Section, we explain how water markets can harden private water control and water use in ways that lock in the negative impacts we have discussed by driving statutory, judicial, and other changes to water law.

The property right to water is particularly susceptible to shifting definitions because it has always been deeply contested.[392] The history of water use is marked by "astonishingly universal regard for communal values,"[393] even in the western water context,[394] but western water law also has a strong bent toward treatment of water as an enclosable commodity.[395] Property law in water functions like fences in the enclosure movement, transforming our relationship with water resources. This is not without complications.[396] Increasing commodification of the public commons has changed the nature of individual claims to the common resource by strengthening private rights at the expense of public rights.[397]

This, then, is the context for the discussion about markets and property rights in water. It builds on three hundred years of enclosure but reflects a deep tension within water rights between water as a commons, vital to life, and water as a commodity. Water as a commodity versus water as a commons has real import; the way we think about property rights in water matters for the way water is used,

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392. The contours and strength of water rights are contested both in the courtroom, *see, e.g.*, Ryan, *supra* note 237 (manuscript at 73) (noting that "different jurists have come to spectacularly contradictory conclusions about how to analyze takings issues associated with water rights"), and in social norms and understanding, *see, e.g.*, Brian E. Gray, *The Property Right in Water*, 9 HASTINGS W.-NW. J. ENV'T L. & POL'Y 1, 1–2 (2002) (noting that water users "believe that their rights are vested and inviolable," while environmentalists "deny that these users have any property or contract rights to divert water under circumstances that harm environmental interests"). For a deep historical discussion of drinking water in this context, see James Salzman, *Thirst: A Short History of Drinking Water*, 18 YALE J.L. & HUMANS. 94, 117 (2006) ("Rights-based and market-based access to water are depicted as antithetical, . . . [but] this popular discourse is both simplistic and distinctly ahistorical." (emphasis omitted)).

393. Sandra B. Zellmer & Jessica Harder, *Unbundling Property in Water*, 59 ALA. L. REV. 679, 693 (2008) (quoting Erin Ryan, Comment, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resource Management*, 31 ENV'T L. 477, 478 (2001)); *see id.* (citing Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 ENV'T L. 425, 429–31 (1989)) (noting that "[a] review of Asian, African, Islamic, Latin American, and Native American laws reveals that the doctrine has been embraced by many societies with divergent legal traditions").

394. *See supra* Section I.A.1.

395. *See supra* Section I.B.

396. *See generally* POLANYI, *supra* note 383 (arguing that land is a fictitious commodity).

397. *See, e.g.*, Katrina Miriam Wyman, *From Fur to Fish: Reconsidering the Evolution of Private Property*, 80 N.Y.U. L. REV. 117, 163–64 (2005); Seth Macinko & Daniel W. Bromley, *Property and Fisheries for the Twenty-First Century: Seeking Coherence from Legal and Economic Doctrine*, 28 VT. L. REV. 623, 623–24 (2004).

allocated, governed, and protected.[398] In the push and pull of commodification against protection of public values, water markets have furthered commodification: "Markets are better served by strengthening individual rights and reducing uncertainties about the scope of those rights . . . ."[399] As we show here, when faced with the challenge of reducing uncertainties, most market advocates push to reduce uncertainty by reducing public limits on water rights rather than by enforcing these limits and allowing markets for what remains. This approach ignores the social, communitarian, cultural, political, physical, place-based, and natural characteristics of water as an essential resource.[400] Though water markets offer distinct benefits, "[a]ny effort to promote water marketing must take into account, and assume responsibility for, the damaging messages that inevitably come along with it: water as commodity; nature as resource; community as voluntary and dispensable; humans as lords."[401] As Bromley puts it, "This is not merely a clash of worldviews. It is a clash of contending truth claims about how to figure out what is to be done in the public sphere—it is confrontation between prescriptive consequentialism and reasoned public debate over how to get to the future."[402]

In the next two subsections, we show (both theoretically and in practice) how markets decrease other elements of water governance—public oversight, enforcement of existing law, protection of nonmarket interests, hardening of rights, etc.—and can make scarcity worse.[403] We conclude this Section by showing that reliance on water markets makes these changes enduring, frustrating future attempts at more robust water governance.[404]

The enduring nature of these changes is particularly important. As noted, water governance has a history of shortcomings, and control of water is often dominated by powerful monied interests.[405] Improved nonmarket governance is not a given; it will inevitably be difficult, and water will often be allocated to politically

398. *See* Johnson, *supra* note 90, at 209 ("Fundamental choices in how society defines property rights influence the resource's efficient allocation and reallocation, the efficiency of the bundles in which rights to the resource are packaged, and whether primary decisionmakers regarding use of the resource are individuals, communities, or larger governmental entities.").

399. Holly Doremus, *Climate Change and the Evolution of Property Rights*, 1 U.C. IRVINE L. REV. 1091, 1117 (2011); *see also* Adam M. Kron, David H. Pope & Gilbert B. Rogers, *Water Issues in the Deep South*, ABA WATER RES. COMM. 15, 16 (2008) ("The water market proposals necessarily would involve removing some state control and management of the water resources and giving it over to market forces and quasi-private ownership.").

400. *See* Salzman, *supra* note 392, at 95–96; Arnold, *supra* note 262, at 828–31.

401. Freyfogle, *supra* note 261, at 38.

402. Daniel W. Bromley, *Environmental Regulations and the Problem of Sustainability: Moving Beyond "Market Failure,"* 63 ECOLOGICAL ECON. 676, 677 (2007). Bromley sees the logic of water markets as dangerously tautological—market reasoning is used both to diagnose (markets are efficient) and prescribe (markets will solve water conflicts). *See id.*

403. *See infra* Section II.C.1.

404. *See infra* Section II.C.2; SIVAS ET AL., *supra* note 243, at 5 ("[W]ater markets – the state's current idealized solution to our water woes – will further entrench our dysfunctional water uses . . . .").

405. *Cf.* SCHORR, *supra* note 93 (discussing the formation of prior appropriation as a response to monopolies).

powerful users. But embracing markets is not a panacea, and, unlike short-term government failures, it makes future efforts at achieving better governance more difficult. Governance is an iterative process, an ongoing societal conversation, with opportunities for future improvement. Good water governance also requires practice and iteration of collective-choice arrangements and visibility of interests.[406] Markets can shut down those conversations and obscure interests, halting the evolution and adaptation of water governance to new physical conditions (climate change) and values (social equity).

1. Markets Decrease Governance of Water Rights and Can Exacerbate Scarcity

The link between property rights and markets is key to understanding how reliance on markets erodes other forms of water governance. Much of the literature advancing water markets focuses on the ways water rights should change to maximize market efficiency; the traditional law and economics approach, following Coase and Demsetz, prescribes "property rules [that] define rights such that transfers to the highest valued use are made easier (cheaper)."[407] That means protecting possession of private water rights and limiting restraints on transfers.[408] Protections for third parties and for the public's interests are seen as impeding water markets by casting doubt on the security of the water right, increasing transaction costs, and making market transfers more difficult and thus less appealing.[409] As market advocates say again and again, "[t]he most significant fundamental requirement for a successful and efficient water market is that water-use rights also be secure property rights."[410] The drive for markets "provides political and economic pressure for the modification of existing or the introduction of new laws and regulations to support market exchange."[411] Other commentators have noted that, in practice, states with stronger property protections for water rights

406. *Compare* OSTROM, *supra* note 61 (outlining principles of common pool resources governance, including the importance of learning and legitimacy), *with* Wilder & Ingram, *supra* note 61 (discussing what constitutes equitable water governance, including the importance of learning and transparency).

407. Baker, *supra* note 241, at 5.

408. *See* Garrick & Svensson, *supra* note 57, at 383 ("Free-market environmentalism is based on the premise of private, exclusive, and secure property rights to align private resource use with the public interest . . . [which are] defined, defensible, and divestible."). *See generally* Brewer et al., *supra* note 219 (discussing relationship between water rights and new institutional economics).

409. *See* George A. Gould, *Water Rights Transfers and Third-Party Effects*, 23 U. WYO. LAND & WATER L. REV. 1, 5 (1988) ("Third-party effects . . . represent a significant impediment to the development of water markets."); TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM 118 (1991) (arguing that the public trust doctrine is a barrier to efforts to "reap the advantages of the market").

410. Paul W. Puckett, *Trading Water: Using Tradable Permits to Promote Conservation and Efficient Allocation of an Increasingly Scarce Resource*, 59 EMORY L.J. 1001, 1012 (2010); *see id.* at 1012 n.80 (collecting sources); Zellmer & Harder, *supra* note 393, at 680 (noting the argument that "[a]bsent legally recognized property rights, water markets are unlikely to thrive"); Glennon, *supra* note 203, at 1888 ("If water markets are to flourish, there must be a system of quantified water rights that are transferable."); Hollinshead, *supra* note 233, at 354–56 (arguing that water markets should "guarantee delivery" of water).

411. Brewer et al., *supra* note 219, at 212.

have a more significant water market.[412] As a result, markets often lead to hardening of water rights through statutory, judicial, and other changes to water law.

Uncertainty comes in many forms for water rights, and we consider two broad categories here. First, many rights do not comply with existing law (for example, the first and second tranches of water rights), and these rights face significant uncertainty because the state could choose to enforce that existing law. Second, even for rights that are well regulated, the amount of the right can change based on new information, changed physical circumstances, and changes in state priorities. In this case, as some pro-market commentators have noted, the push for more defined rights and reduced transfer barriers is fundamentally in tension with the contingent and uncertain nature of water rights.[413] We discuss the second category first.

To illustrate the second category, well-regulated rights that are inherently uncertain, consider the beneficial use requirement, with its reasonable use component.[414] Water rights are limited to beneficial use, and, as the Ninth Circuit has noted, "[i]t is settled that beneficial use expresses a dynamic concept, which is a 'variable according to conditions,' and therefore over time."[415] The category of beneficial use may grow over time—many instream uses like fish and wildlife or recreation were deemed beneficial uses until the mid-twentieth century.[416] But the category can also shrink—a use that was beneficial one hundred years ago, or ten years ago, or even five years ago may not be reasonable now; "[w]hat constitutes reasonable water use is dependent upon not only the entire circumstances presented but varies as the current situation changes."[417] During recent droughts, for example, California's water-permitting agency determined that, in some seasons, some diversions in sensitive streams were unreasonable due to the ongoing drought, a decision upheld by a California appellate court.[418] In 1957, the New Mexico Supreme Court held that wasteful uses, once acceptable because of limited demand for water, could not establish a water right.[419] Making water rights

412. *See* Zellmer & Harder, *supra* note 393, at 733–34 (suggesting that Colorado's vested water rights produce "a relatively active water market").

413. *See* Gray, *supra* note 218, at 24 ("Although the reasonable and beneficial use doctrines, forfeiture laws, the public trust, and the panoply of statutes that protect water quality, instream uses, and endangered species render water rights (and contract rights to water) less certain than other forms of property rights, the law must recognize that parties to water transfers require enhanced protection of water rights before, during, and at the conclusion of water transfers.").

414. *See supra* note 102.

415. United States v. Alpine Land & Reservoir Co., 697 F.2d 851, 855 (9th Cir. 1983) (quoting Farmers Highline Canal & Reservoir Co. v. City of Golden, 272 P.2d 629, 634 (Colo. 1954)); *see also* Idaho Dep't of Parks v. Idaho Dep't of Water Admin., 530 P.2d 924, 931–32 (Idaho 1974) (Bakes, J., concurring) ("[T]here is always a possibility that . . . uses beneficial in one era will not be in another and vice versa." (emphasis omitted)).

416. Börk et al., *supra* note 73, at 848–50 (collecting sources for California law).

417. Env't Def. Fund, Inc. v. E. Bay Mun. Util. Dist., 605 P.2d 1, 6 (Cal. 1980).

418. Stanford Vina Ranch Irrigation Co. v. State, 264 Cal. Rptr. 3d 509, 514–15 (Ct. App. 2020), *reh'g denied* (July 6, 2020), *as modified* (July 8, 2020).

419. *See* State *ex rel.* Erickson v. McLean, 308 P.2d 983, 987 (N.M. 1957) ("Wasteful methods, so common among the early settlers do not establish a vested right to their continuance. Such methods were

more amenable to marketing by reducing the state's ability to fine-tune acceptable use of water would be a mistake. "[W]ater rights are–and always have been–fragile."[420] The malleable nature of water rights is in direct tension with the idea of water as a commodity, as advocated by some market proponents.

Markets can and do function despite such inherent property right uncertainties, but the general push by market advocates to decrease this inherent flexibility in water rights threatens to decrease the state's ability to govern water. These tensions have led some commentators to conclude that "[m]arkets as a system are inherently antithetical to the state's mandatory fiduciary responsibility,"[421] or that markets inherently reduce the state's role in enforcing "the waste and reasonable use doctrine, the public trust doctrine, and various environmental protection laws."[422] If markets are to perform the functions that their advocates suggest, the markets should have to contend with the inherently unsettled nature of even well-regulated water rights rather than change the law to eliminate the uncertainties.

The other category of uncertainty in water rights stems from the unregulated nature of most first- and second-tranche water rights. Because these rights have never been evaluated under public trust, environmental law, or most other public-interest tests, these rights remain subject to a great deal of regulatory uncertainty, no matter how well established their holder may think them. Some market advocates argue that the past failure of most states to provide meaningful enforcement of existing waste and unreasonable use laws or other laws protecting the public interest means that markets are a better way to achieve the same result.[423] But this presupposes that the private preferences expressed through markets actually align with the public interest and cannot be inherently wasteful; this is wrong.[424] Markets reflect private preferences of those with the resources to participate in the market, colored by the starting distributions of rights and resources, within a political context that embodies century-old values. Under existing laws, releasing water rights from public oversight and trusting the aggregated results of individual water exchanges to sort it out is an abdication of government responsibility and likely to produce a dystopian water future. Other commentators have noted that property rule changes that require the state to protect instream flows and

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only deemed a privilege, 'permitted merely because it could be exercised without substantial injury to any one.' The use must not only be beneficial to the lands of the appropriator, but it must also be reasonable in relation." (quoting Hough v. Porter, 98 P. 1083, 1102 (Or. 1909))).

420. Gray, *supra* note 392, at 16; *see also* Craig Anthony (Tony) Arnold, *Working Out an Environmental Ethic: Anniversary Lessons from Mono Lake*, 4 WYO. L. REV. 1, 38 (2004) ("Water law is characterized by what I call a principle of legal fluidity: water law changes as needed to adapt to changing social and natural conditions."); Carol M. Rose, *Property as the Keystone Right?*, 71 NOTRE DAME L. REV. 329, 351 (1996) ("If water were our chief symbol for property, we might think of property rights—and perhaps other rights—in a quite different way. We might think of rights literally and figuratively as more fluid and less fenced-in; we might think of property as entailing less of the awesome Blackstonian power of exclusion and more of the qualities of flexibility, reasonableness and moderation, attentiveness to others, and cooperative solutions to common problems.").

421. SIVAS ET AL., *supra* note 243, at 37.

422. *Id.* at 15.

423. *See* Gray, *supra* note 218, at 37.

424. *See supra* Section II.A.1.

other public interests through market transactions "'will be a fairly expensive proposition' and undervalues the public's entitlement to modify private usufructuary rights (without paying compensation)."[425]

Markets need not decrease governance of water rights to achieve greater certainty. Instead, measures like adjudication of water rights or enforcement of reasonable use, public trust, and other requirements could also increase the certainty of first- and second-tranche water rights. In many cases, the rights would be for a reduced volume of water, but the trade-off is worth considering. This would not eliminate all uncertainty, but it might better cabin it.

Moderate supporters of water markets recognize the tensions between marketable rights and strong governance and seek to incorporate strong governance into market design as a precondition for allowing water trading. For example, Garrick and his colleagues focused on the necessary preconditions for water markets in overallocated regions seeking to protect environmental flows, emphasizing the need for tradable rights coupled with "(1) establishment of rights to and limits on freshwater extraction and alteration; (2) recognition of the environment as a legitimate water use; and (3) authority to transfer existing water rights to an environmental purpose."[426] But the key element is that "institutions and sound governance come before the market. A series of key institutional reforms must establish diversion limits, separate land and water rights, and regulate trade. These market-oriented institutional reforms are necessary but insufficient; narrow market-oriented reforms must be embedded in strong governance institutions."[427]

Proceeding with water markets without robust governance makes future governance efforts harder, but that is exactly what has been happening with western water rights. Changes in state water laws since the 1980s provide concrete examples of the ways states have strengthened water rights in support of markets and at the expense of water governance.[428] In these cases, the push has consistently been for markets before governance, in hopes that markets themselves might resolve scarcity issues. Instead, these changes complicate development of the stronger institutions and governance that markets require.

To understand these changes, it is important to reiterate that, under a traditional appropriative rights doctrine, a water holder forfeits water they do not use or

425. Carol Necole Brown, *Drinking from a Deep Well: The Public Trust Doctrine and Western Water Law*, 34 FLA. ST. U. L. REV. 1, 38 (2006) (footnote omitted) (quoting Janet C. Neuman & Cheyenne Chapman, *Wading into the Water Market: The First Five Years of the Oregon Water Trust*, 14 J. ENV'T L. & LITIG. 135, 183 (1999)).

426. D. Garrick, M.A. Siebentritt, B. Aylward, C.J. Bauer & A. Purkey, *Water Markets and Freshwater Ecosystem Services: Policy Reform and Implementation in the Columbia and Murray-Darling Basins*, 69 ECOLOGICAL ECON. 366, 366 (2009).

427. Garrick & Svensson, *supra* note 57, at 381.

428. *See* Joseph L. Sax, *Understanding Transfers: Community Rights and the Privatization of Water*, 14 HASTINGS W.-NW. J. ENV'T L. & POL'Y 33, 36 (2008) (noting that nearly "all recent legislation" "empower[s] individual sellers as against community claims in order to promote transfers"); Brewer et al., *supra* note 219, at 202–07, 210–13 (documenting changes in water governance measures and their impact).

water that is used unreasonably;[429] under the common law approach, if a water right holder did not really *need* part of their water, it went back to the stream for the next most senior right holder or, absent other right holder claims, back to the stream for allocation to new users.[430] This creates an inherent problem for water markets if right holders seek to sell surplus water or conserved water they no longer need due to improved infrastructure or other improvements; if they are able to free up water for sale, there is a strong argument that they may not have needed that water, or at least that they were not using it reasonably. That, in turn, would mean that they did not have a right to that water and thus had no water to sell.[431] For example, if a farmer lines an irrigation ditch with concrete to reduce leakage or covers the ditch to reduce losses to evaporation, thereby generating water rights for sale while still growing just as many crops, there is a plausible argument that the prior use was wasteful and thus unreasonable.

Early laws to advance water markets aimed to paper over this inherent tension in water transfers. In the late-1970s, as California was emerging from what was then the state's worst drought[432] and free-market environmentalism was on the ascendancy, the Rand Corporation and the 1978 Governor's Commission to Review California Water Rights Law both released reports calling for a greater role for water markets and recommending a variety of changes to water rights to enable them.[433] These changes included "protection of conserved water from forfeiture, authorization of transfers of conserved and surplus water, and a declaration that the willingness of a user to transfer water may not be used as evidence of prior waste or unreasonable use."[434] Within a decade, the California legislature embraced this approach, declaring that the public interest requires state agencies to assist in the deployment of a water-market approach and changing a host of laws to encourage marketing.[435] In the years leading up to that declaration, the legislature enabled local or regional public water agencies to sell surplus water[436] and established that, categorically, "[t]he sale, lease, exchange, or transfer of water or water rights, in itself, shall not constitute evidence of waste or

429. *See, e.g.*, CAL. WATER CODE § 1241 ("If the person entitled to the use of water fails to use beneficially all or any part of the water claimed by him or her, for which a right of use has vested, for the purpose for which it was appropriated or adjudicated, for a period of five years, that unused water may revert to the public and shall, if reverted, be regarded as unappropriated public water.").

430. Dave Owen, *Law, Environmental Dynamism, Reliability: The Rise and Fall of CALFED*, 37 ENV'T L. 1145, 1176–80 (2007); *see, e.g.*, CAL. WATER CODE § 1240 ("The appropriation must be for some useful or beneficial purpose, and when the appropriator or his successor in interest ceases to use it for such a purpose the right ceases."). In practice, this rarely happens, in part due to a lack of enforcement and due to legal fictions like the one described here.

431. Brewer et al., *supra* note 219, at 188 n.17 ("The natural question of how can surplus water be transferred, yet also be protected from forfeiture or waste is still debatable.").

432. Ronald B. Robie, *Foreword* to CAL. DEP'T OF WATER RES., THE RES. AGENCY, THE 1976 - 1977 CALIFORNIA DROUGHT: A REVIEW, at iii, iii (1978).

433. Gray, *supra* note 218, at 25–26.

434. *Id.* at 26.

435. *See* 1986 Cal. Stat. 3351, 3352 (codified at CAL. WATER CODE §§ 475, 480).

436. 1982 Cal. Stat. 3220, 3221 (codified as amended at CAL. WATER CODE § 382(a)).

unreasonable use, unreasonable method of use, or unreasonable method of diversion and shall not affect any determination of forfeiture applicable to water."[437]

Even more surprising, California law provides special treatment for the marketing of pre-1914 appropriative rights, that oldest tranche of water rights that has never been reviewed under modern environmental law.[438] Transfer of pre-1914 rights does not require review or approval by any state agency;[439] third-party impacts are addressed by lawsuits after the fact, and none of California's statutory protections for fish, wildlife, other instream uses, or the broader public interest apply.[440] Due to this exemption and an exemption for transfers that do not require "a change in the point of diversion, place of use, or purpose of use as set forth in a permit or license to appropriate water[,] . . . the lion's share of water transfers that have occurred in California over the past two decades have been undertaken without the [Water Board's] review or approval."[441] These legislative changes short circuit governance for the benefit of marketable rights—they foreclose what should have been an opportunity for state review to catch long-standing water waste or abuses of the public trust.[442] Under these rules, "[m]arkets . . . often benefit large water users who have been profligate in the past,"[443] rather than allowing the Water Board to reign in these past abuses. The rules also succeeded in increasing the volume of water traded in markets, until subsequent judicial rulings restraining water transactions due to potential environmental damage and legislation facilitating third-party protests reduced the number of transfers.[444]

California is not alone in changing its laws in this way. Utah's 2020 Water Banking Act provides that water rights deposited in the "bank are exempt from beneficial use requirements and protected from forfeiture."[445] Oregon seeks to "[e]ncourage the highest and best use of water by allowing the sale or lease of the right to the use of conserved water."[446] Washington,[447] Wyoming,[448] Arizona,[449]

437. 1980 Cal. Stat. 2954, 2955 (codified at CAL. WATER CODE § 1244).

438. *See supra* notes 121–24 and accompanying text.

439. *See* CAL. WATER CODE § 1706. *But see* Hollinshead, *supra* note 233, at 332 n.32 (noting that "if the transfer requires the use of [State Water Project] or [Central Valley Project] conveyance facilities—which most do—then it does require approval from the managing agency").

440. *See* Gray, *supra* note 218, at 31.

441. *Id.*

442. This kind of "grandfathering" of old rights can actually "prove self-defeating over the long term and dampen political will for market-based reallocation." Garrick & Svensson, *supra* note 57, at 386.

443. *Two Decades of Water Law and Policy Reform: A Retrospective and Agenda for the Future*, 5 U. DENV. WATER L. REV. 308, 310 (2001) (remarks of Prof. Barton H. "Buzz" Thompson, Jr.).

444. *See* Brewer et al., *supra* note 219, at 210–11.

445. *Frequently Asked Questions*, UTAH WATER BANKING, https://utahwaterbank.org/frequently-asked-questions/ [https://perma.cc/U7JG-GHZA] (last visited May 17, 2023); *see* Water Banking Act, 2020 Utah Laws 2493, 2497–504 (codified at UTAH CODE §§ 73-31-101 to -601).

446. OR. REV. STAT. § 537.460(2)(b).

447. WASH. REV. CODE § 90.42.040.

448. WYO. STAT. ANN. § 41-3-106.

449. ARIZ. REV. STAT. ANN. § 45-189.01; *see* Melissa Sevigny, *Arizona Law Opens New Pathway for Water Conservation*, KNAU NEWS TALK (Feb. 25, 2021, 5:00 AM), https://www.knau.org/knau-and-arizona-news/2021-02-25/arizona-law-opens-new-pathway-for-water-conservation [https://perma.cc/2VDX-CA5X].

Texas,[450] and Idaho[451] all offer similar protections.[452] A Model Water Transfer Act for California, proposed by the California Business Roundtable, the California Chamber of Commerce, the California Farm Bureau Federation, and the California Manufacturers Association, would have gone even further,[453] but it does not seem to have gotten much traction thus far. There are other concerns about the power of water markets to frustrate regulation,[454] and these concrete examples show that this is not merely a theoretical concern but rather an ongoing result of the push to alter water rights to encourage markets.

These legal changes interact with the reality and history of water rights to produce perverse outcomes. Consider the Kern River example once again. All of the real water rights on the Kern River are pre-1914 rights, which means that they may be transferred without review or approval by any state agency, allowing the statutory protections for fish, wildlife, other instream uses, and the broader public interest to go unenforced.[455] Recall that these rights have never been subjected to a public trust review, application of modern environmental laws, or even the waste and unreasonable use test, at least in a modern context. Under California law, a right holder on the Kern could transfer their right while still evading these laws. As Professor Sivas and her colleagues explain, an inefficient user could free up "new" water for transfer to new uses through conservation and improved efficiency, but selling this new water allows "those who can pay, like urban water districts, to expand water use, thereby creating more structural demand over the long-term. Thus, the more we push for efficient water markets, the more we may increase waterway consumption, rather than waterway restoration."[456] The transfers harden the water right; agricultural uses can be restricted more readily in dry years, while domestic uses are often granted more protection in dry periods for health and safety reasons.[457]

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450. TEX. WATER CODE ANN. § 15.704; *see* Ronald A. Kaiser, *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*, 27 TEX. TECH L. REV. 181, 202 (1996).

451. IDAHO CODE § 42-1764.

452. *See* Lawrence J. MacDonnell & Teresa A. Rice, *Moving Agricultural Water to Cities: The Search for Smarter Approaches*, 14 HASTINGS W.-NW. J. ENV'T L. & POL'Y 105, 107–13, 113 tbl.1 (2008) (summarizing western state laws regarding public-interest review for water transfers).

453. Gray, *supra* note 218, at 23, 36–37. The model act would ensure that, at the end of a temporary transfer, the full right would come back to the original holder. Thus, a habitual and historically inefficient user threatened with loss of a right could make improvements, transfer the conserved water away for a year, and then reclaim its full right with no risk of loss for its past mismanagement. *Id.* at 37. It would also preclude post hoc review of some transfers and explicitly allow transfer of water that would otherwise be lost due to enforcement of state laws on waste and unreasonable use. *Id.* at 36.

454. *See, e.g.*, John L. Fortuna, Note, *Water Rights, Public Resources, and Private Commodities: Examining the Current and Future Law Governing the Allocation of Georgia Water*, 38 GA. L. REV. 1009, 1016–19 (2004) (describing policy and constitutional concerns of water markets); Puckett, *supra* note 410, at 1027–28 (discussing Dormant Commerce Clause concerns that water markets may limit a state's ability to restrict transfers of water out of state).

455. *See supra* notes 118–19 and accompanying text; CAL. WATER CODE § 1706; Gray, *supra* note 218, at 31.

456. SIVAS ET AL., *supra* note 243, at 16.

457. *See id.* at 12, 16, 41.

Finally, the market transfer frustrates governance. Had the state decided to adjudicate the basin or otherwise reign in inefficient uses before the transfer, the state could have mandated more efficient water use across the basin and then used some or all of the "new" water to protect the instream values long ignored in the basin. Or a private lawsuit could have forced the state to reign in water rights that violated the public trust doctrine. But after the transfer, the private party has already eliminated the inefficiency and sold the water, hardening the water right. Where historic inefficiencies, particularly in agricultural use, provide an opportunity for circumscription of water rights and a rededication of some water to public purposes, market transfers *reward* historic inefficiencies and frustrate efforts to reallocate the water to serve public values. Thus, the transfer both increases scarcity and reduces flexibility for water managers.

As this Section shows, the pressure from markets and market advocates changes the nature of water rights through statutes and other means, threatening a state's ability to achieve changing policy goals by altering the way water is used.

2. These Changes Are Durable and Frustrate Future Governance Efforts

The market-driven changes in water rights are not just bad for current governance of water rights; these changes in the legal contours of rights are also durable and thus frustrate future efforts to reassert strong public governance of water rights.[458] The changes have formal legal impacts by increasing the risk of constitutional takings claims that can chill governance efforts[459] and sociopolitical effects by changing the way the public thinks about water rights and the decreasing willingness of regulatory agencies to control the rights.[460]

Professor Erin Ryan discusses the chilling effect of creating potential takings claims in natural resource commons as a tool to frustrate future governance efforts. Ryan defines the "takingsification" of environmental law as

> the strategic deployment of private rights in public commons during periods of environmental deregulation [that] can be used as a foil against later environmental conservation–a tool for "salting the land" against new or resumed legal protections in the future–by creating a variety of legal hurdles, including the threat of takings litigation.[461]

Thus, "property rights become a tool for entrenching environmental deregulation and undermining public rights in critical natural resource commons."[462] In

458. This Section focuses on the impacts of the changes in the rights themselves.

459. *See* Ryan, *supra* note 237 (manuscript at 5) ("The proliferation of private rights in opened commons complicates future lawmaking by encumbering it with potential takings, administrative law, and political liabilities, making it harder for future legislators to reinvigorate weakened environmental laws.").

460. *See* Freyfogle, *supra* note 261, at 34 (noting the "influential, inescapable role" of western water law in "promoting public understanding").

461. Ryan, *supra* note 237 (manuscript at 117).

462. *Id*. (manuscript at 7).

theory, the public commons in water should be less susceptible to takingsification, because the extensive police powers of the state over water immunize it from most takings claims.[463] But in practice, courts have created significant uncertainty about the exact contours of this immunization, and even the potential for takings claims, however misguided, has a significant chilling effect on regulation.[464] Though the government could avoid these concerns by participating in the market and buying desired rights directly, this shifts protection of the public commons from a public responsibility within the state's police power to a public choice subject to fiscal scarcity and other limits. Such a change is likely to result in less protection and seems an abdication of the public trust responsibility.

Beyond takings risks and their chilling impacts, continued commodification and market exchanges can increase resistance to regulation through changing norms around water.[465] Professor Bruce Huber notes this phenomena in public land uses.[466] He notes that permissive uses of public lands "are generally given a great deal of deference even when sustaining these uses appears contrary to broader policy developments and when termination would be well within the bounds of agency authority."[467] This is not a takings issue[468] but rather stems from the regulators' preference not to disrupt uses that have become established and expected; such uses present "local, visible, and immediate reasons not to disrupt them."[469] The same logic appears to be at play in the water world, where agencies decide not to use their significant power to regulate, even where such decisions harm the public interest, in part due to the howls of protest that result when they do regulate. Professor Holly Doremus also highlights the vociferous "attitudes that attend historic property rights and even property claims that have never had the robust backing of law. People cling tenaciously to what they believe are their entitlements."[470]

It is not just norms and "feelings" about rights; there is a political economy aspect to governance reluctance as well. As Professor Carol Rose notes, "people with relatively narrow but intense interests can capture the political process from those with wide but diffuse interests. When they do so, they can pull up the

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463. Börk, *supra* note 316, at 70 (citing Elise L. Larson, *In Deep Water: A Common Law Solution to the Bulk Water Export Problem*, 96 MINN. L. REV. 739, 741 (2011)); *see* Ryan, *supra* note 237 (manuscript at 101).

464. *See* Ryan, *supra* note 237 (manuscript at 22).

465. *See* Freyfogle, *supra* note 261, at 34 ("One of the law's vital public functions is to . . . help us remind and re-educate ourselves about how we ought to act in relation to the natural order.").

466. *See* Bruce R. Huber, *The Durability of Private Claims to Public Property*, 102 GEO. L.J. 991, 996 (2014) ("[L]ongstanding private claims . . . make[] it likely that legislative and administrative decision-making processes will bend in their favor and away from changes that might disfavor existing land uses.").

467. *Id.* at 998.

468. *Id.* at 995 ("[I]n speaking of the durability of private claims, I refer to claims that *may*, as a matter of law, be terminated or limited or allowed to expire, yet *are not* terminated or limited or allowed to expire . . . .").

469. *Id.* at 998.

470. Doremus, *supra* note 399, at 1099–100 (footnote omitted).

gangplank behind themselves, . . . while making the lives of competitors and consumers more costly and difficult."[471] The competitors and consumers here are ecosystems, instream uses, and communities in need of water, and changing water rights to better prepare them for markets is another way to pull up that gangplank. As Professor Doremus argues, commodifying the commons deprives the public of its commons to the benefit of "focused interests" who capture resources. Undoing this change imposes economic losses on those focused interests: "Those losers, as current property owners, are not likely to be the relatively powerless whose claims can be ignored . . . [and] imposing concentrated losses on the rich is likely to prove impossible. Once they emerge, therefore, property rights are expected to be sticky."[472] Changes that impose concentrated costs on powerful groups in exchange for diffuse benefits for the public are notoriously difficult to accomplish.

Washington's instream flow requirements provide a powerful example of this problem.[473] When the state created its instream flow laws, it exempted existing water rights. This was a politically palatable solution that allowed the state to protect instream flows from future diversions, but it also sacrificed streams that were already overallocated. As a consequence, old rights like the ones marketed by TransAlta are protected from instream flow requirements in the future. That is a strange outcome for water rights that were originally subject to reasonable use and public-interest tests. The politically expedient decision dramatically increases the cost of future efforts to restore flow by forcing groups like the Quinault Indian Nation to purchase those rights. Again, strengthening private water rights frustrates water governance.

While some have suggested that doctrines like the public trust serve as "an institutional side constraint on water management by ensuring that the government can always reconfigure water rights and policy in the interest of the general public—no matter what private rights it has awarded," this analysis suggests that reconfiguring marketed water rights will be extremely challenging.[474] In practice, commodification seems like a one-way ratchet. As Professor Huber argues, this durability phenomenon suggests "policymakers would, at times, do better to design around this pathology than to attempt to cure it—for example, by thinking twice before creating new forms or categories of private claims to public resources."[475]

From new statutes to constitutional takingsification to altered norms, treating water as a market commodity changes the way water rights are conceived,

471. Rose, *supra* note 420, at 342 (footnote omitted). Rose goes on to explain how "[c]ommodities producers are a case in point. Through what seem to be unbreakable locks on legislatures the world over, agriculturalists, lumberers, miners, and ranchers enjoy price supports, import limits, subsidized water and transportation, and special rights to use public resources . . . ." *Id.*

472. Doremus, *supra* note 399, at 1099.

473. *See supra* notes 16–20 and accompanying text.

474. Thompson, Jr., *supra* note 56, at 40; *see also id.* (arguing that "[t]he public trust doctrine, in short, restricts the extent of commoditization that can occur").

475. Huber, *supra* note 466, at 999.

making future governance significantly more difficult. Better governance is a precondition for water markets because governing on the back end is just too difficult.

## CONCLUSION: LOOKING FORWARD

In this Article, we have explored the historic value judgments baked into the existing western water law system and showed how layering market approaches over the existing system will both exacerbate the negative impacts of those values and further entrench existing law. We began with a utilitarian view of the history of water rights, which showed that water rights developed to serve a wide variety of social values but that many of those values had been subsumed by the mid-nineteenth century demand for economic growth. As a result, our current water rights system is failing to meet the needs of modern society. We continued with an overview of the push for water markets that emerged as part of the broader law and economic push in the 1970s and 1980s and then discussed the benefits of market approaches to water reallocation. After reviewing these proffered benefits, we turned to our three core critiques of water markets under existing western water law. First, we used an institutional economics analysis to show that markets are embedded in a political economy and physical geography that makes market failure inherent in water markets. Second, relying on our historical analysis and the institutional economics insights, we identified some of the failures in fairness and justice that underpin our current water rights system and showed that a market approach can perpetuate these problems. Third and finally, we explored the ways that markets can change water rights and frustrate future efforts at more robust water governance.

There are no panaceas for our water challenges; any solution will rely on some combination of public governance, end user self-governance, and at times regulated markets.[476] As we have shown here, the public governance leg of that tripod is the weak link in western water law, and proceeding with markets in that context both makes markets less likely to succeed and makes future governance improvements much more difficult.[477] But our analysis also suggests a way forward that everyone who wants a better water future could agree on, market advocates and market skeptics alike: improved water governance.

Most water rights supporters recognize the need for strong governance if water markets are to achieve their objectives. For example, Professor Barton Thompson notes, "Markets, without governmental intervention, will generally not protect the poor, promote the environment, or advance other purely public interests in water resources. The commodification of water can thus lead to greater water inequality and to environmental degradation if adequate governmental institutions

476. *See, e.g.*, Ruth Meinzen-Dick, *Beyond Panaceas in Water Institutions*, 104 PROC. NAT'L ACAD. SCI. 15200, 15200 (2007); Garrick & Svensson, *supra* note 57, at 401.

477. *See* SIVAS ET AL., *supra* note 243, at 18 (arguing that "[a] statewide water market layered onto our current allocation system is destined to continue the dysfunctional status quo").

do not exist to protect these other interests."[478] Similarly, in their review of the political economy of water markets, Professor Dustin Garrick and Jesper Svensson conclude that "a focus on the miracle of the markets risks missing the point: that development of the markets has been contingent upon sustained investment in governance capacity and intense political struggles at all phases."[479] As this Article has shown, however, western water law currently lacks the institutional foundations and governance capacity necessary for water markets that will help rather than hurt.[480] Thus, the first step toward markets that could actually accomplish what their advocates suggest is improved governance. Similarly, market skeptics tend to argue for reinvigorated public water governance, often based on some combination of reasonable use, public trust, revitalization of existing instream flow laws, and meaningful enforcement of existing law.[481] Market skeptics see this as an end goal rather than as a step toward broader deployment of water markets, but the question of the ultimate destination should not get in the way of efforts to achieve better water governance right now.

Water governance is an inherently political, value-driven proposition that "need[s] to be asked, debated, and resolved by civil society, all of us together."[482] And these are not one-off decisions; water governance is an ongoing process requiring consistent revisiting over time.[483] Toward that end, and in hopes of finishing our analysis on a hopeful note, we conclude by briefly highlighting three requirements for proposals to develop water governance that reflects current societal needs, values, and priorities.[484]

First, better governance means addressing the inequities in water rights that result from historic discrimination. As we discussed in Section II.B, and as the California Water Board has recognized, its water "programs were established over a structural framework that perpetuated inequities based on race. These inequities persist . . . ."[485] The Board also "explicitly acknowledged the role racism has played in creating inequities in affordability and access to clean and safe water and in the allocation and protection of water resources."[486] These inequities

478. Thompson, Jr., *supra* note 56, at 51.

479. Garrick & Svensson, *supra* note 57, at 399.

480. *See id.* at 397–98 (noting that market efforts on the Colorado River have "yet to acknowledge the arrival of hard limits" to total water withdrawals and that governance progress on the Columbia River "has been patchy"); SIVAS ET AL., *supra* note 243, at 18 (recognizing that the good governance, limited-scale water market "is not the 'market' process in place or being considered today").

481. *See, e.g.*, SIVAS ET AL., *supra* note 243; Brown, *supra* note 425, at 37–38.

482. DAVID GROENFELDT, WATER ETHICS: A VALUES APPROACH TO SOLVING THE WATER CRISIS 108 (2013); *see also* Garrick & Svensson, *supra* note 57, at 400 ("[P]olitics, coupled with transparency and public engagement, can provide the basis for moving the reform process down a better path."); Freyfogle, *supra* note 261 ("A sound water law would embody and transmit sensitive, ethical messages about the multiple values of water.").

483. *See* Wilder & Ingram, *supra* note 61, at 68–70.

484. There are many other areas of agreement as well, including the use of nonmarket economic principles such as pricing mechanisms and incentives, to achieve conservation. *See* Arnold, *supra* note 262, at 832.

485. State Water Res. Control Bd., *supra* note 337.

486. *Id.*

are widespread and result directly from the West's historic water allocation practices, so addressing them will be hard. Nevertheless, they must be addressed. In some ways, a state's continuing police powers over water make this easier than addressing inequities in land ownership due to redlining, but the water rights community has been slower to acknowledge the issue. The climate justice,[487] resilience justice,[488] and redlining[489] literature may provide some guidance on ways to address this history. What is clear, however, is that addressing these inequities requires a conscious choice both to break from past patterns of discrimination and to actively seek to redress the past. The market will not naturally address this problem and, as we discussed in Section II.B, the existing distribution of water rights is likely to aggravate historic racial divides in water allocation. Absent a focus on equity, water governance is likely to perpetuate historic and ongoing injustices.

Second, improving water governance requires robust instream flow protections. As we discussed in Part I, historic water rights laws typically required diversion or otherwise prohibited protection of instream flows through water rights. Moreover, in California, as in most western states, "water system development did not adequately provide for the consideration of instream and environmental values."[490] The states did little to protect instream flows as most water rights were acquired and even prevented private organizations from securing rights to instream flows.[491] This is a systemic problem, occurring both in the West and in arid regions worldwide.[492] As a result, as we have noted, existing uses leave too little water in many western rivers, resulting in species extinctions, degraded ecosystems, and a loss of ecosystem services. When states have imposed laws requiring minimum instream flows, these laws (or at least their enforcement) have often come too late. In Washington, "instream flow rights are junior in priority to water rights that predate them, [so] they can prevent new water uses in a river, but they cannot put water back in streams once it has been withdrawn by more senior users."[493] Other states, such as California, recognize a more robust and historic public trust doctrine that can result in instream flow protections that take precedence over even riparian and old water rights.[494] But in many cases, the agencies charged with administering minimum flow protections

487. *See, e.g.*, Brian Tokar, *On the Evolution and Continuing Development of the Climate Justice Movement*, *in* ROUTLEDGE HANDBOOK OF CLIMATE JUSTICE 13 (Tahseen Jafry ed., 2019).

488. *See, e.g.*, Craig Anthony (Tony) Arnold, *Resilience Justice and Community-Based Green and Blue Infrastructure*, 45 WM. & MARY ENV'T L. & POL'Y REV. 665 (2021).

489. *See, e.g.*, KEEANGA-YAMAHTTA TAYLOR, RACE FOR PROFIT: HOW BANKS AND THE REAL ESTATE INDUSTRY UNDERMINED BLACK HOMEOWNERSHIP (2019).

490. ARTHUR L. LITTLEWORTH & ERIC L. GARNER, CALIFORNIA WATER II 33–34 (2d ed. 2007).

491. *See supra* notes 126–46 and accompanying text.

492. *See* Garrick & Svensson, *supra* note 57, at 379 (noting caps are rarely established before demand outstrips supply).

493. Haylee J. Hurst, *Changing Course: Revisiting Instream Flow Rulemaking in Washington State Following* Swinomish v. Ecology, 90 WASH. L. REV. 1901, 1913 (2015).

494. *See supra* notes 106–15 and accompanying text.

have been very slow to act.[495] Delays like these mean that 90% of California's trout and salmon are listed under the state and federal endangered species acts.[496] Improved water governance will require more robust protection of instream flows, and proposals to reinvigorate water governance should focus on attaining this goal. States may be able to do so through enhanced administrative actions, through legislation, or even through purchases of water, as is the preferred approach in Washington.[497] Buying water rights is costly and will perpetuate wealth disparities driven by the historic racial disparities in access to water rights, but in some cases, pragmatism may require water purchases in order to put water into ecosystems before more species are lost. In any case, markets alone will not put water back into dry rivers and streams, and they may even exacerbate scarcity. Government intervention is required to restore instream flows and must be a precondition for the use of water markets.

Finally, as water governance adapts to provide robust protection for instream flows and address existing inequities, successful efforts to improve governance must apply to historic water rights, not just new water rights. The first and second tranches of water rights faced little to no regulatory scrutiny and have typically never been assessed against modern environmental law or other priorities for water use.[498] For example, these old rights have frequently evaded review under state public-interest standards, reasonableness requirements, public trust, or other laws that balance private rights against public needs.[499] Regulating new rights alone will do little to address scarcity issues in the West; most surface waters in the West have been fully appropriated since at least the 1970s.[500] In California, for example, the state has issued appropriative rights to more water than is available, and riparian and first-tranche rights claim far more water; the total water claimed is unknown.[501] Regulating the third tranche of water rights is also insufficient. To continue with the California example, the oldest—first-tranche rights

495. *See* Karrigan Börk & Amber Manfree, *Rewatering Napa's Rivers*, 36 NAT. RES. & ENV'T, Summer 2021, at 32, 34 (noting that California's Department of Fish and Wildlife has taken almost forty years to set minimum instream flows on only twelve streams).

496. *Id.* at 33.

497. *See* STATE OF WASH., DEP'T OF ECOLOGY & DEP'T OF FISH & WILDLIFE, NO. 03-11-005, WASHINGTON WATER ACQUISITION PROGRAM: FINDING WATER TO RESTORE STREAMS 5–6, 17 (2003), https://apps.ecology.wa.gov/publications/documents/0311005.pdf [https://perma.cc/YE58-RSZS]; *see generally* Börk et al., *supra* note 236 (highlighting "important considerations for decision makers on making effective environmental water right purchases").

498. *See supra* notes 121–25 and accompanying text.

499. *See supra* notes 39–43 and accompanying text.

500. *See, e.g.*, Joseph Novak, *Abandonment and Forfeiture: How to Hold a Water Right as Development Takes Place*, 28 ROCKY MOUNTAIN MIN. L. INST. 22 (1982); NAT'L RSCH. COUNCIL, WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT 1 (1992); A.D. KONIECZKI & J.A. HEILMAN, U.S. GEOLOGICAL SURV., WATER-USE TRENDS IN THE DESERT SOUTHWEST—1950–2000, at 1, 5–6 (2004), https://pubs.usgs.gov/sir/2004/5148/pdf/sir20045148.pdf [https://perma.cc/659Y-CKH8].

501. *See* Theodore E Grantham & Joshua H Viers, *100 Years of California's Water Rights System: Patterns, Trends and Uncertainty*, ENV'T RSCH. LETTERS, Aug. 2014, at 1, 2. More broadly, the Colorado River Compact, which governs distribution of river water across seven states and roughly 40 million people, assumes that the river will average 16.5 million acre-feet (MAF) per year. *Colorado*

(which predate the state permitting system entirely) and riparian rights (which do not require state permits)—together account for more than half of the water used by California's agricultural and urban interests.[502] Including the second tranche of water rights—granted when review by the Water Board focused only on whether there was any water left to appropriate—drives the total far higher.[503] States have the power to regulate these rights in a constitutional fashion under the reasonable use, public trust, and other doctrines.[504] As Garrick and Svensson note, regulating these rights will be a political challenge, but not doing so creates "steep (deferred) costs,"[505] delegitimizes water rights,[506] and frustrates the very purposes of water governance. Embracing water markets without bringing these rights in line will not provide the benefits that market advocates promise. Governance must regulate these historic rights.

Consider the Kern River one last time. At the outset, we asked if water reallocation on the Kern was a market failure because the unused water was not reallocated to the most valuable use via a market purchase, or a governance failure because California should have used its regulatory powers to rewater the river and meet other water needs. Perhaps the answer is that it is both. The Kern River rights are first-tranche rights, unchecked by public-interest protections. As a first step, the state could apply California's existing laws and thereby reallocate water to protect instream flows and other values that are unlikely to be addressed through market transactions. Among many other laws, California's public trust doctrine requires that "before state courts and agencies approve water diversions they should consider the effect of such diversions upon interests protected by the public trust," which include environmental and recreational uses;[507] Fish and Game Code Section 5937 is more specific, requiring dam owners to release enough water to keep fish downstream in good condition.[508] Imagine a scenario

*River Story*, UTAH DIV. WATER RES., https://water.utah.gov/interstate-streams/colorado-river-story/ [https://perma.cc/6FM9-FJRP] (last visited May 17, 2023); Daniel Craig McCool, *A Better Way to Share Water from the Shrinking Colorado River*, SOURCE NM (Dec. 14, 2021, 5:22 AM), https://sourcenm.com/2021/12/14/a-better-way-to-share-water-from-the-shrinking-colorado-river/ [https://perma.cc/FW23-DGQP]. However, the near-term flow average is actually far lower, at roughly 12.3 MAF per year. Allen Best, *An Unsolved Math Problem on the Colorado River*, COLO. NEWSLINE (Mar. 29, 2022, 9:23 AM), https://coloradonewsline.com/2022/03/29/unsolved-math-problem-colorado-river/ [https://perma.cc/C5NH-GX6Z].

502. *See* HANAK ET AL., *supra* note 124.

503. *See* Börk et al., *supra* note 73, at 835–37, 902 (explaining that the Water Board took a ministerial approach to water appropriations until the early 1980s and providing an example of the earlier ministerial approach).

504. *See, e.g.*, Michael Toll, *Reimagining Western Water Law: Time-Limited Water Right Permits Based on a Comprehensive Beneficial Use Doctrine*, 82 U. COLO. L. REV. 595, 633 (2011); Robert H. Abrams, *Water Law Transitions*, 66 S.C. L. REV. 597, 613 (2015); John Leshy, *Notes on a Progressive National Water Policy*, 3 HARV. L. & POL'Y REV. 133, 158–59 (2009).

505. Garrick & Svensson, *supra* note 57, at 391.

506. *See* Freyfogle, *supra* note 261, at 38–39 ("For a private property regime to fulfill its functions and retain its moral legitimacy, it needs to be kept up to date, to bend and take on new shapes as communal values and circumstances evolve.").

507. Nat'l Audubon Soc'y v. Super. Ct., 658 P.2d 709, 712 (Cal. 1983).

508. CAL. FISH & GAME CODE § 5937; *see* Börk et al., *supra* note 73, at 822.

where the state reexamined the historic Kern River rights and applied these requirements. This would return significant flows to the river—without analysis, it is hard to know how much water, but it is clear that a dry riverbed is not keeping fish in good condition. In turn, this would also reduce the amount of water available under existing water rights. Water markets can then mitigate the impact of those reductions by allowing the reallocation of water among the right holder through voluntary exchanges. Better governance, better reallocation. That first governance step, though, is critical. The state has not taken that step for more than a century, and getting the state to take that step now is a tremendous challenge that everyone who wants better water outcomes should support.

Water markets are not amoral machines that use private willingness to pay to determine the welfare-maximizing distribution of water rights. Instead, water-market outcomes reflect the contested history of water rights, dominated in large part by demand for economic growth and a preference for white ownership. Water-market outcomes also reflect market failures due to the physical geography of water and the political economy of water management. Embracing markets now, without reform of water governance, will harden these past mistakes and frustrate efforts to correct them in the future. Water markets in the West will not be successful unless they are predicated on better nonmarket water governance.