Water and Taxes.pdf

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This article considers how water consumption in the United States is taxed, and how it 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.

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,” as historian Walter Prescott Webb once called it—but recent droughts have set records. According to climate models, the future threatens to bring even more extreme weather, and with it, more intense competition for water. And

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2 See Greg Garfin et al., *Southwest*, in *CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE CHANGE ASSESSMENT* 463 (J.M. Mellilo et al., eds.)
the American West is not unique. Around the world, water is becoming increasingly precious.

Yet in much of the American West, and the rest of the world, people consume water in ways that defy common sense. The highest economic returns from water consumption typically come from urban and industrial use. But most water goes to agriculture, and many agricultural users still grow relatively low-value crops, often in inefficient ways. 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 or just goes to waste. 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. 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.

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

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7 See United States Geological Survey, Irrigation Water Use, http://water.usgs.gov/edu/wuir.html (“Estimates vary, but about 70 percent of all the world’s freshwater withdrawals go towards irrigation uses.”).


9 See Schlosser et al., supra note 3, at 24.

environmentally destructive water use practices. 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. Water transfers also have shifted some water use from low value crops to other higher-value uses. 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, and in political realms,

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13 See Heather Cooley et al., Impacts of California’s Ongoing Drought: Agriculture 12-16 (2015); Western Governors’ Association & Western States Water Council, Water Transfers in the West (2012).


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. 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., Nicholas Kilimani et al., Water Taxation and the Double Dividend Hypothesis, 10 WATER RESOURCES AND ECON. 68 (2015); Changbo Chin et al., The Economic Impact of Water Tax Charges in China: A Static Computable General Equilibrium Analysis, 37 WATER INT’L 279 (2012); Maria Berrettella et al., The Economic Impact of Restricted Water Supply: A Computational General Equilibrium Analysis, 41 WATER RESEARCH 1799 (2007); Anthony Letsoalo et al., Triple Dividends of Water Consumption Charges in South Africa, 43 WATER RESOURCES RESEARCH W05412 (2007). For a rare example of a paper that considers the messy
almost any new tax proposal is toxic. But that has not stopped carbon taxes from becoming the darlings of regulatory theory.\textsuperscript{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.\textsuperscript{16} Indeed, following the theories of Arthur Pigou,\textsuperscript{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 addressing environmental and other social harms.\textsuperscript{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.\textsuperscript{19} This Article asks whether similar arguments apply to water.

More specifically, it addresses two questions. The first 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, such provisions are sprinkled through the field of tax law.\textsuperscript{20} From excise taxes exemptions that encourage irrigation to federal policies that treat water efficiency rebates as taxable incomes to production incentives for water bottling companies, to provide just a few examples, federal and state codes contain a wide variety of minor collisions between water policy and tax law. None of the resulting incentives seems powerful enough to create major changes in water use patterns, but some do offer promising targets for modest reform.


\textsuperscript{16} See JOEL SLEMROD & JON BAKIA, TAXING OURSELVES: A CITIZEN’S GUIDE TO THE DEBATE OVER TAXES 120 (4th ed. 2008) (noting that tax-related incentives are pervasive).

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

\textsuperscript{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., Victor Fleischer, Curb Your Enthusiasm for Pigovian Taxes, 68 VAND. L. REV. 1673 (2015) (arguing that Pigouvian taxes are a good fit for greenhouse gas regulation and not much else); SLEMROD & BAKIA, 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.”).

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

\textsuperscript{20} See infra Part I.
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. And those economic incentives could help improve allocation patterns. Water taxes also could 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. And while water taxation may initially strike people a strange or misguided, there is no compelling argument that explains why water is an inappropriate or unjust focus for taxation.

This Article’s analysis proceeds as follows. Part I addresses the current tax status of consumptive water use in the United States. 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 is a paper 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. Even in other countries,
where a few environmental taxes have been adopted, their sponsors have suffered a political toll.\textsuperscript{28} For those reasons, a few words about this analysis’s degree of political naivete 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.”\textsuperscript{29} 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,\textsuperscript{30} 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.\textsuperscript{31} 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.\textsuperscript{32} In the Rocky Mountain states, the doctrine of prior

\textsuperscript{28} See, e.g., Mark Jaccard, \textit{The Political Acceptability of Carbon Taxes: Lessons from British Columbia}, in \textit{Handbook of Research on Environmental Taxation}, \textit{supra} note 17, at 175, 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, \textit{A Carbon Tax’s Ignoble End: Why Tony Abbott Axed Australia’s Carbon Tax}, \textit{N.Y. Times}, July 24, 2014, at A27.

\textsuperscript{29} A particularly savvy water lawyer will say something like, “their value is factored into tax appraisals of land.” See Moses & Witten, \textit{supra} note 14, at 475.

\textsuperscript{30} See, e.g., Schuerhoff et al., \textit{supra} note 14.


\textsuperscript{32} See \textit{Barton H. Thompson, Jr. et al., Legal Control of Water Resources} 28 (5th ed. 2013).
appropriation displaced riparian rights. In the high plains and west coast states, the two doctrines maintain an uneasy coexistence. 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. Unlike riparian rights, an appropriative right can be tied to any parcel of land, not just parcels adjacent to the waterway.

Despite their profound differences, there are also some underlying similarities between riparian and appropriative rights. First, both systems involve property rights. 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. But the field of water law nevertheless has one foot firmly planted in property law. Second, both kinds of rights increasingly are administered through permitting systems and by administrative agencies. Thus, water law’s other foot is firmly planted in administrative law. Balancing atop that dual foundation is often difficult.

In many states, rights to groundwater are just as important as rights to surface water. 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. 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. That view has changed, at least somewhat, and most states

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33 See Reno Smelting, Milling & Reduction Works v. Stevenson, 21 P. 317 (Nev. 1889) (excising riparian rights from Nevada law); Coffin v. Left Hand Ditch Co., 6 Colo. 443 (1882) (doing the same for Colorado).
36 Id. at 170.
39 See THOMPSON, JR. ET AL., supra note 32, at 132-33, 172-73 (describing movements toward permitting in both riparian and prior appropriation systems).
40 See Fischman, supra note 31, at 718-19 (noting that natural resources law generally sits atop this dual foundation).
42 See id.
43 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, movement and course of such waters…are so secret, occult, and concealed… an attempt to administer
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.\(^{44}\) 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.\(^{45}\) 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.\(^{46}\) Those intermediary suppliers come in a wide variety of legal forms, and there are thousands of them.\(^{47}\) Some are governmental, some are private, and some blur the boundaries between those spheres.\(^{48}\)

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.\(^{49}\) But much of it exists to ensure environmental protection of aquatic resources.\(^{50}\) That environmental purpose implicates the other fundamental tension of modern water politics and law. Much of American water law—particularly in the west—evolved in an era when water that stayed in a stream and flowed to the ocean was viewed as water wasted, and when the United States Supreme Court might reprove great western rivers for “thriftlessly dissipat[ing] their waters in the Pacific tides.”\(^{51}\) Consequently, many water
users—particularly farmers, who were among the first users on the scene, 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. 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. The tension between the new users 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. 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. Unless we buy it in a bottle, we generally pay nothing for water itself.

B. Tax Law 101

Every year, the United States federal government collects well over a trillion dollars in taxes. State and local governments collect over a trillion more. These taxes fund the lion’s share of governmental activity in the

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52 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 (2002) (chronicling the long history of water conflict between Native Americans and white irrigators in Wyoming’s Wind River basin).

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

54 For a sweeping history of these changes in California, see NORRIS HUNDLEY, JR., THE GREAT THIRST (rev’d ed. 2001).


56 Id.; see Olmstead & Stavins, supra note 21, at 1 (“Urban water prices lie well below [long-run marginal cost] in many countries.”).

57 To put the point more specifically, the price does not factor in the scarcity value of water. Hanemann, supra note 55, 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, 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.


59 See U.S. Census Bureau, Quarterly Summary of State and Local Taxes,
United States, and thus play a constitutive role in creating our nation and defining our politics. The law of taxation is just as complicated as the scale of the enterprise might lead one to expect. 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. Each state has its own tax code, and taxation is also a key part of local government law.

The United States’ most important tax is the federal income tax, which applies to both individuals and corporations. Within the income tax system, the federal government gives preferential rates to capital gains on investments. The estate tax gives the federal government a share of particularly large bequests. 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. The collateral effect of those exemptions, however, is to create a tax system that also is widely reviled for its complexity.

State taxes are in some ways similar to the federal system and in some ways quite different. Most states also have income taxes, though state tax rates are generally lower than the federal rates for comparable income brackets. Most states also use sales taxes as a significant revenue source. Local governments in most states tax real property, and those property taxes provide a key revenue source for education and other local government functions. Like federal taxes, state taxes are often subject to multiple


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


63 See Tax Policy Center, supra note 58 (showing amounts collected).


65 See SLEMROD & BAKIJA, supra note 16, at 14 (showing sources of federal revenue).

66 See id. at 165.

67 See id. at 3 (“The cost of such complexity is staggering.”).


exemptions. And unlike federal taxes, which Congress holds relatively unfettered power to enact, many states have constitutional limitations on governments’ ability to raise old taxes or to impose new ones.71

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.72 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 is to frame tax issues as questions of justice and fairness.73 So, for example, a person might argue that taxation is wrong because it is essentially a confiscation of property,74 or that it is right because paying taxes fulfills a social contract shared among members of society.75 Another is to approach tax questions by focusing on economic utility and administrability.76 For that 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.77

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,78 and those states that do discuss water consumption in their tax codes generally do so briefly.79 On a few occasions, state legislators have proposed more

71 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).
73 See SLEMROD & BAKIJA, supra note 16, at 57-98.
75 For arguments grounded in justice and the constitutive role of taxation in creating an economy and society, see LIAM MURPHY & THOMAS NAGEL, The Myth of Ownership: Taxes and Justice (2002).
77 See id.
78 It also is largely absent from state constitutions, though Utah does have a constitutional provision expressly exempting water rights from property taxation. Utah Const. art. XIII § 3.
79 As one might expect, western states are more likely to have tax provisions tied to
comprehensive taxation schemes for water rights, but they have not been enacted. 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.

Those intersections are neither numerous nor bound by any systemic logic, and the examples that follow may seem disjointed. But one key point should emerge. In the United States, there is no real coordination between tax systems and water policy and law. Instead, to the extent water use is indirectly taxed, those taxes are fairly haphazard in their application and modest in their extent.

1. Water and Property Taxes

The most significant area of overlap between water law and tax law is property rights taxation. Real property is taxed in every state, and in many parts of the country, access to water is a significant factor in the valuation of land. 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. Similarly, a residential or commercial developer

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80 See, e.g., California Legislative Information, SB-34: California Water Resources Investment Act of 2011, http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB34 (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, e.g., Scott Thistle, Tax for Bottled Water Companies Faces Struggle in Maine Legislature, LEWISTON SUN-J., March 11, 2015.

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

82 See Moses & Witten, supra note 14, at 476.

83 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);

is likely to place less value on a parcel of land that lacks access to municipal water supplies.\textsuperscript{85} For that reason, it is not actually accurate to say, as my hypothetical water lawyer might, that water rights and water access are not taxed. They are, and in some areas most property taxation is really water taxation.\textsuperscript{86}

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.\textsuperscript{87} 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.\textsuperscript{88} 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 her water right now will generate more income as well as lending value to her property.\textsuperscript{89}

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.\textsuperscript{90} Some of those entities—like college campuses and public golf courses, to provide just two examples—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.\textsuperscript{91}

\textsuperscript{85} 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?, 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.”).

\textsuperscript{86} See City and County of San Francisco 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.”).

\textsuperscript{87} See Moses & Witten, supra note 14, at 481-84 (describing older cases that upheld tax assessments that incorporated the value of unexercised water rights).


\textsuperscript{89} See Kuhnle, supra note 14, at 543. She will also make more money, so paying additional taxes may not seem so bad.


\textsuperscript{91} See Cincinnati v. Testa, 143 Ohio St. 3d 371 (2015) (upholding property tax exemptions for a public golf course that was managed by a private entity).
entities, though not fully exempt, have reduced liability. For example, some
states provide property tax incentives designed to keep land in agricultural
use.\footnote{See, e.g., Neb. Rev. St. § 77-201 (stating that all agricultural land shall be valued, for
property tax purposes, at seventy-five percent of market value); California Dept. of
visited July 11, 2016) (describing California’s Williamson Act, which gives preferential tax
 treatment to agricultural and open space lands).} 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.\footnote{See Benjamin Harris & Brian David Moore, Residential Property Taxes in the United
States 1 (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.").} 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.\footnote{See Nordlinger v. Hahn, 505 U.S. 1, 4-5 (1992) (describing Proposition 13).} 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 much from that shift as longtime homeowners.\footnote{See Cal. Const. art. 13A (referring to all “real property”).} In
many places, 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.\footnote{See Jay Romano, Market vs. Appraisal: What’s the Real Value?, N.Y. TIMES, Aug. 8,
what-s-the-real-value.html?_r=0 (noting common disparities between market and assessed
value).} 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—members of a discipline 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?\footnote{See Brent, supra note 84 (estimating the value of seniority).} How should uncertainties associated with
potential future environmental restrictions, or with climate change, affect the
valuation of the land to which water rights attach? These are deeply thorny issues, but existing guidance on water rights valuation gives them only cursory treatment.

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. A separate system of water rights taxation also could create its own issues with exempt entities. Many water distributors are governmental entities that might be exempt from local taxation. 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. But 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 do 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,

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98 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 ST. J., Jan. 31, 2014; Paul Rogers, California Drought: Feds Say Farmers Won’t Get Any Central Valley Project Water this Year, SAN JOSE MERCURY-NEWS, Feb. 21, 2014.

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

100 See supra notes 83-86 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 (9th Cir. 2001) (holding that the cost basis for a water right could be separated from that of the appurtenant land).

101 See supra note 90-92 and accompanying text (describing property tax exemptions).

and some create strange or even perverse consequences.\footnote{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. \textit{See} Shurbet v. United States, 347 F.2d 103 (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 \textit{Shurbet} as applying only to landowners over the Ogallala Aquifer, a massive—and famously depleted—aquifer stretching from the Texas Panhandle to Nebraska. \textit{DEPT. OF REVENUE, INTERNAL REVENUE SERV., PUBLICATION 225: FARMER’S TAX GUIDE FOR USE IN PREPARING 2015 TAX RETURNS} 108 (2015); \textit{see} U.S. Geological Survey, Groundwater Depletion, http://water.usgs.gov/edu/gwdepletion.html (last visited July 10, 2016).}

\begin{enumerate}
\item 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 the purpose of soil or water conservation,” so long as the work done is consistent with a governmentally-approved soil or water conservation plan.\footnote{26 U.S.C. § 175(a). Section 175 also allows deductions for expenses incurred to implement endangered species recovery plans.}

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.\footnote{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.} 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.\footnote{\textit{See}, e.g., United States v. Gerlach Live Stock, 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”).} 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.\footnote{\textit{Behring v. C.I.R.}, 32 T. Ct. 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.”).}

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.\footnote{Joint Committee on Taxation, \textit{Estimates of Federal Tax Expenditures for Fiscal Years 2015-19} (2015).} 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.

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.\footnote{26 U.S.C. § 199. For general discussion of section 199 and its consequences, see Jennifer L. Blouin et al., \textit{The Effect of the Domestic Production Activities Deduction on Corporate Payout Behavior}, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1092222.} 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.\footnote{26 U.S.C. § 199(c)(4)(A)(i)(III) (2012). 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.}

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.\footnote{For more detailed discussion of consumers’ responses to changes in water pricing, see \textit{infra} notes 188-198 and accompanying text.}

Nevertheless, that economic signal probably exerts only a minor influence on aggregate levels of water use.\footnote{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.} 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.\footnote{See U.S. Geological Survey, \textit{Water Use in the United States: Total Water Use}, http://water.usgs.gov/watuse/wuto.html (last visited July 11, 2016).} 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). For a private and profitable water company, section 199 can generate significant changes in tax liability. But from a water policy perspective, the importance of section 199’s coverage of potable water is probably rather modest.

c. Water and Mortgage 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. 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.” 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. So any tax incentive that encourages sprawling development—and many commentators argue that the mortgage interest deduction does so—will also encourage water use.

Again, however, the extent of that impact is difficult to discern, largely

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115 See, e.g., In the Matter of Application by Aqua North Carolina, Inc., 2011 WL 5345238 (N.C. Utilities Comm’n) (finding that a utility would be eligible for a $85,246 section 199 deduction).


117 COMMITTEE ON THE EFFECTS OF PROVISIONS IN THE INTERNAL REVENUE CODE ON GREENHOUSE GAS EMISSIONS; BOARD ON SCIENCE, TECHNOLOGY, AND ECONOMIC POLICY; POLICY AND GLOBAL AFFAIRS; NATIONAL RESEARCH COUNCIL, EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS 31 (2013) (hereinafter EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS).


119 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 (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. EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS, supra note 117, 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. Id. at 128.
because the extent to which the mortgage interest deduction influences housing patterns is unclear.\textsuperscript{120} While it lowers homeowners’ tax liability—if those homeowners are wealthy enough to itemize 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.\textsuperscript{121} 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.\textsuperscript{122} 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.\textsuperscript{123} These transfers typically come in several forms. Sometimes a transferor will sell its water rights to a transferee.\textsuperscript{124} Often, for example, agricultural users with senior rights will sell those rights to growing cities.\textsuperscript{125} 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.\textsuperscript{126} 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

\textsuperscript{120} See SLEMROD & BAKIJA, supra note 16, at 221-22 (noting questions about whether the deduction actually succeeds in encouraging homeownership).
\textsuperscript{121} For questions about how much the deduction actually encourages homeownership, see EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS, supra note 117, at 125.
\textsuperscript{122} 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).
\textsuperscript{123} See generally WESTERN GOVERNORS’ ASSOCIATION & WESTERN STATES WATER COUNCIL, supra note 13 (summarizing trends and issues in water trading).
\textsuperscript{124} See Jesse Reiblich & Christine Klein, Climate Change & Water Transfers, 41 PEPPERDINE L. REV. 439, 450 (2014).
\textsuperscript{125} See Thompson, Jr., supra note 46, at 701-02 (describing the reasons for agricultural-urban transfers).
\textsuperscript{126} Kuhnle, supra note 14.
purchase water at a fixed price when the need later arises (typically during a period of drought).\textsuperscript{127} 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.\textsuperscript{128}

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.\textsuperscript{129} If, on the other hand, the seller retains the underlying right but sells access to the water, it has created a new income stream.\textsuperscript{130} 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.\textsuperscript{131}

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.\textsuperscript{132} In practice, potential transferors seem far more concerned about the procedural hurdles—which can be significant—associated with obtaining governmental approvals of transfers.\textsuperscript{133}

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


\textsuperscript{128} See \textit{WESTERN GOVERNORS’ ASSOCIATION & WESTERN STATES WATER COUNCIL}, \textit{supra} note 13, at 11-12 (describing policy arguments favoring water transfers); Reiblich & Klein, \textit{supra} note 124, at 448-49 (describing growing support).

\textsuperscript{129} Kuhnle, \textit{supra} note 14, at 544-45.

\textsuperscript{130} \textit{Id.} at 543; see \textit{CAL. ST. BD. OF EQUALIZATION}, \textit{supra} note 99, at 7 (explaining that most water transfers do not involve actual conveyances of property).

\textsuperscript{131} Kuhnle, \textit{supra} note 14 at 547.

\textsuperscript{132} The only academic publication to address the subject is Kuhnle, \textit{supra} note 14. And even Kuhnle observes that the tax implications of water transfers are “[l]argely overlooked.” \textit{Id.} at 536.

\textsuperscript{133} See \textit{WESTERN GOVERNORS’ ASSOCIATION & WESTERN STATES WATER COUNCIL}, \textit{supra} note 13, at 36 (noting the importance of transaction costs).
become increasingly popular, and more legally accepted, in recent decades. 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.

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. While altruistic motivations play a part in these deals, the Internal Revenue Code also helps. 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.

Whether similar federal tax incentives are available for water transfers is not clear. Internal Revenue Code subsection 170(f)(3)(A) limits taxpayers’ ability to claim deductions for donations of partial interests in property. That clearly eliminates deductions for some types of water donations; a temporary donation, for example, would not qualify. And even the status of long-term 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. The IRS has not rejected that position, and a few taxpayers have claimed that deduction without their returns being challenged.

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134 See id. at 26.
136 See The Nature Conservancy, Conservation Easements (describing over fifteen million acres of protection by The Nature Conservancy alone).
137 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?, 2013 UTAH L. REV. 687.
138 See id. at 716 (showing total numbers of deductions and the average value of those deductions).
141 See Mary Anne King, Getting Our Feet Wet: An Introduction to Water Trusts, 28 HARV. ENVTL. L. REV. 495, 512 (2004) (noting that most purchases of conservation water have been short-term and therefore ineligible for federal tax deductions).
142 See Tom Hicks et al., Letter to Associate Chief Counsel (Income Tax and Accounting), Internal Revenue Service, October 30, 2012.
143 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
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. Consequently, one of the most powerful tax incentives for land conservation is available for water only on a limited and uncertain basis.

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. One of those incentive provisions—section 45M—encourages energy efficiency by encouraging water use efficiency. The best way to make a washing machine or dishwasher more energy efficient is to make it use less water, and the section 45M therefore allows tax deductions only for washing machines and dishwashers that meet specific water use standards. 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. 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. In other words, they serve the same policy

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144 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.

145 See King, supra note 141, at 512 (“In practice, water trusts have been less successful than land trusts in using tax deductions to promote transactions.”).


147 Id.

148 Id. § 45M(b) (conditioning the eligibility of washing machines and dishwashers on low water consumption).


goal as federal tax incentives for energy efficiency. But the IRS treats those state rebates as taxable income.\footnote{See Darryl Fears, \textit{California’s Drive to Save Water is Killing Trees, Hurting Utilities and Raising Taxes}, WASH. POST, Feb. 27, 2016.} 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.\footnote{This was one of the unpleasant surprises your author encountered while filling out his 2015 tax return.}

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 environment\footnote{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 U.S. Envtl. Prot. Agency, Lifecycle Analysis of Greenhouse Gases under the Renewable Fuel Standard, \url{https://www.epa.gov/renewable-fuel-standard-program/lifecycle-analysis-greenhouse-gas-emissions-under-renewable-fuel} (last visited July 11, 2016).}—the federal government provides an excise tax exemption for ethanol production.\footnote{26 U.S.C. § 40 (2012); see U.S. Dept. of Energy, Alternative Fuels Data Center, Federal Laws and Incentives for Ethanol, \url{http://www.afdc.energy.gov/fuels/laws/ETH/US} (last visited July 11, 2016).} That exemption encourages the growth of crops that produce ethanol, which, in the United States, means growing corn.\footnote{Amy Diggs, \textit{The Expiration of the Ethanol Tax Credit: An Analysis of Costs and Benefits}, 19 POL’Y PERSPECTIVES 47 (2012) (“[C]orn makes up nearly all of the ethanol produced in the United States.”).} And the amount of corn grown for ethanol production is somewhat staggering. Corn occupies more of the United States’ land than any other crop,\footnote{U.S. Dept. of Agriculture, Farms and Farmland: Numbers, Acreage, Ownership, and Use (2014), \url{https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farms_and_Farmland/Highlights_Farms_and_Farmland.pdf}.} and more than one third of that corn produces ethanol.\footnote{Diggs, \textit{supra} note 155, at 51 (providing statistics from 2010).}

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.\footnote{Renee Cho, \textit{Ethanol’s Impact on our Water Resources}, \textit{STATE OF THE PLANET}, March} For that reason, there is not a direct, linear
relationship between ethanol production and water diversions.\textsuperscript{159} Additionally, ethanol production is not solely attributable to the tax credit. Several other federal policies also encourage, or even mandate, biofuel production.\textsuperscript{160} So while some water consumption almost certainly is attributable to the ethanol fuel mandate, exactly how much is far from clear.

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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 ethanol, for which proponents already have identified other compelling policy justifications.\textsuperscript{161} 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 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


\textsuperscript{159} 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.

\textsuperscript{160} See U.S Dept. of Energy, Alternative Fuels Data Center, supra note ___.

\textsuperscript{161} See, e.g., Dennis J. Ventry, Jr., The Accidental Deduction: A History and Critique of the Tax Subsidy for Mortgage Interest, 73 L. & CONTEMP. PROBS. 233, 278-79 (2010) (recording a litany of arguments against the mortgage interest deduction); Diggs, supra note 155, at 56 (concluding that the ethanol incentive should be allowed to expire).
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
courage socially desirable activities and to discourage activities that cause
harm. But that principle raises a basic question: is water consumption really
socially harmful? After all, as the California Supreme Court once
proclaimed, “[t]he prosperity and habitability of much of this state requires
the diversion of great quantities of water from its streams.”\textsuperscript{162} 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.\textsuperscript{163} 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.\textsuperscript{164}
That ideology has long had its critics, and to many people today it seems

\textsuperscript{162} Nat’l Audubon Soc’y v. Superior Court of Alpine Cnty., 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).

\textsuperscript{163} See, e.g., Colorado 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.”).

\textsuperscript{164} 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
obsolete. 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. A legal scheme that discourages water use therefore might seem, to some, to create exactly the wrong incentives.

But even if some water consumption is indispensable to any society’s prosperity and well-being, many places would be better off consuming less. In the American west, and in much of the rest of the world, current water consumption levels simply cannot be sustained. 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. California, to provide another example, is pumping much more groundwater than nature replenishes, especially during its current drought. 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. Similar problems pervade the southwest.

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166 See, e.g., Devin Nunes, It’s Fish Versus Farmers in the San Joaquin Valley, WALL ST. J., August 14, 2009 (lamenting that water “diverted” into rivers to protect fish “is now flowing underneath the Golden Gate Bridge and out into the Pacific Ocean”).
167 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 (2014).
168 Both aggregate and per capita water consumption in the United States are 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.
171 See Jay S. Famiglietti et al., Satellites Measure Recent Rates of Groundwater Depletion in California’s Central Valley, 38 GEOPHYS. RES. LETTERS L03403 (2011) (warning—before the onset of the recent drought—of “dire consequences”).
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.\footnote{174} 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.”\footnote{175}

All of this water use has problematic secondary consequences. Competition for scarce water resources generates political conflict and litigation.\footnote{176} In some places—a few in the United States, and many in 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.\footnote{177} Indeed, in less stable parts of the world, there is evidence that water scarcity contributes to wars.\footnote{178} Water consumption is also highly energy-intensive, and therefore often requires burning fossil fuels, which contributes to climate change, which then—among other consequences—tends to make water stress worse.\footnote{179} 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.\footnote{180}

Many of these consequences are avoidable. Large amounts of water go

\footnotetext[175]{Schlosser et al., supra note 3, at 24.}
\footnotetext[177]{See, e.g., Faissal Terrass & Meryem Benjelloun, The Effects of Water Shortages on Health and Human Development, 132 PERSP. PUB. HEALTH 240 (2012) (describing widespread and devastating effects); Andrea Castillo, Drought Disaster in East Porterville Turns to Budding Health Crisis, FRESNO BEE, June 20, 2015.}
\footnotetext[178]{See, e.g., Thomas L. Friedman, Without Water, Revolution, N.Y. TIMES, May 18, 2013, at SR1 (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 RESEARCH 227, 228-29 (2013) (finding mixed evidence to support the hypothesis that water scarcity leads to conflict).}
\footnotetext[179]{See CALIFORNIA DEPT. OF WATER RESOURCES, 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.").}
\footnotetext[180]{See C.J. Vorosmarty et al., Global Threats to Human Water Security and River Biodiversity, 467 NATURE 555 (2010); Anthony Ricciardi & Joseph B. Rasmussen, Extinction Rates of North American Freshwater Fauna, 13 CONSERVATION BIOLOGY 1220 (1999) (finding high extinction rates for freshwater species);
to uses—overwatering lawns,\textsuperscript{181} using inefficient irrigation systems,\textsuperscript{182} or generating animal feed,\textsuperscript{183}—that could be reduced 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 thirty-seven percent more water, per capita, than Australians, or 461% more than Israelis.\textsuperscript{184}

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.

\textbf{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.\textsuperscript{185} Similarly, economics is not always simple, and pricing policies can produce counterintuitive results.\textsuperscript{186} 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.\textsuperscript{187} But a substantial body of literature (most of it deriving from

\textsuperscript{181} See U.S. Env’t Prot. Agency, \textit{supra} note 8 (noting that as much as fifty percent of lawn irrigation is wasted).

\textsuperscript{182} See Tianyi Yang et al., \textit{Adaptation of Irrigation Infrastructure on Irrigation Demands under Future Drought in the United States}, 19 EARTH INTERACTIONS, paper 7, p. 5 (2015) (“More than 60% of the irrigation areas in the west were surface irrigation systems with relatively less efficiency compared with eastern systems. . . .”).


\textsuperscript{186} See, e.g., \textit{EFFECTS OF U.S. TAX POLICY ON GREENHOUSE GAS EMISSIONS}, \textit{supra} note 117 (predicting many counterintuitive consequences from changes in the tax code).

\textsuperscript{187} See Dina Pomeranz, \textit{No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax}, 105 AM. ECON. REV. 2539, 2539 (2015) (noting the
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.

1. The Effects of Price Incentives on Water Use

For years, economists have studied homeowners’ responses to water prices.\textsuperscript{188} 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.\textsuperscript{189} Similarly, longer time periods facilitate larger responses.\textsuperscript{190} 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 droughts\textsuperscript{191}—and criticize water suppliers for preferring less economically efficient solutions.\textsuperscript{192}

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.\textsuperscript{193} 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 demand are options, irrigation water delivery demand is . . . likely to be fairly responsive to price.”\textsuperscript{194} Other studies have corroborated that conclusion.\textsuperscript{195} The consensus is not complete,


\textsuperscript{189} See, e.g., Shanti Nataraj, Do Residential Water Consumers React to Price Increases? Evidence from a Natural Experiment in Santa Cruz, 10 ARE UPDATE 9 (2007) (finding low elasticity for users who paid low prices but greater elasticity for high-price consumers).

\textsuperscript{190} See Olmstead & Stavins, supra note 21, at 4.

\textsuperscript{191} See id. at 3.


\textsuperscript{193} See U.S. Geological Survey, supra note 7 (observing that seventy percent of the world’s freshwater withdrawals are for agricultural use).

\textsuperscript{194} Susanne M. Scheierling et al., Irrigation Water Demand: A Meta-Analysis of Price Elasticities, 42 WATER RESOURCES RESEARCH W01411, 8 (2006).

and outcomes vary based on the places studied and the crops grown.\footnote{See Scheierling et al., \textit{supra} note 194, at 1 (noting past studies that find responsiveness only with very large price increases); Beau Olen et al., \textit{Irrigation Decisions for Major West Coast Crops: Water Scarcity and Climatic Determinants}, AM. J. AG. ECON., July 15, 2015, at 18, \url{http://ajae.oxfordjournals.org/content/early/2015/06/15/ajae.aav036} (finding variability based on a long list of factors); Michael R. Moore et al., \textit{Multicrop Production Decisions in Western Irrigated Agriculture: The Role of Water Price}, 76 AM. J. AG. 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).} Research on industrial and commercial water use, though less extensive, points toward similar conclusions.\footnote{See \textit{Renzetti}, \textit{supra} note 188, at 38-47 (summarizing studies).} As Olmstead and Stavins report, “[i]ndustrial price elasticity estimates for water tend to be higher than residential estimates and vary by industry.”\footnote{Olmstead & Stavins, \textit{supra} note 21, at 4.} 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.\footnote{See generally Wojciech Kopczuk & Joel Slemrod, \textit{Putting Firms into Optimal Tax Theory}, 96 AM. ECON. REV. 130, 130 (2006) (noting the essential role information plays in taxation).} Potential taxpayers also must believe there will be audits and enforcement proceedings if required payments are not made, or else cheating will be rampant.\footnote{See Slemrod & Bakiya, \textit{supra} note 16, at 174, 186-88 (explaining the importance of enforcement and the need for information to support that enforcement).} Administration, in short, requires information, and a credible threat that the information will be used.

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.\footnote{U.S. DEPT. OF INTERIOR & U.S. GEOLICAL SURVEY, \textit{DOCUMENTATION OF METHODS AND INVENTORY OF IRRIGATION DATA COLLECTED FOR THE 2000 AND 2005 U.S. GEOLICAL SURVEY ESTIMATED USE OF WATER IN THE UNITED STATES, COMPARISON OF USGS-COMPILRED 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, \textit{Counting Every Drop: Measuring Surface and
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. And regulatory requirements for groundwater use reporting are limited. 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. That means the information that would support a tax on water consumption is often absent.

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, and if the primary goal of a 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

Groundwater in Washington and the West, 39 ENVT. 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 Lindsay, supra, at 205 (describing district-level requirements in Texas).

202 See Owen, supra note 41, at 262 (noting that this feature makes groundwater a particularly appealing water source).

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

204 See Paul Rogers, California Drought: More than 255,000 Homes and Businesses Still Don’t Have Water Meters Statewide, SAN JOSE MERCURY NEWS, March 8, 2014.


206 These gaps can arise for several reasons. First, sometimes there is not enough 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 55, at 72-73 n. 34 (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 generally their cooling water to waterways, and the water consumption associated with hydropower generation is generally minimal. Fourth, sometimes multiple water rights will support a single use. In California, for example, the face value of the Central Valley Project’s water rights is much higher than the amount of water delivered to consumers, but that is mostly because water must pass through a series of dams and diversions before it reaches its delivery points.
values, both of which can change over time.\textsuperscript{207} The resulting formula is notoriously imprecise.\textsuperscript{208} 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.\textsuperscript{209}

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.\textsuperscript{210} Colorado, for example, now has a robust statewide system of water use monitoring.\textsuperscript{211} California has traditionally been more of a laggard, but its governor recently issued an executive order requiring more monitoring and reporting of surface diversions, and the state legislature also passed a separate bill that empowers local agencies to require monitoring of groundwater use.\textsuperscript{212} Similarly, legislative changes and lawsuits have led to tighter monitoring of water withdrawals in Washington State.\textsuperscript{213} Many steps remain to be taken in many states, 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. Or, alternatively, the tax collecting agency could calculate water use based on proxies like crop selection and irrigation method, and water users would then bear the burden of proving that the model had overestimated their use.\textsuperscript{214} Either approach would encourage private

\textsuperscript{207} See THOMPSON, JR. ET AL., supra note 32, at 33-35.
\textsuperscript{208} Id. at 35 (“The lack of predictability of outcomes is an oft-criticized aspect of riparian doctrine.”).
\textsuperscript{209} See id. at 467-68; 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, 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).
\textsuperscript{211} Id. at 44-54.
\textsuperscript{212} Executive Order B-29-15, ¶¶ 9-10 (April 1, 2015); California Water Code § 10725.8.
\textsuperscript{214} See generally U.S. DEPT. OF INTERIOR & U.S. GEOLOGICAL SURVEY, supra note 201 (describing methods for estimating water use in the absence of metering data).
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.\footnote{Return flows contain water that neither evaporates nor is transpired by plants, and that instead flows back into a natural waterway. See THOMPSON, JR. ET AL., supra note 32, at 174.}

Third, these informational challenges are not unique to taxation. Almost any effective system for regulating water use demands information.\footnote{Of course, this is one reason why metering is sometimes unpopular. See Rogers, supra note 204 (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.”).} 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.\footnote{See Dave Owen, The Mono Lake Case, the Public Trust Doctrine, and the Administrative State, 45 U.C. DAVIS L. REV. 1099, 1147-50 (2012) (describing information deficits in traditional water regulation, and the difficulties those deficits create).} Nor can a water trading system work effectively without information about water allocations; a market without informed buyers and sellers cannot function efficiently and may not be able to function at all.\footnote{See Hanemann, supra note 55, at 74 n.23.} So while information deficits may impede taxation, that is a reason 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 therefore 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.

\textit{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.\footnote{See Olmstead & Stavins, supra note 21, at 3 (“Rationing approaches to water conservation are ubiquitous.”).} State and federal regulators, meanwhile, have turned to water use permitting systems, which generally are highly integrated with statutory environmental laws.\footnote{See Owen, supra note 217, at 1115-18 (describing California’s administrative
sometimes, conflicts—with a property and contractual rights system designed
to allocate water among competing users.\textsuperscript{221} One might ask, then, what a tax
could add, or how it would be better than these traditional approaches.

1. Taxes or Traditional Regulation?\textsuperscript{222}

In the past, when governmental entities have decided that water use poses
problems, they often have reacted by either regulating the amount of water
people can use, banning or limiting certain water-use-intensive activities, or
placing limits on specific secondary consequences of water consumption.\textsuperscript{223} Water rationing or watering bans provide an example of the former
approach;\textsuperscript{224} bans on high-flow toilets exemplify the middle strategy;\textsuperscript{225} and
a law like the Endangered Species Act, which prohibits some actions that
harm threatened or endangered species, exemplifies the latter.\textsuperscript{226} 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.\textsuperscript{227} 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,


\textsuperscript{222} 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.

\textsuperscript{223} See Olmstead & Stavins, \textit{supra} note 21, at 3.


\textsuperscript{226} See 16 U.S.C. § 1536(a)(2).

\textsuperscript{227} See, e.g., Jean-Philippe Barde & Oliver Godard, \textit{Economic Principles of Environmental Fiscal Reform}, in \textit{HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, \textit{supra} note 17, at 35 (asserting that traditional regulatory controls “impose uniform requirements” because regulators lack individualized information about regulated entities).
probably correctly, that he will not be caught.\footnote{228}{See Olmstead & Stavins, supra note 21, at 4 (noting the potential for multiple rebound effects and other reactions that thwart a traditional regulation’s goals).} 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.\footnote{229}{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 252-266 and accompanying text.}

The beauty of a price instrument, by contrast, is that achieves efficiency by letting private decision-makers allocate the burdens of environmental protection.\footnote{230}{See Nathaniel O. Keohane & Sheila M. Olmstead, Markets and the Environment 133-37 (2007).} 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.\footnote{231}{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).} 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.\footnote{232}{See Olmstead & Stavins, supra note 21, at 4-5 (discussing how other regulatory restrictions can produce evasion and unintended “rebound effects”).}

The net result of this combination of broad reach and individual discretion can be a huge aggregate cost savings.\footnote{233}{See id. at 8.}

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.\footnote{234}{See, e.g., Masur & Posner, supra note 15, at 139-40; Barde & Godard, supra note 227, at 57.}

making processes can be so slow, regulatory agencies also are reluctant to initiate them, and traditional water users are therefore often able to continue their water uses largely unrestrained, even when those uses impose substantial social costs.\textsuperscript{236} And traditional regulation clearly is sometimes dominated by interest group politics.\textsuperscript{237} 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.\textsuperscript{238} 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.\textsuperscript{239} Conversely, the notion that taxes will be insulated from political influence is belied by the tax codes the United States actually has.\textsuperscript{240} 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.\textsuperscript{241}

\textsuperscript{236} See Owen, supra note 217, at 1134-35 (describing California’s lack of review of water use under existing rights); Janet C. Neuman, \textit{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 courts to demand greater efficiency from existing water users).

\textsuperscript{237} See, e.g., Reed D. Benson, \textit{Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite the Rules of Prior Appropriation}, 28 ENVTL. L. 881 (2000) (describing widespread and largely politically-motivated deference to existing uses). Within the literature on environmental regulation, the classic study of interest group influence is \textsc{Bruce Ackerman} \& \textsc{William T. Hassler}, \textsc{Clean Coal/Dirty Air, or How the Clean Air Act Became a Multibillion Dollar Bailout for High-Sulfur Coal Producers, and What Should Be Done About it} (1981).


\textsuperscript{240} See supra notes 116-122, 153-160 (describing critiques of ethanol subsidies and the mortgage interest deduction—among many other tax code provisions subject to widespread criticism).

\textsuperscript{241} See David Driesen, \textit{The Limits of Pricing Carbon}, 4 CLIMATE L. 107, 114 (2014)
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 mixing them up in ways that defy any simple effort to shoehorn a regulatory system in to a specific theoretical model. 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. A tax, for all its elegant simplicity, can be comparatively blunt.

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. It can leave key decisions up to bounded individual discretion, rather than presuming governmental knowledge about the most effective ways to reduce water use. 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. 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.

(“[M]ost pollution taxes become riddled with complex exemptions that take time to negotiate.”).

242 See Owen, supra note 239, at 197-98 (noting that a diversity of regulatory options is a common feature of environmental law).

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

244 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). Fleisher’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 Fleisher’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.

245 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).

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

2. Taxes or Trading?

A skeptic of traditional regulation might readily agree with the preceding discussion but nevertheless ask, why taxes? After all, the 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.\textsuperscript{248} The more commonly suggested alternative, however, has been a system in which water rights can be transferred among willing sellers and buyers.\textsuperscript{249} 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.\textsuperscript{250} In accordance with those recommendations, many western states have reformed their water law systems to facilitate trading, and water trading volumes have grown.\textsuperscript{251} 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.\textsuperscript{252} But the United States does not have a public canal or pipeline system comparable to our public highway systems, and even private water delivery systems, if they are available to the transferring parties, go only limited sets of places.\textsuperscript{253} 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.\textsuperscript{254} The consequence, throughout much of the west, is a geographically patchy

\begin{footnotesize}
\begin{enumerate}
\item See CULP ET AL., supra note 247, at 11-12; WESTERN STATES GOVERNORS’ ASSOCIATION & WESTERN STATES WATER COUNCIL, supra note 13, at ix.
\item See WESTERN STATES GOVERNORS ASSOCIATION & WESTERN STATES WATER COUNCIL, supra note 13, at 9 (showing growing numbers of transactions).
\item See Gleick & Palaniappan, supra note 168, at 11157.
\item See CULP ET AL., supra note 247, at 11 (noting the importance of physical restrictions on transfers).
\item See Owen, supra note 41, at 262 (noting that the appeal of groundwater is partly that it does not require transportation infrastructure); THOMPSON, JR. ET AL., supra note 32, 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).
\end{enumerate}
\end{footnotesize}
transfer system, with many would-be sellers and buyers either unable to access a larger market or able to reach only limited sets of buyers. Because of that isolation, the potential efficiencies of markets are likely to fall well short of their proponents’ aspirations. 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 are generally presumed inviolate, and are subject to change only if someone pays compensation for the shift. 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. 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. 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—will exist only to the extent that someone is willing to pay. 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.

See, e.g., Hanak et al., supra note 57, 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).

See CULP ET AL., supra note 247, at 11 (noting that physical limits on water availability can lead to huge disparities in water prices).

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.

See Adler, supra note 249, at 102 (noting that certainty facilitates trading).

See Freyfogle, supra note 53 (developing this critique of water transfers).

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.

See Gray, supra note 38 (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 THOMPSON, JR. ET AL., supra note
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.\textsuperscript{262} 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.\textsuperscript{263} But review of major water rights transfers can take years; indeed, the largest water transfer in United States history, which sends water from the 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.\textsuperscript{264} Taxation would not involve analogous review of individual transactions, and thus should offer a more procedurally efficient mechanism for creating water conservation incentives.\textsuperscript{265}

For all of these reasons, water transfers cannot bring comprehensive reform to western water systems.\textsuperscript{266} They do have their place; where 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.\textsuperscript{267} Taxation, by contrast, offers the possibility of a more comprehensive response.

3. Taxes or Service Charges

\textsuperscript{32} 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); 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.").

\textsuperscript{262} See Western States Governors Association & Western States Water Council, supra note 13, at 22-29 (describing third-party impacts of water transfers); Owen, supra note 167, at 2 (explaining how the intertwined nature of western water use can make transfers difficult to complete).

\textsuperscript{263} See Cal. Water Code § 1725 (exempting temporary transfers from review under the California Environmental Quality Act).

\textsuperscript{264} See In re Quantification Settlement Agreement Cases, 134 Cal. Rptr. 2d 274, 299-305 (Cal. Ct. App. 2011) (describing the negotiations and part of the litigation).

\textsuperscript{265} See Jan Pavel & Leos Vitek, Transaction Costs of Environmental Taxation: The Administrative Burden, in HANDBOOK OF RESEARCH ON ENVIRONMENTAL TAXATION, supra note 17, at 273, 279 (summarizing studies that generally find low transaction costs).

\textsuperscript{266} See Hanak et al., supra note 57, at 35 (making a similar point about California water allocation).

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.\(^{268}\) Indeed, the large and growing economic literature on water pricing focuses primarily on these service charges,\(^{269}\) and some water suppliers now have decades of experience integrating conservation incentives into their service charge systems.\(^{270}\) 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.\(^{271}\) 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.\(^{272}\) The impacts of supplying water upon in-stream environmental quality, for example, generally are not borne 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.\(^{273}\) 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

\(^{268}\) See infra notes 327-329 and accompanying text (discussing progressive block pricing).

\(^{269}\) For exceptions, see supra note 14 (citing sources).


\(^{271}\) See Hanemann, supra note 55, at 76 (noting that water prices typically include these costs).

\(^{272}\) 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.

\(^{273}\) See THOMPSON, JR. ET AL., supra note 32, at 766-74 (describing the variety of entities that supply water).
systems have become increasingly integrated. 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, 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. 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. 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.”

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274 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).

275 See Kilimani et al., supra note 14, at ___.


277 See William K. Jaeger, The Double Dividend Debate, in HANDBOOK OF RESEARCH
controversy and confusion include the few studies focusing upon water taxes, with studies reaching disparate results even when focused on the same economy.  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.

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. That deterioration creates major water supply problems; cities lose huge amounts of water to leaks. It also creates public health issues, as the recent debacle in Flint, Michigan illustrates. 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.

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. And there is a real danger that a water project fund might be

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ON ENVIRONMENTAL TAXATION, supra note 17, at 211, 211.

278 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 ECONOMICS 105 (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.”).

279 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 Letsoalo et al., supra note 14, at 8 (“The first of the three dividends is the environmental dividend reaped.”).


283 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 U.C. DAVIS L. REV. 1043 (2015); Thompson, Jr., supra note 135, at 307-14 (describing “environmental brokerage accounts”).

284 See Claudia Dias Soares, Earmarking Revenues from Environmentally Related
allocated largely as pork. For many decades, that is how water funding in the United States was often spent. Nevertheless, there is an intuitive logic to using revenues from water consumption taxes to upgrade water infrastructure or to protect aquatic environments, and that intuitive logic might make a water tax into an easier political sell, even if it falls short of an economic ideal.

Finally, revenues could be recycled back to the public as rebates. 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. But there are reasons why some 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.

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.

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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.\footnote{290}{See Keohane & Olmstead, supra note 230, at 136 (summarizing traditional Pigouvian theory, and noting that with a properly-set Pigouvian tax, “[n]o other government intervention . . . is necessary”).} The argument here does not go quite that far. The real world has an uncanny knack for sullying the theoretical elegance of any regulatory system, and taxation has not been exempt from that general rule.\footnote{291}{See Barde & Godard, supra note 227, 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 (describing the real-world problems that beset the Dutch groundwater tax).} Other regulatory systems do also have their justifications; among others, sometimes they can provide greater certainty about ultimate environmental consequences than a tax.\footnote{292}{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).} 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 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.

\section*{D. Justice and Water Taxation}

In 2014, Maryland’s gubernatorial race turned in large part on something derided as a “rain tax.”\footnote{293}{See Jenna Johnson, Maryland Senate Unanimously Approves Easing ‘Rain Tax’ Terms, WASH. POST, March 20, 2015.} 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.\footnote{294}{See Jon Green, Martin O’Malley’s Rain Tax Is Actually a Great Idea, Sept. 9, 2015, AMERICABLOG, http://americablog.com/2015/09/martin-omalleys-rain-tax-is-actually-a-great-idea.html.} 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.  

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 nonstater. 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?

1. The “Everyday Libertarian” 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. 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. Taking water out of streams therefore was not self-interested


\[\text{This term comes from Murphy & Nagel, supra note 75. Murphy and Nagel use it to describe a widespread view—perhaps best illustrated by economists’ repeated discussion of the “distortions” that taxation imposes—that taxation is an intrusion upon a naturally functioning, tax-free market ordering.}\]


\[\text{See United States Bureau of Reclamation, Brief History: Bureau of Reclamation, http://www.usbr.gov/history/2011NEWBRIEFHISTORY.pdf (last visited July 13, 2016) (‘The concept was that irrigation would ‘reclaim’ or ‘subjugate’ western arid lands for}\]
behavior; it was, instead, the heroic correction of a “perversity of nature.”

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. 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. Wealth and social stability depend upon governance. As flawed as governance can be, anarchy is usually much worse. And governance generally requires taxes; they are, as Justice Oliver Wendell Holmes once put it, “what we pay for civilized society.” 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. Those agencies, in turn, often operate water projects built and operated at public expense. 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. 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.

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, 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. But that

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300 See Murphy & Nagel, supra note 75.
301 See id.
302 See id. at 33.
304 See Thompson, Jr., supra note 46, at 786-89.
305 See Wilkinson, supra note 297, at 231 (noting the importance of federal subsidies to western water development); Hundley, supra note 54, at xix (same). The classic critique of federal water project development is Reisner, supra note 4.
306 See, e.g., Hundley, supra note 54, at 88-119, 203-302 (describing the struggles that led to California to transition away from an era of small-scale, private water development).
307 See Hanemann, supra note 55, at 74-76.
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.\textsuperscript{309} Without governance, water rights therefore are likely to hold little value, for they would be unprotected against interference by other competing users.\textsuperscript{310} Long-term investments in 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.\textsuperscript{311} 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.\textsuperscript{312} But ownership of the water itself remains with the state, which holds that water in trust for its citizens.\textsuperscript{313} The implications of this dual ownership system are not always entirely clear, and they vary from state to state.\textsuperscript{314} But the system nevertheless reflects a


\textsuperscript{310} See Barton H. Thompson, Jr., \textit{Tragically Difficult: The Obstacles to Governing the Commons}, 30 ENVTL. L. 241, 249-53 (2000) (describing this dynamic with groundwater use).

\textsuperscript{311} See id.

\textsuperscript{312} 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.”).

\textsuperscript{313} See, e.g., Cal. Water Code § 102 (“All water within the State is the property of the people of the state.”); Nevada Rev. Stat. § 533.025 (“[T]he 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.”)

\textsuperscript{314} 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, \textit{Comparative Guide to the Western States’ Public Trust Doctrines: Public Values, Private Rights, and the Evolution of Limited Resources} (critiquing Edwards Aquifer Authority 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).
widespread view that water is a public resource that never entirely sheds its public character.\textsuperscript{315} Users pay to access many other public natural resources; they pay fees to harvest timber, for example, and royalties to extract oil and natural gas.\textsuperscript{316} Obtaining water without charge therefore is somewhat anomalous.\textsuperscript{317} 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.\textsuperscript{318} 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.\textsuperscript{319} 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.\textsuperscript{320} 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.\textsuperscript{321} Or, alternatively, the


\textsuperscript{315} See Joseph L. Sax, \textit{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 resource. . . .”).

\textsuperscript{316} See WILKINSON, supra note 297, at 242.

\textsuperscript{317} Id. (“This is nearly unique in public resource law and policy.”).

\textsuperscript{318} That caveat would not apply, however, to a country that does not treat water use as a matter of property law.

\textsuperscript{319} See, \textit{e.g.,} Penn. Coal v. Mahon, 260 U.S. 393, 415 (1922) (allowing regulation of property, but holding that regulations that go “too far” are takings).

\textsuperscript{320} 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. \textit{See} Nat’l Audubon Soc’y v. Superior Ct., of Alpine Cnty., 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.”); 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”).

\textsuperscript{321} See generally Margaret Jane Radin, \textit{Property and Personhood,} 34 STAN. L. REV. 957 (1982) (arguing that some forms of property deserve special treatment because of their close
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.

2. Commodity fying 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. 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. Often these critiques are thoroughly intertwined with debates over the privatization of water deliveries, and thus target private corporations rather than public taxation. But some of the rhetoric is often broad enough to sweep in any attempt to treat water as a commodity with a price.

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. 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

connections to individual identity).

322 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.”).


324 See, e.g. Shiva, supra note 322, at x (describing water wars as pitting people and species against large corporations); William Finnegan, Leasing the Rain, The New Yorker, April 8, 2002, http://www.newyorker.com/magazine/2002/04/08/leasing-the-rain (describing conflicts over water privatization in Cochabamba, Bolivia).

325 E.g. Barlow & Clarke, supra note 323 (“[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.”).

increasing rates for each additional increment of water use. Progressive block pricing, as this scheme is 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. 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.

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. 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. 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. Many rural areas already are struggling economically, and the strain of a water tax would be an unwelcome additional blow.

328 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).
331 This effect would not occur if farmers can pass increase 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 & BAKUJA, supra note 16, at 76 (noting that producers generally cannot shift tax costs onto consumers when those consumers have alternative suppliers).
333 See U.S. Dept. of Ag., 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 Maria Berretella et al., The Economic Impact of Restricted Water Supply: A Computational General Equilibrium Analysis, 41 WATER RESEARCH 1799, 1804-06 (2007) (finding that scarcity charges or
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.\footnote{See Culp et al., supra note 247 (repeatedly citing low-value uses by agriculture as the primary evidence of the need for better price incentives for water).} 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.\footnote{See Herrero, supra note 183, at 20888 (discussing the massive environmental impact of livestock production); see also Berrettini et al., supra note 332, 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).} 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.\footnote{See Owen, supra note 11, at 1185-86.} 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.\footnote{See, e.g., Yigit Saglam, Supply-Based Dynamic Ramsey Pricing: Avoiding Water Shortages, 51 Water Resources Research 669 (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, April 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).} 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.\footnote{By creating an incentive for greater efficiency, the scheme might actually increase the welfare of the agricultural sector. See Saglam, supra note 337, at 683.} 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 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...
Additionally, has always been somewhat fanciful, for societies have often treated water partly as a community resource and partly as an economic commodity. 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.

339 Compare Freyfogle, supra note 53, 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 332 (raising community interests in water as reasons why water should not be transferred).