
Water and Taxes

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This article considers how water consumption in the United States is and should be taxed. It reviews the few federal and state tax code provisions that directly target water use and the somewhat larger number of provisions with indirect implications for water policy. It also draws upon existing literature on tax policy, water law, and water economics to evaluate whether taxation of water consumption makes sense.

That analysis leads to two key conclusions. First, although provisions of tax law affect water use, and although some provisions undercut key policy goals of water law, they do so only to a modest extent. The intersections between the two fields are limited and largely inadvertent. Second, the interconnections between the fields should be stronger; water use should be taxed. The reasons are similar to commonly-cited justifications for carbon taxes and other so-called Pigouvian taxes: taxation would encourage more efficient water consumption, decreasing the negative environmental and energy consequences of water overuse and alleviating conflict among competing users. Taxation also would raise revenue, which could fund badly-needed water infrastructure and governance or reduce the need to tax more socially desirable activities.

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INTRODUCTION

The past few decades have brought drought after drought to the American West. The region has always been dry — “a semi-desert with a desert heart,” — but recent droughts have set records.¹ According to climate models, the future threatens to bring even more extreme weather, and with it, more intense competition for water.² And the American West is not unique.³ Around the world, water is becoming increasingly precious.⁴

Yet in much of the American West, and the rest of the world, people consume water in puzzling ways.⁵ The highest economic returns from water consumption typically come from urban and industrial use.⁶ But most water goes to agriculture, and many agricultural users still grow relatively low-value crops, often in inefficient ways.⁷ Even in urban areas, huge quantities of water go to questionable uses; much of the United States’ water irrigates non-native ornamental plants and lawns

¹ See WALLACE STEGNER, *WHERE THE BLUEBIRD SINGS TO THE LEMONADE SPRINGS* 60 (1992). Stegner attributes the phrase to historian Walter Prescott Webb, and the quote is widely credited to Webb’s article. See Walter Prescott Webb, *The American West, Perpetual Mirage*, *HARPERS*, May 1, 1957. But the phrase does not actually appear in that article, though Webb’s central thesis is indeed that the West has a desert heart. On the severity of California’s current drought, see Michael E. Mann & Peter H. Gleick, *Climate Change and California Drought in the 21st Century*, 112 *PROC. NAT’L ACAD. SCI.* 3858, 3858 (2015).

² See Gregg Garfin et al., *Southwest*, in *CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE CHANGE ASSESSMENT* 463 (J.M. Melillo et al. eds., 2014) (“Severe and sustained drought will stress water sources, already over-utilized in many areas, forcing increasing competition among farmers, energy producers, urban dwellers, and plant and animal life for the region’s most precious resource.”).

³ See Jacob Schewe et al., *Multimodal Assessment of Water Scarcity Under Climate Change*, 111 *PROC. NAT’L ACAD. SCI.* 3245 (2014); C. ADAM SCHLOSSER ET AL., *THE FUTURE OF GLOBAL WATER STRESS: AN INTEGRATED ASSESSMENT 1* (2014), http://globalchange.mit.edu/files/document/MITJPSPGC_Rpt254.pdf.

⁴ See Schewe et al., *supra* note 3. For a very partial sampling of the many warnings of water crises, see generally BRAHMA CHELLANEY, *WATER, PEACE, AND WAR: CONFRONTING THE GLOBAL WATER CRISIS* (2013); ROBERT GLENNON, *UNQUENCHABLE: AMERICA’S WATER CRISIS AND WHAT TO DO ABOUT IT* (2009); SANDRA POSTEL, *LAST OASIS: FACING WATER SCARCITY* (1992); MARC REISNER, *CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER* (1993).

⁵ See Eduardo Porter, *The Risks of Cheap Water*, *N.Y. TIMES*, Oct. 14, 2014, at B1.

⁶ See Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 *TEX. L. REV.* 1873, 1887-88 (2005) (discussing value disparities).

⁷ See *Irrigation Water Use*, U.S. GEOLOGICAL SURV., <http://water.usgs.gov/edu/wuir.html> (last updated Oct. 27, 2016) (“Estimates vary, but about 70 percent of all the world’s freshwater withdrawals go towards irrigation uses.”).

or just goes to waste.⁸ Water use in many parts of the world is also unsustainable. One recent study predicted that by 2050, three billion people could live in areas where surface water demand exceeds supply.⁹ And aggressive water use is environmentally destructive. Aquatic ecosystems depend on flow, and when those flows are pumped away, biological diversity and other measures of water quality almost inevitably suffer.¹⁰

Addressing these challenges has become the central focus of the field of water law. And the field has responded in many ways, some partially successful. Environmental laws have constrained some of the most environmentally destructive water use practices.¹¹ Urban and agricultural water use efficiency has improved, and for decades, the United States has grown its economy and population without increasing aggregate water withdrawals.¹² Water transfers also have shifted some water use from low value crops to other higher-value uses.¹³ But even with all these changes, water shortages and water conflict persist.

So what else might be done? This Article proposes what initially might seem like an odd solution. Water lawyers hardly ever discuss the possibility of using taxation to influence water allocation,¹⁴ and in

⁸ See Sarah B. Schindler, *Banning Lawns*, 82 GEO. WASH. L. REV. 394, 395-96 (2014); *Outdoor Water Use in the United States*, U.S. ENVTL. PROT. AGENCY, <https://www3.epa.gov/watersense/pubs/outdoor.html> (last updated Nov. 30, 2016) (“Nationwide, landscape irrigation is estimated to account for nearly one-third of all residential water use [S]ome experts estimate that as much as 50 percent of water used for irrigation is wasted.”).

⁹ See SCHLOSSER ET AL., *supra* note 3, at 24.

¹⁰ See Stuart E. Bunn & Angela H. Arthington, *Basic Principles and Ecological Consequences of Altered Flow Regimes for Aquatic Biodiversity*, 30 ENVTL. MGMT. 492, 492-93 (2002).

¹¹ See, e.g., Dave Owen, *Law, Environmental Dynamism, Reliability: The Rise and Fall of CALFED*, 37 ENVTL. L. 1145, 1183-89 (2007) [hereinafter *Environmental Dynamism*] (describing federal and state environmental laws and their influence in California).

¹² See WILLIAM B. DEOREO ET AL., RESIDENTIAL END USES OF WATER, VERSION 2, EXECUTIVE REPORT 3 (2016); Peter Gleick, *Peak Water: United States Water Use Drops to Lowest Level in 40 Years*, SCI. BLOGS (Nov. 5, 2014), <http://scienceblogs.com/significantfigures/index.php/2014/11/05/peak-water-united-states-water-use-drops-to-lowest-level-in-40-years/>.

¹³ See HEATHER COOLEY ET AL., IMPACTS OF CALIFORNIA’S ONGOING DROUGHT: AGRICULTURE 12-16 (2015); W. GOVERNORS’ ASS’N & W. STATES WATER COUNCIL, WATER TRANSFERS IN THE WEST 11 (2012).

¹⁴ For rare legal-academic papers on water use and taxation, see generally Lonnie R. Beard, *Survey of the Law and Selected Issues Relating to the Deductibility of Soil and Water Conservation Expenditures under Section 175 of the Internal Revenue Code*, 73 KY.

political realms, almost any new tax proposal is toxic. But that has not stopped carbon taxes from becoming the darlings of regulatory theory.¹⁵ The growing focus upon carbon taxes — and upon regulatory taxes more generally — stems from simple economics. Every tax creates collateral incentives, and ideally those incentives would maximize socially beneficial behavior and minimize harm.¹⁶ Indeed, following the theories of Arthur Pigou,¹⁷ many economists and legal scholars have argued that taxes set at a level sufficient to offset negative externalities should be *the* preferred legal instrument for

L.J. 723 (1985); C. Marvin Brewer, *Taxation of Water Rights in California*, 53 J. AM. WATER WORKS ASS'N 619 (1961); James A. Fellows, *The Taxation of Water Rights*, 30 REAL EST. L.J. 333 (2002); Stanford D. Herlick, *Water Rights Taxation*, 3 SANTA CLARA L. REV. 153 (1963); Thomas Lee, *The Water Excise Tax: Preserving a Necessary Resource*, 4 NW. J.L. & SOC. POL'Y 171 (2009); John H. Messing, *Recent Development: Cost Depletion of Groundwater*, 18 STAN. L. REV. 1229 (1966); Raphael J. Moses & M. Wray Witten, *Taxation of Water Rights*, 25 S.D. L. REV. 475 (1980); Tom Kuhnle, Note, *The Federal Income Tax Implications of Water Transfers*, 47 STAN. L. REV. 533 (1995).

This article adds to previous work in two key ways. First, with one exception, none of these articles considers taxation as a mode of regulation, and many focus narrowly on a particular provision of tax law. Lee's article does consider the possibility of a Pigouvian tax, *see* Lee, *supra*, at 184-89, but my article offers a broader and deeper analysis of the advantages and disadvantages of such taxation, as well as a survey of the existing intersections between water law and tax law.

A much larger body of economic literature considers how water users respond to price signals, and some of that literature mentions taxes as a potential mechanism for pricing. However, much of that literature focuses on other pricing instruments, like use fees, and the literature that does focus on taxation generally assumes the existence of both taxation and economically rational responses to that taxation. *See, e.g.*, Maria Berrittella et al., *The Economic Impact of Restricted Water Supply: A Computable General Equilibrium Analysis*, 41 WATER RES. 1799 (2007); Nicholas Kilimani et al., *Water Taxation and the Double Dividend Hypothesis*, 10 WATER RESOURCES & ECON. 68 (2015); Anthony Letsoalo et al., *Triple Dividends of Water Consumption Charges in South Africa*, 43 WATER RESOURCES RES. W05412 (2007); Changbo Qin et al., *The Economic Impact of Water Tax Charges in China: A Static Computable General Equilibrium Analysis*, 37 WATER INT'L 279 (2012). For a rare example of a paper that considers the messy institutional complexities of water taxation, *see* Marianne Schuerhoff et al., *The Life and Death of the Dutch Groundwater Tax*, 15 WATER POL'Y 1064 (2013).

¹⁵ *See, e.g.*, SHI-LING HSU, THE CASE FOR A CARBON TAX: GETTING PAST OUR HANG-UPS TO EFFECTIVE CLIMATE POLICY (2011); Jonathan S. Masur & Eric A. Posner, *Toward a Pigouvian State*, 164 U. PA. L. REV. 93, 96 (2015) (noting the esteemed membership of the "Pigou Club" supportive of carbon taxes).

¹⁶ *See* JOEL SLEMROD & JON BAKIJA, TAXING OURSELVES: A CITIZEN'S GUIDE TO THE DEBATE OVER TAXES 120 (4th ed. 2008) (noting that tax-related incentives are pervasive).

¹⁷ *See* Janet E. Milne & Mikael Skou Andersen, *Introduction to Environmental Taxation Concepts and Research*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION 15-17 (Janet E. Milne & Mikael Skou Andersen eds., 2012) (discussing Pigou's ideas).

addressing environmental and other social harms.¹⁸ A carbon tax presents a classic opportunity for such incentive-based regulation: governments might reduce climate change while simultaneously generating revenues, and those revenues could reduce the need to tax income (and thus labor) or some other socially desirable activity.¹⁹ This Article asks whether similar arguments apply to water.

More specifically, it addresses two questions. The first major question is how, if at all, existing tax law in the United States affects water use. Federal, state, and local tax codes contain few provisions directly targeted at water use, but that does not preclude indirect effects. And, indeed, provisions with such indirect effects are sprinkled throughout the field of tax law.²⁰ From excise tax exemptions that encourage irrigation²¹ to federal policies that treat water efficiency rebates as taxable income²² to production incentives for water bottling companies,²³ federal and state codes contain a wide variety of minor collisions between water policy and tax law. None of the resulting incentives seem powerful enough to create major changes in water use patterns, but some do offer promising targets for modest reform.

This Article's second major question is broader: how *should* tax law address water use? To put it slightly differently, does the field of water law offer another promising opportunity for Pigouvian taxation, or at least something like it? Here, the answer is a qualified yes. Water use is sensitive to economic incentives.²⁴ And those economic incentives could help improve allocation patterns.²⁵ Water taxes also could

¹⁸ E.g., Masur & Posner, *supra* note 15 (“Other forms of regulation are inferior to the Pigouvian tax.”). Not everyone is so sure. See, e.g., SLEMROD & BAKIJA, *supra* note 16, at 169 (“Just about every time someone comes up with a bright idea about how the government should encourage one activity or discourage another, the tax system gets the call.”); Victor Fleischer, *Curb Your Enthusiasm for Pigovian Taxes*, 68 VAND. L. REV. 1673, 1691-92 (2015) (arguing that Pigouvian taxes are a good fit for greenhouse gas regulation and not much else).

¹⁹ See N. Gregory Mankiw, *Smart Taxes: An Open Invitation to Join the Pigou Club*, 35 E. ECON. J. 14, 16 (2009).

²⁰ See *infra* Part I.

²¹ See 26 U.S.C. § 40 (2012) (granting an excise tax exemption for the production of ethanol, which incentivizes irrigation for corn growth); *infra* notes 156-63 and accompanying text.

²² See *infra* notes 152-55 and accompanying text.

²³ See 26 U.S.C. § 199(c)(4)(A)(i)(III) (2012); *infra* notes 112-15 and accompanying text.

²⁴ See Sheila M. Olmstead & Robert N. Stavins, *Comparing Price and Nonprice Approaches to Urban Water Conservation*, 45 WATER RESOURCES RES., W04301 (2009), <http://onlinelibrary.wiley.com/doi/10.1029/2008WR007227/epdf>.

²⁵ See Glennon, *supra* note 6, at 1883-88. While Glennon advocates pricing as a

provide a new source of revenue, which could help pay for better water infrastructure or governance, provide direct rebates to the public, or reduce the need for other forms of taxation.²⁶ And while water taxation may initially strike people as strange or misguided, there is no compelling argument that explains why water is an inappropriate or unjust focus for taxation.²⁷

This Article's analysis proceeds as follows. Part I addresses the current tax status of consumptive water use²⁸ in the United States.²⁹ It explores the few direct and somewhat more numerous indirect ways in which tax policy is likely to affect water use, and the incentives those interactions create. Part II then provides a qualified argument for water use taxation. It considers the basic justifications for water taxation, as well as important caveats to those justifications, and concludes that water use is an appropriate, though not exactly easy, target for taxation.

Of course, because this paper is about tax policy, there is an elephant in the room. All taxes are unpopular, and the academic enthusiasm for Pigouvian taxes has not translated — so far — into widespread political support for the concept, at least within the United States.³⁰ Even in other countries, where a few environmental taxes have been adopted, their sponsors have suffered a political toll.³¹ For

mechanism for water allocation reform, he recommends raising service costs for municipal users and allowing water transfers, not imposing taxes on water rights or water use.

²⁶ See *infra* notes 280–94 and accompanying text.

²⁷ See *infra* notes 298–326 and accompanying text.

²⁸ Because my focus is consumptive use, this article is not about the tax status of waterfront property. The article also does not deal in any great depth with the reality that some water uses, like hydropower generation, consume very little of the water they use. The architects of any system of water use taxation would need to address that reality, perhaps by taxing net use of water rather than withdrawals, or perhaps by taxing largely non-consumptive uses at much lower rates. But the details of those systems are a subject for another paper.

²⁹ Much of this paper focuses on the western United States, where water law is generally more developed, water shortages are more acute, and the academic literature on water use is more extensive. But its arguments should apply to any jurisdiction concerned about water consumption levels.

³⁰ See Mankiw, *supra* note 19, at 35-36 (“As judged on purely political terms, higher Pigouvian taxes are a wacky idea.”).

³¹ See, e.g., Mark Jaccard, *The Political Acceptability of Carbon Taxes: Lessons from British Columbia*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 17, at 175-76, 187 (observing that British Columbia's carbon tax hurt the popularity of the party that sponsored it — but also that the tax survived, and that political attacks have diminished); Julia Baird, *A Carbon Tax's Ignoble End: Why Tony Abbott Axed Australia's Carbon Tax*, N.Y. TIMES, July 24, 2014, at A27.

those reasons, a few words about this analysis's degree of political naiveté are appropriate. In short, I do not analyze the political economy of water taxes. My goal, instead, is to introduce and support a policy idea that has merit, and thus, perhaps, to extend slightly the realm of political possibility.

I. THE CURIOUS TAX STATUS OF WATER USE

The fields of water and tax law do not normally mix. Ask a water lawyer how water rights are taxed, and the answer, most likely, will be, "they're not."³² Ask a tax lawyer about water law and the conversation will probably come to a quick end. There are some reasons for that mutual lack of awareness. In the United States, water taxes are generally an unfamiliar concept. In some other countries, interest in water taxes is slightly higher,³³ but the law of water taxation is still notable primarily for its absence.

That mutual lack of awareness has many consequences, one of which is that few people are familiar with both realms. For that reason, this part begins with a brief summary of each field before turning to discussion of their intersections. Readers should be aware that both water and tax law are exceedingly complex, and what follows is just an introductory overview.

A. Water Law 101

For many years, the primary goal of water law in the United States was to divvy surface water up among competing private claimants.³⁴ Their claims generally arose under two primary systems of water rights. In the eastern United States, riparian water rights, which entitled waterfront landowners to make reasonable use of waterways, offered the primary system for allocating rights in surface water.³⁵ In the Rocky Mountain states, the doctrine of prior appropriation displaced riparian rights.³⁶ In the high plains and west coast states, the

³² A particularly savvy water lawyer will say something like, "their value is factored into tax appraisals of land." See generally Moses & Witten, *supra* note 14, at 475.

³³ See, e.g., Schuerhoff et al., *supra* note 14 (discussing the implementation of "a Dutch groundwater tax implemented in 1995").

³⁴ See Robert L. Fischman, *What Is Natural Resources Law?*, 78 U. COLO. L. REV. 717, 720-21 (2007).

³⁵ See BARTON H. THOMPSON, JR. ET AL., *LEGAL CONTROL OF WATER RESOURCES* 28 (5th ed. 2013).

³⁶ See *Reno Smelting, Milling & Reduction Works v. Stevenson*, 21 P. 317, 322 (Nev. 1889) (excising riparian rights from Nevada law); see also *Coffin v. Left Hand*

two doctrines maintain an uneasy coexistence.³⁷ In a prior appropriation system, rights exist on a first-come, first-served basis, and the earliest, or most “senior,” user can take his full share before a junior user takes any of his.³⁸ Unlike riparian rights, an appropriative right can be tied to any parcel of land, not just parcels adjacent to the waterway.³⁹

Despite their profound differences, there are also some underlying similarities between riparian and appropriative rights. First, both systems involve property rights.⁴⁰ Those rights may be highly qualified, and the state, acting as trustee for its people, typically maintains its own interests in and regulatory authority over waterways.⁴¹ But the field of water law nevertheless has one foot firmly planted in property law. Second, both kinds of rights are increasingly administered through permitting systems and by administrative agencies.⁴² Thus, water law’s other foot is firmly planted in administrative law. Balancing atop that dual foundation is often difficult.⁴³

In many states, rights to groundwater are just as important as rights to surface water.⁴⁴ A surprisingly large percentage of water use in the United States (and in many other parts of the world) depends on underground sources, and in many agricultural and rural regions, groundwater is the primary or even the exclusive source of water supply.⁴⁵ At one time, groundwater use was very lightly regulated, partly on the theory that groundwater flow was too incomprehensible to allow any meaningful legal intervention.⁴⁶ That view has changed,

Ditch Co., 6 Colo. 443, 447 (1882) (doing the same for Colorado).

³⁷ See Eric T. Freyfogle, *Lux v. Haggin and the Common Law Burdens of Modern Water Law*, 57 U. COLO. L. REV. 485, 486-87 (1986) (critiquing the case that retained riparian rights in California).

³⁸ See THOMPSON ET AL., *supra* note 35, at 171.

³⁹ See *id.* at 170.

⁴⁰ See Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257, 260 (1990) (“Water rights are property.” (emphasis added)).

⁴¹ See Brian E. Gray, *The Property Right in Water*, 9 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 1, 4, 26-27 (2002).

⁴² See THOMPSON ET AL., *supra* note 35, at 132-33, 172-73 (describing movements toward permitting in both riparian and prior appropriation systems).

⁴³ See Fischman, *supra* note 34, at 718-19 (noting that natural resources law generally sits atop this dual foundation).

⁴⁴ See Dave Owen, *Taking Groundwater*, 91 WASH. U. L. REV. 253, 254-55 (2013) [hereinafter *Taking Groundwater*] (explaining the importance of groundwater).

⁴⁵ See *id.*

⁴⁶ See *Frazier v. Brown*, 12 Ohio St. 294, 311 (1861), *overruled by* *Cline v. Am. Aggregates Corp.*, 15 Ohio St. 3d 384, 387 (1984) (“Because the existence, origin,

at least somewhat, and most states now have legal doctrines defining the boundaries of property rights in groundwater, as well as some degree of administrative agency involvement in administering those rights.⁴⁷

While these rights hold fundamental importance to the water law field, most water users do not actually hold water rights. Instead, most people obtain water through contracts with cities, water districts, mutual water companies, or other types of suppliers.⁴⁸ Many suppliers obtain their water through contracts with other suppliers, so sometimes the end user of water is several contracts removed from the holder of the underlying right.⁴⁹ There are thousands of these intermediary suppliers, and they come in a wide variety of legal forms.⁵⁰ Some are governmental, some are private, and some blur the boundaries between those spheres.⁵¹

In carrying out their work, these suppliers are bound not just by property doctrines and contractual terms, but also by a massive superstructure of federal and state regulatory law. Some of that regulation exists purely for the purpose of managing conflicts among competing water consumers.⁵² But much of it exists to ensure environmental protection of aquatic resources.⁵³ That environmental purpose implicates another fundamental tension of modern water politics and law. Much of American water law — particularly in the

movement and course of such waters . . . are so secret, occult, and concealed . . . an attempt to administer any sort of legal rules in respect to them would be involved in hopeless uncertainty, and would be, therefore, practically impossible.”). Nineteenth-century commitments to laissez-faire political ideologies also slowed the development of groundwater use regulation. See MORTON J. HORWITZ, *THE TRANSFORMATION OF AMERICAN LAW, 1780-1860*, at 105 (1977).

⁴⁷ See Owen, *Taking Groundwater*, *supra* note 44, at 268-69.

⁴⁸ See *Public-Supply Water Use*, U.S. GEOLOGICAL SURV., <http://water.usgs.gov/edu/wups.html> (last visited July 6, 2016) (showing data on sources of water supply). This is less likely to be true in rural areas, where many people rely on their own groundwater wells. See Owen, *Taking Groundwater*, *supra* note 44, at 254-55.

⁴⁹ See Barton H. Thompson, Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CALIF. L. REV. 671, 687 (1993) [hereinafter *Institutional Perspectives*].

⁵⁰ See THOMPSON ET AL., *supra* note 35, at 766-74.

⁵¹ In a series of cases, the United States Supreme Court held that one person/one vote principles do not apply to water districts, which instead can allocate voting rights on the basis of landownership. See *Ball v. James*, 451 U.S. 355, 371-72 (1981); *Salyer Land Co. v. Tulare Lake Basin Water Storage Dist.*, 410 U.S. 719, 733-74 (1973). Consequently, a water district can be dominated by a relatively small number of landowners even if it serves a relatively large population.

⁵² See, e.g., CAL. WATER CODE § 1375 (2016) (allowing new appropriations only if unappropriated water is available, and thus protecting existing appropriators).

⁵³ See Owen, *Environmental Dynamism*, *supra* note 11, at 1182-89.

West — evolved in an era when water that flowed to the ocean was viewed as water wasted, and when the United States Supreme Court might reprove great western rivers for “thrif[t]lessly dissipat[ing] their waters in the Pacific tides.”⁵⁴ Consequently, many water users — particularly farmers, who were among the first users on the scene,⁵⁵ and who often benefited from major federal infrastructure projects — appropriated enormous quantities of water, leaving scant flows in rivers and little new water for later-growing cities or towns.⁵⁶ With the advent of the environmental movement, and with the increasing urbanization of the nation, values and demands have shifted, often dramatically — but not everywhere.⁵⁷ The tension between the new users and the old now drives much of the work of water lawyers.

One other feature of American water law also bears mention, particularly in a paper about taxes. In the United States (and elsewhere in the world), water is generally subsidized, if not free.⁵⁸ That may sound surprising, for most people pay a water bill every month. But that water bill generally covers the cost — or, often, just part of the cost — of building, maintaining, and operating the infrastructure necessary to store, move, and treat water.⁵⁹ Unless we buy it in a plastic bottle, we generally pay nothing for water itself.⁶⁰

⁵⁴ *United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 728 (1950).

⁵⁵ To put the point a bit more precisely, western farmers were among the first *white* users on the scene. Native Americans had also been using water for centuries, and tensions between the old white uses and the very old Native American uses are also an important part of western water law. See, e.g., GEOFFREY O’GARA, *WHAT YOU SEE IN CLEAR WATER: LIFE ON THE WIND RIVER RESERVATION* (2000) (chronicling the long history of water conflict between Native Americans and white irrigators in Wyoming’s Wind River basin).

⁵⁶ See Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 ENVTL. L. 27, 42 (1996) [hereinafter *Common Wealth*] (arguing that traditional water law generated allocation patterns that have become harmful and obsolete).

⁵⁷ For a sweeping history of these changes in California, see generally NORRIS HUNDLEY, JR., *THE GREAT THIRST* (rev. ed. 2001).

⁵⁸ See Michael Hanemann, *The Economic Conception of Water*, in *WATER CRISIS: MYTH OR REALITY* 61, 74-76 (Peter P. Rogers et al. eds., 2006).

⁵⁹ See *id.*; Olmstead & Stavins, *supra* note 24, at 1 (“Urban water prices lie well below [long-run marginal cost] in many countries.”).

⁶⁰ To put the point more specifically, the price does not factor in the scarcity value of water. Hanemann, *supra* note 58, at 76. The exception to this principle is that purchasers of property with water rights will generally pay the seller for the value of those rights. See Ellen Hanak et al., *Myths of California Water: Implications and Reality*, 16 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 3, 21 (2010). But neither the purchaser nor the seller will ever have paid the public for the ability to pump water.

B. Tax Law 101

Every year, the United States federal government collects well over a trillion dollars in taxes.⁶¹ State and local governments collect over a trillion dollars more.⁶² These taxes fund the lion's share of governmental activity in the United States, and thus play a constitutive role in creating our nation and defining our politics.⁶³ The law of taxation is just as complicated as one might expect from the scale of the enterprise. At the federal level, the Internal Revenue Code defines tax law, along with the IRS's many implementing regulations, guidance documents, advice letters, and other formal and informal modes of communicating tax law principles and rules.⁶⁴ Each state has its own tax code, and taxation is also a key part of local government law.⁶⁵

The United States' most important tax is the federal income tax, which applies to both individuals and corporations.⁶⁶ Within the income tax system, the federal government gives preferential rates to capital gains on investments.⁶⁷ The estate tax also gives the federal government a share of particularly large bequests.⁶⁸ As politicians frequently remind us, federal tax requirements are generally riddled with exemptions and deductions, all designed, in theory, to create a fairer and more economically sensible tax system.⁶⁹ The collateral effect of those exemptions, however, is to create a tax system widely reviled for its complexity.⁷⁰

State taxes are in some ways similar to the federal system and in some ways quite different. Most states also have income taxes, though

⁶¹ For statistics, see *Amount of Revenue by Source*, TAX POL'Y CTR. (Feb. 4, 2015), <http://www.taxpolicycenter.org/statistics/amount-revenue-source>.

⁶² See *Quarterly Summary of State and Local Tax Revenue*, U.S. CENSUS BUREAU, <http://www.census.gov/govs/qtax/> (last visited July 6, 2016).

⁶³ See SLEMROD & BAKIJA, *supra* note 16, at 2 (“[Taxation] is the aspect of government that directly affects more people than any other.”).

⁶⁴ See *Tax Code, Regulations, and Official Guidance*, IRS, <https://www.irs.gov/tax-professionals/tax-code-regulations-and-official-guidance> (last visited July 11, 2016).

⁶⁵ See MICHAEL J. GRAETZ & DEBORAH H. SCHENK, *FEDERAL INCOME TAXATION: PRINCIPLES AND POLICIES 15-16* (7th ed. 2015) (discussing state and local taxes).

⁶⁶ See TAX POL'Y CTR., *supra* note 61 (showing amounts collected).

⁶⁷ See *Ten Important Facts about Capital Gains and Losses*, IRS (Feb. 18, 2011), <https://www.irs.gov/uac/ten-important-facts-about-capital-gains-and-losses>.

⁶⁸ See *Estate Tax*, IRS, <https://www.irs.gov/businesses/small-businesses-self-employed/estate-tax> (last updated Oct. 28, 2016) (stating thresholds for estate tax requirements); SLEMROD & BAKIJA, *supra* note 16, at 14 (showing sources of federal revenue).

⁶⁹ See SLEMROD & BAKIJA, *supra* note 16, at 165.

⁷⁰ See *id.* at 3, 4 (“The cost of such complexity is staggering.”).

state tax rates are lower than the federal rates for comparable income brackets.⁷¹ Most states also use sales taxes as a significant revenue source.⁷² Local governments in most states tax real property, and those property taxes provide a key revenue source for education and other local government functions.⁷³ Like federal taxes, state taxes are often subject to multiple exemptions. And unlike federal taxes, which Congress holds relatively unfettered power to enact, many states have constitutional limitations on their governments' ability to raise old taxes or to impose new ones.⁷⁴

At the most general level, the reasons for all of this taxation are uncontroversial. As James Madison once put it, “[t]he power of taxing people and their property is essential to the very existence of government,” and most people would readily agree that the unpleasant alternative to government is a Hobbesian state of nature.⁷⁵ But agreement on that general principle does not resolve the more thorny questions about how much taxation should occur, what should be taxed, and from whom those taxes should be collected. Those questions capture the basic policy debates of tax law, and there are a variety of ways of coming to answers. One approach frames tax issues as questions of justice and fairness.⁷⁶ So, for example, a person might argue that taxation is wrong because it is essentially a confiscation of property,⁷⁷ or that it is right because paying taxes fulfills a social contract shared among members of society.⁷⁸ Another approach to tax questions focuses on economic utility and administrability.⁷⁹ For that

⁷¹ See Jared Walczak, *State Individual Income Tax Rates and Brackets for 2015*, Tax Found. (Apr. 15, 2015), <http://taxfoundation.org/article/state-individual-income-tax-rates-and-brackets-2015>.

⁷² See Scott Drenkard & Nicole Kaeding, *State and Local Sales Tax Rates in 2016*, TAX FOUND. (Mar. 9, 2016), <http://taxfoundation.org/article/state-and-local-sales-tax-rates-2016>.

⁷³ See generally Richard Briffault, *Our Localism: Part I — The Structure of Local Government Law*, 90 COLUM. L. REV. 1 (1990) (explaining connections between property taxation, local zoning, education, and inequality).

⁷⁴ See, e.g., CAL. CONST. art. XIII A (limiting overall property tax rates and the rate at which tax assessments for individual properties can increase).

⁷⁵ *Tax Quotes*, IRS, <https://www.irs.gov/uac/tax-quotes> (last visited June 1, 2016).

⁷⁶ See SLEMROD & BAKIJA, *supra* note 16, at 57-98.

⁷⁷ E.g., RICHARD A. EPSTEIN, *TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN* 283-305 (1985).

⁷⁸ For arguments grounded in justice and the constitutive role of taxation in creating an economy and society, see, for example, LIAM MURPHY & THOMAS NAGEL, *THE MYTH OF OWNERSHIP: TAXES AND JUSTICE* (2002).

⁷⁹ E.g., Roland Benabou, *Unequal Societies: Income Distribution and the Social Contract*, 90 AM. ECON. REV. 96, 97 (2000); see SLEMROD & BAKIJA, *supra* note 16, at

latter framing, the key questions are whether a tax will create incentives that maximize aggregate wealth and whether that tax actually can be collected in an efficient and consistent way.⁸⁰

C. Where Water and Taxes Meet

So how do those two systems intersect? The most striking feature of tax law's treatment of water rights is how little treatment there actually is. The phrase "water right" does not appear in the United States Internal Revenue Code. It is similarly absent from the tax codes of many states,⁸¹ and those states that do discuss water consumption in their tax codes generally do so briefly.⁸² On a few occasions, state legislators have proposed more comprehensive taxation schemes for water rights, but they have not been enacted.⁸³ Nevertheless, intersections do exist, and the paragraphs that follow survey key ways in which federal and state tax laws in the United States affect water policy.⁸⁴

1. Water and Property Taxes

The most significant area of overlap between water law and tax law is property rights taxation.⁸⁵ Real property is taxed in every state, and

99-188.

⁸⁰ See Benabou, *supra* note 79, at 97.

⁸¹ It also is largely absent from state constitutions, though Utah does have a constitutional provision expressly exempting water rights from property taxation. See UTAH CONST. art. XIII, § 3.

⁸² As one might expect, western states are more likely to have tax provisions tied to water use. See, e.g., ARIZ. REV. STAT. § 43-1090.01 (2014), *repealed by* Laws 2014, Ch. 245, § 21 (allowing tax credits for the installation of water conservation systems); COLO. REV. STAT. ANN. § 39-22-533 (2017) (allowing a tax credit for donations of water rights to instream flow).

⁸³ See, e.g., California Water Resources Investment Act of 2011, S.B. 34, 2011-2012 Sess. (Cal. 2011), http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB34 (containing text of a never-enacted bill that would have required all water suppliers to include volume- or acreage-based water charges). For narrower, and also-unsuccessful, efforts, see, for example, Scott Thistle, *Tax for Bottled Water Companies Faces Struggle in Maine Legislature*, LEWISTON SUN-J., Mar. 11, 2015.

In the 1960s, California considered a constitutional amendment that would have banned water taxation, but that, too, was not adopted. See Brewer, *supra* note 14, at 622.

⁸⁴ My selection of tax provisions comes with a caveat: these are tax code provisions with particularly strong relationships to water use. In one sense, every tax code provision that affects the overall level of economic activity also affects water use. But for purposes of maintaining some focus, this Part does not address every causal relationship, no matter how attenuated, between tax code provisions and water use.

⁸⁵ See Moses & Witten, *supra* note 14, at 476.

in many parts of the country, access to water is a significant factor in the valuation of land.⁸⁶ In the West, for example, a parcel of agricultural land with associated senior water rights should be much more valuable than an otherwise similar parcel with junior rights.⁸⁷ Similarly, a residential or commercial developer is likely to place less value on a parcel of land that lacks access to municipal water supplies.⁸⁸ For that reason, it is not actually accurate to say, as my hypothetical water lawyer did, that water rights and water access are not taxed. They are, and in some areas, most property taxation is really water taxation.⁸⁹

But the use of taxes on land as a vehicle for indirect taxation of water has several intriguing implications. First, and most importantly, property taxes focus on *access* to water, not actual *use* of water.⁹⁰ Two suburban parcels with equivalent water access are likely to be treated exactly the same (assuming all other things are equal), even if one owner's sprinklers routinely douse his lawns and gardens while his neighbor's xeriscaped garden requires hardly any water at all.⁹¹ Similarly, two similar agricultural parcels with otherwise equivalent water rights will pay the same amount of taxes even if one owner actually uses half as much water to irrigate her crops. Indeed, if that second owner sells some of the conserved water, and thus turns it into a secondary income stream, she actually will pay more taxes, because

⁸⁶ See Allan Jenkins et al., *Water Rights and Land Values in the West-Central Plains*, 17 GREAT PLAINS RES. 101, 109-10 (2007) (finding a significant contribution from water rights to land values, and summarizing other studies reaching similar conclusions).

⁸⁷ See DANIEL BRENT, THE VALUE OF HETEROGENEOUS WATER RIGHTS: THE COSTS OF WATER VOLATILITY (2013), http://ageconsearch.umn.edu/bitstream/149698/2/Brent_WaterRights_AAEA.pdf (finding that farmers in Washington's Yakima Valley will pay nine to twelve percent more for properties with senior water rights).

⁸⁸ While my focus here is water consumption, recreational and visual water access also are important factors in valuations of land. See Andy Krause, *What Is Waterfront Worth?*, ZILLOW (Sept. 11, 2014), <http://www.zillow.com/research/what-is-waterfront-worth-7540/> ("Nationally, waterfront homes are worth more than double of the value of homes overall.").

⁸⁹ See *City & Cty. of S.F. v. Alameda County*, 54 P.2d 462, 464 (Cal. 1936) ("In some cases the value of the land severed from the water right might well be negligible for taxing purposes.").

⁹⁰ See Moses & Witten, *supra* note 14, at 481-84 (describing older cases that upheld tax assessments that incorporated the value of unexercised water rights).

⁹¹ Xeriscaping means landscaping with plants that require relatively little water. See U.S. ENVTL. PROT. AGENCY, WATER-SMART LANDSCAPES 4 (2013).

her water right now will generate more income as well as lending value to her property.⁹²

A second implication is that exemptions from property rights taxation also become exemptions from water taxation. In the United States, thousands of entities do not pay property taxes.⁹³ Some of those entities — like college campuses and public golf courses — use large quantities of water to keep their grass green, but they escape even indirect taxes on the value their properties receive from water consumption.⁹⁴ Other entities, though not fully exempt, have reduced liability. For example, some states provide property tax incentives designed to keep land in agricultural use.⁹⁵ To the extent those incentives lower property tax assessments below market rates, they also provide indirect tax breaks for water access.

Third, and relatedly, using property taxation as a vehicle for water taxation has important implications for the overall rates of water taxes. Many states have constitutional limits on the rates at which property taxes may change.⁹⁶ California is a prominent example; taxes on all forms of property — including agricultural property — may rise by only two percent each year, even if the market value of that property has increased to a much greater extent, and only when the property is sold may assessments reset.⁹⁷ The net result is an enormous shift in tax burdens from longtime property owners to recent purchasers, and owners of agricultural land with established water rights benefit just as

⁹² See Kuhnle, *supra* note 14, at 543-44. She will also make more money, so paying additional taxes may not seem so bad.

⁹³ See, e.g., N.Y. ST. DEPT. OF TAXATION & FIN., ASSESSOR'S MANUAL, EXEMPTION ADMINISTRATION: SUBJECT INDEX § 2.01, https://www.tax.ny.gov/research/property/assess/manuals/vol4/pt1/section2/sec2_01.htm (last updated Jan. 15, 2015) (providing a long list of exemptions from property taxation); *Exemptions*, CAL. ST. BD. EQUALIZATION, <https://www.boe.ca.gov/proptaxes/exempt.htm> (last visited July 11, 2016).

⁹⁴ See, e.g., *Cincinnati v. Testa*, 38 N.E.3d 847, 847 (Ohio 2015) (upholding property tax exemptions for a public golf course that was managed by a private entity).

⁹⁵ See, e.g., NEB. REV. STAT. § 77-201 (2016) (stating that all agricultural land shall be valued, for property tax purposes, at seventy-five percent of market value); *The Land Conservation Act*, CAL. DEPT. CONSERVATION, <http://www.conservation.ca.gov/dlrp/lca> (last visited July 11, 2016) (describing California's Williamson Act, which gives preferential tax treatment to agricultural and open space lands).

⁹⁶ See Benjamin H. Harris & Brian David Moore, *Residential Property Taxes in the United States*, URBAN-BROOKINGS TAX POL'Y CTR. 1 (Nov. 18, 2013), <http://www.brookings.edu/~media/research/files/papers/2013/11/18-residential-property-taxes/18-residential-property-taxes-harris.pdf> ("Virtually all states have statutes limiting the scope of the property tax . . .").

⁹⁷ See *Nordlinger v. Hahn*, 505 U.S. 1, 4-5 (1992) (describing Proposition 13).

much from that shift as longtime homeowners.⁹⁸ Even in many places that lack California's formal restraints, a combination of tradition, politics, and tax assessors' discretion keeps property tax assessments well below market values, and those lowered assessments also reduce whatever portion of a property tax bill would be attributable to water access or rights.⁹⁹ A variety of mechanisms designed to keep property taxes low thus benefits water users.

Taxing water by taxing land also means a hidden but important institutional choice. Assessments of the value of water access and water rights are generally done by tax assessors, who are trained primarily to value land. Yet in some circumstances, the valuation of water rights will raise highly complex questions, many of which would challenge even an experienced water lawyer. How should the relative seniority of different rights be valued?¹⁰⁰ How should uncertainties associated with potential future environmental restrictions, or with climate change, affect the valuation of the land to which water rights attach?¹⁰¹ These are thorny issues, but existing guidance on water rights valuation gives them only cursory treatment.¹⁰²

There are also advantages to folding water rights taxation into the taxation of real property. Most importantly, it avoids — sometimes — the necessity of placing separate values on land and water rights, when in reality the value of each is often intertwined.¹⁰³ A separate system of water rights taxation also could create its own issues with exempt

⁹⁸ See CAL. CONST. art. XIII A (referring to all “real property”).

⁹⁹ See Jay Romano, *Market vs. Appraisal: What's the Real Value?*, N.Y. TIMES (Aug. 8, 2004), <http://www.nytimes.com/2004/08/08/realestate/your-home-market-vs-appraisal-what-s-the-real-value.html> (noting common disparities between market and assessed value).

¹⁰⁰ See BRENT, *supra* note 87 (estimating the value of seniority).

¹⁰¹ For example, water deliveries by California's major federal and state water projects have fluctuated drastically in recent years, partly in response to environmental restrictions but primarily in response to warmer and dryer weather. See Jim Carlton, *California Cuts Water Delivery in Drought*, WALL STREET J. (Jan. 31, 2014, 6:52 PM), <http://www.wsj.com/articles/SB10001424052702303743604579355241804705208>; Paul Rogers, *California Drought: Feds Say Farmers Won't Get Any Central Valley Project Water This Year*, SAN JOSE MERCURY-NEWS (Feb. 21, 2014, 7:00 AM), <http://www.mercurynews.com/2014/02/21/california-drought-feds-say-farmers-wont-get-any-central-valley-project-water-this-year/>.

¹⁰² See, e.g., CAL. ST. BD. OF EQUALIZATION, ASSESSORS' HANDBOOK §542, PART II: ASSESSMENT OF WATER RIGHTS (2000) (providing very little information about how water right uncertainties should be valued).

¹⁰³ See *supra* notes 86–89 and accompanying text. Separate valuations can become necessary when water rights are conveyed separately from land. See *Gladden v. C.I.R.*, 262 F.3d 851, 854–55 (9th Cir. 2001) (holding that the cost basis for a water right could be separated from that of the appurtenant land).

entities. Many water distributors are governmental entities that might be exempt from local taxation.¹⁰⁴ The United States Bureau of Reclamation, for example, is the largest holder of water rights in the American West, but the Supremacy Clause of the United States Constitution protects it from state or local taxation.¹⁰⁵ By taxing the Bureau of Reclamation's property-owning end users on the value of their water access, state and local governments do receive some value from the private benefits that the Bureau of Reclamation provides. Nevertheless, the bottom line is that taxing water primarily by taxing land keeps those water taxes low and offers only limited incentives to conserve.

2. Water and Income Taxation

While property taxes are particularly important to local government, the most important federal tax is the income tax. And the income tax system is not completely indifferent to water use. Among the federal income tax system's many exemptions and deductions, a few provisions specifically target water, and several other provisions have indirect consequences for water consumption. Nevertheless, as with property taxation, those intersections do not reflect any sort of coordinated plan or policy objective, and some create strange or even perverse consequences.¹⁰⁶

a. Water Conservation Deductions

One of the few federal tax code provisions to directly target water use is Internal Revenue Code section 175, which encourages soil and water conservation. Specifically, section 175 allows "[a] taxpayer engaged in the business of farming" to deduct "expenditures . . . for

¹⁰⁴ See *supra* notes 93–95 and accompanying text (describing property tax exemptions).

¹⁰⁵ See *Cal. Farm Bureau Fed'n v. Cal. State Water Res. Control Bd.*, 247 P.3d 112, 127 (Cal. 2011) (noting that the Bureau of Reclamation holds such immunity).

¹⁰⁶ The most curious intersection, which I do not address in depth, is a limited authorization for landowning farmers to treat groundwater drawdown beneath their land as a business loss. See *United States v. Shurbet*, 347 F.2d 103, 104 (5th Cir. 1965). The anti-conservation incentive is obvious: the deduction gives a tax advantage to those who quickly deplete the aquifer beneath their land. The IRS has interpreted *Shurbet* as applying only to landowners over the Ogallala Aquifer, a massive — and famously depleted — aquifer stretching from the Texas Panhandle to Nebraska. See DEPT. OF REVENUE, IRS, PUBLICATION 225: FARMER'S TAX GUIDE FOR USE IN PREPARING 2015 TAX RETURNS 108 (2015); *Groundwater Depletion*, U.S. GEOLOGICAL SURV., <http://water.usgs.gov/edu/gwdepletion.html> (last visited July 10, 2016).

the purpose of soil or water conservation,” so long as the work done is consistent with a governmentally-approved soil or water conservation plan.¹⁰⁷

That may appear to be a direct and powerful incentive to reduce water use, but things are not always as they seem. Clearly section 175 authorizes income tax deductions for a farmer who — to provide one possible example — lines earthen irrigation ditches with impermeable plastic to prevent seepage losses.¹⁰⁸ The section, therefore, provides incentives for greater efficiency. But in water parlance, the term “conservation” has had a chameleonic history. In the 1950s, when Congress first enacted section 175, most western water users believed conserving water meant storing it behind dams so it could be put to use, not letting it flow, wasted, through rivers and into the sea.¹⁰⁹ In accordance with that perception, farmers could, and at least sometimes did, claim section 175 deductions for actions that would actually increase water use, like converting a dryland farm to irrigated agriculture.¹¹⁰

Whether present-day section 175 deductions are similarly used is a difficult question to answer. The IRS does not compile data on specific uses of section 175 deductions, and that absence of data suggests that section 175 is not particularly important in practice, at least in the IRS’s view. The Joint Committee on Taxation does publish aggregate data — section 175 deductions create a total tax expenditure of approximately 120 million dollars per year — but again does not break that down into specific uses.¹¹¹ The most one can confidently conclude is that section 175 might provide modestly consequential incentives for increased water consumption or for decreased water consumption — or both.

¹⁰⁷ 26 U.S.C. § 175(a) (2012). Section 175 also allows deductions for expenses incurred to implement endangered species recovery plans. *See id.*

¹⁰⁸ Many western irrigators have traditionally used dirt-bottomed ditches to distribute water. Water then seeps through the bottom of the ditch, and the losses can be substantial.

¹⁰⁹ *See, e.g., United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 728 (1950) (describing the tendency of California’s rivers to “thriftlessly dissipate” their “wasting treasures” into the ocean as a “perversity of nature”).

¹¹⁰ *See Behring v. C.I.R.*, 32 T.C. 1256, 1260 (1959) (“The Commissioner concedes that a farmer who decides to switch from dry farming to wet farming by installing irrigation facilities can deduct the expenditures under section 175.”).

¹¹¹ *See* STAFF OF J. COMM. ON TAX’N, 114TH CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2015-2019, at 31 (Comm. Print 2015).

b. *Water and the Domestic Production Tax Credit*

The Internal Revenue Code's other direct reference to water comes in section 199, a sweeping provision designed to encourage domestic economic productivity.¹¹² In accordance with that purpose, section 199 allows producers of a wide variety of commodities, including, curiously, "potable water," to deduct a percentage of their receipts on that commodity from their income taxes.¹¹³

Section 199 provides a clear incentive for increased water use. By making potable water less expensive to produce, it will either increase the profits for private firms that deliver water, making the business of water delivery more enticing to enter, or lower the costs end users pay for their water, reducing financial impediments to water purchases.¹¹⁴

Nevertheless, that economic signal probably exerts only a minor influence on aggregate levels of water use.¹¹⁵ The deduction applies only to deliveries of potable water by private entities with positive income balances, and that description only applies to a small percentage of American water use. The United States' primary water uses are irrigated agriculture and industrial cooling water, and both typically use non-potable water.¹¹⁶ Among potable water users, the vast majority receive their water from public entities, and many private water delivery companies are non-profit entities (and for-profit entities do not always make profits).¹¹⁷ For a private and profitable water company, section 199 can generate significant changes in tax

¹¹² See 26 U.S.C. § 199 (2012). For general discussion of section 199 and its consequences, see Jennifer Blouin et al., *The Effect of the Domestic Production Activities Deduction on Corporate Payout Behavior*, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1092222.

¹¹³ 26 U.S.C. § 199(c)(4)(A)(i)(III). The inclusion of potable water is curious because the overall purpose of section 199 was to encourage domestic production of commodities traded on global markets, and, with the minor exception of bottled water sold by a few companies like Perrier, hardly any of the potable water consumed in the United States comes from foreign sources.

¹¹⁴ For more detailed discussion of consumers' responses to changes in water pricing, see *infra* notes 191–201 and accompanying text.

¹¹⁵ For that reason, section 199 may drive levels of water use more by influencing overall levels of economic activity than by encouraging the production of potable water.

¹¹⁶ See *Water Use in the United States: Total Water Use*, U.S. GEOLOGICAL SURV. <http://water.usgs.gov/watuse/wuto.html> (last modified May 2, 2016).

¹¹⁷ See Craig Anthony (Tony) Arnold, *Water Privatization Trends in the United States: Human Rights, National Security, and Public Stewardship*, 33 WM. & MARY ENVT'L. L. & POL'Y REV. 785, 791 (2009) (noting that a small (but growing) percentage of water supply is handled by private companies).

liability.¹¹⁸ But from a water policy perspective, the importance of section 199's coverage of potable water is probably rather modest.

c. Water and Mortgage Interest Deductions

Among the many income tax provisions that indirectly impact water use, the most important is probably the mortgage interest deduction. Internal Revenue Code Section 163(h)(3) allows homeowners to deduct the interest they pay on mortgages.¹¹⁹ As a recent National Research Council report explains, “because the subsidy lowers the cost of housing, it makes it easier for families and individuals to own more or larger houses.”¹²⁰ Owning more or larger homes generally means consuming more water. Single family homeowners tend to use more water than apartment owners, and large homes on large lots tend to consume more water than small homes on small lots.¹²¹ So any tax incentive that encourages sprawling development — and many commentators argue that the mortgage interest deduction does so — will also encourage water use.¹²²

Again, however, the extent of that impact is difficult to discern, largely because the extent to which the mortgage interest deduction influences housing patterns is unclear.¹²³ While it lowers homeowners' tax liability — if those homeowners are wealthy enough to itemize

¹¹⁸ See, e.g., *In re Application by Aqua N.C., Inc.*, No. W-218 Sub 319, 2011 WL 5345238 (N.C. Utils. Comm'n 2011) (finding that a utility would be eligible for an \$85,246 section 199 deduction).

¹¹⁹ 26 U.S.C. § 163(h)(3) (2012).

¹²⁰ COMM. ON THE EFFECTS OF PROVISIONS IN THE INTERNAL REVENUE CODE ON GREENHOUSE GAS EMISSIONS, EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS 31 (William D. Nordhaus et al. eds., 2013) [hereinafter EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS].

¹²¹ See Ellen Hanak & Matthew Davis, *Lawns and Water Demand in California*, 2 CAL. ECON. POL'Y 1, 3 (2006).

¹²² See, e.g., Roberta F. Mann, *The (Not So) Little House on the Prairie: The Hidden Costs of the Home Mortgage Interest Deduction*, 32 ARIZ. ST. L.J. 1347, 1350-51, 1378-82 (2000). The National Research Council report on greenhouse gases and the tax code illustrates the difficulties of calculating the environmental consequences of the mortgage income deduction. The committee found few prior studies that attempted to model those relationships, and their own modeling showed that eliminating the deduction might actually increase greenhouse gas emissions, largely because removing the deduction could increase overall economic output. See EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS, *supra* note 120, at 127-28. But the committee also noted that their model could not take into account several key variables, like the effect of the deduction on housing size and driving patterns. See *id.* at 128.

¹²³ See SLEMROD & BAKIJA, *supra* note 16, at 221-22 (noting questions about whether the deduction actually succeeds in encouraging homeownership).

deductions — home buyers and sellers typically factor the deduction into sale prices, and buyers therefore pay more for homes, negating some of the homeownership incentives the deduction otherwise might produce.¹²⁴ Additionally, many other factors, like consumer preferences, zoning restrictions, racial and class divisions, government subsidies for road construction, and population growth have helped advance the suburbanization of America.¹²⁵ That suburbanization clearly has increased water use, but the mortgage income deduction is at most only a partial cause of the changes.

d. The Tax Implications of Water Transfers and Donations

In addition to encouraging or discouraging aggregate levels of water use, tax provisions also may affect exchanges of water. The most likely impacts fall upon transfers between consumptive water users and on donations of water rights to conservation organizations. But here, again, the importance of the incentives is difficult to discern and, probably, minor.

i. Consumer-to-consumer transfers

In recent decades, water transfers have become increasingly important to water policy and law.¹²⁶ These transfers typically come in several forms. Sometimes a transferor will sell its water rights to a transferee.¹²⁷ Often, for example, agricultural users with senior rights will sell those rights to growing cities.¹²⁸ In other exchanges, the transferee will pay for the ability to use water while the transferor retains the underlying right, much like a renter paying for the right to use a landlord's house.¹²⁹ And sometimes the parties will negotiate some form of option contract, under which the purchaser pays the right-holder an annual fee and obtains, in return, the right to lease or

¹²⁴ For questions about how much the deduction actually encourages homeownership, see EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS, *supra* note 120, at 125.

¹²⁵ See Jeremy R. Meredith, Note, *Sprawl and the New Urbanist Solution*, 89 VA. L. REV. 447, 466-78 (2003) (summarizing the literature on causes of sprawl).

¹²⁶ See generally W. GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13 (summarizing trends and issues in water trading).

¹²⁷ See, e.g., Jesse Reiblich & Christine A. Klein, *Climate Change and Water Transfers*, 41 PEPP. L. REV. 439, 450 (2014).

¹²⁸ See Thompson, *Institutional Perspectives*, *supra* note 49, at 701-02 (describing the reasons for agricultural-urban transfers).

¹²⁹ See Kuhnle, *supra* note 14, at 549 (discussing transferor's reservation of control when licensing water rights).

purchase water at a fixed price when the need later arises (typically during a period of drought).¹³⁰ Water law once disfavored these kinds of exchanges, but most western states have enacted reforms designed to encourage transfers, on the general theory that mutually agreeable exchanges offer a better way to reallocate water than regulatory intervention or private litigation.¹³¹

The form of these transfers has tax implications. If a seller conveys the underlying water right, it must pay capital gains tax on any appreciation in the value of that right, but it may also pay reduced property taxes because of the lowered value of its land.¹³² If, on the other hand, the seller retains the underlying right but sells access to the water, it has created a new income stream.¹³³ A water right sale therefore can generate a larger one-time tax bill. But because ordinary income tax rates are typically higher than capital gains tax rates, there are long-term advantages to structuring the deal as a right sale rather than as a transfer of water.¹³⁴

But while these incentives exist, there is scant evidence that they matter much. With rare exceptions, the abundant legal literature on water transfers says hardly anything about taxes.¹³⁵ In practice, potential transferors seem far more concerned about the procedural hurdles — which can be significant — associated with obtaining governmental approvals of transfers.¹³⁶

¹³⁰ See CLAIRE D. TOMKINS ET AL., WOODS INST. FOR THE ENV'T, MANAGING WATER SUPPLY UNCERTAINTY: OPTION CONTRACTS AND SHORT-TERM WATER TRANSFERS IN CALIFORNIA, 4-6 (2008), <http://woods.stanford.edu/sites/default/files/files/200809-Policy-Brief-1-Option-Contracts.pdf>.

¹³¹ See W. GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13, at 11-12, 29 (describing policy arguments favoring water transfers); Reiblich & Klein, *supra* note 127, at 448-49 (describing growing support for water transfers).

¹³² See Kuhnle, *supra* note 14, at 544-45 (noting that the IRS determines value of the water by subtracting the fair market value of the dry land from the sale price, indicating the land has lost value).

¹³³ See CAL. ST. BD. OF EQUALIZATION, *supra* note 102, at 7 (explaining that most water transfers do not involve actual conveyances of property); Kuhnle, *supra* note 14, at 543-44.

¹³⁴ Kuhnle, *supra* note 14, at 547 (giving a hypothetical showing that considering revenue from water sale as capital gains can reduce the seller's income taxes by nearly 50 percent).

¹³⁵ The only academic publication to address the subject is Kuhnle, *supra* note 14. And even Kuhnle observes that the tax implications of water transfers are "[l]argely overlooked." *Id.* at 536.

¹³⁶ See W. GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13, at 36 (noting the importance of transaction costs).

ii. Conservation transfers

A somewhat thornier and more important tax issue arises with water transfers from consumptive users to entities — often environmental organizations — that wish to keep water in rivers or streams. Like transfers among consumptive water users, these conservation-oriented transfers have become increasingly popular, and more legally accepted, in recent decades.¹³⁷ Some conservation advocates and many water right holders argue that voluntary transfers are a much better way to secure environmental flows than regulatory interventions or citizen lawsuits.¹³⁸

This emergence of water conservation transfers parallels the explosive growth of conservation-oriented transfers of land. Since the 1970s, land trusts have purchased millions of acres of fee simple ownership rights and conservation easements.¹³⁹ While altruistic motivations play a part in these deals, the Internal Revenue Code also helps.¹⁴⁰ Section 170 allows landowners to claim charitable deductions for donations to conservation groups, and landowners now claim over a billion dollars in such tax deductions in an average year.¹⁴¹

Whether similar federal tax incentives are available for water transfers is not clear.¹⁴² Internal Revenue Code subsection 170(f)(3)(A) limits taxpayers' ability to claim deductions for donations of partial interests in property.¹⁴³ That clearly eliminates deductions for some types of water donations; a temporary donation, for example, would not qualify.¹⁴⁴ And even the status of long-term

¹³⁷ See *id.* at 26.

¹³⁸ See Barton H. Thompson, Jr., *Markets for Nature*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 261, 272-76 (2000) [hereinafter *Markets for Nature*] (describing arguments favoring water acquisitions as a protective strategy, as well as some associated concerns).

¹³⁹ See *Private Lands Conservation: Conservation Easements*, NATURE CONSERVANCY, <http://www.nature.org/about-us/private-lands-conservation/conservation-easements/> (last visited Feb. 8, 2017) (describing millions of acres of protection by The Nature Conservancy alone).

¹⁴⁰ For discussion of the growth — and growing pains — of the land conservation movement, see Nancy A. McLaughlin, *Perpetual Conservation Easements in the 21st Century: What Have We Learned and Where Should We Go From Here?*, 2013 UTAH L. REV. 687.

¹⁴¹ See *id.* at 716 (showing total numbers of donations and the average value of those donations).

¹⁴² In Colorado, a state tax incentive clearly is available. See COLO. REV. STAT. § 39-22-533 (2009).

¹⁴³ 26 U.S.C. § 170(f)(3)(A) (2012).

¹⁴⁴ See Mary Anne King, *Getting Our Feet Wet: An Introduction to Water Trusts*, 28 HARV. ENVTL. L. REV. 495, 512-13 (2004) (noting that most purchases of conservation

donations is somewhat uncertain. Because appropriative water rights are severable from particular parcels of land and may be transferred separately, some conservation groups have argued that the donation of an entire appropriative right should be deductible.¹⁴⁵ The IRS has not rejected that position, and a few taxpayers have claimed that deduction without their returns being challenged.¹⁴⁶ But the IRS also has declined, at least to date, to issue a revenue ruling affirming the availability of tax deductions for donations of appropriative rights. Even if it does issue such a ruling, it would apply only to appropriative rights; the status of donations of riparian rights is likely to remain ambiguous.¹⁴⁷ Consequently, one of the most powerful tax incentives for land conservation is available for water only on a limited and uncertain basis.¹⁴⁸

e. Efficiency Inconsistencies

A final area of interaction between federal income taxation and water consumption involves the tax treatment of efficiency rebates. That treatment is oddly paradoxical.

On the one hand, the Internal Revenue Code contains tax incentives designed to promote energy efficiency.¹⁴⁹ One of those incentive provisions — section 45M — encourages energy efficiency by encouraging water use efficiency.¹⁵⁰ The best way to make a washing machine or dishwasher more energy efficient is to make it use less water. Therefore, section 45M allows tax deductions only for washing

water have been short-term and, therefore, ineligible for federal tax deductions).

¹⁴⁵ See Letter from Tom Hicks et al., Res. Renewal Inst. to Assoc. Chief Counsel, IRS (Oct. 30, 2012) (on file with author).

¹⁴⁶ See Thomas Hicks, *An Interpretation of the Internal Revenue Code and Treasury Regulations Supporting the Tax Deductibility of the Voluntary Charitable Contribution in Perpetuity of a Partial Interest in an Appropriative or Riparian Water Right Transferred Instream for Conservation Purposes (with an Emphasis on California Water Law)*, 17 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 93, 106 (2011) (describing claimed deductions).

¹⁴⁷ Because traditional riparian rights were not severable from riparian parcels of land, the donation of a riparian right would probably be considered to be a donation of a partial interest. However, because many eastern states are moving away from traditional riparian systems and toward “regulated riparianism,” in which permit systems allocate rights with varying degrees of fealty to traditional riparian principles, the same arguments that favor deductions for appropriate right donations might also favor deductions for water right donations in some eastern states.

¹⁴⁸ See King, *supra* note 144, at 512 (“In practice, water trusts have been less successful than land trusts in using tax deductions to promote transactions.”).

¹⁴⁹ See, e.g., 26 U.S.C. § 45M (2012).

¹⁵⁰ See *id.*

machines and dishwashers that meet specific water use standards.¹⁵¹ The code thus actively encourages some steps to increase residential water use efficiency.

On the other hand, federal tax law undermines some state incentives for water use efficiency. In some states, homeowners can obtain rebates for tearing out lawns, replacing high-flush toilets, or installing other water efficiency technology.¹⁵² Those rebates not only serve the policy goal of increasing water use efficiency; they also save energy by lowering demand for pumped and treated water.¹⁵³ In other words, they serve the same policy goal as federal tax incentives for energy efficiency. But the IRS treats those state rebates as taxable income.¹⁵⁴ A homeowner who receives a rebate for installing a low-flow toilet, therefore, must send a substantial portion of that rebate to the federal government.¹⁵⁵

3. Water and Federal Excise Taxes

While income taxation may generate the longest list of intersections between tax law and water policy, the most important intersection, at least at the federal level, may come from a single exemption from one particular excise tax. To promote production of biofuels — and, ostensibly, to protect the environment¹⁵⁶ — the federal government provides an excise tax exemption for ethanol production.¹⁵⁷ That

¹⁵¹ See *id.* § 45M(b) (conditioning the eligibility of washing machines and dishwashers on low water consumption).

¹⁵² See, e.g., Cal. Dep't Water Res., SAVE OUR WATER: REBATES, <http://www.saveourwaterrebates.com/> (last visited July 11, 2016) (describing water efficiency rebates in California).

¹⁵³ See *Water-Energy Connection*, U.S. ENVTL. PROT. AGENCY, <https://www3.epa.gov/region9/waterinfrastructure/waterenergy.html> (last visited July 11, 2016) (“Saving [w]ater [s]aves [e]nergy.”).

¹⁵⁴ See Darryl Fears, *California's Drive to Save Water Is Killing Trees, Hurting Utilities and Raising Taxes*, WASH. POST (Feb. 27, 2016), https://www.washingtonpost.com/1bd88a50-d71d-11e5-b195-2e29a4e13425_story.html.

¹⁵⁵ This was one of the unpleasant surprises your author encountered while filling out his 2015 tax return.

¹⁵⁶ The environmental rationale for biofuels is that because the carbon they contain comes from the atmosphere (via plants), no aggregate increase in carbon will occur when that carbon goes back to the atmosphere. The reality can be more complicated. See *Lifecycle Analysis of Greenhouse Gases Under the Renewable Fuel Standard*, U.S. ENVTL. PROT. AGENCY (last updated Aug. 16, 2016), <https://www.epa.gov/renewable-fuel-standard-program/lifecycle-analysis-greenhouse-gas-emissions-under-renewable-fuel>.

¹⁵⁷ See 26 U.S.C. § 40 (2012); see *Federal Laws and Incentives for Ethanol*, U.S. DEP'T. ENERGY, ALT. FUELS DATA CTR., <http://www.afdc.energy.gov/fuels/laws/ETH/US> (last visited July 11, 2016) (excluding ethanol from a list of alternative fuels subject to

exemption encourages the growth of crops that produce ethanol, which, in the United States, means growing corn.¹⁵⁸ And the amount of corn grown for ethanol production is staggering. Corn occupies more of the United States' land than any other crop,¹⁵⁹ and more than one third of that corn produces ethanol.¹⁶⁰

But even with ethanol subsidies, the aggregate effects on water consumption are unclear. Some corn grows in areas where irrigation is necessary, but much of it grows in comparatively wet regions, where rainfall alone suffices to water fields.¹⁶¹ For that reason, there is not a direct, linear relationship between ethanol production and water diversions.¹⁶² Additionally, ethanol production is not solely attributable to the tax credit. Several other federal policies also encourage, or even mandate, biofuel production.¹⁶³ So while some water consumption almost certainly is attributable to the ethanol fuel mandate, exactly how much is far from clear.

In summary, tax law affects water use in a wide variety of ways, most of them inadvertent and probably no more than modestly consequential. A reasonable response to that conclusion might be to propose a series of reforms. Congress could expressly limit section 175 deductions to activities that reduce water consumption, for example, eliminate the section 199 deduction for potable water production, and clarify that charitable deductions are available for conservation-oriented donations of water rights. Similarly, water policy provides an additional reason for older reform proposals, like eliminating the mortgage interest deduction and the favorable tax treatment of

an excise tax).

¹⁵⁸ See Amy Diggs, *The Expiration of the Ethanol Tax Credit: An Analysis of Costs and Benefits*, 19 POL'Y PERSP. 47, 50 (2012) (“[C]orn makes up nearly all of the ethanol produced in the United States.”).

¹⁵⁹ See U.S. DEP'T. OF AGRIC., FARMS AND FARMLAND: NUMBERS, ACREAGE, OWNERSHIP, AND USE 2 (2014), https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farms_and_Farmland/Highlights_Farms_and_Farmland.pdf.

¹⁶⁰ Diggs, *supra* note 158, at 51 (providing statistics from 2010).

¹⁶¹ See Renee Cho, *Ethanol's Impacts on Our Water Resources*, COLUM. UNIV. STATE OF THE PLANET (Mar. 21, 2011), <http://blogs.ei.columbia.edu/2011/03/21/ethanol%E2%80%99s-impacts-on-our-water-resources/>.

¹⁶² This is particularly true because it is hard to determine whether fields currently used for ethanol would simply be used for other crops if the mandate disappeared, and because increased ethanol production may have pushed other crops to lands where they would not otherwise have been grown.

¹⁶³ See U.S. DEP'T. OF ENERGY, ALT. FUELS DATA CTR., *supra* note 157.

ethanol, for which proponents already have identified other compelling policy justifications.¹⁶⁴ Those are all sensible responses, but the analysis that follows instead asks whether lawmakers ought to do something more ambitious.

II. SHOULD WATER BE TAXED?

The central point of the previous section is that tax law in the United States is mostly indifferent to water consumption. This part confronts a larger question: should taxes be more of a part of water law? Would it be wise, in areas that already have complicated water law systems but also have continuing problems with water allocation, to add a tax on water use? And what about a state, or a country, where water law is not so developed? Should it build its system of water law around a water tax?

My answer to these questions is a qualified yes. The supporting argument rests on a series of steps, each explained in more detail below. First, and notwithstanding some of the grand old myths of water law, reducing water consumption is a desirable goal. Second, taxation would help achieve those reductions; water use is generally responsive to economic signals. Third, there are reasons why taxation could achieve those reductions more efficiently and more equitably than alternative modes of regulatory constraint — though, as I explain, those advantages are not compelling enough to justify a complete turn away from alternative regulatory approaches. Fourth, and finally, water use is the kind of thing a government would be justified in taxing. To many people, the idea of taxing water will seem puzzling or even inappropriate. But that sense of oddity would arise from novelty, and from a generalized and somewhat inchoate hostility toward all forms of taxation, not from any compelling policy argument against the taxation of water use.

A. *The Case for Water Conservation*

The basic premise of a Pigouvian tax scheme is that taxes ought to encourage socially desirable activities and to discourage activities that cause harm. But that principle raises a question: is water consumption really socially harmful? After all, as the California Supreme Court once

¹⁶⁴ See, e.g., Dennis J. Ventry, Jr., *The Accidental Deduction: A History and Critique of the Tax Subsidy for Mortgage Interest*, 73 *LAW & CONTEMP. PROBS.* 233, 278-79 (2010) (recording a litany of arguments against the mortgage interest deduction); Diggs, *supra* note 158, at 56 (concluding that the ethanol incentive should be allowed to expire).

proclaimed, “[t]he prosperity and habitability of much of this state requires the diversion of great quantities of water from its streams.”¹⁶⁵ California is hardly the only place that once adhered to this view. Human civilization arose around water diversion, and westerners, who were well aware of this reality, wrote provisions encouraging water use, or equating private exploitation of water with public benefit, into many of their state constitutions.¹⁶⁶ For decades after those constitutions went into effect, both the rhetoric of water use and the on-the-ground realities of water development reflected a sense that a river undammed and undiverted was a river wasted.¹⁶⁷ That ideology has long had its critics, and to many people today it seems obsolete.¹⁶⁸ But it also has continued adherents, and even staunch critics of traditional water ideologies would readily concede that societies must use water for sanitation, drinking, and the production of food.¹⁶⁹ A legal scheme that discourages water use, therefore, might seem, to some, to create exactly the wrong incentives.¹⁷⁰

But even if some water consumption is indispensable to any society’s prosperity and well-being, many places would be better off consuming less.¹⁷¹ In the American West, and in much of the rest of the world,

¹⁶⁵ Nat’l Audubon Soc’y v. Superior Court of Alpine Cty., 658 P.2d 709, 712 (Cal. 1983); see also Josh Patashnik, *Arizona v. California and the Equitable Apportionment of Interstate Waterways*, 56 ARIZ. L. REV. 1, 2-3 (2014) (crediting the United States Supreme Court, which ruled in Arizona’s favor in a dispute over Colorado River water, with enabling much of the state’s economic success).

¹⁶⁶ See, e.g., COLO. CONST. art. XVI, § 6 (“The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied.”); IDAHO CONST. art. XV, § 3 (same); WASH. CONST. art. XXI, § 1 (“The use of the waters of this state for irrigation, mining and manufacturing purposes shall be deemed a public use.”).

¹⁶⁷ Perhaps the clearest physical manifestation of this view is the Colorado River, which now rarely wastes any water upon the sea. See Henry Brean, *Colorado River Could Reach the Sea for the First Time in Decades*, L.V. REV.-J. (May 14, 2014, 2:18 PM), <http://www.reviewjournal.com/news/water-environment/colorado-river-could-reach-sea-first-time-decades>.

¹⁶⁸ See, e.g., Jeffrey Mount, *Water to the Sea Isn’t Wasted*, CAL. WATERBLOG (Mar. 1, 2011), <https://californiawaterblog.com/2011/03/01/water-to-the-sea-isnt-wasted/>.

¹⁶⁹ See, e.g., Devin Nunes, *It’s Fish Versus Farmers in the San Joaquin Valley*, WALL STREET J. (Aug. 14, 2009, 11:26 PM ET), <https://www.wsj.com/articles/SB10001424052970204619004574318621482123090> (lamenting that water “diverted” into rivers to protect fish “is now flowing underneath the Golden Gate Bridge and out into the Pacific Ocean.”).

¹⁷⁰ Increasing efficiency also can often have complex consequences on downstream water users who benefited from excessive use. See Dave Owen, *Overallocation, Conflict, and Water Transfers*, 9 ENVTL. RES. LETTERS 091005, at 1-2 (2014) [hereinafter *Overallocation*].

¹⁷¹ Both aggregate and per capita water consumption in the United States are

current water consumption levels simply cannot be sustained.¹⁷² For example, water levels in the Ogallala Aquifer, which supplies water to farmers from the Texas Panhandle to South Dakota, have been declining for decades, threatening the future of a huge and highly productive agricultural region.¹⁷³ California, to provide another example, is pumping much more groundwater than nature replenishes, especially during its current drought.¹⁷⁴ It cannot continue to do so unless people are willing to pay the massive energy costs associated with pumping and treating saline groundwater from deep below the earth's surface.¹⁷⁵ Similar problems pervade the southwest.¹⁷⁶ And global consumption of groundwater exceeds recharge by such a wide margin that the transfer of groundwater to land and, eventually, the seas is actually making the oceans measurably higher.¹⁷⁷ Surface water systems across much of the world are similarly overtaxed, with one recent study predicting that “by 2050, the population at risk of exposure to at least a moderate level of water stress could reach at least 5 billion people.”¹⁷⁸

All of this water use has problematic secondary consequences. Competition for scarce water resources generates political conflict and litigation.¹⁷⁹ In some places — a few in the United States, and many in

actually decreasing, so trends toward increased water scarcity are by no means universal. See Peter H. Gleick & Meena Palaniappan, *Peak Water Limits to Freshwater Withdrawal and Use*, 107 PROC. NAT'L ACAD. SCI. 11155, 11160 (2010). But they are pervasive enough to be very problematic.

¹⁷² See Peter H. Gleick, *Roadmap for Sustainable Water Resources in Southwestern North America*, 107 PROC. NAT'L ACAD. SCI. 21300, 21300 (2010).

¹⁷³ See Ian James & Steve Reilly, *Pumped Beyond Limits, Many U.S. Aquifers in Decline*, DESERT SUN, Dec. 10, 2015, <http://www.desertsun.com/story/news/environment/2015/12/10/pumped-beyond-limits-many-us-aquifers-decline/76570380/>.

¹⁷⁴ See J. S. Famiglietti et al., *Satellites Measure Recent Rates of Groundwater Depletion in California's Central Valley*, 38 GEOPHYSICAL RES. LETTERS, no. L03403, Feb. 2011, at 1, 3-4 (2011) (warning — before the onset of the recent drought — of “dire consequences” of groundwater depletion).

¹⁷⁵ See Juliet Christian-Smith, *Leave California's 'New' Water in the Ground*, L.A. TIMES (July 6, 2016), <http://www.latimes.com/opinion/op-ed/la-oe-christian-smith-aquifers-california-20160706-snap-story.html>.

¹⁷⁶ See, e.g., ROBERT GLENNON, *WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS* (2002); Stephanie L. Castle et al., *Groundwater Depletion During Drought Threatens Future Water Security of the Colorado River Basin*, 41 GEOPHYSICAL RES. LETTERS 5904 (2014).

¹⁷⁷ See Leonard F. Konikow, *Contribution of Global Groundwater Depletion Since 1900 to Sea-Level Rise*, 38 GEOPHYSICAL RES. LETTERS, no. L17401, Sept. 2, 2011, at 1, 4-5.

¹⁷⁸ SCHLOSSER ET AL., *supra* note 3, at 24.

¹⁷⁹ See, e.g., *Westlands Water Dist. v. United States*, 337 F.3d 1092, 1100 (9th Cir. 2003) (“One of the most contentious issues in the western United States is the

the developing world — water scarcity takes a heavy toll on the poor, forcing them to spend more time and money procuring supplies or to rely on unsafe sources.¹⁸⁰ Indeed, in less stable parts of the world, some evidence suggests that water scarcity contributes to wars.¹⁸¹ Water consumption is also highly energy-intensive, and, therefore, often requires burning fossil fuels. This contributes to climate change, which then — among other consequences — tends to make water stress worse.¹⁸² Other environmental consequences of water use are also often drastic. Aquatic ecosystems around the world are chronically stressed, and water diversions are a primary cause.¹⁸³

Many of these consequences are avoidable. Large amounts of water go to uses — overwatering lawns,¹⁸⁴ using inefficient irrigation systems,¹⁸⁵ or generating animal feed,¹⁸⁶ — that could be reduced

management of water resources.”); Planning & Conservation League v. Dep’t. of Water Res., 100 Cal. Rptr. 2d 173, 185 (Ct. App. 2000) (“Shortage precipitates conflict.”).

¹⁸⁰ See, e.g., Faissal Tarrass & Meryem Benjelloun, *The Effects of Water Shortages on Health and Human Development*, 132 PERSP. PUB. HEALTH 240 (2012) (describing widespread and devastating effects of inadequate sanitation); Andrea Castillo, *Drought Disaster in East Porterville Turns to Budding Health Crisis*, FRESNO BEE (June 20, 2015), <http://www.fresnobee.com/news/local/water-and-drought/article25023559.html> (detailing the many health problems arising from water shortage).

¹⁸¹ See, e.g., Thomas L. Friedman, *Without Water, Revolution*, N.Y. TIMES, May 19, 2013, at SRI (describing Syria’s drought and its contribution to civil war). *But see* Vally Koubi et al., *Do Natural Resources Matter for Interstate and Intrastate Armed Conflict?*, 51 J. PEACE RES. 227, 228-29 (2013) (finding mixed evidence to support the hypothesis that water scarcity leads to conflict).

¹⁸² See CAL. DEP’T. OF WATER RES., *MANAGING FOR AN UNCERTAIN FUTURE: CLIMATE CHANGE ADAPTATION STRATEGIES FOR CALIFORNIA’S WATER* 8 (2008) (“[W]ater-related energy use in California also consumes approximately 20 percent of the state’s electricity, and 30 percent of the state’s non-power plant natural gas (i.e. natural gas not used to produce electricity).”).

¹⁸³ See Anthony Ricciardi & Joseph B. Rasmussen, *Extinction Rates of North American Freshwater Fauna*, 13 CONSERVATION BIOLOGY 1220, 1221-22 (1999) (finding high extinction rates for freshwater species); C.J. Vörösmarty et al., *Global Threats to Human Water Security and River Biodiversity*, 467 NATURE 555, 555 (2010).

¹⁸⁴ See U.S. ENVTL. PROT. AGENCY, *supra* note 8 (noting that as much as fifty percent of lawn irrigation is wasted).

¹⁸⁵ See Tianyi Zhang et al., *Adaptation of Irrigation Infrastructure on Irrigation Demands Under Future Drought in the United States*, 19 EARTH INTERACTIONS, Mar. 2015, at 1, 5 (“More than 60% of the irrigation areas in the west were surface irrigation systems with relatively less efficiency compared with eastern systems . . .”).

¹⁸⁶ See Mario Herrero et al., *Biomass Use, Production, Feed Efficiencies, and Greenhouse Gas Emissions from Global Livestock Systems*, 110 PROC. NAT’L ACAD. SCI. 20888, 20888 (2013) (noting that livestock production consumes one third of global freshwater withdrawals).

without any great loss of social welfare, and sometimes with collateral gains. Statistics on aggregate water use also suggest that many people consume much more water than they really need. There is no obvious reason, for example, why Americans need 37% more water, per capita, than Australians, or 461% more than Israelis.¹⁸⁷

In short, water use is not an unqualified social bad, quite the way emitting noxious pollution might be. It generates a mix of benefits and costs. But that balance of benefits and costs — and the simple and harsh reality that some places do not have enough water to sustain present use practices — justifies incentives to use less.

B. Taxes as Conservation Tools

Even if consuming less water is desirable, taxation might not be an effective way of achieving that outcome. As behavioral economists are fond of noting, people are not always economically rational actors, and sometimes price signals do not produce behavioral changes.¹⁸⁸ Similarly, economics is not always simple, and pricing policies can produce counterintuitive results.¹⁸⁹ Or sometimes they cannot even be implemented; if, for example, government lacks information about water use, it will be very difficult to tax that use.¹⁹⁰ But a substantial body of literature (most of it deriving from studies of water *sale* pricing rather than water taxation) suggests that water taxation would change water use. And the informational challenges of water taxation, though significant, are surmountable.

¹⁸⁷ See *The World Factbook, Field Listing: Freshwater Withdrawal (Domestic/Industrial/Agricultural)*, CENT. INTELLIGENCE AGENCY, <https://www.cia.gov/library/publications/the-world-factbook/fields/2202.html> (last visited July 12, 2016). Similar disparities between the United States and the developed economies of northern Europe might be explained partly by climate, but Australia and Israel face similar, if not greater, challenges with aridity.

¹⁸⁸ See Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 CALIF. L. REV. 1051, 1053, 1143-44 (2000).

¹⁸⁹ See, e.g., EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS, *supra* note 120 (predicting many counterintuitive consequences from changes in the tax code).

¹⁹⁰ See Dina Pomeranz, *No Taxation Without Information: Deterrence and Self-Enforcement in the Value Added Tax*, 105 AM. ECON. REV. 2539, 2539 (2015) (noting the importance of information to effective taxation).

1. The Effects of Price Incentives on Water Use

For years, economists have studied homeowners' responses to water prices.¹⁹¹ The results of those studies are mixed, but most conclude that homeowners' water use is moderately sensitive to at least some economic incentives. In particular, when water charges are relatively high, or when prices change dramatically, residential users tend to respond.¹⁹² Similarly, longer time periods facilitate larger responses.¹⁹³ That makes sense. The most effective measures to reduce residential water use typically involve replacing thirsty plants with drought-tolerant landscaping and removing high-flow toilets and faucets, and homeowners sometimes need time and continued economic prodding to get around to making such improvements. But the long-term effectiveness of price incentives is now sufficiently established that some economists argue that pricing is clearly the best way for municipalities to respond to droughts¹⁹⁴ — and criticize water suppliers for preferring less economically efficient solutions.¹⁹⁵

Homeowners are relatively minor players in the water world, and in most areas, the real impact of a water tax will depend on how agricultural, industrial, and commercial users respond.¹⁹⁶ For agriculture in particular, the effects of pricing incentives appear to be powerful. One meta-analysis of over twenty-four price elasticity studies concluded that “in the long run, where changes in crops and irrigation technologies are options, irrigation water delivery demand is . . . likely to be fairly responsive to price.”¹⁹⁷ Other studies have

¹⁹¹ See STEVEN RENZETTI, *THE ECONOMICS OF WATER DEMANDS* 21-34 (2002) (summarizing studies).

¹⁹² See, e.g., Shanthi Nataraj, *Do Residential Water Consumers React to Price Increases? Evidence from a Natural Experiment in Santa Cruz*, 10 *AGRIC. & RESOURCE ECON. UPDATE*, Jan.–Feb. 2007, at 9 (finding low elasticity for users who paid low prices but greater elasticity for high-price consumers).

¹⁹³ See Olmstead & Stavins, *supra* note 24, at 4.

¹⁹⁴ See *id.* at 3.

¹⁹⁵ See, e.g., Erin T. Mansur & Sheila M. Olmstead, *The Value of Scarce Water: Measuring the Inefficiency of Municipal Regulations*, 71 *J. URBAN ECON.* 332 (2012) (noting that policy makers have used command and control applications for water rationing and arguing that these policies are likely not efficient).

¹⁹⁶ See U.S. GEOLOGICAL SURV., *supra* note 7 (observing that seventy percent of the world's freshwater withdrawals are for agricultural use); *Agriculture at a Crossroads*, GLOBAL AGRIC., <http://www.globalagriculture.org/report-topics/water.html> (last visited Jan. 5, 2017).

¹⁹⁷ Susanne M. Scheierling et al., *Irrigation Water Demand: A Meta-Analysis of Price Elasticities*, 42 *WATER RESOURCES RES.*, No. W01411, Jan. 2006, at 1, 1, 8.

corroborated that conclusion.¹⁹⁸ The consensus is not complete, and outcomes vary based on the places studied and the crops grown.¹⁹⁹ But even though points of disagreement remain, the weight of these studies supports the conclusion that agricultural water use is generally responsive to economic incentives. Research on industrial and commercial water use, though less extensive, points toward similar conclusions.²⁰⁰ As Olmstead and Stavins report, “[i]ndustrial price elasticity estimates for water tend to be higher than residential estimates and vary by industry.”²⁰¹ Consequently, while price sensitivities are likely to be heterogeneous, both agricultural and industrial users are generally likely to change water use in response to taxation.

2. The Informational Challenges of Water Taxation

Even if tax incentives could, in theory, shift water use, a government agency must know something about water use in order to impose those taxes. More specifically, to administer a tax effectively, the government agency responsible for implementing the tax must know, first, who is engaged in the taxed activity or owns the taxed property, and, second, the extent of that activity or value of that property.²⁰² Potential taxpayers also must believe there will be audits and enforcement proceedings if required payments are not made, or else cheating will be rampant.²⁰³ Administration, in short, requires information, and a credible threat that the information will be used.

¹⁹⁸ See, e.g., Ziv Bar-Shira et al., *Block-Rate Versus Uniform Water Pricing in Agriculture: An Empirical Analysis*, 88 AM. J. AGRIC. ECON. 986, 998 (2006).

¹⁹⁹ See Michael R. Moore et al., *Multicrop Production Decisions in Western Irrigated Agriculture: The Role of Water Price*, 76 AM. J. AGRIC. ECON. 859, 872 (1994) (noting that responses vary by crop, and also that responses tend to occur through longer-term decisions like crop allocation and selection of irrigation technology); Beau Olen et al., *Irrigation Decisions for Major West Coast Crops: Water Scarcity and Climatic Determinants*, AM. J. AGRIC. ECON., at 1, 18 (July 15, 2015), <http://ajae.oxfordjournals.org/content/early/2015/06/15/ajae.aav036> (finding variability based on a long list of factors); Scheierling et al., *supra* note 197, at 1 (noting past studies that find responsiveness only with very large price increases).

²⁰⁰ See RENZETTI, *supra* note 191, at 38-47 (summarizing studies).

²⁰¹ Olmstead & Stavins, *supra* note 24, at 4.

²⁰² See generally Wojciech Kopczuk & Joel Slemrod, *Putting Firms into Optimal Tax Theory*, 96 AM. ECON. REV. 130 (2006) (noting the essential role information plays in taxation).

²⁰³ See SLEMROD & BAKIJA, *supra* note 16, at 174, 186-88 (explaining the importance of enforcement and the need for information to support that enforcement).

But many states have poor records of water use. In some areas — even fairly dry ones — agricultural surface water use goes unmeasured and unreported, and individual farmers simply take what they need so long as the water is available in the ditch.²⁰⁴ Groundwater use is even less likely to be measured. Because individual farmers and homeowners typically operate their own wells, rather than obtaining water from some third party that might want to be paid on a per-volume basis, they generally have no need to tell anyone how much they are actually using.²⁰⁵ And regulatory requirements for groundwater use reporting are limited.²⁰⁶ Urban water suppliers are much more likely to measure individual users' water consumption, but not all of them do; in some municipalities, water users still pay flat rates for access, regardless of the water volume they actually consume.²⁰⁷ That means the information that would support a tax on water consumption is often absent.²⁰⁸

An alternative approach — to tax water rights rather than water consumption — might seem more feasible, for some states have better documentation of rights than of actual uses. But that approach would generate even greater problems. There can be substantial gaps between water rights and actual consumption,²⁰⁹ and if the primary goal of a

²⁰⁴ See U.S. DEP'T OF INTERIOR & U.S. GEOLOGICAL SURVEY, DOCUMENTATION OF METHODS AND INVENTORY OF IRRIGATION DATA COLLECTED FOR THE 2000 AND 2005 U.S. GEOLOGICAL SURVEY: ESTIMATED USE OF WATER IN THE UNITED STATES, COMPARISON OF USGS-COMPILED IRRIGATION DATA TO OTHER SOURCES, AND RECOMMENDATIONS FOR FUTURE COMPILATIONS 2 (2011) (“[T]he majority of irrigation withdrawals are not metered in the United States.”); Stephanie Lindsay, *Counting Every Drop: Measuring Surface and Ground Water in Washington and the West*, 39 ENVTL. L. 193, 196 (2009) (noting that while Washington State had adopted metering requirements, no other western state had done so — though Kansas' program comes close). Even where no statewide metering requirement exists, individual water suppliers may impose such requirements. See *id.* at 205 (describing district-level requirements in Texas).

²⁰⁵ See Owen, *Taking Groundwater*, *supra* note 44, at 262 (noting that this feature makes groundwater a particularly appealing water source).

²⁰⁶ See NAT'L CONFERENCE OF STATE LEGISLATURES, STATE WATER WITHDRAWAL REGULATIONS (2013) (describing state groundwater regulatory programs, many of which are filled with exemptions).

²⁰⁷ See Paul Rogers, *California Drought: More than 255,000 Homes and Businesses Still Don't Have Water Meters Statewide*, SAN JOSE MERCURY NEWS (Aug. 12, 2016), <http://www.mercurynews.com/2014/03/08/california-drought-more-than-255000-homes-and-businesses-still-dont-have-water-meters-statewide/>.

²⁰⁸ See Ted Grantham & Joshua Viers, *California Water Rights: You Can't Manage What You Don't Measure*, CAL. WATER BLOG (Aug. 20, 2014), <https://californiawaterblog.com/2014/08/20/california-water-rights-you-cant-manage-what-you-dont-measure/>.

²⁰⁹ These gaps can arise for several reasons. First, sometimes there is not enough

tax is to encourage greater efficiency of water use, focusing on a flawed proxy for actual use makes little sense. Additionally, in many parts of the country, water rights are even more indeterminate than actual water use. Traditional riparian rights, for example, allow “reasonable” use of a watercourse, with reasonableness defined in relation to other competing uses and to social values, both of which can change over time.²¹⁰ The resulting formula is notoriously imprecise.²¹¹ Similarly, most of the traditional doctrines defining groundwater use rights lack numeric precision, and instead entitle users to take a reasonable share of the aquifer or, in some states, as much as they can get.²¹²

Because of these information gaps, water taxes may sound impossible to implement. But there are three key reasons why the idea should not be dismissed so quickly. First, though major information gaps remain, some states are moving toward greater measurement and quantification.²¹³ Colorado, for example, now has a robust statewide system of water use monitoring.²¹⁴ California has traditionally been more of a laggard, but its governor recently issued an executive order requiring more monitoring and reporting of surface diversions.²¹⁵ The California Legislature also passed a separate bill that empowers local agencies to require monitoring of groundwater use.²¹⁶ Similarly, legislative changes and lawsuits have led to tighter monitoring of

water to fulfill junior users’ paper rights. Second, users do not always choose to use all the water to which they are legally entitled. *See Hanemann, supra* note 58, at 72-73 n.23 (noting that on the ground, practices in western states often depart from the appropriative systems that exist on paper). Third, some major uses are non-consumptive. For example, power plants often return their cooling water to waterways, and the water consumption associated with hydropower generation is generally minimal.

²¹⁰ *See* THOMPSON ET AL., *supra* note 35, at 33-35.

²¹¹ *Id.* at 35 (“The lack of predictability of outcomes is an oft-criticized aspect of riparian doctrine.”).

²¹² *See* Maddocks v. Giles, 728 A.2d 150, 153 (Me. 1999) (retaining the absolute dominion rule, which allows essentially unlimited pumping); Sipriano v. Great Spring Waters of America, Inc. 1 S.W.3d 75, 75 (Tex. 1999) (retaining the rule of capture, which gives landowners a right to however much groundwater they can pump, in Texas); THOMPSON ET AL., *supra* note 35, at 467-68.

²¹³ *See generally* ALVAR ESCRIVA-BOU ET AL., ACCOUNTING FOR CALIFORNIA’S WATER: TECHNICAL APPENDIX (2016) (describing water use monitoring systems in the western United States, Australia, and Spain).

²¹⁴ *Id.* at 44-54.

²¹⁵ Cal. Exec. Order No. B-29-15, ¶¶ 9–10 (Apr. 1, 2015).

²¹⁶ CAL. WATER CODE § 10725.8 (2017).

water withdrawals in Washington state.²¹⁷ Many steps remain to be taken, but water management is grudgingly moving into the information age.

Second, carefully designed taxes can encourage water users to provide more information. In a state where water rights are carefully documented but water use is poorly measured, taxes might be based, as a default, on the face value of a water right, but water users could reduce their tax bills by showing a lesser quantity of use.²¹⁸ Or, alternatively, the tax collecting agency could calculate water use based on proxies like the crop selection and irrigation method, and water users would then bear the burden of proving that the model had overestimated their use.²¹⁹ Either approach would encourage private users to provide information about their actual water consumption. Similarly, water users who only partly consume the water they divert, and who return some of that water to the environment, might obtain a partial reduction in their tax bills if they measure and report their return flows.²²⁰

Third, these informational challenges are not unique to taxation. Almost any effective system for regulating water use demands information.²²¹ One cannot ensure the success of a permit system without knowing how much water other permittees are allowed to take, and how much they are actually taking.²²² Nor can a water trading system work effectively without information about water allocations; a market without informed buyers and sellers cannot

²¹⁷ See Lindsay, *supra* note 204, at 200-04, 206-08 (describing Washington's and Kansas' efforts); *Measuring Water Use*, WASH. DEP'T ECOLOGY, <http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html> (last visited July 12, 2016).

²¹⁸ A potential problem with this proxy approach is that it would undertax particularly profligate users of water, and finding those uses might require some focused detection efforts.

²¹⁹ See generally U.S. DEP'T OF INTERIOR & U.S. GEOLOGICAL SURVEY, *supra* note 204 (describing methods for estimating water use in the absence of metering data).

²²⁰ Return flows contain water that neither evaporates nor is transpired by plants, and that instead flows back into a natural waterway. See THOMPSON ET AL., *supra* note 35, at 174.

²²¹ Of course, this is one reason why metering is sometimes unpopular. See Rogers, *supra* note 207 (quoting an anti-tax activist and metering opponent in Fresno, California: "The bureaucrats want a guaranteed method of a cash register that they can manipulate.").

²²² See Dave Owen, *The Mono Lake Case, the Public Trust Doctrine, and the Administrative State*, 45 UC DAVIS L. REV. 1099, 1147-50 (2012) [hereinafter *Mono Lake Case*] (describing information deficits in traditional water regulation, and the difficulties those deficits create).

function efficiently and may not be able to function at all.²²³ Information deficits, in other words, are challenges for any regulatory system, and the proper response is to fix the information deficits, not to eschew taxation as a regulatory approach. Fixes will not happen overnight, and any jurisdiction considering a water tax should consider whether it has the needed information, and, if not, how that information will be obtained. But while information deficits may inform the design and timing of a water tax, they should not preclude its adoption.

C. Taxes or Other Regulatory Controls?

Even if taxes would encourage more efficient water use, and more efficient water use is a desirable outcome, that does not necessarily mean taxes should be adopted. A tax is just one of many regulatory options, and water suppliers have traditionally turned to a wide variety of other controls. In urban areas, suppliers have used service charges, water rationing, bans on certain water uses, building code requirements, and educational programs to try to limit water use.²²⁴ State and federal regulators, meanwhile, have turned to water use permitting systems, which generally are highly integrated with statutory environmental laws.²²⁵ This entire system intertwines — or, sometimes, conflicts — with a property and contractual rights system designed to allocate water among competing users.²²⁶ One might ask, then, what a tax could add, or how it would be better than these traditional approaches.

1. Taxes or Traditional Regulation?²²⁷

In the past, when governmental entities have decided that water use poses problems, they often have reacted by either regulating the

²²³ See Hanemann, *supra* note 58, at 72-73 n.23.

²²⁴ See Olmstead & Stavins, *supra* note 24, at 3 (“Rationing approaches to water conservation are ubiquitous.”).

²²⁵ See Owen, *Mono Lake Case*, *supra* note 222, at 1115-18 (describing California’s administrative system).

²²⁶ See, e.g., Melinda Harm Benson, *The Tulare Case, Water Rights, the Endangered Species Act, and the Fifth Amendment*, 32 ENVTL. L. 551 (2002); John D. Leshy, *A Conversation About Takings and Water Rights*, 83 TEX. L. REV. 1985 (2005).

²²⁷ Economists and legal scholars often use the phrase “command and control” to describe traditional forms of regulation. But that phrase tends to be much clearer in its pejorative overtones than its actual content, and I prefer the more neutral phrase “traditional regulation.” As the discussion below will make clear, that phrase also serves as an umbrella term for a wide variety of regulatory approaches.

amount of water people can use, banning or limiting certain water-use-intensive activities, or placing limits on specific secondary consequences of water consumption.²²⁸ Water rationing or watering bans provide an example of the former approach;²²⁹ bans on high-flow toilets exemplify the middle strategy;²³⁰ and a law like the Endangered Species Act, which prohibits some actions that harm threatened or endangered species, exemplifies the latter.²³¹ Presumably these regulatory instruments became popular for at least some good reasons, and their entrenchment raises questions about what advantages, if any, taxation could offer.

For many environmental economists, and to the many legal thinkers who have been influenced by economic theory, the answer to that question is easy. Taxes, in their view, are generally superior to traditional regulatory systems. Those traditional regulatory systems, in their view, are chronically insensitive to the differences among regulated entities.²³² A ban on high-flow toilets, for example, does nothing to constrain the water use of the homeowner who resorts to double-flushing, or who reinstalls a high-flow toilet, assuming, probably correctly, that he will not be caught.²³³ Nor does it account for the possibility that the same homeowner might save much more water, and do so much more cheaply, by xeriscaping his yard. Nor, finally, do most traditional regulatory systems induce people to weigh the relative value of highly different water uses; the farmer and the microchip manufacturer are not measured on any kind of common scale.²³⁴

²²⁸ See Olmstead & Stavins, *supra* note 24, at 3.

²²⁹ See Bettina Boxall, *New Watering Restrictions Imposed Amid California Drought*, L.A. TIMES (Mar. 17, 2015), <http://www.latimes.com/local/lanow/la-me-state-officials-watering-restrictions-20150317-story.html>.

²³⁰ See, e.g., Melody Gutierrez, *California Drought: Toilets, Faucets Sold in '16 Must Be Low-Flow*, S.F. CHRON. (Apr. 9, 2015, 10:25 AM), <http://www.sfgate.com/bayarea/article/California-drought-Toilets-faucets-sold-in-2016-6187726.php>.

²³¹ See 16 U.S.C. § 1536(a)(2) (2012).

²³² See, e.g., Jean-Philippe Barde & Olivier Godard, *Economic Principles of Environmental Fiscal Reform*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 17, at 35 (asserting that traditional regulatory controls “impose uniform requirements” because regulators lack individualized information about regulated entities).

²³³ See Olmstead & Stavins, *supra* note 24, at 4 (noting the potential for multiple rebound effects and other reactions that thwart a traditional regulation’s goals).

²³⁴ One possible exception to this general statement is a system that allows water trading. But, for reasons discussed in more depth below, that is likely to be a very partial solution. See *infra* notes 257–71 and accompanying text.

The beauty of a price instrument, by contrast, is that it achieves efficiency by letting private decision-makers allocate the burdens of environmental protection.²³⁵ It does so by reaching every water user and imposing a price commensurate with the overall social cost of water use, while also leaving each user discretion to draw upon her own knowledge and make her own decisions.²³⁶ So, for example, a tax would allow a farmer who produces high value crops with excellent water efficiency to keep pumping, while encouraging another farmer who produces an economically marginal alfalfa crop to fallow his fields. Similarly, the tax would catch the high-flow-toilet-reinstaller or the double-flusher, while traditional regulation probably will not.²³⁷ The net result of this combination of broad reach and individual discretion can be a huge aggregate cost savings.²³⁸

Advocates of incentive-based regulation also argue that traditional regulation is exceedingly difficult to implement, both because it is cumbersome and because regulatory decisions become fraught with politics and rent-seeking.²³⁹ There is something to these critiques. Individualized water permitting processes can be incredibly time-consuming, and one of the most common complaints of water users is that both agencies and courts make decisions about water at glacial speed.²⁴⁰ Because those decision-making processes can be so slow, regulatory agencies also are reluctant to initiate them, and traditional water users are often able to continue their water uses largely unrestrained, even when those uses impose substantial social costs.²⁴¹

²³⁵ See NATHANIEL O. KEOHANE & SHEILA M. OLMSTEAD, *MARKETS AND THE ENVIRONMENT* 133-37 (2d ed. 2007).

²³⁶ See HSU, *supra* note 15, at 33-34 (describing similar benefits for a carbon tax); Masur & Posner, *supra* note 15, at 101-02 (arguing that the reality of limited governmental knowledge makes Pigouvian taxation a superior regulatory instrument).

²³⁷ See Olmstead & Stavins, *supra* note 24, at 4-5 (discussing how other regulatory restrictions can produce evasion and unintended “rebound effects”).

²³⁸ See *id.* at 8.

²³⁹ See, e.g., Barde & Godard, *supra* note 232, at 57; Masur & Posner, *supra* note 15, at 139-40.

²⁴⁰ See, e.g., Lawrence J. MacDonnell, *Rethinking the Use of General Stream Adjudications*, 15 WYO. L. REV. 347, 349 (2015) (noting that general stream adjudications, a common mechanism for resolving a wide set of water right claims, are widely criticized as “cumbersome”); Steve Brown, *Part of Water Right Processing Moves to Private Sector*, CAPITAL PRESS, Nov. 29, 2012 (describing Washington’s backlog of 7,000 water right applications).

²⁴¹ See Owen, *Mono Lake Case*, *supra* note 222, at 1134-35 (describing California’s lack of review of water use under existing rights). See generally Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919 (1998) (documenting the reluctance of regulators and

And traditional regulation clearly is sometimes dominated by interest group politics.²⁴² A tax, then, does provide an enticing alternative. It could be much simpler than a regulatory system, demand less information, reach more broadly yet allow greater individual autonomy, and be harder for rent-seekers to distort.

But these arguments are often overstated. As numerous commentators have pointed out, rent-seeking and public choice politics offer only limited explanatory value for many traditional regulatory regimes.²⁴³ Much regulatory governance — particularly in the environmental realms that overlap so heavily with water law — is more easily explained by theories that view protection of public interests as a genuine regulatory goal, not a smokescreen behind which special interests use government authority to bludgeon each other.²⁴⁴ Conversely, the notion that taxes will be insulated from political influence is belied by the tax codes the United States actually has.²⁴⁵ Clearly, the ability of powerful interests to secure loopholes and favors does not disappear when legislators turn from drafting regulatory statutes to amending or expanding tax codes.²⁴⁶

Alternative regulatory systems also tend to be more flexible than the caricatures that often appear in economics-infused legal literature. Most of those traditional systems employ flexible permitting regimes, combinations of performance and technology standards, informational regulation, planning mechanisms, and incentive-based schemes, often

courts to demand greater efficiency from existing water users).

²⁴² See, e.g., Reed D. Benson, *Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite the Rules of Prior Appropriation*, 28 ENVTL. L. 881, 888 (1998) (describing widespread and largely politically-motivated deference to existing uses). Within the literature on environmental regulation, the classic study of interest group influence is BRUCE A. ACKERMAN & WILLIAM T. HASSLER, *CLEAN COAL/DIRTY AIR, OR HOW THE CLEAN AIR ACT BECAME A MULTIBILLION-DOLLAR BAIL-OUT FOR HIGH-SULFUR COAL PRODUCERS AND WHAT SHOULD BE DONE ABOUT IT* (1981).

²⁴³ See, e.g., Daniel A. Farber, *Politics and Procedure in Environmental Law*, 8 J.L. ECON. & ORG. 59, 62-63 (1992) (questioning accounts that attribute environmental regulation primarily to rent-seeking).

²⁴⁴ See, e.g., Dave Owen, *Critical Habitat and the Challenge of Regulating Small Harms*, 64 FLA. L. REV. 141, 147-48, 187-88 (2012) [hereinafter *Critical Habitat*] (documenting public-service-oriented approaches to endangered species protection); Dave Owen, *Little Streams and Legal Transformations*, 2017 UTAH L. REV. 1.

²⁴⁵ See *supra* notes 119–25, 156–63 (describing critiques of ethanol subsidies and the mortgage interest deduction — among many other tax code provisions subject to widespread criticism).

²⁴⁶ See David M. Driesen, *The Limits of Pricing Carbon*, 4 CLIMATE L. 107, 114 (2014) (“[M]ost pollution taxes become riddled with complex exemptions that take time to negotiate.”).

mixing them up in ways that defy any simple effort to shoehorn a regulatory system in to a specific theoretical model.²⁴⁷ That flexibility makes regulatory systems difficult to understand, but it also has virtues. Most importantly, it allows regulators and regulated entities to tailor regulatory approaches to the circumstances before them — and, sometimes, to exempt harmless instances of otherwise regulated activities from governmental constraint.²⁴⁸ A tax, for all its elegant simplicity, can be comparatively blunt.²⁴⁹

But even with those caveats, the arguments in favor of taxation are powerful. It can reach users who have largely been insulated from traditional regulatory controls.²⁵⁰ It can leave key decisions up to bounded individual discretion, rather than presuming governmental knowledge about the most effective ways to reduce water use.²⁵¹ It provides an effective common metric for evaluating water use, which could help facilitate reallocation of water both among and within different sectors of the economy.²⁵² It can coexist with other regulatory systems. And, perhaps most importantly, while traditional regulatory approaches have their defenders, hardly anyone argues that they have completely succeeded in generating good water use policies. There clearly is room for alternative approaches and some additional help.

2. Taxes or Trading?

A skeptic of traditional regulation might readily agree with the preceding discussion but nevertheless ask, why taxes? After all, the

²⁴⁷ See Owen, *Critical Habitat*, *supra* note 244, at 197-98 (noting that a diversity of regulatory options is a common feature of environmental law).

²⁴⁸ See *id.* (arguing that giving agencies a range of instruments to choose from has value).

²⁴⁹ See Fleischer, *supra* note 18, at 1676-77 (arguing that Pigouvian taxation schemes inappropriately assume that the marginal cost of each instance of the regulated activity is the same, when in fact those costs can vary widely). Fleischer's point has some resonance with water, for the negative impacts of water use will vary depending upon the place and purpose of use. But that variability is a problem for any regulatory scheme that relies upon broad rules. See Masur & Posner, *supra* note 15, at 138 (offering this critique of Fleischer's argument). Tax schemes also can include exemptions that account for some of the variability in social costs, though such exemptions necessarily make the tax more complicated.

²⁵⁰ See HSU, *supra* note 15, at 38-40 (noting that alternative regulatory schemes often leave out smaller sources, while a tax need not do so).

²⁵¹ See Masur & Posner, *supra* note 15, at 101 (discussing the challenges information shortfalls pose for traditional regulation).

²⁵² See PETER W. CULP ET AL., SHOPPING FOR WATER: HOW THE MARKET CAN MITIGATE WATER SHORTAGES IN THE AMERICAN WEST 10 (2014) (describing huge disparities created by current pricing systems).

basic premise of water taxation — that economic incentives would bring greater rationality to water policy — is not at all new; for decades, it has animated proposals for reform.²⁵³ The more commonly suggested alternative, however, has been a system in which water rights can be transferred among willing sellers and buyers.²⁵⁴ The possibility of trading, according to reformers, creates powerful incentives for increasing the efficiency of water use; now a low-value user can install water conservation technology, or simply abandon low-value uses, and sell the newly-created excess.²⁵⁵ In accordance with those recommendations, many western states have reformed their water law systems to facilitate trading, and water trading volumes have grown.²⁵⁶ One might ask, then, what advantages taxation offers over these reforms that are already in place.

One significant advantage is broader coverage. Trading creates powerful conservation incentives for potential sellers that actually can get their water to willing buyers. But in many places, transporting water is hard to do. Because of its bulk, water is usually prohibitively expensive to truck, and moving it requires pipelines, ditches, or canals.²⁵⁷ But the United States does not have a public canal or pipeline system comparable to our public highway systems. Even private water delivery systems, if they are available to the transferring parties, go only limited sets of places.²⁵⁸ That problem is widespread for surface water, and infrastructure for transporting groundwater is even less likely to be available — if such trades are even legal.²⁵⁹ The consequence, throughout much of the West, is a geographically patchy transfer system, with many would-be sellers and buyers either unable

²⁵³ See, e.g., TERRY L. ANDERSON & PAMELA SNYDER, *WATER MARKETS: PRIMING THE INVISIBLE PUMP* 134 (1997); Thomas J. Graff & David Yards, *Reforming Western Water Policy: Markets and Regulation*, 12 NAT. RESOURCES & ENV'T. 165 (1998).

²⁵⁴ See, e.g., CULP ET AL., *supra* note 252, at 11-12; Jonathan H. Adler, *Water Rights, Markets, and Changing Ecological Conditions*, 42 ENVTL. L. 93, 101-02 (2012).

²⁵⁵ See CULP ET AL., *supra* note 252, at 11-12; W. STATES GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13, at ix.

²⁵⁶ See W. STATES GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13, at 9 (showing growing numbers of transactions).

²⁵⁷ See Gleick & Palaniappan, *supra* note 171, at 11157.

²⁵⁸ See CULP ET AL., *supra* note 252, at 11 (noting the importance of physical restrictions on transfers).

²⁵⁹ See THOMPSON ET AL., *supra* note 35, at 467 (describing the correlative rights doctrine for groundwater, which gives priority to overlying users, and would allow them to enjoin off-site uses (and thus trading) where a groundwater surplus does not exist); Owen, *Taking Groundwater*, *supra* note 44, at 262 (noting that the appeal of groundwater is partly that it does not require transportation infrastructure).

to access a larger market or able to reach only limited sets of buyers.²⁶⁰ Because of that isolation, the potential efficiencies of markets are likely to fall well short of their proponents' aspirations.²⁶¹ A tax, by contrast, could reach everywhere, providing conservation incentives even where the possibility of direct trades does not exist.

A second significant advantage involves the allocation of cost burdens. In a transfer-based system, at least as envisioned by many of its strongest proponents, existing water right holders occupy a distinctly advantaged position. Their water uses would generally be presumed inviolate, and are subject to change only if someone pays compensation for the shift.²⁶² That presumption would have advantages — most importantly, it provides clarity, which makes it easier for buyers and sellers to know what they are transferring — and it also accords with the way we often treat property rights.²⁶³ But if those existing uses have been generating large and uncompensated externalities — and doing so by appropriating a partially public resource — then simply privileging existing uses creates a windfall.²⁶⁴ Or, to put the point in more practical terms, it means that any protection for uses that traditional water allocations did not directly value — including, most importantly, environmental protection —

²⁶⁰ See, e.g., Hanak et al., *supra* note 60, at 35 (noting that transfers in California are limited by the need to move water across the Sacramento/San Joaquin Bay-Delta, where regulatory restrictions on water pumping apply).

²⁶¹ See CULP ET AL., *supra* note 252, at 11 (noting that physical limits on water availability can lead to huge disparities in water prices).

²⁶² See, e.g., James L. Huffman, *Institutional Constraints on Transboundary Water Marketing*, in WATER MARKETING — THE NEXT GENERATION: THE POLITICAL ECONOMY FORUM 31, 38-39 (Terry L. Anderson & Peter J. Hill eds., 1997) (criticizing laws, including environmental restrictions, that undermine the certainty of water rights). For this reason, traditional water trading is quite different from cap-and-trade systems, where overall shares of the activity or resource are limited and trading occurs beneath a cap (which may decline over time). It stands in even greater contrast to auctioned cap-and-trade systems, in which participants must pay for their initial shares.

²⁶³ See Adler, *supra* note 254, at 102 (noting that certainty facilitates trading).

²⁶⁴ See Freyfogle, *Common Wealth*, *supra* note 56, at 2-5 (developing this critique of water transfers). In response to this argument, some commentators have argued that there is no windfall because water subsidies are reflected in prices paid for land, and most land has changed hands since water supplies first appeared. That argument is flawed in two respects. First, it overlooks the basic reality that the private seller, not the public that supplies the water, was the payment recipient. In other words, it is somewhat like arguing that my children's public education is not subsidized because I paid a lot for my house. Second, it assumes equivalency in between the public benefit received and the private payments made. But proponents of this argument have not explained the empirical basis for that assumption.

will exist only to the extent that someone is willing to pay.²⁶⁵ To impose a tax that demands compensation for environmental harms, by contrast, accords with the basic principle that water users retain some level of public duty, even if they hold and exercise private rights.²⁶⁶

A third significant advantage involves transaction costs. Because transfers routinely have third-party impacts, most western states have created administrative processes for reviewing transfer proposals.²⁶⁷ For some forms of transfers, those administrative processes are not overly time-consuming; California, for example, exempts some short-term transfers from key environmental review requirements, greatly expediting the process.²⁶⁸ But review of major water rights transfers can take years. Indeed, the largest water transfer in United States history, which sends water from California's Imperial Valley to the Los Angeles and San Diego metropolitan areas, took years to negotiate and has been the subject of ongoing litigation for an additional thirteen years.²⁶⁹ Taxation would not involve analogous review of individual transactions, and thus should offer a more procedurally efficient mechanism for creating water conservation incentives.²⁷⁰

For all of these reasons, water transfers cannot bring comprehensive reform to western water systems.²⁷¹ They do have their place; where

²⁶⁵ This problem is somewhat analogous to the problems economists have identified with cap-and-trade systems in which shares are allocated for free, rather than auctioned. *See, e.g.*, Mankiw, *supra* note 19, at 18 (describing cap-and-trade systems without initial auctions as unjustified giveaways). But in the water realm, there is an additional problem: typically, there is no regulatory cap at all.

²⁶⁶ *See* Gray, *supra* note 41 (explaining why water rights are heavily qualified by broader public interests and needs). Gray's article focuses primarily on California, but, as others have noted, water nearly everywhere has been treated as a hybrid public/private resource, in which private claims are not absolute. *See* United States v. Willow River Power Co., 324 U.S. 499, 510 (1945) ("Rights, property or otherwise, which are absolute against the world are certainly rare, and water rights are not among them."); THOMPSON ET AL., *supra* note 35, at 588 ("[T]he most distinctive legal feature of water is its status as a public resource that cannot be privatized in the ordinary way.").

²⁶⁷ *See* W. STATES GOVERNORS' ASS'N & W. STATES WATER COUNCIL, *supra* note 13, at 22-29 (describing third-party impacts of water transfers); Owen, *Overallocation*, *supra* note 170, at 2 (explaining how the intertwined nature of western water use can make transfers difficult to complete).

²⁶⁸ *See* CAL. WATER CODE § 1725 (2016) (exempting temporary transfers from review under the California Environmental Quality Act).

²⁶⁹ *See In re Quantification Settlement Agreement Cases*, 134 Cal. Rptr. 3d 274, 299-305 (Ct. App. 2011) (describing the negotiations and part of the litigation).

²⁷⁰ *See* Jan Pavel & Leoš Vitek, *Transaction Costs of Environmental Taxation: The Administrative Burden*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 17, at 273 (summarizing studies that generally find low transaction costs).

²⁷¹ *See* Hanak et al., *supra* note 60, at 35 (making a similar point about California

willing buyers and sellers share physical access to water, and where third-party effects can be addressed, transfers can help improve water use efficiency. But those circumstances are unevenly present; and it is no happenstance that many transfer proponents believe that not enough water transfers are occurring.²⁷² Taxation, by contrast, offers the possibility of a more comprehensive response.

3. Taxes or Service Charges

Allowing water transfers is not the only traditional way to bring economic incentives into water management. Instead, the most obvious alternative to a tax is a close cousin: a service charge for water use. Most water suppliers already charge users a fee for water delivery, and these fees can be structured to encourage more efficient water use.²⁷³ Indeed, the large and growing economic literature on water pricing focuses primarily on these service charges,²⁷⁴ and some water suppliers now have decades of experience integrating conservation incentives into their service charge systems.²⁷⁵ But taxation offers at least two significant advantages over this more traditional system.

First, a service charge is likely to ignore the scarcity value of water and, therefore, is likely to be artificially low. A water supplier can pass on to its customers the expenses it incurs delivering water, and it can also structure those charges in a way that discourages low-efficiency, high-volume use.²⁷⁶ If the supplier is a private utility or a for-profit company, it also can charge enough additional money to generate a profit. But a private supplier generally has neither the incentive nor, in all likelihood, the ability to charge consumers for water supply costs that are borne by third parties.²⁷⁷ The impacts of supplying water upon in-stream environmental quality, for example, generally are not borne

water allocation).

²⁷² See, e.g., CULP ET AL., *supra* note 252, at 10-14 (arguing that transfers face excessive legal impediments); Jelena Jezdimirovic & Ellen Hanak, *State Water Market Needs Reform*, PPIC BLOG (Feb. 2, 2016), http://www.ppic.org/main/blog_detail.asp?i=1943.

²⁷³ See *infra* notes 332-34 and accompanying text (discussing progressive block pricing).

²⁷⁴ For exceptions, see *supra* note 14 (citing sources).

²⁷⁵ See, e.g., *Brydon v. E. Bay Mun. Util. Dist.*, 29 Cal. Rptr. 2d 128, 137-44 (Ct. App. 1994) (upholding a progressive block pricing system).

²⁷⁶ See Hanemann, *supra* note 58, at 76 (noting that water prices typically include these costs).

²⁷⁷ Regulated utilities, for example, can charge only those prices that state regulators allow, and those regulators generally base their price calculations on the necessary operating expenses of the utility.

by the water supplier and, therefore, cannot be passed on to its consumers. Those impacts instead are just externalities, the cost of which society as a whole bears.

Second, service charges will apply haphazardly. This problem arises from a basic institutional reality of water supply: it is handled by an extraordinary number of entities, most of them local or, at most, regional in scale.²⁷⁸ Unless incentive-based service charges were compelled by state mandate, it is likely that some of these entities would adopt such charges and many would not. Of course, if each local entity draws on its own water source, and some of those water sources are overtapped while others are not, that kind of localized decision-making would make some sense. But in much of the United States, water suppliers share common sources, and water systems have become increasingly integrated.²⁷⁹ To leave fee-based incentives to local discretion within a partially integrated supply system would create puzzling inconsistencies, at the very least. At worst, it would create a sort of prisoners' dilemma, in which a rational supplier would be reluctant to adopt pricing schemes that reduce its own water use for fear that its competitors will simply take whatever it conserves.

Neither of those arguments suggests that local suppliers should not adopt incentive-based service charges. If a supplier needs to reduce its water use, those charges are a sensible way of proceeding. But they do explain why a tax that is adopted at a broader geographic scale, and that takes into account societal costs as well as the operating costs of water suppliers, would be a more optimal policy.

4. Revenues and the Double Dividend

The foregoing paragraphs have only considered regulatory effectiveness when comparing taxes to other tools. But taxes also raise revenue; indeed, for most taxes, that is their *raison d'être*, and behavioral incentives are just a collateral consequence. The same might well be true for water taxes. If a tax causes only subtle adjustments in water use patterns, its greater value might arise from the uses to which its revenues are put. And even if the tax is highly effective in modifying water use — which would cause declining and,

²⁷⁸ See THOMPSON ET AL., *supra* note 35, at 766-74 (describing the variety of entities that supply water).

²⁷⁹ See, e.g., Theodore E. Grantham & Joshua H. Viers, *100 Years of California's Water Rights System: Patterns, Trends and Uncertainty*, 9 ENVTL. RES. LETTERS 084012 (2014), https://watershed.ucdavis.edu/files/biblio/WaterRights_UCDavis_study.pdf (demonstrating that most major California waterways are subject to multiple water claims, with aggregate claims often greatly exceeding flows).

perhaps, unstable revenues — some money will continue to come in, and uses of that money should be factored into any comparison between taxes and alternative regulatory regimes.

One possible use of tax revenues is to reduce the need for other forms of taxation. Water tax revenues, for example, might be used to reduce income taxes, thus lessening a disincentive for labor.²⁸⁰ For many environmental economists, this is a preferred outcome. They argue that by discouraging socially harmful activities and reducing the need for taxes with larger distortionary effects, Pigouvian taxation can produce a “double dividend” for society.²⁸¹ Whether that double dividend will actually occur remains a hotly debated question in the environmental economics literature, with one recent study calling the research “controversial and confusing.”²⁸² And the controversy and confusion include the few studies focusing upon water taxes, with studies reaching disparate results even when focused on the same economy.²⁸³ Nevertheless, the studies suggest that a second dividend is at least possible, if a tax is carefully designed, and that economic gains might at least reduce the social cost caused by imposing a new tax.²⁸⁴

Another possible use of tax revenues is to fund water governance and infrastructure. As many recent studies have noted, the United States’ public water systems are old and deteriorating.²⁸⁵ That deterioration creates major water supply problems; cities lose huge amounts of water to leaks.²⁸⁶ It also creates public health issues, as the

²⁸⁰ See Kilimani et al., *supra* note 14, at 75.

²⁸¹ David Pearce, *The Role of Carbon Taxes in Adjusting to Global Warming*, 101 *ECON. J.* 938, 940 (1991).

²⁸² See William K. Jaeger, *The Double Dividend Debate*, in *HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION*, *supra* note 17, at 211.

²⁸³ Compare, e.g., Jan H. van Heerden et al., *Integrated Water and Economic Modelling of the Impacts of Water Market Instruments on the South African Economy*, 66 *ECOLOGICAL ECON.* 105, 114-15 (2008) (concluding that in the long term, water taxes in South Africa will not produce a double dividend), with Letsoalo et al., *supra* note 14, at 10 (“We show that there can be a triple dividend of water policy, simultaneously reducing water scarcity, improving economic growth/reducing unemployment, and reducing poverty.”).

²⁸⁴ Of course, even if the second dividend does not arise, the first dividend — reducing water scarcity and environmental impacts — might alone justify the tax. See Letsoala et al., *supra* note 14, at 8 (“The first of the three dividends is the environmental dividend reaped.”).

²⁸⁵ See *America’s Neglected Water Systems Face a Reckoning*, WHARTON UNIV. PA. (June 10, 2015), <http://knowledge.wharton.upenn.edu/article/americas-neglected-water-systems-face-a-reckoning/>.

²⁸⁶ David Schaper, *As Infrastructure Crumbles, Trillions of Gallons of Water Lost*, NPR (Oct. 29, 2014), <http://www.npr.org/2014/10/29/359875321/as-infrastructure->

recent debacle in Flint, Michigan illustrates.²⁸⁷ Upgrading that infrastructure would require major financial investments, which a water use tax might help supply. A new influx of funding also could support many environmental restoration projects, which in turn might help compensate for the enormous environmental impacts of water consumption.²⁸⁸ There are also downsides to revenue earmarking. According to most economists, it is not the ideal use of tax revenues; they would prefer sending revenues to general funds or using them to offset other taxes.²⁸⁹ And there is a real danger that a water project fund might be allocated largely as pork. For many decades, that is how water funding in the United States was often spent.²⁹⁰ Nevertheless, there is an intuitive logic to using revenues from water consumption taxes to upgrade water infrastructure or to protect aquatic environments. That intuitive logic might make a water tax into an easier political sell, even if it falls short of an economic ideal.²⁹¹

Finally, revenues could be recycled back to the public as rebates.²⁹² Determining the rebate formula could be a thorny challenge; for example, figuring out whether to return revenues on a per capita basis or to set aside a larger share for heavy water users like farmers would probably involve difficult economic and political issues. And, again, the economic consensus seems to be that this option is inferior to a simple reduction in other taxes.²⁹³ But there are reasons why some

crumbles-trillions-of-gallons-of-water-lost.

²⁸⁷ Joseph Kane & Robert Puentes, *Flint's Water Crisis Highlights Need for Infrastructure Investment and Innovation*, AVENUE (Jan. 13, 2016), <http://www.brookings.edu/blogs/the-avenue/posts/2016/01/13-flint-water-crisis-infrastructure-kane-puentes>.

²⁸⁸ Restoration funds might be used for dam removals or to purchase environmental flows, to provide two particularly promising examples. See Dave Owen & Colin Apse, *Trading Dams*, 48 UC DAVIS L. REV. 1043, 1093 (2015) (discussing the importance of financial carrots for dam removals); Thompson, *Markets for Nature*, *supra* note 138, at 307-14 (describing "environmental brokerage" accounts).

²⁸⁹ See Claudia Dias Soares, *Earmarking Revenues from Environmentally Related Taxes*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 17, at 102, 108-09.

²⁹⁰ See generally REISNER, *supra* note 4, at 306-31 (chronicling decades of pork-barrel spending on dams and other water projects).

²⁹¹ See Dias Soares, *supra* note 289, at 110 ("Earmarking within environmental tax policy can have a strong image-related effect . . . reducing the political costs of a tax intervention.").

²⁹² See, e.g., HSU, *supra* note 15, at 101-02 (describing the rebate component of British Columbia's carbon tax).

²⁹³ See Dias Soares, *supra* note 289, at 103 ("Non-earmarking is conventionally acclaimed to represent sound public finance management.").

carbon tax schemes have included rebate programs: most importantly, they buy political support, and, depending on the allocation scheme, they also can insulate the taxes against charges that they are particularly harmful to the poor.²⁹⁴

Lastly, government could do all of these things with the tax revenue. They are mutually exclusive in the sense that the same dollars cannot be used for more than one purpose. But some of the tax revenues could support each goal.

In summary, there are many reasons why taxes could be a promising addition to systems of water use regulation. Indeed, those reasons are compelling enough that for some tax proponents, the real question probably would not be whether taxes should be added into systems of water use regulation, but instead whether they should completely displace existing systems. After all, if Pigouvian taxation is indeed the optimal mode of regulation, then any introduction of alternative regulatory approaches means costly sacrifices to efficiency and unnecessary increases in regulatory complexity.²⁹⁵

The argument here does not go quite that far. The real world has an uncanny knack for sullyng the theoretical elegance of any regulatory system, and taxation has not been exempt from that general rule.²⁹⁶ Other regulatory systems do also have their justifications; among others, sometimes they can provide greater certainty about ultimate environmental consequences than a tax.²⁹⁷ And, perhaps most importantly, people are familiar with those alternative systems. Even if a heavily tax-based policy might have made more sense initially, there can be substantial costs as regulators and regulated entities figure out

²⁹⁴ See HSU, *supra* note 15, at 101 (noting the heavy emphasis supporters of British Columbia's carbon tax placed on its rebate program); Katri Kosonen, *Regressivity of Environmental Taxation: Myth or Reality?*, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, *supra* note 17, at 161, 173 (noting that targeted revenue recycling can eliminate regressive effects).

²⁹⁵ See KEOHANE & OLMSTEAD, *supra* note 235, at 152 (summarizing traditional Pigouvian theory, and noting that with a properly-set Pigouvian tax, "[n]o other government intervention . . . is necessary").

²⁹⁶ See Barde & Godard, *supra* note 232, at 33 ("[D]espite a few success stories . . . implementing consistent environmental tax reforms is often fraught with difficulties and obstacles."); Schuerhoff et al., *supra* note 14, at 6-13 (describing the real-world problems that beset the Dutch groundwater tax).

²⁹⁷ This potential has generated ongoing debate between proponents of cap-and-trade systems and proponents of carbon taxes. See HSU, *supra* note 15, at 104-14 (summarizing the debate, and coming down on the side of taxes).

how to work with new regulatory approaches, and inevitably there will be glitches along the way. But even if abandoning prior regulatory approaches would be too drastic a step, the arguments in favor of taxation are compelling enough that supplementing, and even partially displacing, those traditional systems is an experiment worth trying.

D. Justice and Water Taxation

In 2014, Maryland's gubernatorial race turned in large part on something derided as a "rain tax."²⁹⁸ In reality, the tax raised money to address the very real water quality problems associated with stormwater runoff, and landowners' payments would have been scaled in proportion to their contributions to the underlying problem.²⁹⁹ The tax, in other words, served widely supported policy goals, and its architects had tried to be fair. But the outraged political reaction illustrates the presence of a widespread, if somewhat inchoate, sense that water just isn't the sort of thing that ought to be taxed. At times, that sense seems to cut across political lines. Whether the activists are conservatives who view water use charges as attacks on their way of life or liberals who decry private commodification of water, there is a shared sense that water is our birthright and entitlement, not something anyone should use economic instruments to discourage us from using. With the United Nations and some countries now treating water access as a fundamental human right, that sense of entitlement might seem particularly compelling.³⁰⁰

Those beliefs might undercut all the arguments raised thus far. If, regardless of any economic argument in its favor, there is something fundamentally unjust about taxing water, then any other argument in favor of water taxation will be a nonstarter. This section, therefore, confronts that basic question: are there compelling reasons, economics and practicalities aside, why taxing water is something government just should not do?

²⁹⁸ See Jenna Johnson, *Maryland Senate Unanimously Approves Easing 'Rain Tax' Terms*, WASH. POST (Mar. 20, 2015), https://www.washingtonpost.com/46783bb2-cf16-11e4-8a46-b1dc9be5a8ff_story.html.

²⁹⁹ See Jon Green, *Martin O'Malley's "Rain Tax" Is Actually a Great Idea*, AMERICABLOG (Sept. 9, 2015, 1:46 PM), <http://americablog.com/2015/09/martin-omalley-s-rain-tax-is-actually-a-great-idea.html>.

³⁰⁰ See generally David Takacs, *South Africa and the Human Right to Water: Equity, Ecology, and the Public Trust Doctrine*, 34 BERKELEY J. INT'L L. 55, 63 (2016) (describing the United Nations' endorsement of a human right to water).

1. The “Everyday Libertarian”³⁰¹ Critique of Water Taxation

Maryland is an eastern state, and thus a place where precipitation seems like a predictable inconvenience, not a thing to be taxed. But to someone steeped in the libertarian mythology of the American West, visceral opposition to water taxes might seem even more intuitive. Central to the western self-image is the strong, independent man who turns nature to societal benefit through the sweat of his own physical labor. That self-image intertwines rather nicely with the creation myths of western water law, for the creators of prior appropriation doctrine were gold miners, men who thumbed their noses at both federal ownership of the lands they used and traditional eastern water law doctrines that would have restrained their fortune-seeking.³⁰² The benefit of nature’s conquest, at least in traditional western ideology, also was clear; turning deserts into agricultural fields was “reclamation,” a word infused with manifest destiny and biblical overtones.³⁰³ Taking water out of streams, therefore, was not self-interested behavior; it was, instead, the heroic correction of a “perversity of nature.”³⁰⁴ None of these views is unique to water. Anti-tax arguments are often grounded in a libertarian worldview, in which a pre-tax economic ordering is presumptively moral and just, and in which any argument for reallocating resources must meet a high burden of persuasion.³⁰⁵ But in the water realm, with its particularly close identity with western ideals of independence and individualism, everyday libertarianism might seem to hold especially powerful sway.

But tax libertarianism, as its many critics have noted, rests on a core fallacy.³⁰⁶ Wealth and social stability depend upon governance.³⁰⁷ As flawed as governance can be, anarchy is usually much worse. And governance generally requires taxes; they are, as Justice Oliver

³⁰¹ This term comes from MURPHY & NAGEL, *supra* note 78, at 65. Murphy and Nagel use it to describe a widespread view — perhaps best illustrated by economists’ repeated discussion of the “distortions” that taxation imposes — that taxation is an intrusion upon a naturally functioning, tax-free market ordering. *See id.* at 36, 65.

³⁰² *See* CHARLES F. WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER AND THE FUTURE OF THE WEST* 232 (1992).

³⁰³ *See Brief History: Bureau of Reclamation*, U.S. BUREAU RECLAMATION, <http://www.usbr.gov/history/2011NEWBRIEFHISTORY.pdf> (last visited July 13, 2016) (“The concept was that irrigation would ‘reclaim’ or ‘subjugate’ western arid lands for human use.”).

³⁰⁴ *United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 728 (1950).

³⁰⁵ *See* MURPHY & NAGEL, *supra* note 78, at 15.

³⁰⁶ *See, e.g., id.* at 32-33.

³⁰⁷ *See id.*

Wendell Holmes once put it, “what we pay for civilized society.”³⁰⁸ This has been particularly true for water. Most people, even in the West, get their water through government agencies, and often through sequences of agencies.³⁰⁹ Those agencies, in turn, often operate water projects built and operated at public expense.³¹⁰ Conversely farmers who attempted to proceed without government assistance often failed. Floods overwhelmed their irrigation works, or their groundwater wells ran dry when they and their neighbors pumped more water than natural recharge could replace.³¹¹ Their struggles reflected basic water project economics. The up-front capital costs of water infrastructure are generally so high, and payback periods so long, that private projects cannot pencil out.³¹²

Government also brings value to water rights by regulating them. This proposition may not seem obvious, and to many water users, it may even seem bizarre. Government regulation, in their view, is just an onerous intrusion, and the idea that water users might have to pay to be regulated would seem like asking a victim to pay compensation for his own injuries.³¹³ But that proposition is not absurd at all. Water is a classic commons; it is a shared resource that competing users will often exploit to self-destructive excess unless they are bound by some mutual constraint.³¹⁴ Without governance, water rights, therefore, are likely to hold little value, for they would be unprotected against interference by other competing users.³¹⁵ Long-term investments in

³⁰⁸ IRS, *supra* note 75.

³⁰⁹ See Thompson, *Institutional Perspectives*, *supra* note 49, at 686-89.

³¹⁰ See WILKINSON, *supra* note 302, at 231 (noting the importance of federal subsidies to western water development); see also HUNDLEY, *supra* note 57, at xix (same). For the classic critique of federal water project development, see REISNER, *supra* note 4.

³¹¹ See, e.g., HUNDLEY, *supra* note 57, at 88-119, 203-302 (describing the struggles that led to California to transition away from an era of small-scale, private water development).

³¹² See Hanemann, *supra* note 58, at 74-76.

³¹³ See, e.g., Dave Owen, *Bragg, Takings, and the Economics of Limited Resources*, ENVTL. L. PROF. BLOG (Aug. 29, 2013), http://lawprofessors.typepad.com/environmental_law/2013/08/bragg-takings-and-the-economics-of-limited-resources.html (critiquing *Edwards Aquifer Auth. v. Bragg*, 421 S.W. 3d 118 (Tex. Ct. App. 2013), a recent Texas case in which the trial and appellate courts assumed that, in the absence of regulation, users of an overtapped aquifer would simply be able to take as much water as they wanted).

³¹⁴ See ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* 82-88, 103-39 (1990) (using water management case studies to explore challenges (and successes) of common-access resource management).

³¹⁵ See Barton H. Thompson, Jr., *Tragically Difficult: The Obstacles to Governing the*

water infrastructure would make little sense, for the assets could be left stranded when supplies disappear. And water rights would be difficult to trade, for the purchasing party would have no guarantees that the conveyed rights meant anything. The end result of non-regulation would likely be a conflict-ridden system in which each user strives to obtain as much as possible as quickly as possible, but in which the prospects for long-term stability (and environmental protection of aquatic resources) are slim.³¹⁶ Regulatory interventions to prevent that state of nature, therefore, provide powerful collective benefits, and those regulatory interventions must be funded somehow. Taxes on other activities have been the traditional source of that funding, but a tax on water use would better align the burdens of taxation with the governance benefits that taxation allows.

Beyond these reasons, traditional water law doctrines support the idea that water use is an appropriate target for taxation. Across the United States, water is subject to a dual ownership regime. Private users can and do obtain property rights to use water.³¹⁷ But ownership of the water itself remains with the state, which holds that water in trust for its citizens.³¹⁸ The implications of this dual ownership system are not always entirely clear, and they vary from state to state.³¹⁹ But the system nevertheless reflects a widespread view that water is a public resource that never entirely sheds its public character.³²⁰ Users pay to access many other public natural resources; they pay fees to

Commons, 30 ENVTL. L. 241, 249-53 (2000) (describing this dynamic with groundwater use).

³¹⁶ See *id.*

³¹⁷ See *Eddy v. Simpson*, 3 Cal. 249, 252 (1853) (“[T]he right of property in water is *usufructuary*, and consists not so much of the fluid itself as the advantage of its use.”).

³¹⁸ See, e.g., CAL. WATER CODE § 102 (2016) (“All water within the State is the property of the people of the state.”); NEV. REV. STAT. § 533.025 (2016) (“The water of all sources of water supply within the boundaries of the State whether above or beneath the surface of the ground, belongs to the public.”).

³¹⁹ For discussion of various versions of the public trust doctrine — which is just one of the doctrines that qualifies water rights — see 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 (2010), and Robin Kundis Craig, *A Comparative Guide to the Eastern Public Trust Doctrine: Classifications of States, Property Rights, and State Summaries*, 16 PENN. ST. ENVTL. L. REV. 1 (2007).

³²⁰ See Joseph Sax, *Proceedings of the 2001 Symposium on Managing Hawai’i’s Public Trust Doctrine*, 24 U. HAW. L. REV. 21, 24 (2001) (“All these diverse laws from widely separated places on the globe emphasize one idea: Water is first and foremost a public community resource . . .”).

harvest timber, for example, and royalties to extract oil and natural gas.³²¹ Obtaining water without charge, therefore, is somewhat anomalous.³²² And paying taxes on water would just partly compensate the public for allowing a shared resource to be redirected to private use.

That argument comes with a caveat: private ownership of water rights should still mean something.³²³ Landowners are not asked to make an annual payment of the full scarcity value of their land; while that ownership may be taxed and regulated, ownership does confer some degree of economic privilege against government revenue-seeking and control.³²⁴ If property rights in water are to be meaningful, then some protection against governmental fundraising must also exist; requiring water right holders to pay the full scarcity value of their water rights would be akin to requiring them to purchase those rights anew each successive year.³²⁵ But that caveat only suggests that water taxation rates should be moderate, not that water taxation should not exist at all.

Perhaps there are human activities, or forms of wealth, that simply do not belong in the tax system. They may be too closely tied to personal labor or personal identity for society to claim a share.³²⁶ Or, alternatively, the activities may provide such important social benefits that government would never want to dissuade them through taxation. But water use is not one of those activities.

³²¹ See WILKINSON, *supra* note 302, at 242.

³²² See *id.* at 241-42 (“This is nearly unique in public resource law and policy.”).

³²³ That caveat would not apply, however, to a country that does not treat water use as a matter of property law.

³²⁴ See, e.g., *Penn. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922) (allowing regulation of property, but holding that regulations that go “too far” are takings).

³²⁵ Of course, if inherent limitations in a water right — like its subsidiarity to public interests embodied in state public trust doctrines or the federal navigational servitude — could lawfully result in the elimination of water use under that right, then there is no great injustice in allowing the state to tax water consumption under that right quite heavily. See *United States v. Willow River Power Co.*, 324 U.S. 499, 507-10 (1945) (holding that private water rights are subservient to the “dominant public interest in navigation”); *Nat’l Audubon Soc’y v. Superior Court, of Alpine Cty.*, 658 P.2d 709, 712 (Cal. 1983) (stating that the public trust doctrine “bars [the Los Angeles Department of Water and Power] or any other party from claiming a vested right to divert waters once it becomes clear that such diversions harm the interests protected by the public trust.”).

³²⁶ See generally Margaret Jane Radin, *Property and Personhood*, 34 *STAN. L. REV.* 957 (1982) (arguing that some forms of property deserve special treatment because of their close connections to individual identity).

2. Commodifying the Sacred and Hurting the Poor?

A very different critique of water taxation is likely to arise from those on the political left. In recent years, there has been no shortage of critiques of any effort at commodifying water.³²⁷ Those critiques are based partly on the direct consequences of water pricing for poor people and partly on a more general sense that pricing water undercuts its status as a community resource with almost sacred importance to human life.³²⁸ Often these critiques are thoroughly intertwined with debates over the privatization of water deliveries, and thus target private corporations rather than public taxation.³²⁹ But some of the rhetoric is often broad enough to sweep in any attempt to treat water as a commodity with a price.³³⁰

The former critique is a potentially powerful one, for water taxes could hit poor people especially hard. To meet basic human needs, everyone needs some water. And while rich people typically use much more water than poor people, largely because their lots and houses tend to be bigger, poor people often pay a much larger percentage of their income for water.³³¹ To pile an additional water charge onto poor people's pre-existing economic burdens, therefore, might seem rather unwise and unfair.

This is an important problem, but it is not a new one, and economists and policymakers studying water pricing have identified a straightforward fix. Water suppliers can deliver a basic allocation of water — a block, in water pricing parlance — for a very low rate, or even for free, and then can charge increasing rates for each additional increment of water use.³³² Progressive block pricing, as this scheme is

³²⁷ See, e.g., VANDANA SHIVA, *WATER WARS: PRIVATIZATION, POLLUTION, AND PROFIT* x (2002) (“The culture of commodification is at war with diverse cultures of sharing, of giving and receiving water as a free gift.”).

³²⁸ E.g., Maude Barlow & Tony Clarke, *Who Owns Water?*, *NATION* (Aug. 15, 2002), <https://www.thenation.com/article/who-owns-water/>.

³²⁹ See, e.g., SHIVA, *supra* note 327, at x (describing water wars as pitting people and species against large corporations); William Finnegan, *Leasing the Rain*, *NEW YORKER* (Apr. 8, 2002), <http://www.newyorker.com/magazine/2002/04/08/leasing-the-rain> (describing conflicts over water privatization in Cochabamba, Bolivia).

³³⁰ E.g., Barlow & Clarke, *supra* note 328 (“[C]itizens must establish clear perimeters around those areas that are sacred to life and necessary for the survival of the planet. Simply, governments must declare that water belongs to the earth and all species and is a fundamental human right. No one has the right to appropriate it for profit.”).

³³¹ Outside the United States' borders, this problem is even more pronounced. See WATERAID, *WATER: AT WHAT COST? THE STATE OF THE WORLD'S WATER 2016* (2016).

³³² See Charles W. Howe, *The Functions, Impacts and Effectiveness of Water Pricing*:

known, is already used for some utility fee structures, and there is no legal or economic reason why it could not also be used for taxes.³³³ Indeed, in some states, like California, where constitutional restrictions on fees could limit suppliers' ability to use progressive block pricing, the tax code might offer an easier (legally, if not politically) way to implement a progressive pricing scheme, and thus to reduce the regressive effects of water pricing.³³⁴

An alternative version of this argument focuses on the likely effects on farmers and food production. Imposing taxes on water would raise the economic cost of water-intensive activities, and no activity consumes more water than agriculture.³³⁵ If the tax revenues simply remit to the general fund, or go to support water use regulation, the aggregate effect of a water tax would be to transfer wealth from agricultural communities to the rest of society.³³⁶ And if the tax tips marginally economic agricultural activities to a point of non-viability, it could eliminate those activities, with ripple effects throughout the communities where the eliminated activities once occurred.³³⁷ Many rural areas already are struggling economically, and the strain of a water tax would be an unwelcome additional blow.³³⁸

Evidence from the United States and Canada, 21 WATER RESOURCES DEV. 43, 45 (2005) (discussing "life line pricing").

³³³ See *id.* at 47-48 (discussing various pricing structures, and also observing that some utilities still use declining block pricing, which offers lower per-volume rates to higher users).

³³⁴ See *Capistrano Taxpayers Ass'n v. City of San Juan Capistrano*, 186 Cal. Rptr. 3d 362, 380-81 (Ct. App. 2015) (invalidating a progressive block pricing scheme); *City of Palmdale v. Palmdale Water Dist.*, 131 Cal. Rptr. 3d 373, 380-81 (Ct. App. 2011) (same).

³³⁵ See U.S. GEOLOGICAL SURVEY, *supra* note 7.

³³⁶ This effect would not occur if farmers can pass increased production costs on to consumers. But in a global market, where consumers can readily seek food from alternative sources, producers are not likely to be able to pass on their costs. See generally SLEMROD & BAKIJA, *supra* note 16, at 76-77 (noting that producers generally cannot shift tax costs onto consumers when those consumers have alternative suppliers).

³³⁷ Similar concerns often arise with water transfers. See, e.g., Kenneth R. Weber, *Effects of Water Transfers on Rural Areas: A Response to Shupe, Weatherford, and Checchio*, 30 NAT. RESOURCES J. 13, 13-15 (1990).

³³⁸ See U.S. DEP'T OF AGRIC., *RURAL AMERICA AT A GLANCE* 2-5 (2014) (describing stagnant job growth, higher poverty rates, declining population, and lagging education levels). The impacts would not be equally felt across agricultural sectors, however. If the tax focuses on water diversions, rather than use of natural rainfall, agricultural producers in humid areas would benefit from a new competitive advantage (or, from their perspective, the reduction in their former competitive disadvantage). See Berrittella et al., *supra* note 14, at 1804-06 (finding that scarcity charges or restrictions

That is a harsh consequence, but it also is difficult to divorce it from the benefits of water taxation. If the whole purpose of a Pigouvian tax is to internalize externalities and thus correct flaws in the market, then the decline of activities that depended upon those flaws for their viability is a sign that the tax is working.³³⁹ To put it in more practical terms, if a water tax reduces the production of alfalfa and raises the price of beef, that may be evidence that the pricing system is helping people realize, and account for, the real economic cost of beef.³⁴⁰ Additionally, there are many other legal doctrines, from the public trust doctrine to the Endangered Species Act, to which regulators or activists might also turn to compel shifts in water use.³⁴¹ Reallocations through the comparatively gentle tax system may be preferable to these other regulatory alternatives.

Taxes also can be structured to mitigate those impacts. If a goal is to reduce water use without transferring money away from the agricultural sector, revenue from the tax could be remitted to farmers.³⁴² The incentive to conserve water still would exist, for a farmer could obtain the best balance of tax and remittance payments by keeping her water use as low as possible. But if the aggregate payments to farmers are tied to the aggregate taxes they pay, the net loss to agricultural communities would only be the transaction costs of collecting the taxes and delivering remittances.³⁴³ The remittance also need not be complete; a partial remittance scheme might balance fairness to non-agricultural users with the need to soften agriculture's blows.

That leaves the argument that placing a price on water will somehow undermine the sacred, and that argument is not so

will benefit agricultural producers in areas with abundant water).

³³⁹ See CULP ET AL., *supra* note 252, at 10-19 (repeatedly citing low-value uses by agriculture as the primary evidence of the need for better price incentives for water).

³⁴⁰ See Herrero et al., *supra* note 186, at 20888 (discussing the massive environmental impact of livestock production); see also Berrittella et al., *supra* note 14, at 1809 (finding that water taxes could benefit the overall United States economy by correcting for excessive subsidization of agriculture and shifting resources into more productive endeavors).

³⁴¹ See Owen, *Environmental Dynamism*, *supra* note 11, at 1184-86.

³⁴² See, e.g., Yiğit Sağlam, *Supply-Based Dynamic Ramsey Pricing: Avoiding Water Shortages*, 51 WATER RES. RESEARCH 669, 669-72 (2015) (modeling a somewhat similar scenario, and finding that it avoids shortages and produces welfare benefits). This idea is analogous to tax-and-dividend approaches for greenhouse gas emissions. See, e.g., Evan Lehmann, *A 'Believer' Takes over Conservative Carbon Tax Effort*, CLIMATEWIRE (Apr. 27, 2015), <http://www.eenews.net/stories/1060017471> (describing work by the R Street Institute, a conservative think tank, to support a revenue-neutral carbon tax).

³⁴³ By creating an incentive for greater efficiency, the scheme might actually increase the welfare of the agricultural sector. See Sağlam, *supra* note 342, at 683.

compelling. Initially, the implications of that argument, even if it is correct, are far from clear; people who assert with great vehemence that water is a community resource, not just a commodity, often employ that rhetoric in support of diametrically opposing ends.³⁴⁴ Additionally, that argument has always been somewhat fanciful, for societies have often treated water partly as a community resource and partly as an economic commodity.³⁴⁵ Putting a price on water, therefore, is not new, and what would be new is making the price sensible. A price that incorporates the value of water to society as a whole, not just to the consumer who receives it or the supplier who delivers it, would be a dramatic step toward incorporating community values into water allocation. And while the cold hand of economics may not seem like a particularly sacred way to promote those values, it does often work.

CONCLUSION

In the United States, few legal areas are as complicated as water law. The field draws heavily upon property, administrative, and environmental law while adding in many of its own doctrinal principles. But in all of this complexity, taxes have never played a prominent role. That has been an unfortunate oversight. As this article has shown, there are numerous intersections between the tax code and water policy, and while the resulting incentives probably are of no more than minor importance, they do offer promising targets for reform. More importantly, direct taxation of water consumption could be an effective method of water policy reform.

³⁴⁴ Compare Freyfogle, *Common Wealth*, *supra* note 56, at 45 (asserting that understanding water as a community resource will lead to greater environmental protection and less entrenchment of traditional agricultural uses), with Weber, *supra* note 337, at 13-15 (raising community interests in water as reasons why water should not be transferred).

³⁴⁵ See James Salzman, *Thirst: A Short History of Drinking Water*, 18 *YALE J.L. & HUMAN.* 94, 99-113 (2006) (finding this dual treatment of water in Islamic, Hebrew, Roman, and American custom and law).