

William & Mary Environmental Law and Policy Review

Volume 33 (2008-2009)
Issue 3

Article 4

April 2009

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Craig Anthony (Tony) Arnold, *Water Privatization Trends in the United States: Human Rights, National Security, and Public Stewardship*, 33 Wm. & Mary Env'tl. L. & Pol'y Rev. 785 (2009), <https://scholarship.law.wm.edu/wmelpr/vol33/iss3/4>

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WATER PRIVATIZATION TRENDS IN THE UNITED STATES: HUMAN RIGHTS, NATIONAL SECURITY, AND PUBLIC STEWARDSHIP*

CRAIG ANTHONY (TONY) ARNOLD**

OVERVIEW

Current debates in U.S. law and politics seem to be questioning whether national security and human rights are in fundamental tension with each other, as our legal and political systems struggle with the scope of government powers to fight terrorism and the legal limits on the detention, interrogation, and punishment of suspected terrorists, such as those held at Guantanamo Bay, among other issues.¹ This Article will address an area of law and public policy in which the shared (or common) interests of both national security and human rights receive too little attention. It is the area of privatization of water and public water services and infrastructure.

The Article will focus on water privatization trends in the United States. In particular, it will discuss three aspects of water privatization in the U.S.: 1) the privatization of public water services, 2) private property rights in water, and 3) water as a consumer commodity. These trends arise in the context of global water privatization trends and the opposition of human rights advocates and environmentalists to private corporate exploitation of water for profit. They arise in the context of the legal and socio-cultural history of private property rights in the United States.

* A version of this Article was given as a lecture for the Distinguished Lecture Series of the Human Rights and National Security Law Program at the College of William and Mary Marshall-Wythe School of Law on September 16, 2008. Professor Arnold thanks Professor Linda Malone for her organization of the lecture, kind invitation, and gracious hospitality.

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¹ See, e.g., Rosa E. Brooks, *War Everywhere: Rights, National Security Law, and the Law of Armed Conflict in the Age of Terror*, 153 U. PA. L. REV. 675 (2004); Kenneth Anderson, *U.S. Counterterrorism Policy and Superpower Compliance with International Human Rights Norms*, 30 FORDHAM INT'L L.J. 455 (2007).

They arise in the context of tensions between the private and public nature of water; economic efficiency and social equity; globalization and local control; resource development and resource conservation; and the meaning of water as an economic good and as the ecological, ethical, religious, and social meanings of water.

For example, the water woes of the state of Georgia illustrate the power of water privatization and commodification forces in U.S. society and their deleterious effects. In recent years, Georgia has had at least eleven public water systems operated by private water companies.² Most famously, Atlanta granted a twenty year contract to United Water in 1998 to operate its municipal water system, which Atlanta terminated just four years later for quality-of-service and mismanagement problems.³ Water often had to be boiled due to insufficient water pressure, ran a rusty brown color, and did not even reach many customers for lengthy periods due to backlogged work orders.⁴

The water problems of Atlanta and Georgia have extended far beyond poorly-run municipal systems to problems of water scarcity and conflict. Once considered to be water abundant, the U.S. Southeast now struggles with drought, relentless and growing demand for water, depleting water sources, and persistent conflicts among major water users.⁵ Georgia has found itself in water crisis due to legal and political institutions' accommodation of consumer demand for both water and energy produced by water: a growing population particularly in the sprawling Atlanta metropolitan area, recreational users of water, agricultural irrigators, power generators, and industries like pulp and paper mills, textiles, chemical manufacturing facilities, and the mining industry.⁶ For example, Georgia's population grew by over 140% between 1950 and 2000, and its

² See Institute for Agriculture & Trade Policy [IATP], Trade Observatory, U.S. Water Privatization: Georgia, <http://www.tradeobservatory.org/waterprivatization/index.cfm?state=ga> (last visited Feb. 13, 2009).

³ See *infra* note 69 and accompanying text.

⁴ See *id.*

⁵ See, e.g., Kristen Choo, *Gulp: Litigation Won't End the Battles Over Depleted Water Resources in Several Regions of the United States*, ABA JOURNAL, Sept. 2008, at 56-61; Catherine D. Little, *Eastern Water Law: Less Water, More Change*, TRENDS: ABA SEC. OF ENV'T, ENERGY, AND RESOURCES NEWSL., Mar./Apr. 2008, at 8-9; Janet C. Neuman, *Have We Got a Deal for You: Can the East Borrow from the Western Water Marketing Experience?*, 21 GA. ST. U. L. REV. 449, 449-51, 479-85 (2004); J.B. Ruhl, *Equitable Apportionment of Ecosystem Services: New Water Law for New Water Age*, 19 J. LAND USE & ENVTL. L. 47, 47-48 (2003).

⁶ See Neuman, *supra* note 5, at 479-80.

agricultural withdrawals from the Apalachicola-Chattahoochee-Flint ("ACF") River System increased by 1320% just between 1970 and 1990.⁷

However, the state and local governments have done little to constrain sprawl, mandate water-conservation techniques in design and development, or manage growth based on sustainable and secure water supplies.⁸ In addition, Georgia's statutes regulating riparian rights to water through permits for water allocation have largely exempted agricultural water users, the largest category of water use in the state.⁹ Instead, Georgia has attempted to satisfy its diverse and powerful interest groups' water demands by increasing withdrawals from the ACF system—primarily though increased withdrawals from Lake Lanier, to the detriment of its neighbors, Alabama and Florida—and the ecology of the system.¹⁰ Georgia also is seeking to redraw its boundary with Tennessee so that it can obtain rights to water in the Tennessee River, which currently does not cross into Georgia.¹¹

The Georgia state government finally adopted the state's first state-wide comprehensive water management plan in February 2008—only after experiencing sustained drought and losing to Alabama and Florida in an action enjoining Georgia's additional withdrawals from Lake Lanier.¹² The Georgia Department of Natural Resources issued a draft of a water

⁷ *Id.* at 479-80 & nn.166 & 172.

⁸ See SPRAWL CITY: RACE, POLITICS, AND PLANNING IN ATLANTA 8-10 (Robert D. Bullard, Glenn S. Johnson & Angel O. Torres eds., 2000); Christine A. Klein, *On Integrity: Some Considerations for Water Law*, 56 ALA. L. REV. 1009, 1011 (2005).

⁹ See Joseph W. Dellapenna, *Georgia Water Law: How to Go Forward Now?*, at 6-7, PROCEEDINGS OF THE 2005 GEORGIA WATER RESOURCES CONFERENCE, available at <http://www.gwri.gatech.edu/conferences/previous-gwrc-conferences/gwrc-2005/>.

¹⁰ For several analyses of the ACF conflict, see JOHN COPELAND NAGLE & J.B. RUHL, THE LAW OF BIODIVERSITY AND ECOSYSTEM MANAGEMENT 622-29 (2002); Steven Leitman, *Apalachicola-Chattahoochee-Flint Basin: Tri-State Negotiations of a Water Allocation Formula*, in ADAPTIVE GOVERNANCE AND WATER CONFLICT: NEW INSTITUTIONS FOR COLLABORATIVE PLANNING 74-88 (John T. Scholz & Bruce Stiftel eds., 2005); Joseph W. Dellapenna, *Interstate Struggles Over Rivers: The Southeastern States and the Struggle Over the Hooch*, 12 N.Y.U. ENVTL. L. J. 828, 830-31 (2005); Klein, *supra* note 8, at 1064-67; Neuman, *supra* note 5, at 479-85; Ruhl, *supra* note 5, at 48; J.B. Ruhl, *Water Wars, Eastern Style: Divvying Up the Apalachicola-Chattahoochee-Flint River Basin*, J. CONTEMP. WATER RES. & EDUC., June 2005, at 47, 47 (2005).

¹¹ See Choo, *supra* note 5, at 58.

¹² See *Fed. Power Customers, Inc. v. Green*, 514 F.3d 1316, 1318 (D.C. Cir. 2008) (decided Feb. 5, 2008), *cert. denied sub nom. Georgia v. Florida*, No. 08-199 (Jan. 12, 2009); Press Release, Governor Sonny Perdue, Georgia, Governor Perdue Signs Water Plan into Law (Feb. 6, 2008), available at http://gov.georgia.gov/00/press/detail/0,2668,78006749_78013037_105162841,00.html.

conservation plan in December 2008.¹³ The Georgia Chamber of Commerce, however, has insisted that any comprehensive water planning for Georgia recognize that water rights in Georgia are private property with which the legislature cannot interfere and should be freely transferable by the owner.¹⁴ In fact, the new state water plan allows for inter-basin transfers while relying on soft study and planning techniques, instead of hard allocations.¹⁵ Atlanta's recent metropolitan plans for water conservation are modest at best.¹⁶ Georgia's persistent treatment of water as a private consumer good, instead of a necessary public resource, is especially remarkable considering that Governor Sonny Perdue declared a state of emergency in northern Georgia in October 2007 when dangerously low levels of water in Lake Lanier put area residents arguably within 90 days of running out of water.¹⁷

¹³ GEORGIA DEPT OF NATURAL RES., ENVTL. PROT. DIV., THE WATER CONSERVATION IMPLEMENTATION PLAN (2008), available at <http://www.georgiawcip.org/PDF/WCIP-DRAFT-December2008.pdf>.

¹⁴ See Gregory W. Bount et al., *The Role of Water Rights and Georgia Law in Comprehensive Water Planning for Georgia: A White Paper to the Joint Comprehensive Water Plan Study Committee 1* (Georgia Chamber of Commerce, Mar. 2002), available at <http://www.troutmansanders.com/mc/art-pickett2.pdf>. In a bankruptcy case in south-eastern Georgia, the court determined that a paper company's permit to withdraw groundwater was private property and must be auctioned at an interstate sale as an asset or commodity to be marketed. See Patricia McIntosh, *Battle Looms Over Water Rights as Private Property Assets*, SAVANNAH MORNING NEWS, July 20, 2005, <http://old.savannahnow.com/stories/072005/3172401.shtml>.

¹⁵ See Debbie Gilbert, *Green Group Says Georgia Water Plan is No Plan at All*, GAINESVILLE TIMES, Feb. 2, 2008, available at <http://www.gainesvilletimes.com/news/archive/2851>; see also Lyle V. Harris, *Water Plan is Diluted and Deluded*, ATLANTA J.-CONST., Jan. 8, 2008, at A12, available at <http://www.cviog.uga.edu/spotlight/news/item.php?print=y&id=529>.

¹⁶ See Stacy Shelton, *Metro Water Plan: What Level of Commitment?*, ATLANTA J.-CONST., Jan. 18, 2009, <http://www.ajc.com/services/content/printedition/2009/01/18/waterplan01183dot.html>; see also PACIFIC INSTITUTE FOR STUDIES IN DEVELOPMENT, ENVIRONMENT, AND SECURITY, A REVIEW OF WATER CONSERVATION PLANNING FOR THE ATLANTA, GEORGIA REGION 4 (2006), available at http://www.pacinst.org/reports/atlanta/atlanta_analysis.pdf.

¹⁷ Kristen Johnson, *Georgia Governor Calls for State of Emergency Due to Drought* (WDEF News 12 television broadcast Oct. 20, 2007), available at http://www.wdef.com/news/georgia_governor_calls_for_state_of_emergency_due_to_drought/10/2007. But see *Georgia Governor, Corps Differ Over Extent of Water Emergency*, CNN, Oct. 20, 2007, <http://www.cnn.com/2007/US/10/20/georgia.drought/index.html> (reporting that the U.S. Army Corps of Engineers disputed the Governor's assessment of the drought emergency). However, Governor Perdue ordered reductions in water consumption and limits on certain uses (e.g., residential lawn watering) during the emergency period. See Jeffrey Scott, *Georgians Reduce Water Consumption by 13 Percent*, ATLANTA J.-CONST., Jan. 25, 2008, at A8, available at http://ajc.com/travel/content/metro/stories/2008/01/25/drought_0126.html%253Fcxntlid%253Dinform_artr.

This Article argues that privatization of water and public water systems pose underappreciated risks to both public rights and national security in the United States. All life depends on water. Therefore, all communities, social and political systems, and economies depend on this finite resource for survival and vitality. However, both human rights and national security protections are inadequate to guarantee that all people will receive sufficient quantities of good quality water to meet basic human needs. These inadequacies result from the deeply entrenched conceptualization of rights in the United States, the fact that human rights and national security policies are not self-implementing, and the particular characteristics of water. Individual rights to water or protections against terrorist threats to water supplies do not necessarily achieve water conservation, sustainable management of water and watersheds, or long-term planning and investment.

Instead, the United States needs legislation and legal doctrines that limit private control over water sources and systems and that regulate privatization processes in order to protect the integrity and security of individuals, communities, and the nation. Even more importantly, the United States needs comprehensive principles of public stewardship of water resources to support human life and national security. Public stewardship principles are premised on the concept that the government is a trustee of water resources for the public, a fiduciary obligation not limited to the traditional public trust doctrine, but based in the many public characteristics of water in the United States, as well as the social and human necessities of a complex society. However, each member of the public would not only be a beneficiary but would also owe duties to his, her, or its co-beneficiaries, the other members of the public. Public stewardship principles would require long-range place-based planning with transparency and public participation, public investment, water conservation, watershed protection, water quality controls, full-cost pricing with subsidies to those unable to pay full costs, and heightened security measures.

Part I describes the trend towards water privatization in the United States. First, it explores the privatization of public water services, including: 1) status and trends, 2) causes, and 3) conflicts and failures. Then, Part I examines the legal doctrines, public policies, and cultural norms treating water as an object of private property rights. Lastly, Part I discusses water as a consumer commodity. Part II turns to the human rights aspects of water privatization in the United States, concluding that human rights legal theories lack the capacity to resolve the underlying concerns about meeting the human need for water. Part III examines several aspects

of national security that are exacerbated by privatization and commodification of water: 1) conflict and scarcity, 2) foreign control of domestic water supplies, and 3) terrorism. However, national security policy is better equipped to address terrorist threats to water supplies than to address the larger issues of long-term water governance to ensure secure, stable, and sustainable supplies for the public. Finally, Part IV argues that the public needs water laws and policies that protect and facilitate the integrity and sustainability of human and natural water systems. Although human rights theories and national security policies may be insufficient by themselves to achieve this goal, a new concept of public stewardship of water would create new institutional capacity and responsibility to achieve this goal by imposing six fiduciary duties on state governments and the federal government for the benefit of the public: 1) the duty of security; 2) the duty of conservation; 3) the duty of sustainability; 4) the duty of equity; 5) the duty of investment; and 6) the duty of long-range, place-based planning. Members of the public, while being beneficiaries of these duties, would also share responsibility for acting on them.

I. WATER PRIVATIZATION IN THE UNITED STATES

While the term "water privatization" can mean many different things in various contexts,¹⁸ this Article treats the topic at a relatively broad level: the private ownership, control, development, exploitation, trade in, and use of water for private purpose or gain. This includes water at its sources, such as groundwater or surface water in rivers, streams, and lakes, or even as part of wetlands or coastal estuaries. It also includes water being distributed to human users, such as public drinking water supplies, industrial and commercial supplies of water, agricultural irrigation systems, and bottled water.

¹⁸ Various commentators define the terms in different ways. *E.g.*, KEN CONCA, GOVERNING WATER: CONTENTIOUS TRANSNATIONAL POLITICS AND GLOBAL INSTITUTION BUILDING 215-16 (2006) (distinguishing between water privatization and water marketization); ERIC T. FREYFOGLE, THE LAND WE SHARE: PRIVATE PROPERTY AND THE COMMON GOOD 157-201 (carefully analyzing privatization and markets separately); Aldo Davila & Andrew Whitford, *Water, Water Everywhere?: Legal Structures for the Contracting and Privatization of Public Water Resources*, 15 MO. ENVTL. L. & POL'Y REV. 49, 51 (2007) (distinguishing between contracting and privatization). For other examples of scholarly analyses of public water services privatization, private property interests in water, and commodification of water as being integrally related to one another, see Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 TEX. L. REV. 1873, 1898 (2005); David J. Hayes, *Privatization and Control of U.S. Water Supplies*, NAT. RESOURCE & ENV'T, Fall 2003, at 19, 19.

In particular, this Article highlights three aspects of private control over water. The first is the privatization of public water systems and drinking water supplies and infrastructure. The second is the legal treatment of water as an object of private property rights. And the third is our society's framing of water as a marketable consumer commodity.

A. *Privatization of Public Water Services*¹⁹

1. Status and Trends

The United States is experiencing a controversial trend towards privatization of public water services.²⁰ The amount of all public water services in the United States provided by privately-owned water suppliers is relatively small.²¹ They serve about 15% of U.S. water customers (measured in volume of water handled), take in about 14% of total water revenues, and hold about 11% of all water system assets in the United States, even though the number of such systems constitutes about 33% of all community water systems.²² Nonetheless, private operation, control, or ownership of local water supply systems has increased dramatically since the 1980s.²³ The increased interest in privatizing public water

¹⁹ See generally Craig Anthony (Tony) Arnold, *Privatization of Public Water Services: The States' Role in Ensuring Public Accountability*, 32 PEPP. L. REV. 561 (2005).

²⁰ See generally PETER H. GLEICK ET AL., THE NEW ECONOMY OF WATER: THE RISKS AND BENEFITS OF GLOBALIZATION AND PRIVATIZATION OF FRESH WATER (Pacific Inst. Studies in Dev., Env't & Sec. 2002); ROBIN A. JOHNSON ET AL., LONG-TERM CONTRACTING FOR WATER AND WASTEWATER SERVICES(2002); NATIONAL RESEARCH COUNCIL, PRIVATIZATION OF WATER SERVICES IN THE UNITED STATES: AN ASSESSMENT OF ISSUES AND EXPERIENCE (2002); Isabelle Fauconnier, *The Privatization of Residential Water Supply and Sanitation Services: Social Equity Issue in the California and International Contexts*, 13 BERKELEY PLAN. J. 37 (1999); Robert Vitale, *Privatizing Water Systems: A Primer*, 24 FORDHAM INT'L L. J. 1382 (2001); Kathy Neal et al., *Restructuring America's Water Industry: Comparing Investor-Owned and Government Water Systems* (Reason Found., Policy Study No. 200, 1996), available at <http://www.reason.org/files/0b4ab41ed21ba3e16dbac550019e26ab.pdf>; Wolfgang Harter, *The Giants of Water: RWE, Vivendi, & Suez*, ECO WORLD, Dec. 12, 2002, <http://www.ecoworld.org/Home/articles2.cfm?TID=329> (describing the reasons behind water privatization).

²¹ NATIONAL RESEARCH COUNCIL, *supra* note 20, at 2-3, 14-15.

²² *Id.* at 3, 15.

²³ See, e.g., Johnson, *supra* note 20, at 3-5; David L. Correll, *Water Industry Catches Wave of Opportunity*, UTIL. BUS., Mar. 30, 1999; John Maggs, *The State Experience*, 35 NAT'L J. 2234, 2234-35 (2003); Marianne Lavelle et al., *The Coming Water Crisis*, U.S. NEWS & WORLD REP., Aug. 12, 2002, at 22, 22-25; Jon Luoma, *Water for Profit: Contamination, Riots, Rate Increases, Scandals*, MOTHER JONES, Nov. 1, 2002, at 34, 34-36; Mort Rosenblum, *Is Water a Human Right or a Commodity?*, L.A. TIMES, Aug. 25, 2002, at A.3.

services is an outgrowth of political forces and public policies favoring privatization of public services generally, and water resources specifically.²⁴ A growing number of contracts to privatize public water services is an indicator that privatization has become increasingly attractive to many public water institutions.²⁵ According to one report, in only a three year period from 1997 to 2000, seventy cities entered into long-term contracts with private entities to operate and maintain their local water supplies or wastewater systems.²⁶ A 2007 survey showed that nearly 600 cities had contracts with private water companies in 43 states.²⁷

State legal authority for public entities to privatize water systems has aided the privatization trend. States have enacted statutes authorizing municipalities and other public entities to enter into contracts with private entities to supply water to the public. Many states have statutes expressly authorizing public entities to contract with private entities for the long-term operation or lease of public water works facilities, or even to sell these facilities to private buyers, in some cases with few to no significant conditions to safeguard the public.²⁸ On the other hand, some states

²⁴ See, e.g., DAVID F. LINOWES, PRESIDENT'S COMM'N ON PRIVATIZATION, *PRIVATIZATION: TOWARD MORE EFFECTIVE GOVERNMENT* (1988); Donald G. Featherstun et al., *State and Local Privatization: An Evolving Process*, 30 PUB. CONT. L.J. 643, 644-45 (2001); Maggs, *supra* note 23, at 2234-35; Shirley L. Mays, *Privatization of Municipal Services: A Contagion in the Body Politic*, 34 DUQ. L. REV. 41, 42-45 (1995); Cynthia DeLaughter, Comment, *Priming the Water Industry Pump*, 37 HOUS. L. REV. 1465, 1466 (2000).

²⁵ SHINEY VARGHESE, *PRIVATIZING U.S. WATER 1* (Institute for Agriculture and Trade Policy 2007).

²⁶ Johnson, *supra* note 20, at 4-5.

²⁷ VARGHESE, *supra* note 25, at 2-3.

²⁸ See MCQUILLIN MUN. CORP., § 10.35 (3d ed. 1997 & Supp. 2001) (referencing statutes in Kentucky, New Jersey, Texas, and Utah); V. Woerner, *Power of Municipality to Sell, Lease, or Mortgage Public Utility Plant or Interest Therein*, 61 A.L.R. 2d 595, § 3(b) (1999) (citing cases where state statutes conferring power upon municipalities to sell public utilities have been held constitutional); see also Cornell, *supra* note 23 (discussing trend towards state authorization of water privatization); see, e.g., CAL. PUB. UTIL. CODE § 10061 (West 2004) (authority to lease, sell, or transfer municipally owned water service utilities); COLO. REV. STAT. § 30-35-202 (2004) (power to sell public utilities and sell or lease real property); IDAHO CODE ANN. § 50-326 (2004) (providing procedures to the leasing and selling of water, light, power, and gas plants); 220 ILL. COMP. STAT. 5/7-102(A)(c) (2004) (requiring commission approval for transactions to assign, transfer, lease, mortgage, sell any of its franchises, licenses, permits, plant, equipment, business, or other property); KY. REV. STAT. ANN. §§ 107.700-107.770 (West 2004) (authorizing privatization of water and wastewater improvements); TEX. WATER CODE ANN. §§ 13.511-13.515 (Vernon 2004) (granting powers to privatize sewage treatment and disposal); UTAH CODE ANN. § 73-10d-4 (2004) (allowing government projects for the private ownership or operation of water and wastewater facilities and services).

water privatization statutes are comprehensive and detailed, not only specifying what types of privatization are authorized, but also mandating specific standards, conditions, and procedures to govern local privatization of municipal water services. An example is the New Jersey Water Supply Public-Private Contracting Act.²⁹ In other states, courts have historically upheld the inherent power of cities to enter into contracts with private firms concerning public utilities. A recent Pennsylvania case reflects the trend of courts to allow sales, leases, and long-term contracts, even in the absence of statutory authority, on the theory that water services are a proprietary, not governmental, function of municipalities and therefore can be transferred to private entities.³⁰

Water privatization takes several different forms, ranging from: 1) outsourcing specific services of publicly owned water supply and service systems, to 2) having private sector operation, maintenance, or even construction of public owned water systems with agreed-upon returns to the private companies for their services and investments, to 3) outright transfer of ownership of public water systems to private.³¹

2. Causes

Several conditions have contributed to the water privatization trend. First, many municipalities have aging or obsolete water service infrastructure that requires enormous investment to upgrade or replace. Some municipalities and public entities have failed to make major investments during the life of aging facilities, often due to other demands for public finance, the desire to keep water rates low, and limited legal and financial capacity to engage in debt-financing.³² At the same time, all

²⁹ New Jersey Water Supply Contracting Act, N.J. STAT. ANN. §§ 58:26-1 to 26-27 (West 2004).

³⁰ *Boyle v. Mun. Auth. of Westmoreland County*, 796 A.2d 389, 392-93 (Pa. Commw. Ct. 2002).

³¹ For discussions of the types of privatization of municipal water services and systems, see NATIONAL RESEARCH COUNCIL, *supra* note 20, at 56-80; Gleick, *supra* note 20, at 26-28; Johnson, *supra* note 20, at 1-2, 11-13; Vitale, *supra* note 20, at 1386-90. Arrangements short of ownership transfer include Operate-Maintain-Manage ("OMM") contracts, and Design-Build-Operate ("DBO") contracts. An alternate hybrid arrangement is a Design-Build-Own-Operate-Transfer ("DBOOT") contract, in which the private entity finances and engages in the design, building, and operation of the facility as a private owner, and then transfers it to the city at a particular time. NATIONAL RESEARCH COUNCIL, *supra* note 20, at 21.

³² See NATIONAL RESEARCH COUNCIL, *supra* note 20, at 3-4, 18-19; Ted Sherman, *Liquid Assets*, THE STAR-LEDGER, Oct. 1, 2003, at 27; Varghese, *supra* note 25, at 4.

suppliers of public drinking water have had to comply with increasingly stringent federal requirements for drinking water quality under the Safe Drinking Water Act.³³ Furthermore, operational costs for public water supply systems have increased with growing public demand for water, decreasing supplies of readily available inexpensive water, and environmental constraints on water exploitation.³⁴ Estimates put the infrastructure investment needed in the United States to be \$140-250 billion in the next 20-30 years.³⁵ Many publicly-owned and publicly-operated water utilities, especially the small and medium sized ones (i.e., serving populations of 50,000 or less), "lack the financial capacity and scale of operations to make the imminent investments required without immediate, severe rate increases for water service . . ."³⁶ In some cases, they simply do not have the debt capacity to make such large capital improvements, regardless of rate increases.³⁷

Second, private water corporations have identified U.S. public water systems as potentially profitable to own or operate.³⁸ These are primarily U.S. subsidiaries of the three major multinational water companies: the French corporation Suez Lyonnaise des Eaux, which is now called Suez Environment which owns United Water in the United States, and the two German corporations RWE AG, which controls American Water Works Company, and Siemens, which acquired US Filter Corps from French Veolia Environment, and runs US Filter under the Siemens name.³⁹ They

³³ Safe Drinking Water Act of 1974, Pub. L. No. 93-523, 88 Stat. 1660 (1974) (codified at 42 U.S.C. §§ 300f - 300j-26 (2006)), amended significantly by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Pub. L. No. 107-188, 116 Stat. 594 (2002); see also NATIONAL RESEARCH COUNCIL *supra* note 20, at 3, 37, 47-48; Vitale, *supra* note 20, at 1382-84. See generally Cornell, *supra* note 23; Lavelle, *supra* note 23.

³⁴ NATIONAL RESEARCH COUNCIL, *supra* note 20, at 81-87.

³⁵ *Id.* at 3, 18.

³⁶ Arnold, *supra* note 19, at 571.

³⁷ *Innovative Financing Techniques for Water Infrastructure Improvement: Hearing Before the Subcomm. Fisheries, Wildlife, and Water of the S. Comm. on Env't and Pub. Works*, 107th Cong. 62 (2001) (statement of Harold J. Gorman, Board Member, Association of Metropolitan Water Agencies).

³⁸ Arnold, *supra* note 19, at 571-73.

³⁹ United Water, About US, <http://www.unitedwater.com/company-overview.aspx> (last visited Apr. 1, 2009); *Update 1 - American Water Works Files with U.S. SEC for IPO*, REUTERS, Aug. 27, 2007, <http://www.reuters.com/article/governmentFilingsNews/idUSN2720297920070827> (last visited Apr. 1, 2009); MSN Money, American Water Works Co. Inc.: Ownership, <http://moneycentral.msn.com/ownership?Holding=5%25+Ownership&Symbol=AWK> (last visited Apr. 1, 2009) (indicating that as of Dec. 31, 2008, an RWE AG subsidiary owned 60.5% of American Water Works outstanding shares); *Siemens to Buy U.S. Filter Systems Services Businesses*, FILTRATION INDUSTRY ANALYST, May 2004, at 1;

have engaged in systematic marketing of their financial capacity to make substantial capital investments in new or upgraded public water supply infrastructure and to operate public water systems more efficiently than public sector operators.⁴⁰ Municipalities and other local water systems have found privatization proposals to be attractive ways of meeting regulatory, performance, and capital improvement requirements that have seemed beyond public sector capacity, and private water companies have successfully bid to provide water services to a growing number of U.S. cities of all sizes.⁴¹ In some cases, public officials have no other practical options, but in other cases, public officials are seeking to avoid costly and politically unpalatable choices.

Third, private water companies now can compete better with public sector water system operators due to a 1997 change in the tax treatment of interest on state and local bonds. Under Internal Revenue Service Revenue Procedure 97-13, bonds financing public works that are subject to private operation and maintenance contracts retain their tax exempt status, provided that the contracts do not exceed twenty years and that the contractor not share in net profits, but instead chooses either to share cost savings or share in revenue enhancements.⁴² For these type of privatization arrangements, the I.R.S. rule eliminated a historical tax advantage of two to three percentage points that public water systems had over private water systems.⁴³ Also, private entities do not have to repay the federal government in full for federal investments in public infrastructure projects subsequently sold to private entities.⁴⁴

Fourth, water privatization is a subset of a political and ideological agenda to privatize many government functions, reducing the role of government and increasing the role of private market and private sector providers of public services.⁴⁵ Political leaders sympathetic to reducing

see also Sheila R. Cherry, *Monopolies on the Local Water Front*, INSIGHT ON NEWS, Feb. 11, 2002, at 18, 18-19, 39; Sherman, *supra* note 32, at 27-28; Harrer, *supra* note 20.

⁴⁰ See, e.g., United Water, Our Business, <http://www.unitedwater.com/municipal-partnerships.aspx> (last visited Apr. 1, 2009); see also Arnold, *supra* note 19, at 572.

⁴¹ See NATIONAL ASSOCIATION OF WATER COMPANIES, PUBLIC WATER SUPPLY FACTS (1999) (information sheet on file with author); UNITED WATER, PUBLIC PRIVATE PARTNERSHIPS (2003) (information sheet on file with author).

⁴² Rev. Proc. 97-13, 1997-1 C.B. 632.

⁴³ See NATIONAL RESEARCH COUNCIL, *supra* note 20, at 27-28.

⁴⁴ See Exec. Order No. 12,803, 57 Fed. Reg. 19063, 19063-64 (May 4, 1992).

⁴⁵ See TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM (1991); LINOWES, *supra* note 24; REGULATION AND THE REAGAN ERA: POLITICS, BUREAUCRACY AND THE PUBLIC INTEREST (Roger E. Meiners & Bruce Yandle eds., 1989); David Haarmeyer,

government, supporting private sector companies, or stretching limited public funds have found justifications for privatizing public water systems in policy reports and studies by private market advocates like the Reason Foundation and the Cato Institute.⁴⁶

Finally, privatization of public water supplies and infrastructure is a global trend, appearing prominently in developing countries and creating intense conflicts over human rights, community vitality, ecological sustainability, and national security.⁴⁷ In 2000 alone, ninety-three countries had municipalities that underwent some form of privatization.⁴⁸ Financially-strapped developing nations are turning to large multinational water corporations to invest in, build, and operate water systems that will supply potable drinking water to large populations currently lacking access to water.⁴⁹ In addition, world economic institutions, such as the International Monetary Fund and the World Bank, are pressuring developing nations to turn to privatized water systems, and even conditioning loans to developing nations on water privatization.⁵⁰

Worldwide, over 1 billion people, mostly in developing countries, lack access to adequate supplies of safe drinking water for basic human

Privatizing Infrastructure: Options for Municipal Water Systems, (Reason Pub. Pol'y Inst., Report No. 151 1992), available at <http://www.reason.org/files/4ae2b80350813f066fbae6baa3d98b7c.pdf>.

⁴⁶ See FREDERIK SEGERFELDT, *WATER FOR SALE: HOW BUSINESS AND THE MARKET CAN RESOLVE THE WORLD'S WATER CRISIS* (Cato Institute 2005); Johnson, *supra* note 20; Robin Johnson & Adrian Moore, *Opening the Floodgates: Why Water Privatization Will Continue* (Reason Pub. Pol'y Inst., Policy Brief 17, 2001), available at <http://www.reason.org/pbrief17.html>; Neal, *supra* note 20; Reason Foundation, *Water Services*, http://www.privatization.org/database/policyissues/water_local.html (last visited Feb. 14, 2009); see also WATER PARTNERSHIP COUNCIL, *ESTABLISHING PUBLIC-PRIVATE PARTNERSHIPS FOR WATER AND WASTEWATER SYSTEMS: A BLUEPRINT FOR SUCCESS* (2003).

⁴⁷ See Jeffry S. Wade, *Privatization and the Future of Water Services*, 20 FLA. J. INT'L L. 179, 181, 198 (2008).

⁴⁸ Violeta Petrova, Note, *At the Frontiers of the Rush for Blue Gold: Water Privatization and the Human Right to Water*, 31 BROOK. J. INT'L L. 577, 577 (2006).

⁴⁹ See GLEICK, *supra* note 20.

⁵⁰ See KEN CONCA, *GOVERNING WATER: CONTENTIOUS TRANSNATIONAL POLITICS AND GLOBAL INSTITUTION BUILDING* 221-23 (2006); Jason Astle, *Between the Market and the Commons: Ensuring the Right to Water in Rural Communities*, 33 DENV. J. INT'L L. & POL'Y 585, 588-89 (2005); James Salzman, *Thirst: A Short History of Drinking Water*, 18 YALE J. L. & HUMAN. 94, 95-96 (2006); Timothy O'Neill, Note, *Water and Freedom: The Privatization of Water and Its Implications for Democracy and Human Rights in the Developing World*, 17 COLO. J. INT'L ENVTL. L. & POL'Y 357, 358-59 (2006); Petrova, *supra* note 48 at 585-86; Rachel Welch, Comment, *And Not a Drop to Drink: Water Privatization, Pseudo-Sovereignty, and the Female Burden*, 15 TUL. J. INT'L COMP. L. 311, 313, 315-16 (2006).

needs, and over 2 billion people lack access to sanitation services.⁵¹ As a result, enormous amounts of time are spent, mostly by women, to seek out and transport domestic drinking water to their homes daily.⁵² A 2003 World Health Organization report identified 2.2 million deaths worldwide, mostly among children, due to lack of safe drinking water and sanitation,⁵³ the third highest mortality cause in the developing world behind malnutrition and HIV/AIDS.⁵⁴ Governments of developing nations, however, typically lack the financial resources required to make the major investments in water development, management, and distribution systems needed to ensure safe water supplies.⁵⁵

Large multinational water corporations have capital to invest in water systems worldwide in exchange for ownership or control of these systems and the (estimated) substantial profits from these water ventures.⁵⁶ These corporations have specialized in water development, management, and distribution, seeing a globally unmet need that will be increasingly profitable, and they aggressively seek out investment and ownership opportunities in water service systems worldwide. Vivendi (or Veolia Environment) operates in over 100 countries and provides water services to 110 million people, Suez operates in 130 countries and provides water services to 115 million people; and RWE AG provides water services to over 70 million people.⁵⁷ The combined revenue potential of these three dominant multinational water corporations is close to \$3 trillion.⁵⁸

⁵¹ WORLD HEALTH ORGANIZATION, GLOBAL WATER SUPPLY AND SANITATION ASSESSMENT 2000 REPORT 1 (2000), available at http://www.who.int/water_sanitation_health/monitoring/jmp2000.pdf.

⁵² See Janet Neuman, *Chop Wood, Carry Water: Cutting to the Heart of the World's Water Woes*, 23 J. LAND USE & ENVT'L. L. 203, 209-10 (2008); Welch, *supra* note 50, at 315-16.

⁵³ WORLD HEALTH ORGANIZATION, THE RIGHT TO WATER 6 (2003), available at http://www.unhcr.ch/html/menu2/6/who_ohchr.pdf.

⁵⁴ WORLD HEALTH ORGANIZATION, THE WORLD HEALTH REPORT 2002: REDUCING RISKS, PROMOTING HEALTHY LIFE 8-9 (2002), available at http://www.who.int/whr/2002/en/whr02_en.pdf.

⁵⁵ See Petrova, *supra* note 48, at 581-82.

⁵⁶ See O'Neill, *supra* note 50, at 359-60.

⁵⁷ Julio Godoy, The Center for Public Integrity, Water Barons, Water and Power: The French Connection, <http://projects.publicintegrity.org/water/> (follow "Water and Power: The French Connection" hyperlink) (last visited Apr. 2, 2009); see also Petrova, *supra* note 48, at 578 n.9.

⁵⁸ Bill Marsden, The Center for Public Integrity, Water Barons, Cholera and the Age of Water Barons, <http://projects.publicintegrity.org/water/> (follow "Cholera and the Age of Water Barons" hyperlink) (last visited Apr. 2, 2009).

Water privatization in the developing world has been met with public opposition and conflict, as opponents argue that water is a human right and that global corporations are exploiting the needs of the world's poor for profit.⁵⁹ In Cochabamba, Bolivia, the government, under pressure from the World Bank, granted a 40-year concession to a private consortium, headed by the Bechtel Corporation, to operate the municipal water system.⁶⁰ The municipal water system had failed to meet local need, with over forty percent of the area residents lacking access to a water supply network.⁶¹ After only four months, water prices had increased as much as 400% and workers were spending over one-quarter of their income on water.⁶² The government cancelled the contract after anti-privatization protests of 15,000 to 20,000 people from a diverse cross-section of Bolivian society resulted in hundreds of injuries, \$20 million in property damage, and the death of a 17-year-old boy from confrontations between the protesters and police.⁶³ The consortium filed a \$25 million claim against Bolivia, but eventually dropped it in the face of worldwide public outrage.⁶⁴ The controversy also produced the Cochabamba Declaration, a nonbinding assertion that "[w]ater is a fundamental human right and a public trust to be guarded by all levels of government, therefore, it should not be commodified, privatized or traded for commercial purposes."⁶⁵

Though tensions between water privatization and human rights in developing countries cause great unrest, Canada and the United States are not immune to conflict.⁶⁶ Private-market advocates declare that the privatization of water services in the U.S. will grow,⁶⁷ but substantial

⁵⁹ See Petrova, *supra* note 48, at 592-93.

⁶⁰ For descriptions of the Cochabamba water privatization dispute, see Salzman, *supra* note 50, at 94-96; Astle, *supra* note 50, at 589-90; O'Neill, *supra* note 50, at 361-71; Welch, *supra* note 50, at 316-19.

⁶¹ O'Neill, *supra* note 50, at 363.

⁶² *Id.* at 367-68.

⁶³ *Id.* at 361, 368, 370.

⁶⁴ Welch, *supra* note 50, at 317.

⁶⁵ Cochabamba Declaration, Dec. 8, 2000, available at <http://www.nadir.org/nadir/initiativ/agp/free/imf/bolivia/cochabamba.htm#declaration>.

⁶⁶ See CONCA, *supra* note 50, at 239-41; Glennon, *supra* note 18, at 1890-96; Melissa Kwaterski Scanlan, *Protecting the Public Trust and Human Rights in the Great Lakes*, 2006 MICH. ST. L. REV. 1333, 1339-45 (2006); Patricia Wouters, *A New Generation of Local Water Leaders*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 513, 515 (2007).

⁶⁷ See, e.g., Johnson & Moore, *supra* note 46; see also WATER PARTNERSHIP COUNCIL, ESTABLISHING PUBLIC-PRIVATE PARTNERSHIPS FOR WATER AND WASTEWATER SYSTEMS: A BLUEPRINT FOR SUCCESS (2003); Varghese, *supra* note 25, at 3 (reporting that two water companies are seeking to acquire between twenty and thirty public water systems in the U.S. per year).

opposition has arisen from local citizens' groups, environmental groups, and others.⁶⁸

3. Conflicts and Failures

The privatization trend in the U.S. has encountered obstacles in the form of conflicts over privatization and notable failures of privatization arrangements. Some communities have terminated contracts or bought out private water suppliers due to dissatisfaction. The most visible of these failed privatization efforts was Atlanta's termination of its twenty-year municipal water system operation contract with United Water, a U.S. subsidiary of Suez Lyonnaise, in 2003.⁶⁹ Atlanta entered into the contract in 1999 due to the inefficiencies and inadequacies of its public sector water operations, as well as high infrastructure-related costs.⁷⁰ The parties, however, rushed through the bidding and approval process, failed to gather sufficient information, and did not negotiate carefully.⁷¹ Moreover, United ran the Atlanta system poorly, resulting in extensive complaints and widespread public and municipal regret over the privatization decision.⁷² It underbid the highly competitive contract to operate, maintain, and upgrade Atlanta's aging water infrastructure, but blamed the city for

⁶⁸ See, e.g., Harrer, *supra* note 20; *Privatization of Water and Wastewater Services 1* (Texas Living Waters Project, Issue Paper No. 6, 2002), available at http://www.texaswatermatters.com/pdfs/water_planning_committee6.pdf.

⁶⁹ For the history of Atlanta's woes with United Water, see D.L. Bennett, *Auction No Winner for City Bids High on United Water Equipment*, ATLANTA J.-CONST., Aug. 7, 2003, at 3; D.L. Bennett, *Water Utility Equipment to Go on Auction Block, Atlanta to Bid on Backhoes, Trucks, Chairs*, ATLANTA J.-CONST., July 30, 2003, at B4; Colin Campbell, *There's No Pot of Gold in More Privatization*, ATLANTA J.-CONST., Nov. 2, 2003, at E2; Martha Carr, *Water Woes in Atlanta a Cautionary Tale for N.O., Privatizing Doable, Not Cure-All, City Told*, NEW ORLEANS TIMES-PICAYUNE, June 29, 2003, at 1; Tedra DeSue, *Atlantans Beg City Council Not to Impose Huge Water Rate Hike*, BOND BUYER, Dec. 2, 2003, at 36; Tedra DeSue, *Water Rates May Rise to Cover Debt, Atlanta Mayor Warns*, BOND BUYER, Oct. 16, 2003, at 4; Milo Ippolito, *Atlanta Takes Over Water System, Huge Utility With Aging Pipes Back Under City Control*, ATLANTA J.-CONST., Apr. 30, 2003, at B5; Frank Koller, *No Silver Bullet, Water Privatization in Atlanta, Georgia—A Cautionary Tale*, CBCNEWS, Feb. 5, 2003, <http://www.cbc.ca/news/features/water/atlanta.html>; Lavelle, *supra* note 23; Sherman, *supra* note 32; Water Remunicipalisation Tracker, Atlanta, <http://www.remunicipalisation.org/cases#Atlanta> (last visited Apr. 5, 2009); The City of Atlanta and United Water, Inc.: A Case Study in Privatization (Dec. 11, 2006), http://docs.google.com/View?docid=ddnrwjv_7f5msvf (last visited Apr. 5, 2009).

⁷⁰ Carr, *supra* note 69, at 1.

⁷¹ Maggs, *supra* note 23, at 2235-37.

⁷² Carr, *supra* note 69, at 1.

allegedly failing to fully disclose the condition of its infrastructure.⁷³ As United Water cut jobs and training to reduce expenses, it developed backlogs of thousands of work orders and delivered poor quality of water, often with inadequate pressure.⁷⁴ As a result, water ran orange to brown for many customers, tinting clothes laundered in it and hair washed in it,⁷⁵ and United Water had to issue numerous "boil water" orders because low pressure or insufficient water treatment made the water unsafe to drink, even though some customers said that they did not receive notices until one to two days after the water became unsafe.⁷⁶ In one example, United did not address a broken main gushing water into the street and washing away pavement during a severe drought for ten days, even though a customer notified United repeatedly.⁷⁷ In addition, inefficiencies led to waste, such as failure to bill customers properly, which resulted in millions of dollars of lost revenues to the City of Atlanta.⁷⁸ After city officials and United Water management agreed to terminate the contract after only four years, the city resumed operation of its water system under a new structure, making infrastructure upgrades, hiring new staff, and introducing new customer service processes.⁷⁹

Other communities have also terminated privatization arrangements. In 2005, halfway through a five-year water system operation contract with the City of Laredo, Texas, United Water sought to terminate the contract because the costs of operating the system were higher than they had anticipated in negotiating the contract.⁸⁰ The City of Laredo retook control of the system only after United agreed to the City's demands to pay the City \$3 million in exit fees, leaving the City with the obligation

⁷³ Koller, *supra* note 69.

⁷⁴ Carr, *supra* note 69, at 1.

⁷⁵ Koller, *supra* note 69; *see also* Massachusetts Department of Environmental Protection, Water, Wastewater, & Wetlands, Color, Taste, and Odor: What You Should Know, <http://www.mass.gov/dep/water/drinking/color.htm> (last visited Apr. 5, 2009).

⁷⁶ Carr, *supra* note 69, at 1; Koller *supra* note 69.

⁷⁷ Koller, *supra* note 69.

⁷⁸ GLOBAL HEALTH WATCH 2005-2006: AN ALTERNATIVE WORLD HEALTH REPORT 219 (Zed Books 2005), *available at* <http://www.ghwatch.org/2005report/ghw.pdf>.

⁷⁹ The Center for Public Integrity, The Water Barons, Water Privatization Becomes a Signature Issue in Atlanta, <http://projects.publicintegrity.org/water/report.aspx?aid=55> (last visited Apr. 5, 2009).

⁸⁰ FOOD AND WATER WATCH, FAULTY PIPES: WHY PUBLIC FUNDING-NOT PRIVATIZATION-IS THE ANSWER FOR U.S. WATER SYSTEMS 19 (2006), *available at* http://www.win-water.org/reports/2006-06faulty_pipes.pdf; PUBLIC CITIZEN, WAVES OF REGRET 7-8 (2005), *available at* <http://www.citizen.org/documents/waves.pdf>.

to address repair and maintenance needs.⁸¹ Even though RWE and its subsidiary American Water successfully spent at least \$2.71 million to defeat a Lexington, Kentucky, voter initiative to require the city to re-take its water system by eminent domain,⁸² residents of the City of Felton, California, voted to borrow \$11 million to repurchase their water system from Cal-Am, a subsidiary of RWE, following increasing water rates, deteriorating service, and poor management, despite substantial amounts spent by RWE attempting to defeat the vote.⁸³ In 2004, OMI/CH2M Hill canceled its contract with East Cleveland, Ohio because OMI failed to generate its projected water and sewer revenues that the city needed to pay the monthly operating fee to OMI.⁸⁴ In addition, a federal indictment unsealed in 2005 charged a consultant working for OMI with bribing the then-Mayor of East Cleveland to retain OMI's contract with the city.⁸⁵ The bribery charge is, sadly enough, not surprising. Water privatization bid processes in Birmingham, Atlanta, and New Orleans have also been tainted by charges that political favors were exchanged for favorable treatment of private companies' bids, according to a National Academy of Sciences National Research Council report.⁸⁶

In other communities, public opposition has defeated proposed privatization arrangements. Like Atlanta, Stockton, California, may be a harbinger of growing conflicts over water privatization in the United States. In 2003, Stockton city officials had approved a highly controversial \$600 million contract with OMI/Thames to operate the city's water and sewer systems, shortly before voters passed a ballot initiative to require any new water privatization contracts be submitted to the voters.⁸⁷

⁸¹ See FOOD AND WATER WATCH, *supra* note 80, at 19.

⁸² Food and Water Watch, *Water: Lexington, KY*, <http://www.foodandwaterwatch.org/water/private-vs-public/usa/lexington-ky> (last visited Apr. 5, 2009).

⁸³ See Mike Esterl, *U.S. Water Privatizations Fail to Pan Out*, WALL ST. J., June 26, 2006.

⁸⁴ See Mike Hudson, *Two Deal Brokers With Dirty Hands Manipulated Ohio Water Contracts*, L.A. TIMES, May 29, 2006, at 6.

⁸⁵ *Id.*

⁸⁶ NATIONAL RESEARCH COUNCIL, *supra* note 20, at 26.

⁸⁷ Water Industry News, "Concerned Citizens" Ask Courts to Stop Stockton OMI-Thames Deal, <http://www.waterindustry.org/New%20Projects/stockton-ca-19.htm> (last visited Feb. 23, 2009). For details on the Stockton water privatization controversy, see *Concerned Citizens Coalition v. City of Stockton*, Case No. CV 020397, *ruling on pet. for mandamus* (Cal. Super. Ct. Oct. 17, 2003), 2003 WL 25777610; GARY H. WOLFF, INDEPENDENT REVIEW OF THE PROPOSED STOCKTON WATER PRIVATIZATION (Pacific Inst. for Studies in Dev., Env't & Sec. 2003), available at http://www.pacinst.org/topics/water_and_sustainability/water_privatization/stockton/stockton_privatization_review.pdf; Symposium, *Private Sector Participation in Water Services: Through the Lens of Stockton*, 57 HASTINGS L.J. 1323, 1328-31 (2006).

However, the opponents' lawsuit against the city over its failure to conduct an environmental impact analysis of the privatization arrangement, although hard fought by the city and OMI, proved to be the critical factor in killing the deal.⁸⁸ OMI spent millions unsuccessfully to defeat the anti-privatization initiative and to defend the lawsuit brought by opponents under the California Environmental Quality Act ("CEQA").⁸⁹ After independent analyses showed that the contract was based on underestimated inflation figures, overestimated energy expenditures, and overstated capital cost savings, courts determined that CEQA required the city to engage in thorough environmental impact analyses before approving the contract.⁹⁰ At that point, the city and OMI decided to terminate the arrangement, and the city retook control of its water system in March 2008.⁹¹

In 2002, the New Orleans Water and Sewerage Board rejected a proposal to privatize its water and sewer system under strong pressure from citizen groups concerned about service and cost to low-income city residents, impact on city employees, compromise of environmental standards, and other public-impact issues.⁹² After political efforts to revive the water privatization process, the City finally decided in 2004 to reject privatizing a combined water/wastewater operation, determining that bids by United Water and Veolia Water were inadequate and expressing concern that Veolia's operation of the city's wastewater system at the time was marred by numerous environmental violations, mechanical failures, and lack of regard for the maintenance and long-term needs of the system.⁹³ Likewise, Orange County (California) Local Agency Formation Commission ("LAFCO") voted to reject a proposal to privatize the Santa Margarita Water District in the face of strong opposition by residential customers concerned about insufficient oversight by the California Public Utilities Commission and the potential for poorer service for higher costs.⁹⁴ Moreover, Phoenix, Arizona's decision to privatize part of its water system fell

⁸⁸ Editorial, *Stockton's Thirst Gets Quenched*, SAN FRANCISCO CHRON., July 30, 2007, at B6.

⁸⁹ See Environmental News Service, *Stockton Obeys Court Ruling, Ends Water Privatization*, <http://www.ens-newswire.com/ens/jul2007/2007-07-20-09.asp#anchor3> (last visited Apr. 5, 2009).

⁹⁰ *Concerned Citizens Coal.*, 2003 WL 25777610; WOLFF, *supra* note 87, at 3.

⁹¹ See Environmental News Service, *supra* note 89.

⁹² PUBLIC CITIZEN, *THE BIG GREEDY* 1-2 (2001), available at [http://www.citizen.org/documents/Big_Greedy_\(PDF\).pdf](http://www.citizen.org/documents/Big_Greedy_(PDF).pdf); Martha Carr, *Forum Speakers Oppose Privatizing S&WB: Local Control Called Important*, NEW ORLEANS TIMES-PICAYUNE, July 23, 2003, at 01.

⁹³ See PUBLIC CITIZEN, *VEOLIA ENVIRONMENT: A CORPORATE PROFILE* 4-5 (2005), available at <http://www.citizen.org/documents/Vivendi-USFilter.pdf>.

⁹⁴ See Fauconnier, *supra* note 20, at 57-59.

apart when its top bidder, Earth Tech, failed to obtain a letter from a bank guaranteeing a \$20 million line of credit, because its parent company, the Bermuda-based Tyco International, had been looted by former top executives for up to \$600 million.⁹⁵

Finally, communities have experienced performance problems with private water companies owning or operating their local systems. For example, federal authorities raided a facility operated by OMI in Santa Paula, California in 2003 because investigators discovered that OMI was violating terms of its discharge permit and had apparently filed false water-quality reports.⁹⁶ In addition, private water companies' attempts to sell or develop public watershed lands in Connecticut and New Jersey were met with public opposition and government restrictions on sales and development.⁹⁷ A Connecticut state statute prohibiting sales of watershed lands to private parties was upheld by federal courts.⁹⁸ However, New Jersey has also experienced problems with private transfers of municipal water supplies. A 2004 audit found that United Water diverted \$1.2 million worth of water between 2000 and 2003 without paying the Jersey City Municipal Utilities Authority.⁹⁹ This water was diverted from municipal reservoirs and shipped to other communities that are also customers of the system.¹⁰⁰

Even the primary premise of water privatization—that it produces more efficient water system operations than the public sector can provide—is questionable. Economic analyses of only the operating efficiencies of privately operated systems versus publicly operated systems show mixed results, with four studies finding that private utilities are more efficient, five studies finding that public utilities are more efficient, and three studies finding no differences in efficiencies between private and public water utilities.¹⁰¹ In addition, private water companies have little incentive to

⁹⁵ See Tom Zoellner, *Privatizing Water Hits Roadblock; Firm's Finances Put Phoenix Deal at Risk*, ARIZ. REPUBLIC, June 9, 2003, at 1B; Tom Zoellner, *Water Plant Verdict Due Today; Phoenix Council Will Decide on Privatizing Supply*, ARIZ. REPUBLIC, July 3, 2003, at 4B.

⁹⁶ PUBLIC CITIZEN, *supra* note 80, at 10; News Release, County of Ventura District Attorney (June 29, 2006), available at <http://da.countyofventura.org/06-051.htm>.

⁹⁷ See NATIONAL RESEARCH COUNCIL, *supra* note 20, at 104-105; Matthew Futterman, *Watershed's Development Rekindles Fight*, STAR-LEDGER, Feb. 4, 1999, at 17; Vitale, *supra* note 20, at 1392.

⁹⁸ See *Bridgeport Hydraulic Co. v. Council on Water Co. Lands of State of Conn.*, 453 F. Supp 942, 946-48 (D. Conn. 1977).

⁹⁹ PUBLIC CITIZEN, *supra* note 80, at 8-9.

¹⁰⁰ See *id.*

¹⁰¹ Steven Renzetti & Diane Dupont, *The Relationship Between the Ownership and Performance of Municipal Water Utilities*, in FROM CONFLICT TO CO-OPERATION IN INTERNATIONAL WATER RESOURCES MANAGEMENT: CHALLENGES AND OPPORTUNITIES 141-46 (Saskia Castelein ed., 2002).

invest in public water systems' improvements or maintenance activities that will produce benefits beyond the end of the privatization contract's term.¹⁰² As a result, privatization may not solve the long-term upgrade and maintenance problems of public entities, which may receive their systems back from private operators in surprisingly serious need of immediate public investment. Furthermore, motivated by cost reduction goals, private water companies may fail to consider impacts on the natural environment, including watershed ecosystem services, instream flows, and aquifer health, when seeking inexpensive sources of water, shifting those environmental costs to society as a whole.¹⁰³

B. *Private Property Rights in Water*

Beyond private ownership and control of public water supply systems, privatization is also about the recurring and relentless efforts in the United States to treat interests in water as private property rights, akin to private ownership of land. Water is different than other objects of private ownership and rights, and as such, it has always had both strong public characteristics and strong private characteristics.¹⁰⁴ Therefore, the legal system's treatment of water as a private property right has been more about a reiterative tension than about a linear trend.

Nonetheless, five contemporary aspects of the public-private tension over water are worth special note.

¹⁰² See NATIONAL RESEARCH COUNCIL, *supra* note 20, at 87, 102-103.

¹⁰³ See Gleick, *supra* note 20, at 37-38; William Booth, *Liquid Assets: Thirsty States Turning to New Water Sources*, SEATTLE TIMES, Aug. 15, 2002, at A3; Cherry, *supra* note 39, at 18-19. Indeed, California-American Water Co. was found guilty of illegally pumping water from an underground river connected to the Carmel River, causing harm to fish and riparian habitat. Mary Ann Milbourn, *Water Company Taps River Source Illegally*, ORANGE COUNTY REG., July 8, 1995, at B04.

¹⁰⁴ See ROBERT W. ADLER, RESTORING COLORADO RIVER ECOSYSTEMS: A TROUBLED SENSE OF IMMENSITY 199 (2007); ERIC FREYFOGLE, BOUNDED PEOPLE, BOUNDLESS LANDS: ENVISIONING A NEW LAND ETHIC 145 (1998); ERIC FREYFOGLE, WHY CONSERVATION IS FAILING AND HOW IT CAN REGAIN GROUND 189 (2006); DAVID M. GILLILAN & THOMAS C. BROWN, INSTREAM FLOW PROTECTION: SEEKING A BALANCE IN WESTER WATER USE 37 (1997); Joseph W. Dellapenna, *Adapting Riparian Rights to the Twenty-First Century*, 106 W. VA. L. REV. 539, 545-54 (2004); David H. Getches, *Constraints of Law and Policy on the Management of Western Water*, in WATER AND CLIMATE IN THE WESTERN UNITED STATES 183-233 (William M. Lewis ed., 2003); A. Dan Tarlock, *Water Law Reform in West Virginia: The Broader Context*, 106 W. VA. L. REV. 495, 527-30 (2004); Sandra B. Zellmer & Jessica Harder, *Unbundling Property in Water*, 59 ALA. L. REV. 679, 691-99 (2008).

First, and most fundamentally, public rights and interests in water may be a theoretical starting point from which private rights and interests in water emerge, but as a practical matter, private rights in water have primacy, subject to a few key public interest limitations. Several doctrines define the public interests in water. The “state ownership doctrine” holds that ownership of navigable waters and their submerged lands passed from the federal government into state ownership upon the state’s admission to the Union.¹⁰⁵ The “public trust doctrine” limits the ability to of the state government to convey navigable waters and their submerged lands if such conveyances would be contrary to the public’s equitable interest in these resources for navigation, fishing, recreation, and possibly ecological value.¹⁰⁶ The “federal navigation servitude” allows the federal government to limit private uses of navigable waters and adjacent lands if they would interfere with the federal government’s interest in navigation and the waters as channels of interstate commerce.¹⁰⁷ Government development and management of large-scale water systems, such as dams, reservoirs, and water distribution systems also serves as a doctrinal underpinning.¹⁰⁸ Other doctrines include a variety of statutory and regulatory systems requiring water permits or registration in order to perfect rights in water withdrawals and usage,¹⁰⁹ regulating rates, service areas, and standards

¹⁰⁵ OR. REV. STAT. ANN. § 537.110 (West 2008); see W. VA. CODE ANN. § 20-3-3 (West 2009); see also *Shively v. Bowlby*, 152 U.S. 1, 11-26 (1894); *Bamford v. Upper Republican Natural Res. Dist.*, 512 N.W.2d 642, 649, 651 (Neb. 1994) (declaring state ownership of groundwater); Michael C. Blumm & Lucas Ritchie, *Lucas’s Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 350 nn.192-93 (2005). But see *Tarlock*, *supra* note 104, at 529-30 (contending that the state ownership doctrine was a legal fiction that facilitated state authority to regulate essentially private rights in water).

¹⁰⁶ See *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469, 482 (1988); *Illinois Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 436-37 (1892); *Nat’l Audubon Soc’y v. Superior Court*, 658 P.2d 709, 712 (Cal. 1983); *In re Water Use Permit Applications*, 9 P.3d 409, 501 n.106 (Haw. 2000) (declaring groundwater subject to the public trust); *Cinque Bambini P’ship v. Mississippi*, 491 So. 2d 508, 519 (Miss. 1986); *United Plainsmen Ass’n v. North Dakota State Water Conservation Comm’n*, 247 N.W.2d 457 (N.D. 1976). See generally *Zellmer & Harder*, *supra* note 104, at 691-99.

¹⁰⁷ See *United States v. Rands*, 389 U.S. 121, 122-23 (1967); *United States v. Willow River Power Co.*, 324 U.S. 499, 507 (1945); *Gibson v. United States*, 166 U.S. 269, 271-73 (1897); *Palm Beach Isles Assoc. v. United States*, 58 Fed. Cl. 657, 686 (2003); Martha Haber, Note, *The Navigation Servitude and the Fifth Amendment*, 26 WAYNE L. REV. 1505, 1505-06, 1508 (1980).

¹⁰⁸ See David J. Hayes, *Connecting Population Growth and Water Supply: Strangers No Longer*, [2008] 38 Env’tl. L. Rep. (Env’tl. L. Inst.) 10596, at 10596; Daniel McCool, *The River Commons: A New Era in U.S. Water Policy*, 83 TEX. L. REV. 1903, 1903 (2005).

¹⁰⁹ See *Nekoosa-Edwards Paper Co. v. Pub. Serv. Comm’n*, 99 N.W.2d 821, 825-28 (Wis.

for supplying water to the public,¹¹⁰ protecting surface water conditions and wetlands,¹¹¹ restricting discharges into surface waters,¹¹² preventing and imposing liability for contamination of groundwater,¹¹³ guaranteeing minimum instream flows,¹¹⁴ integrating management of groundwater and surface water,¹¹⁵ evaluating the environmental impacts of water projects,¹¹⁶ imposing conservation policies,¹¹⁷ and subjecting new water

1959) (upholding the statutory authority of the Wisconsin Public Service Commission to regulate common-law riparian rights to the use of nonsurplus water in a navigable stream); JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 101-18, 215-47 (4th ed. 2006); A. DAN TARLOCK ET AL., *WATER RESOURCE MANAGEMENT: A CASEBOOK IN LAW AND PUBLIC POLICY*, 275-387 (5th ed. 2002); A. DAN TARLOCK, *BOTTLED WATER: LEGAL ASPECTS OF GROUNDWATER EXTRACTION* 10-11 (2004) (describing statutory reforms to control groundwater withdrawals); Dellapenna, *supra* note 104, at 583-86 (outlining regulated riparianism adopted by eighteen states).

¹¹⁰ See, e.g., NATIONAL RESEARCH COUNCIL, *supra* note 20, at 91-99 (describing the variety of regulations applicable to public water supplies).

¹¹¹ See, e.g., Clean Water Act § 404, 33 U.S.C. § 1344(a) (2006) (regulating the "discharged or dredged or fill material" into wetlands and requiring a permit for any such discharge); *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 132-33 (1985) (upholding federal restrictions on the development of wetlands under Clean Water Act § 404); A. Dan Tarlock, *Putting Rivers Back in the Landscape: The Revival of Watershed Management in the United States*, 14 HASTINGS W. NW. J. ENVTL. L. & POL'Y 1059, 1078-80 (2008) (describing water quality, wetlands, and endangered species protections under the federal statute as "regulatory water rights"); see also Fred P. Bosselman, *Limitations Inherent in the Title to Wetlands at Common Law*, 15 STAN. ENVTL. L.J. 247, 275-76 (1996) (giving the history of wetland ownership in England prior to and during Norman times).

¹¹² See Clean Water Act §§ 301 & 402, 33 U.S.C. §§ 1311 & 1342 (2006).

¹¹³ See Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S.C. §§ 9601-9675 (2006); Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6921 et seq. (2006); Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq. (2006); *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1188 (6th Cir. 1988).

¹¹⁴ See, e.g., CAL. FISH & GAME CODE §§ 5937 & 5946 (West 2008); CAL. WATER CODE §§ 1243, 1243.5, 1257.5, & 1258 (West 2008); IDAHO CODE ANN. § 42-1501 (2008). See generally PUD No. 1 of Jefferson County v. Washington Dept. of Ecology, 511 U.S. 700 (1994); *Phelps Dodge Corp. v. Arizona Dept. of Water Res.*, 118 P.3d 1110 (Ariz. Ct. App. 2005); *Hubbard v. State of Washington*, 936 P.2d 27 (Wash. Ct. App. 1997); DAVID M. GILLILAN & THOMAS C. BROWN, *INSTREAM FLOW PROTECTION: SEEKING A BALANCE IN WESTERN WATER USE* (1997); Reed D. Benson, *Rivers to Live By: Can Western Water Law Help Communities Embrace Their Streams?*, 27 J. LAND RESOURCES & ENVTL. L. 1, 10-14 (2007); George William Sherck, *Meetings of Waters: The Conceptual Confluence of Water Law in Eastern & Western States*, 5 NAT. RESOURCES & ENV'T 3-5, 47 (1991).

¹¹⁵ See, e.g., NEB. REV. STAT. ANN. § 46-656 (LexisNexis 2008); SAX ET AL., *supra* note 109, at 137, 454-68; TARLOCK, *supra* note 109, at 564-67.

¹¹⁶ See, e.g., *Stempel v. Dept. of Water Res.*, 508 P.2d 166, 171 (Wash. 1973) (en banc) (environmental impacts of proposed water diversion permit and fundamental state policy of an "ecological ethic" had to be considered in public welfare review of permit application); *Central Delta Water Agency v. State Water Res. Control Bd.*, 20 Cal. Rptr. 3d 898, 914

rights or transbasin transfers of waters to public interest review.¹¹⁸ Even common law doctrines recognizing private property rights in water contain inherent limits, such as the correlative nature of water rights that riparian landowners share along a water body,¹¹⁹ and prior appropriation doctrine prohibitions on waste and speculation in water.¹²⁰ Justice Oliver Wendell Holmes, Jr., articulated a particularly strong formulation of the public nature of water:

[F]ew public interests are more obvious, indisputable, and independent of particular theory than the interest of the public of a state to maintain the rivers that are wholly within it substantially undiminished, except by such drafts upon them as the guardian of the public welfare may permit for the purpose of turning them to a more perfect use.¹²¹

Nonetheless, all of these public interests in water actually operate in practice as a patchwork of partial and partially effective constraints on private rights in water. Policy makers, regulators, water institutions, market participants, and the public take private property rights in water as a given, subject to certain public limits, instead of starting with the

(Cal. Ct. App. 2004).

¹¹⁷ See, e.g., KAN. STAT. ANN. § 82a-732 (2007); TEX. WATER CODE ANN. § 16.051(a) (Vernon 2008); Sherk, *supra* note 114, at 47-48.

¹¹⁸ See, e.g., IDAHO CODE ANN. § 42-203A(5)(e) (authorizing the director of the department of water resources to reject any application for a water appropriation permit if it "will conflict with the local public interest"); NEB. REV. STAT. § 46-289 (2008) (enumerating factors for director of department of natural resources to consider in determining whether public interest requires limiting water rights); UTAH CODE ANN. § 73-3-8 (2008) (directing state engineer to reject or limit appropriations of water that would be detrimental to the public welfare); GILLILAN & BROWN, *supra* note 104, at 37; Sherk, *supra* note 114, at 5.

¹¹⁹ See, e.g., Harris v. Brooks, 283 S.W.2d 129, 133-34 (Ark. 1955); Mason v. Hoyle, 14 A. 786, 788-97 (Conn. 1888); Dellapenna, *supra* note 104, at 556; see also Lindsley v. Natural Carbonic Gas Co., 220 U.S. 61 (1911) (upholding government authority to protect correlative rights of multiple holders of interests in groundwater).

¹²⁰ See, e.g., COLO. REV. STAT. § 37-92-103(3) (2008); Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972, 976 (Cal. 1935); State Dep't of Ecology v. Grimes, 852 P.2d 1044, 1053 (Wash. 1993); Janet Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919, 928-33, 946-60, 978-95 (1998); Sandra Zellmer, *The Anti-Speculation Doctrine and Its Implications for Collaborative Water Management*, NEV. L.J. (forthcoming 2009), available at <http://ssrn.com/abstract=1121961>.

¹²¹ Hudson County Water Co. v. McCarter, 209 U.S. 349, 356 (1908).

premise that all water is public property, subject to certain recognized private interests.¹²²

Second, constitutional protections of private property rights under the Takings Clause of the Fifth Amendment¹²³ have made the growing regulatory protections of waters, wetlands, and watershed-supporting lands costly to regulatory agencies when they limit the exercise of private property rights on environmentally sensitive lands and waters. For example, some federal courts have treated water rights as vested private property rights for which the government must compensate the rights-holders when government regulations protecting critical and sensitive ecological resources limit the exercise of those private water rights.¹²⁴ In addition, the Oklahoma Supreme Court held that the state could not extinguish unexercised riparian water rights in its attempt to unify its hybrid water rights system under the prior appropriation doctrine without compensating riparian landowners.¹²⁵ Several cases have required the government to compensate landowners who were not allowed to build on wetlands.¹²⁶ Even though water rights are usufructuary rights—rights to use—and not possessory or title ownership rights¹²⁷ and even though there are numerous counter-examples where courts have held that restrictions on water rights and the development of water-sensitive lands are not takings,¹²⁸ the private property rights movement seeks to treat water rights

¹²² See, e.g., GILLILAN & BROWN, *supra* note 104, at 37; Getches, *supra* note 104, at 186; Glennon, *supra* note 18, at 1898; Hayes, *supra* note 18, at 19-22; Joseph L. Sax, *Rights that "Inhere in the Title Itself": The Impact of the Lucas Case on Western Water Law*, 26 LOY. L. A. L. REV. 943, 945 (1993); Tarlock, *supra* note 104, at 527-30. For example, the Wyoming Constitution provides that no private water appropriation right may be denied "except when such denial is demanded by the public interests." WYO. CONST. art. VIII, §3.

¹²³ U.S. CONST. amend. V.

¹²⁴ See *Fallini v. Hodel*, 725 F. Supp. 1113 (D. Nev. 1989); *Casitas Mun. Water Dist. v. United States*, 543 Fed. Cl. 1276 (2008); *Hage v. United States*, 35 Fed. Cl. 147 (1996), 51 Fed. Cl. 570 (2002); *Tulare Lake Basin Water Storage Dist. v. United States*, 49 Fed. Cl. 313 (2001).

¹²⁵ See *Franco-American Charolaise, Ltd. v. Okla. Water Res. Bd.*, 855 P.2d 568, 582 (Okla. 1990).

¹²⁶ See *Loveladies Harbor, Inc. v. United States*, 28 F.3d 1171 (Fed. Cir. 1994); *Fla. Rock Indus. v. United States*, 18 F.3d 1560 (Fed. Cir. 1994); *Bowles v. United States*, 31 Fed. Cl. 37 (1994); *Friedenberg v. N.Y. Dep't of Env'tl. Conservation*, 767 N.Y.S.2d 451 (N.Y. App. Div. 2003).

¹²⁷ See ADLER, *supra* note 104, at 199; FREYFOGLE (2006), *supra* note 104, at 189; FREYFOGLE (1998), *supra* note 104, at 145; Zellmer & Harder, *supra* note 104, at 691-99; Glennon, *supra* note 18, at 1898.

¹²⁸ See, e.g., *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001) (leading to a state court remand in *Palazzolo v. Rhode Island*, No. WM 88-0297, 2005 WL 1645974 (R.I. Super.

like land ownership rights.¹²⁹ These advocates are using takings litigation either to force government regulators to abandon restrictions on water and land use or to force government to pay them substantial sums when the ecological or natural conditions of waters and watersheds inhibit profitable consumptive use of those resources.¹³⁰

Third, groundwater has become a target for exploitation and pumping by private water bottling companies to meet high consumer demand for bottled water. The bottled water industry generates \$35 billion per year.¹³¹ In the United States, the consumption of bottled water has increased by between eight and twenty percent per year since 1992.¹³² The combination of consumer demand and profit potential has led to large groundwater withdrawals by water bottling companies, which in turn has generated fierce community opposition over the ecological and community harms of such substantial withdrawals, particularly in Wisconsin, Michigan, Texas, and Florida.¹³³ This trend has been facilitated by a variety of common law rules governing rights to extract groundwater—the so-called English rule of absolute ownership, the American or reasonable use rule, the Restatement of Torts § 858 (also a reasonable use rule), correlative rights, and prior appropriation—and also by judicial treatment of groundwater as an article of interstate commerce.¹³⁴ Large-scale extraction of groundwater for bottled water contributes to over-pumping of aquifers, resulting in depletion of the aquifer, increased contamination, salt water intrusion in coastal areas, harm to surface water systems connected to groundwater, interference with biological and hydrologic

July 5, 2005)); *United States v. Willow River Power Co.*, 324 U.S. 499 (1945); *New Jersey v. New York*, 283 U.S. 366 (1931); *Hudson County Water Co. v. McCarter*, 209 U.S. 349 (1908); *Cooley v. United States*, 324 F.3d 1297 (Fed. Cir. 2003); *Good v. United States*, 189 F.3d 1355 (Fed. Cir. 1999); *Forest Props, Inc. v. United States*, 177 F.3d 1360 (Fed. Cir. 1999); *Palm Beach Isles Assoc. v. United States*, 58 Fed. Cl. 657 (2003); *R & Y, Inc. v. Anchorage*, 34 P.3d 289 (Alaska 2001); *Gove v. Zoning Bd. of Appeals*, 831 N.E.2d 865 (Mass. 2005); *Spear T. Ranch Inc. v. Knaub*, 691 N.W.2d 116 (Neb. 2005); *McQueen v. S.C. Coastal Council*, 580 S.E.2d 116 (S.C. 2003); *Just v. Marinette County*, 201 N.W.2d 761 (Wis. 1972).

¹²⁹ See *Hage v. United States*, 35 Fed. Cl. 147 (1996); see also Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 ENVTL. L. 27, 31 (1996) (critiquing the framing of water as subject to private property rights akin to land rights).

¹³⁰ See The Pacific Legal Foundation, *Property Rights Litigation*, <http://community.pacificlegal.org/Page.aspx?pid=269> (last visited Apr. 7, 2009).

¹³¹ Scanlan, *supra* note 66, at 1341 (citing TONY CLARKE, *INSIDE THE BOTTLE: AN EXPOSE OF THE BOTTLED WATER INDUSTRY* 9 (2005)).

¹³² Tarlock, *supra* note 109, at 1.

¹³³ See *id.* at 2; see also Scanlan, *supra* note 66, at 1341-42.

¹³⁴ See Tarlock, *supra* note 109, at 8-10.

processes, and social harm to local communities.¹³⁵ However, an increasing number of common law principles, statutory reforms, and regulatory and management systems, particularly at the state level, are attempting to limit private exploitation of groundwater in order to protect the public's interest in these resources.¹³⁶

Fourth, states have struggled to develop doctrines and policies to protect the minimum instream flows necessary for the ecological and hydrological integrity of flowing waters.¹³⁷ The movement to protect instream flows has had to work against a political, economic, cultural, and sometimes legal presumption that the entirety of surface waters are potentially subject to private appropriation and use.¹³⁸

Finally, increasing water scarcity, stress on watersheds, and competition for water have prompted growing pressures for clear water quantification and scarcity management rules, as well as private and public markets in water rights and supplies.¹³⁹ The conditions in most states—for a long time in the West but even more so now, and also now for the first time in the East—are characterized by growing demand for water and decreasing supply of available water for human consumption.¹⁴⁰ The demand growth is a result of increases in population, land development sprawl, and consumption patterns.¹⁴¹ Supplies have decreased as groundwater levels have dropped from over-pumping, streams have dried up, waters have become contaminated, and climate changes have produced drought conditions, sometimes followed by flooding that has eroded surface water

¹³⁵ *Id.* at 2-3.

¹³⁶ See *id.* at 5-7, 10-11; see also Christine A. Klein & Ling-Yee Huang, *Cultural Norms as a Source of Law: The Example of Bottled Water*, 30 CARDOZO L. REV. 507, 507-08 (2008) (identifying water law principles of reasonable use, beneficial use, preferred uses, and the public interest as means of mediating between a culture of bottled water adherents and a culture of bottled water opponents).

¹³⁷ See *supra* note 114.

¹³⁸ See DONALD WORSTER, *RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST* (1985); Freyfogle (1996), *supra* note 129, at 41-42 (urging reform to "the longstanding, much-modified rule that water is available for appropriation so long as a single drop remains in the stream or aquifer.").

¹³⁹ See Jonathan Adler, *Water Marketing as an Adaptive Response to the Threat of Climate Change*, HAMLINE L. REV. ____ (forthcoming), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1097594; see also Barton H. Thompson Jr., *Markets for Nature*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 261, 261 (2000).

¹⁴⁰ See Little, *supra* note 5, at 8-9; Choo, *supra* note 5, at 56-61.

¹⁴¹ WESTERN RESOURCE ADVOCATES, *SMART WATER: A COMPARATIVE STUDY OF URBAN WATER USE ACROSS THE SOUTHWEST* 93-104 (2003), available at <http://www.westernresourceadvocates.org/media/pdf/SWChapter4.pdf>.

channels and changed regional hydrology.¹⁴² As a result, private sector solutions, such as water marketing, look increasingly attractive to policy makers and the public.¹⁴³ Moreover, even public water suppliers act in an essentially proprietary capacity, seeking to satisfy consumers and manage economic risk.¹⁴⁴

C. *Water as a Consumer Commodity*

Even more broadly than embracing privatized public water systems and private water rights, American society and public policy are increasingly framing water solely as a consumer commodity.¹⁴⁵ In this mindset, the primary purpose of water is to satisfy consumer demand for it, regardless of whether the consumers are agricultural irrigators

¹⁴² ROBERT GLENNON, *WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS* (2002); SANDRA POSTEL AND BRIAN RICHTER, *RIVERS FOR LIFE: MANAGING WATER FOR PEOPLE AND NATURE* (2003); WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? (Craig Anthony (Tony) Arnold ed., 2005); CYNTHIA BARNETT, *MIRAGE: FLORIDA AND THE VANISHING WATER OF THE EASTERN U.S.* (2007); Klein, *supra* note 8, at 1012-50; Glennon, *supra* note 18, at 1874-76; Choo, *supra* note 5, at 56-61.

¹⁴³ See, e.g., Adler, *supra* note 139; Olen Paul Matthews, *Fundamental Questions About Water Rights and Market Reallocation*, 40 WATER RESOURCES RES. W09S08 1 (2004), available at http://www.geo.oregonstate.edu/classes/ecosys_info/readings/2003WR002836.pdf; Neuman, *supra* note 5, at 489-98; Thompson, *supra* note 139, at 262.

¹⁴⁴ See, e.g., BARNETT, *supra* note 142; Craig Anthony (Tony) Arnold, *Working Out an Environmental Ethic: Anniversary Lessons from Mono Lake*, 4 WYO. L. REV. 1, 13-23, 36-38 (2004) (highlighting the example of Los Angeles Department of Water and Power and its consumptive uses of Mono Lake's feeder streams); Hayes, *supra* note 18, at 19-24. For examples of public sector development of water to serve private interests, see, for example, F. LEE BROWN & HELEN M. INGRAM, *WATER AND POVERTY IN THE SOUTHWEST* (1987); WORSTER, *supra* note 138; Daniel McCool, *The River Commons: A New Era in U.S. Water Policy*, 83 TEX. L. REV. 1903, 1912 & n.64 (2005).

¹⁴⁵ See Glennon, *supra* note 18, at 1889. For an international perspective on the framing of water as a consumer commodity, see Astle, *supra* note 50, at 587-90. Eric Freyfogle frames the issue by noting that

Conservation is in trouble today, not chiefly at the level of legal detail where scholars and lawyers focus their work, but at the larger, cultural scale. The vast entertainment industry in all its forms (including those labeled as "news") pound people day by day, minute by minute, with messages that undercut conservation values: live life with no bounds; consume now; think only of yourself; forget the future; perhaps above all, remain happily ignorant of the harms that American-style living causes worldwide.

Eric T. Freyfogle, *Private Rights in a Connected Land*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 320 (Craig Anthony (Tony) Arnold, ed., 2005).

receiving federally subsidized water,¹⁴⁶ commercial or industrial enterprises that expect localities to provide abundant supplies and up-to-date infrastructure to support their private profit-making ventures,¹⁴⁷ or members of residential households who feel entitled to fill their pools, keep their non-native lawns looking lush, take long showers, and have ready access to bottled water.¹⁴⁸ Conservation is inconvenient. Remarkably, many homeowners in Las Vegas expressed defiance towards government limits on lawn watering in a climate that receives three to five inches of rainfall per year.¹⁴⁹ They insisted that they were entitled to grassy lawns in the desert.¹⁵⁰

Moreover, scarcity and competition increase pressures to get water now from any available source, regardless of where it is or regardless of the long-term ecological impacts.¹⁵¹ Water markets and trans-basin transfers have become popular policy proposals in order to satisfy consumer demand.¹⁵² As a result, water has become disconnected conceptually and politically from its places of origin: particular watersheds, ecosystems, and landscapes.¹⁵³ Even some attempts to protect the environmental features

¹⁴⁶ See McCool, *supra* note 144, at 1912-16.

¹⁴⁷ See Douglas Jehl, *A New Frontier in Water Wars Emerges in East*, N.Y. TIMES, Mar. 3, 2003, at A1, A21.

¹⁴⁸ See Craig Anthony (Tony) Arnold, *Introduction: Integrating Water Controls and Land Use Controls: New Ideas and Old Obstacles*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 24-28 (Craig Anthony (Tony) Arnold ed., 2005).

¹⁴⁹ See *id.* at 26-27.

¹⁵⁰ *Id.*

¹⁵¹ BARNETT, *supra* note 142; GLENNON, *supra* note 142; POSTEL & RICHTER, *supra* note 142; Freyfogle, *supra* note 129, at 41-42; Klein, *supra* note 8, 1151-67; Glennon, *supra* note 18, at 1873-76; see also WORSTER, *supra* note 138 (a primary theme of Worster's history of water development in the West).

¹⁵² See, e.g., Neuman, *supra* note 5, at 455-62; Matthews, *supra* note 143, at 4-8; Adler, *supra* note 139.

¹⁵³ FREYFOGLE (1998), *supra* note 104; FREYFOGLE (2003), *supra* note 18, at; GLENNON, *supra* note 142; MARJORIE M. HOLLAND, ELIZABETH R. BLOOD, & LAWRENCE R. SHAFFER, *ACHIEVING SUSTAINABLE FRESHWATER SYSTEMS: A WEB OF CONNECTIONS* (2003); POSTEL & RICHTER, *supra* note 142; Robert W. Adler, *The Law at the Water's Edge: Limits to "Ownership" of Aquatic Ecosystems*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 201-69 (Craig Anthony (Tony) Arnold ed., 2005); Craig Anthony (Tony) Arnold, *Clean-Water Land Use: Connecting Scale and Function*, 23 PACE ENVTL. L. REV. 291, 301-12 (2006); Arnold, *supra* note 144, at 26-48; Freyfogle, *supra* note 129, at 43-47; Christine A. Klein, *Water Transfers: The Case Against Transbasin Diversions in Eastern States*, 25 UCLA J. ENVTL. L. & POL'Y 249, 250-59 (2008); Klein, *supra* note 8, at 1051-67; Janet Neuman, *Dusting Off the Blueprint for a Dryland Democracy: Incorporating Watershed Integrity and Water Availability Into Land Use Decisions*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 119-69 (Craig Anthony (Tony) Arnold ed., 2005).

of water, such as private water trusts¹⁵⁴ and monetary valuation of ecosystem services,¹⁵⁵ are seeking to rely on the economic value of water and watersheds and on consumer demand for healthy environment. Public policy is framed in terms of satisfying private consumer interest. Indeed, one of the problems of modernity is that social institutions and government regimes are themselves engines of consumerism and the “growth imperative,” responding to public dependence on perpetual growth by supporting and facilitating uses of natural resources beyond nature’s carrying capacity.¹⁵⁶

Some of these developments are deeply disturbing and others are merely practical options recognizing the economic characteristics of water in human society. However, all of them illustrate an essentially privatized concept of water as a commodity for human use and consumption, even if consumer demand is satisfied by a combination of public sector and market institutions.

II. HUMAN RIGHTS AND WATER PRIVATIZATION IN THE UNITED STATES

Water privatization raises important issues of human rights, as demonstrated by human-rights-based opposition to water privatization efforts worldwide.¹⁵⁷ Given that water is essential to life, one cannot be a

¹⁵⁴ See Mary Ann King, *Getting Our Feet Wet: An Introduction to Water Trusts*, 28 HARV. ENVTL. L. REV. 495, 495-96 (2004).

¹⁵⁵ See Stephen C. Farber, Robert Costanza, & Matthew A. Wilson, *Economic and Ecological Concepts for Valuing Ecosystem Services*, 41 ECOLOGICAL ECON. 375, 384-89 (2002); Sandra Postel & Stephen Carpenter, *Freshwater Ecosystem Services*, in NATURE’S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 195-214 (Gretchen C. Daily, ed., 1997); James Salzman, *A Field of Green? The Past and Future of Ecosystem Services*, 21 J. LAND USE & ENVTL. L. 133, 139-41 (2006); James Salzman, *Valuing Ecosystem Services*, 24 ECOLOGY L.Q. 887, 892-98 (1997). Jim Chen raises concerns that

The instrumentalist view inherent in the ecosystem services concept dictates that the “chemical, physical, and biological” integrity of basic environmental media such as water not be viewed as an objective for its own sake, but rather as the crucial first step toward achieving human goals such as “propagation of fish” and “recreation in and on the water.”

Jim Chen, *Webs of Life: Biodiversity Conservation as a Species of Information Policy*, 89 IOWA L. REV. 495, 548 (2004).

¹⁵⁶ Robert J. Antonio, *Climate Change, the Resource Crunch, and the Global Growth Imperative*, 26 CURRENT PERSP. IN SOC. THEORY ____ (forthcoming 2009) (on file with author). For a defense of the role of government in supporting commercial ventures and markets based on a political theory of the U.S. as a commercial republic, see Stephen L. Elkin, *City and Regime in the American Republic* (1987).

¹⁵⁷ See, e.g., CONCA, *supra* note 50, at 246-48; Sarah I. Hale, *Water Privatization in the Philippines: The Need to Implement the Human Right to Water*, 15 PAC. RIM. L. & POL’Y J. 765, 767-68 (2006); O’Neill, *supra* note 50, at 457-60; Petrova, *supra* note 48, at 578-82;

human being—at least for very long—without adequate supplies of clean drinking water. Therefore, it would seem to follow that reasonable access to sufficient quantities of clean drinking water to support human life would be a universal right of every human.¹⁵⁸ In addition, given that seriously degraded environmental conditions, such as contaminated waters, harm human life, it would seem to follow that every human has a right to life in a watershed that is at least minimally healthy and functioning.¹⁵⁹

These general principles, however, encounter several formidable obstacles to being translated into operational rights, especially in the United States.

First, there is arguably no universal human right to clean drinking water or to basic environmental conditions expressly recognized in generally applicable and binding international agreements. The three core documents on human rights, the Universal Declaration of Human Rights (1948),¹⁶⁰ the International Covenant on Civil and Political Rights (1966),¹⁶¹ and the International Covenant on Economic, Social, and Cultural Rights (1966),¹⁶² make no express mention of either type of right. Environmental human rights and/or human rights to water are expressly recognized only in interpretive comments to international covenants, international agreements applicable only to specific circumstances, various non-binding declarations,

Melina Williams, Note, *Privatization and the Human Right to Water: Challenges for the New Century*, 28 MICH. J. INT'L L. 469, 470-72 (2007).

¹⁵⁸ See Astle, *supra* note 50, at 585-86; Erik B. Bluemel, *The Implications of Formulating a Human Right to Water*, 31 ECOLOGY L.Q. 957, 962-77 (2004); Malgosia Fitzmaurice, *The Human Right to Water*, 18 FORDHAM ENVTL. L. REV. 537, 537-39 (2007); Amy Hardberger, *Whose Job is it Anyway?: Governmental Obligations Created by the Human Right to Water*, 41 TEX. INT'L L.J. 533, 536-41 (2006); Amy Hardberger, *Life, Liberty, and the Pursuit of Water: Evaluating Water as a Human Right and the Duties and Obligations it Creates*, 4 NW. J. INT'L HUM. RTS. 331, 331-333 (2005); Stephen C. McCaffrey, *A Human Right to Water: Domestic and International Implications*, 5 GEO. INT'L ENVTL. L. REV. 1, 1-3 (1992); Ramin Pejman, *The Right to Water: The Road to Justiciability*, 36 GEO. WASH. INT'L L. REV. 1181, 1181-83 (2004); Pedro de Jesus Pallares Yabur, *The Human Right to Water and the Great Lakes Basin*, 2006 MICH. ST. L. REV. 1323, 1323-25 (2006). See generally SVITLANA KRAVCHENKO & JOHN E. BONINE, HUMAN RIGHTS AND THE ENVIRONMENT: CASES, LAW, AND POLICY 112-46 (2008).

¹⁵⁹ For a discussion of human rights as they relate to environmental conditions, see KRAVCHENKO & BONINE, *supra* note 158, at 113-46.

¹⁶⁰ Universal Declaration of Human Rights, G.A. Res. 217A, at 71, U.N. GAOR, 3rd Sess., 1st plen. mtg., U.N. Doc. A/810 (Dec. 12, 1948).

¹⁶¹ International Covenant of Civil and Political Rights (ICCPR), G.A. Res. 2200A, at 52, U.N. GAOR Supp. (No. 16) at 52, 21st Sess., U.N. Doc. A/6316 (Dec. 16, 1966).

¹⁶² International Covenant on Economic, Social and Cultural Rights (ICESCR), G.A. Res. 2200A, 21 U.N. GAOR Supp. (No. 16) at 49, 21st Sess., U.N. Doc. A/6316 (Dec. 16, 1966).

and specific regional protocols or agreements. The strongest of these is General Comment No. 15, The Right to Water, to the International Covenant on Economic, Social and Cultural Rights.¹⁶³ Issued by the United Nations Committee on Economic, Social and Cultural Rights, General Comment No. 15 asserts that the Covenant's express recognition of each person's right to an adequate standard of living implicitly contains a right to water, which is fundamental to an adequate standard of living.¹⁶⁴ Despite the patent logic of this interpretation, it is not itself a binding agreement ratified by nations. The right to water is expressly protected in some international agreements, such as the Geneva Conventions and U.N. Standard Minimum Rules for the Treatment of Prisoners,¹⁶⁵ and conventions governing the rights of women and children,¹⁶⁶ but these agreements have specific applications and do not establish a universal human right. Regional human rights treaties, such as the African Charter on the Rights and Welfare of the Child¹⁶⁷ and the San Salvador Protocol,¹⁶⁸ establish human rights to water or a healthy environment, but do not apply globally. Some have argued that the right to water is implicit in the right to development, as established by the U.N. Declaration on the Right to Development.¹⁶⁹ Most experts in environmental human rights, however, speak of human rights to water and the environment as emerging, aspirational, or implicit rights.¹⁷⁰

¹⁶³ U.N. Econ. & Soc. Council [ECOSOC], Comm. on Econ., Soc. and Cultural Rights, *Report on the Twenty-Eighth and Twenty-Ninth Sessions: General Comment No. 15, The Right to Water*, 120, U.N. Doc. E/C 12/2002/13 (2002).

¹⁶⁴ *Id.*

¹⁶⁵ Protocol Additional to the Geneva Conventions of Aug. 12, 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), *adopted* June 8, 1977, 125 U.N.T.S. 3, art. 54; Standard Minimum Rules for the Treatment of Prisoners, *adopted* Aug. 30, 1955, First United Nations Congress on the Prevention of Crime and the Treatment of Offenders, U.N. Doc. A/CONF/611, annex I, E.S.C. res. 663C, 24 U.N. ESCOR Supp. (No. 1), at 11, U.N. Doc E/3048 (1957), amended E.S.C. res. 2076, 62 U.N. ESCOR Supp. (No.1), at 35, U.N. Doc. E/5988 (1977), at ¶¶ 13, 15, 21.

¹⁶⁶ Convention on the Elimination of All Forms of Discrimination Against Women, G.A. Res. 34/180, art. 14(2)(h), U.N. GAOR Supp. (No. 46), 34th Sess., U.N. Doc. A/34/46 (Dec. 18, 1979); Convention on the Rights of the Child, G.A. Res. 44/25 annex, art. 24, U.N. GAOR Supp. (No. 49), 44th Sess., U.N. Doc. A/44/49 (Nov. 20, 1989).

¹⁶⁷ African Charter on the Rights and Welfare of the Child art. 14(2)(c), OAU Doc. CAB/LEG/24.9/49 (1990), *entered into force* Nov. 25, 1999.

¹⁶⁸ KRAVCHENKO & BONINE, *supra* note 158, at 4 (quoting and citing The Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social, and Cultural Rights, ratified by 14 nations in the American hemisphere but not the United States or Canada).

¹⁶⁹ Astle, *supra* note 50, at 592-93.

¹⁷⁰ See Fitzmaurice, *supra* note 158, at 537-56; Hardberger (2006), *supra* note 158, at 534-41; Hardberger (2005), *supra* note 158, at 331-33; McCaffrey, *supra* note 158, at 1-5;

Second, even if a human right to water or to basic environmental conditions were to be recognized internationally, it is not clear exactly what this right would mean. For example, is it an affirmative right to receive water and live in certain conditions or is it the right to unhindered access to water and good environments? It is far easier for judicial bodies or legislative or executive bodies at national or international levels to use human rights as limitations on decisions that would patently harm human access to safe and clean water—basically negative rights—than it would be to force governments to affirmatively provide specific quantities of safe and clean water to every person within their respective jurisdictions—the full effectuation of affirmative rights to resources.¹⁷¹ Moreover, how much water would a person be entitled to receive? Even estimates of the minimal amount of water for human survival by the World Health Organization range from as little as five liters per person per day for hydration to one hundred liters per person per day for hydration, cooking, sanitation, and hygiene.¹⁷² How clean would the water have to be? Would the person be entitled to the water for free? If so, who would pay for it? If the person would be required to pay for water that he or she consumes, is there a limit on how much can be charged? Should this limit be determined by ability to pay, physical conditions of supply and scarcity, proportionate share of the cost to obtain and distribute the water, or market conditions of supply and demand? More importantly, will clean and safe water or environmental conditions actually be available simply because a right to them is declared?

One of the basic problems with human rights principles is that, by themselves, they do not induce public or private investment in water systems and services or overcome both physical and economic conditions that lead to scarcity for some populations. Indeed, advocates of privatization argue that recognition of human rights in water discourages private investment because of the resulting insecurity about the likely returns on the investment.¹⁷³ An unresolved question about human rights to water and basic environmental conditions is whether private companies

Petrova, *supra* note 43, at 593-601; Williams, *supra* note 157, at 472-80. *But see* Astle, *supra* note 50, at 590 (arguing that sufficient international consensus has developed that water is a basic human right to justify its enforcement on the basis of customary international law).

¹⁷¹ See Hardberger (2006), *supra* note 158, at 541-66; *see also* Yabur, *supra* note 158, at 1325-29.

¹⁷² See Hardberger (2006), *supra* note 158, at 540-41.

¹⁷³ See SEGERFELDT, *supra* note 46.

are responsible for ensuring that they are met or liable for breaches of them.¹⁷⁴ For the most part, there has been far more international consensus that human rights are operable and legally enforceable against governments than there has been about the nature and degree of their enforceability against business entities, nonprofit entities, or individuals.¹⁷⁵ Nonetheless, attempts to enforce affirmative rights to water and/or environmental conditions against a government that does not have the resources to provide these basics for its citizens may simply be exercises in futility.

In addition, global water scarcity problems are, in some substantial part, physical problems of geography, hydrology, and distributional capacity. About 80% of the people in the world who lack adequate water and sanitation live in rural areas, mostly remote and dispersed geographically.¹⁷⁶ This fact makes it very expensive for either financially strapped governments or risk averse private corporations to provide water where the need is the greatest.¹⁷⁷ While human rights advocates use aspirational language describing the universality and fundamentality of basic human rights, water specialists use the term "wet water," which reminds us of the practical barriers to rights and norms translating into actual water supplies. The term "wet water" means actual supplies of water that are available to be put to particular uses in particular locations, in contrast to mere conceptual, or "paper," rights to water.¹⁷⁸

Third, human rights in water and environmental conditions arguably conflict with environmental ethics at some level. Critics of a human rights approach to environmental protections would argue that such an approach is highly anthropocentric, elevating the rights of humans to the consumption of nature over the rights of other species and of nature itself

¹⁷⁴ See Petrova, *supra* note 48, at 583, 593, 598.

¹⁷⁵ See Hardberger, *supra* note 158, at 532-66; see, e.g., Pejan, *supra* note 158, at 1196-1202.

¹⁷⁶ WORLD HEALTH ORGANIZATION, *supra* note 51, at 1.

¹⁷⁷ James Salzman points out that water has never been free and that substantial capital investment, facilitated by cost recovery and a return on investment, is needed to create the water distribution infrastructure needed, yet the potential for this investment is inhibited by a lack of ability to pay. Salzman, *supra* note 50, at 113-17; see also Williams, *supra* note 157, at 503; O'Neill, *supra* note 50, at 359 (privatization creates incentives for capital investment in the development and provision of water services); Astle, *supra* note 50, at 587 (describing the costs associated with supplying clean drinking water).

¹⁷⁸ See Susan D. Brienza, *Wet Water vs. Paper Rights: Indian and Non-Indian Negotiated Settlements and Their Effects*, 11 STAN. ENVTL. L.J. 151, 152 (1992) (outlining this tension as it plays out from Native American tribes in the U.S. West). See generally Hardberger (2006), *supra* note 158 (discussing the difficulties of translating human rights into actual water supplies); Astle, *supra* note 50 (discussing the difficulties of translating human rights into actual water supplies).

or the ecocentric responsibilities and duties of humans as integral parts of nature.¹⁷⁹ While we could think of many examples and arguments where human interests and nature's interests coincide and even mutually support one another, the potential conflicts between the two are not purely theoretical. For example, transferring substantial amounts of water from areas of water abundance to arid areas of greatest human need can impose tremendous ecological harm on the source watersheds that support humid ecosystems and depend on return flows, not to mention the energy costs and related environmental outputs of transporting water great distances.¹⁸⁰ Moreover, a legal and political entitlement to water facilitates migration to areas of water scarcity,¹⁸¹ undermines conservation, and promotes over-consumption, except in relatively closed communal water systems where informal group norms discourage waste.¹⁸²

Fourth, the United States legal system and socio-political culture do not provide much, if any, recognition for affirmative human rights to minimum levels of safe and clean water and aquatic environments. U.S. courts do not enforce rights created in international agreements unless Congress has expressly made them judicially enforceable in the U.S.¹⁸³ In fact, the United States has not ratified some of the treaties expressly or implicitly creating a positive human right to water, including the International Convention on Economic, Social, and Cultural Rights, the Covenant on the Elimination of All Forms of Discrimination Against

¹⁷⁹ See FREYFOGLE, *supra* note 104, at 138-42 (expressing concern that incorporation of social justice concerns into a sustainability agenda can undermine the ecological conservation agenda); Gabriel Eckstein, *Precious, Worthless, or Immeasurable: The Value and Ethic of Water*, 38 TEX. TECH. L. REV. 963, 965-66 (2006); Aphrodite Smagadi, *Analysis of the Objectives of the Convention on Biological Diversity: Their Interrelation and Implementation Guidance for Access and Benefit Sharing*, 31 COLUM. J. ENVTL. L. 243, 259 (2006); Alison Lindsay Shinsato, Note, *Increasing the Accountability of Transnational Corporations for Environmental Harms: The Petroleum Industry in Nigeria*, 4 NW. J. INT'L HUM. RTS. 186, 197-202 (2005).

¹⁸⁰ See Klein, *supra* note 153, at 259-74.

¹⁸¹ See Hardberger, *supra* note 158, at 547 (arguing that governments have affirmative human-rights obligations to provide water to areas of need beyond their borders); Yabur, *supra* note 158, at 1329-30 (exploring whether the U.S. would have a duty to supply water from the Great Lakes Basin to poor children in Mexico who lack it).

¹⁸² CONCA, *supra* note 50, at 217; O'Neill, *supra* note 50, at 359 (privatization encourages conservation).

¹⁸³ See Sanchez-Llamas v. Oregon, 548 U.S. 331, 353-54 (2006); Curtis A. Bradley & Jack L. Goldsmith, *Treaties, Human Rights, and Conditional Consent*, 149 U. PA. L. REV. 399, 399-403 (2000); Jack Goldsmith, *International Human Rights Law and the United States Double Standard*, 1 GREEN BAG 2D 365, 367 (1998).

Women, and the Convention on the Rights of the Child.¹⁸⁴ Moreover, in our legal, social, and political culture, we give judicial enforcement to negative political and civil rights that guarantee individuals freedom from certain exercises of government power but do not tend to recognize positive rights to basic human necessities, such as food, shelter, water, or a clean and safe environment.¹⁸⁵ For example, attempts to amend the U.S. Constitution to provide a fundamental right to environmental protection have repeatedly failed,¹⁸⁶ and only six states—Hawaii, Illinois, Massachusetts, Montana, Pennsylvania, and Rhode Island—have adopted such a right in their state constitutions,¹⁸⁷ despite the popularity and strength of the environmental movement in the United States. Instead of speaking of human rights, we tend in this nation to frame rights in terms of constitutional rights, individual rights and freedoms, and political and civil rights.

However, we also tend to frame affirmative duties of government in terms of the public interest or public rights. Despite the strong protection of individual freedoms from government interference, there is also a modest protection of the public's interests in natural resources, environmental policies, and government decision making. This is the point where human rights concerns over water and the environment are most salient in the American legal tradition.¹⁸⁸

The water law doctrines and systems identified previously¹⁸⁹—the public trust doctrine, the state ownership doctrine, correlative rights, the anti-speculation doctrine, the beneficial use doctrine, regulatory permitting systems, public interest review, environmental regulation, public utility rate regulation, and the usufructuary or nonpossessory nature of water rights, among others—provide strong conceptual foundations and useful legal tools for protecting the public's interests in water and water systems. Moreover, non-discrimination principles in U.S. law can also be helpful.¹⁹⁰

¹⁸⁴ See Goldsmith, *supra* note 183, at 367.

¹⁸⁵ See Bryan P. Wilson, Comment, *State Constitutional Environmental Rights and Judicial Activism: Is the Big Sky Falling?*, 53 EMORY L.J. 627, 635-39 (2004).

¹⁸⁶ See David Takacs, *The Public Trust Doctrine, Environmental Human Rights, and the Future of Private Property*, 16 N.Y.U. ENVTL. L.J. 711, 730 (2008).

¹⁸⁷ See *id.* at 730 n.106.

¹⁸⁸ See *id.* at 730; Zellmer & Harder, *supra* note 104, at 696.

¹⁸⁹ See discussion *supra* Part I.B.

¹⁹⁰ For a brief overview of the nondiscrimination principle in U.S. constitutional law, including a critique that is largely limited to formal equality in government actions with respect to suspect classifications of race, national origin, and gender, see Gil Kujovich, *Comment on Accommodating Differences in Constitutional Law*, 30 VT. L. REV. 489 (2006).

For example, residents of the mostly African American Coal Run neighborhood in rural east-central Ohio recently received \$11 million to remedy the government's discrimination against them in running water lines in throughout the area but not in Coal Run.¹⁹¹ The powers of federal, state, and local governments to regulate private sector activity in order to protect the public also serve to effectuate basic human and public rights. For example, local land use laws and subdivision controls now operate to ensure basic water infrastructure is provided; lack of such regulatory controls can result in situations like the Texas *colonias*, where private developers created entire communities for low-income Latinos in unincorporated areas near the U.S.-Mexico border that lack water services and other basic public services.¹⁹² Public entities are concerned with policy considerations, social equity, politics, and impacts of thirsty low-income residents on society.¹⁹³ For example, low-income people, who may struggle to afford all basic needs (e.g., water, housing, food, energy, medical care), benefit from public sector water system water rates that are often below-market, or essentially publicly subsidized.¹⁹⁴ These artificially low rates, though, incite waste in consumers who can afford to pay higher rates.¹⁹⁵

The doctrines designed to protect the public's interest in water work imperfectly and do not guarantee that every individual has a legal entitlement to a specified amount of water or a certain standard of environmental conditions. However, U.S. legal theories use the political and social nature of water—water as a community resource—to protect and advance the human interest in water as a necessity of life and the ecological characteristics of water as part of biological, physical, and chemical systems in nature.

¹⁹¹ See Dirk Johnson, *For a Recently Plumbed Neighborhood, Validation in a Verdict*, N.Y. TIMES, Aug. 11, 2008, <http://www.nytimes.com/2008/08/12/us/12ohio.html>; Eoin O'Carroll, *Black Ohio Neighborhood Denied Water for Decades*, CHRISTIAN SCI. MONITOR, July 11, 2008, <http://features.csmonitor.com/environment/2008/07/11/black-ohio-neighborhood-unjustly-denied-water-for-decades-jury-finds/>; Claire Suddath, *Making Water a Matter of Race*, TIME, July 14, 2008, <http://www.time.com/time/nation/article/0,8599,1822455,00.html>.

¹⁹² See Jane E. Larson, *Free Markets Deep in the Heart of Texas*, 84 GEO. L.J. 179, 183 (1995).

¹⁹³ See *Thayer v. Cal. Dev. Co.*, 128 P. 21, 29 (Cal. 1912) (differentiating between public and private suppliers of water); See also Fauconnier, *supra* note 20, at 42, 45-46, 59-61; Rosenblum, *supra* note 23, at A.3. However, there is also evidence that public water institutions serve private interests and values. See BROWN & INGRAM, *supra* note 144; WORSTER, *supra* note 138.

¹⁹⁴ See, e.g., NATIONAL RESEARCH COUNCIL, *supra* note 20, at 86-88; Lavelle, *supra* note 23; Rosenblum, *supra* note 23, at A.3. For a discussion of the nuances, merits, and controversies of subsidizing water for basic human needs, see GLEICK, *supra* note 20, at 31-34.

¹⁹⁵ See *supra* note 194.

III. NATIONAL SECURITY AND WATER PRIVATIZATION IN THE UNITED STATES

Private control over water resources also raises several potential risks to national security from: 1) inter-jurisdictional conflicts over scarce water resources; 2) foreign control of domestic water supplies; and 3) vulnerabilities of water supplies to acts of terrorism.

A. *Conflict and Scarcity*

Conflict and competition over water is one of the major sources of armed conflicts between nations and groups throughout world history.¹⁹⁶ Scarcity and competing diversions for water among nations has led to armed conflict or other national security problems along the Jordan River Basin (among Israel, Jordan, Syria), the Nile River Basin (among Egypt, Ethiopia, and the Sudan), and the Euphrates River Basin (among Turkey, Syria, and Iraq).¹⁹⁷ In fact, in 1995, the then Vice-President of the World Bank predicted that water would replace oil as the resource over which wars would be fought in the twenty-first century.¹⁹⁸ Global conflict over water will affect U.S. foreign policy and security worldwide.¹⁹⁹ Privatization is likely to contribute to global conflict over water, because: 1) civil unrest over private control over water and the typical substantial rate increases that accompanying privatization may spark inter-group conflict across borders or put political pressure on national governments to seek new supplies of water from transnational sources,²⁰⁰ and 2) private water

¹⁹⁶ See Peter H. Gleick, *Water and Conflict: Fresh Water Resources and International Security*, 18 INT'L SEC. 79, 79 (1993); Christopher L. Kukuk & David A. Deese, *At the Water's Edge: Regional Conflict and Cooperation over Fresh Water*, 1 UCLA J. INT'L L. & FOREIGN AFF. 21, 31 (1996); Williams, *supra* note 157, at 471. The Middle East has experienced particularly virulent fights over water. See generally JOHN BULLOCH & ADEL DARWISH, *WATER WARS: COMING CONFLICTS IN THE MIDDLE EAST* (1993).

¹⁹⁷ See Kukuk & Deese, *supra* note 196, at 35-50.

¹⁹⁸ See O'Neill, *supra* note 50, at 358; see also Colleen P. Graffy, *Water, Water, Everywhere, Nor Any Drop to Drink: The Urgency of Transnational Solutions to International Riparian Disputes*, 10 GEO. INT'L ENVTL. L. REV. 399, 408 (1998).

¹⁹⁹ See Neuman, *supra* note 52, at 231-41 (arguing that water is particularly salient to international security and U.S. foreign policy); Elizabeth Burleson, *Water Is Security*, 31 ENVIRONS ENVTL. L. & POL'Y J. 197, 199 (2008).

²⁰⁰ Even along the peaceful U.S./Canadian border, water privatization has created some political unrest. See SGM Publications, *The Union War on Water Privatization*, <http://www.sgmlaw.com/en/about/publication/PublicationsUnionWaronWaterPrivatization.cfm> (last visited Apr. 7, 2009).

corporations may transfer water supplies in some countries to users in other countries who are willing to pay more for the water.²⁰¹

Moreover, conflict over water will affect U.S. domestic security. Three scenarios are possible in the U.S. in an environment of increasing privatization. First, tensions and conflicts between the U.S. and other nations could develop as private water exporters tap U.S. waters to meet needs elsewhere in the world, or as U.S. water consumers seek new sources from shared waters, oceans, or other parts of the world to meet relentless consumer demand. Second, civil unrest and protests over privatization of public water services in the U.S. could weaken internal security. These domestic conflicts over privatization could also develop into conflicts and tensions with nations that are home to multinational water companies, such as France and Germany.

Third, the combination of increased consumption patterns, norms, and the failure of existing water governance institutions to adapt to regional or temporal scarcity are resulting in regional and interstate water conflicts in many areas of the U.S.²⁰² These conflicts may undermine internal security and distract government leaders from addressing global threats to domestic security, such as terrorism. Some of the many contributing factors to these regional water conflicts involve privatization trends. One is the influence of private interests in advancing their self-interested water use goals and, in the process, undermining conservation goals, cooperative or collaborative solutions, and adaptation of water institutions to changing conditions and societal needs. Another trend contributing to regional water conflict is the framing of water as a consumer commodity that should be plentiful and cheap to meet human wants, regardless of the environment-sustaining, community-defining, or power-distributing functions of water.

²⁰¹ Though not an international border issue, Arizona proposed allowing its water to be exported to thirsty Las Vegas, Nevada. Arizona's citizen expressed great concern. Joe Gelt, *Arizona-to-Nevada Water Export Plan Proposed, Contested*, ARIZ. WATER RES., May-June 2007, <http://ag.arizona.edu/AZWATER/awr/mayjune07/feature1.html>.

²⁰² See PETER ANNIN, *THE GREAT LAKES WATER WARS* (2006); CRAIG ANTHONY ARNOLD & LEIGH A. JEWELL, *BEYOND LITIGATION: CASE STUDIES IN WATER RIGHTS DISPUTES* (2002); HOLLY DOREMUS & A. DAN TARLOCK, *WATER WAR IN THE KLAMATH BASIN: MACHO LAW, COMBAT BIOLOGY, AND DIRTY POLITICS* (2008); ADAPTIVE GOVERNANCE AND WATER CONFLICT: NEW INSTITUTIONS FOR COLLABORATIVE PLANNING 74-88 (John T. Scholz & Bruce Stiftel, eds., 2005); Dellapenna, *supra* note 10; Ruhl, *supra* note 10, at 49-53; Ruhl, *supra* note 5, at 47-49; Choo, *supra* note 5, at 56-61; Little, *supra* note 5, at 8-9.

B. *Foreign Control of Domestic Water Supplies*

Another national security issue is the degree to which foreign-owned and foreign-operated private corporations control public water systems, water rights, and actual water resources in the U.S., making the American public vulnerable to decisions that may not adequately protect its interests. As discussed in Part I.A.2, most of the private owners or operators of public water systems in the United States are subsidiaries of French or German corporations.²⁰³

International free trade agreements may serve to protect foreign or multinational corporations' rights to export U.S. water supplies to other nations.²⁰⁴ The General Agreement on Tariffs and Trade ("GATT")²⁰⁵ and the North American Free Trade Agreement ("NAFTA")²⁰⁶ support the international treatment of water as a tradable good or commodity for which prohibitions on transfers could be deemed impermissible export restrictions.²⁰⁷ However, there is an argument that restrictions on water exports might be permissible under exceptions for nonrenewable resources, particularly if these transfers threaten the sustainability of particular water systems or watersheds.²⁰⁸ Nonetheless, the U.S. Supreme Court

²⁰³ See discussion *supra* Part I.A.2.

²⁰⁴ On the issue of international water exports, see Scanlan, *supra* note 66 (discussing the export of water from the Great Lakes through bottled water sales).

²⁰⁵ General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, T.I.A.S. 1700, 55 U.N.T.S. 194; see also Harmonized Tariff Schedule of the United States, Classification 2201: Waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavored; ice and snow (2009), available at <http://hts.usitc.gov/>.

²⁰⁶ North American Free Trade Agreement, Dec. 17, 1992, 19 U.S.C. §§ 3312-17 (2006), 32 I.L.M. 289; see also Dr. Isabel Al-Assar, Water as a Commodity, Paper Presentation Before the Third International Water Law Symposium, University of Dundee (June 14, 2000), available at <http://www.waterbank.com/Newsletters/nws18.html>; Stephen Leahy, Canada: Losing Water through NAFTA, Sept. 23, 2007, <http://www.globalresearch.ca/index.php?context=va&aid=6859> (last visited Apr. 8, 2009).

²⁰⁷ See CONCA, *supra* note 50, at 223-27; Jennifer Naegle, *What is Wrong With Full-Fledged Privatization?*, 6 J. L. & SOC. CHALLENGES 99, 109 (2004) (noting that NAFTA and GATT define water as a tradable good, service, and investment, and asserting that government regulation of water may be an illegal barrier to trade).

²⁰⁸ See *id.*; see also GLEICK, *supra* note 20, at 15-20; Brian D. Anderson, *Selling Great Lakes Water to a Thirsty World: Legal, Policy & Trade Considerations*, 6 BUFF. ENVTL. L.J. 215, 238-42 (1999); Milos Barutciski, *Trade Regulation of Fresh Water Exports: The Phantom Menace Revisited*, 28 CAN.-U.S. L.J. 145 (2002); Sanford E. Gaines, *Fresh Water: Environment or Trade?*, 28 CAN.-U.S. L.J. 157 (2002); A. Dan Tarlock, *How Well Can International Water Allocation Regimes Adapt to Global Climate Change?*, 15 J. LAND USE & ENVTL. L. 423, 443 (2000).

has declared groundwater to be an article of interstate commerce,²⁰⁹ which would support the argument of foreign exporters of water that domestic laws cannot burden their international rights to exploit U.S. waters for commercial gain. Moreover, some theories of the basic human right to water would impose on governments in areas with "surplus" water the affirmative duty to transfer the water internationally to areas with water scarcity.²¹⁰ This would create a regime of international control over domestic supplies.²¹¹

C. Terrorism

Terrorism poses risks to water supply systems that might be greater for privately controlled systems than for government controlled systems. The threats include the introduction of chemical, biological, or radioactive contaminants into reservoirs of public drinking water or into the water distribution system.²¹² However, given the large amount of contaminants needed to pollute large amounts of drinking water and the likelihood that treatment works will eliminate the harm from any substances introduced pre-treatment,²¹³ the more serious risk is damage to pumping

²⁰⁹ See *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941, 953-54 (1982).

²¹⁰ See, e.g., Yabur, *supra* note 158, at 1327-28.

²¹¹ See *id.* (noting that such a regime could be established through treaty obligations).

²¹² See B. Suzi Ruhl, *The Role of Homeland Security in Drinking Water Safety*, SL036 ALI-ABA 217, 219-20 (2005). See generally OFFICE OF THE INSPECTOR GENERAL, U.S. ENVIRONMENTAL PROTECTION AGENCY, EVALUATION REPORT, SURVEY RESULTS ON INFORMATION USED BY WATER UTILITIES TO CONDUCT VULNERABILITY ASSESSMENTS, REPORT NO. 2004-M-0001 (2004); Robert M. Anderson, *The Emerging Field of Environmental Security Law and Its Applicability to Water Resources and Infrastructure*, 2005 ALI-ABA 227 (2005); Peter H. Gleick, *Water and Terrorism*, 8 WATER POLICY 481 (2006); Itzhak E. Kornfeld, *Terror in the Water: Threats to Drinking Water and Infrastructure*, 9 WIDENER L. SYMP. J. 439, 449-54 (2003); Steven D. Shermer, *The Drinking Water Security and Safety Amendments of 2002: Is America's Drinking Water Infrastructure Safer Four Years Later?*, 24 UCLA J. ENVT. L. & POL'Y 355, 407-19 (2006); Varu Chilakamarri, Note, *A New Instrument in National Security: The Legislative Attempt to Combat Terrorism via the Safe Drinking Water Act*, 91 GEO. L. J. 927, 946-47 (2003); U.S. Environmental Protection Agency, Water Security, <http://www.epa.gov/safewater/security/index.ctm> (last visited Feb. 24, 2009).

²¹³ See Vicki Kemper, *Flood of Money Targets Drinking Water Security*, L.A. TIMES, July 28, 2002, at 20; Genevieve Marshall, *Security is Watered Down at Reservoirs, Treatment Plants*, MORNING CALL (Allentown, PA), Mar. 30, 2003, at A1. But see Ruhl, *supra* note 212, at 221 (emphasizing growing concern about terrorist contamination of drinking water by introducing contaminants, especially disinfectant-resistant pathogens, directly into distribution system post-treatment); Kornfeld *supra* note 212, at 468-72 (discussing use of Cryptosporidiosis and Giardiasis as tools of terror if introduced into disinfected, filtered water supplies).

or distribution equipment that could shut down public water supplies to significant numbers of people.²¹⁴ Although an explosion at a critical location could cause widespread harm that could not be fixed quickly, it has been said that great harm could be done by someone with merely a hammer, screwdriver, and access to water system machinery or pipes.²¹⁵

At some level, all public water systems are vulnerable, regardless of who is operating them.²¹⁶ In response, the U.S. Congress enacted the Public Health, Security, and Bioterrorism Preparedness and Response Act of 2002.²¹⁷ The Act requires public water systems to prepare emergency response plans to address threats to water supplies and to conduct and submit vulnerability assessments to the U.S. Environmental Protection Agency.²¹⁸ Both public and private water systems have bolstered security, and many states have passed legislation or implemented programs to enhance security of the water supply.²¹⁹

Nonetheless, private operation of local water systems supplying basic drinking water to the public can pose certain security vulnerabilities that public sector operation does not, as I have previously written:

Private water suppliers, just like municipal and governmental water suppliers, have called for government attention to (and funding for) security and have engaged in heightened security measures. However, private water companies usually operate with less transparency and accountability to the public than do public entities. This fact raises three

²¹⁴ See Kornfeld, *supra* note 212, at 447-49; Ruhl, *supra* note 212, at 219-220; Kemper, *supra* note 213, at 20; Marshall, *supra* note 213, at A1.

²¹⁵ See Marshall, *supra* note 213, at A1.

²¹⁶ See Ruhl, *supra* note 212, at 219-220 (describing susceptibility of drinking water to the following acts of terrorism: 1) physical destruction of facilities; 2) cyber-attacks; 3) biological agents added to water supply; 4) chemical agents added to water supply; 5) radioactive materials added to water supply; 6) release of hazardous chemicals used to treat water into the public environment).

²¹⁷ Pub. L. No. 107-188, 116 Stat. 594 (2002) (codified at 42 U.S.C. §§ 300f to 300j-26 (2006)) (amending the Safe Drinking water Act).

²¹⁸ *Id.* § 401, 116 Stat. at 682 (codified at 42 U.S.C. § 300i-2 (2006)).

²¹⁹ See Marshall, *supra* note 213, at A1; AWWA *Seeks Federal Support for Enhanced Water Utility Security: Security of Water Supply Essential to Homeland Security*, U.S. NEWSWIRE, Mar. 20, 2002; *Deadline for Water Utility Security Assessments, Nation's Largest Water Supplies Required to Submit Security Studies to EPA Today*, U.S. NEWSWIRE, Mar. 31, 2003; U.S. Environmental Protection Agency, Water Security, <http://cfpub.epa.gov/safewater/watersecurity/index.cfm> (last visited Mar. 13, 2009).

particular concerns about private control over the public's water supply.

First, a private water system operator may have less of a close working relationship with local law enforcement than would a municipal water department or local water district. In general, public operators of water systems are either under municipal control or closely connected to local government, and therefore involvement of local law enforcement in safeguarding water supplies and monitoring potential threats and local emergency response and public health officials in responding to emergencies is likely to be greater (recognizing, though, that some inter-departmental or inter-agency communication within government can be quite poor). A private company may be less likely to cooperate with local law enforcement and emergency and public health officials simply due to poorly developed lines of communication, unfamiliarity of local officials with the private company's operations, or desires to keep confidential proprietary information about private operations.

Second, private entities may be less likely to reveal information about private operations, employees, breaches of security, and system security status than public entities would. For example, when Congress was considering the Public Health, Security, and Bioterrorism Preparedness and Response Act of 2002, private water companies objected to submitting assessments to the EPA, and instead wished merely to certify that they had done so: Congress added provisions to exempt these assessments from the Freedom of Information Act and unauthorized disclosure. The conflict over disclosing assessments to a federal agency illustrates a possibly inherent tension between private interests in keeping water management practices private and public interests in a well-informed, well-prepared set of anti-terrorism specialists at local, state, and federal levels.

Third, it might be more difficult to ascertain if there are security breaches or threats from a private company's employees. There is no reason to believe that private companies on average have poorer employee screening and background check systems than do public entities. In fact, the private systems on the whole might be better than the

public systems, or the opposite might be true. What is at issue, though, are whether public officials concerned with public water supply security have adequate opportunity to check a private company's processes, practices, and safeguards. Both public and private water service providers have access to certain water security information that is confidential and not made available to the general public. However, it is not clear how widely this information is disseminated throughout large multinational water companies based in other countries, or the degree of risk that an employee sympathetic to terrorists could access it.²²⁰

The critical dependence of the U.S. public on public water supply systems, surface waters, groundwater, and water infrastructure heighten the vulnerability of these systems not only to conflict and scarcity but also to terrorism and intentional harm. Therefore, we require savvy, far-reaching, effective government oversight of our water supplies and facilities for their security. Decentralized private control of waters and water systems complicates the government's attempts to fulfill this responsibility. Owners, operators, managers, and even users of water systems must affirmatively embrace policies and practices that protect the security of our waters and facilities, and must be held accountable for security breaches under proactive planning and oversight, use of best practices, frequent inspection and review by government water security experts, and effective enforcement mechanisms. Nonetheless, national security policies with respect to water far too often focus solely on preventing terrorism and intentional harm and do not sufficiently treat other aspects of water security and sustainability—long-range planning, conservation, equitable distribution, watershed and ecological protections, growth management, adaptive management of waters, improving existing institutional capacity and developing new institutional capacity, public education and development of social ethics, development of scientific knowledge, widespread use of impact assessment methods, inter-group and inter-jurisdictional conflict resolution, land use and energy use policies, and allocation policies and systems—as critical to national security.

²²⁰ Arnold, *supra* note 19, at 595-96 (internal citations omitted). But see generally Kenneth A. Bamberger, *Global Terror, Private Infrastructure, and Domestic Governance*, in 2 THE IMPACT OF GLOBALIZATION ON THE UNITED STATES: LAW AND GOVERNANCE 203-28 (2008) (arguing that private sector responses to terrorism risk are preferable to top-down government regulation).

IV. PUBLIC STEWARDSHIP OF WATER

A. *The Harms of Privatization and Commodification of Water*

Private control and commodification of water in the United States pose large-scale and long-term risks and harms of which human rights concerns and national security risks are only parts. Private control and commodification of water threaten the *integrity* and *sustainability* of waters, water systems, and watersheds in interconnected human and natural systems.

Privatization and commodification of water fail to achieve *ecological integrity and sustainability*, because water is treated as disaggregated into discrete units of private control and consumption, instead of being considered part of interdependent human and natural communities.²²¹ A private commodity concept of water fails to see the sustainability of human life as integrally tied to the sustainability of entire ecosystems, biodiversity and biological life, and nature's hydrology. For example, private development of wetlands eliminates critical natural biodiversity, filtration, and absorption functions, contributing to disasters like the flooding of New Orleans after Hurricane Katrina.²²² Over-pumping of groundwater sources, whether by private landowners, water bottling companies, or sprawling cities meeting consumer demand, leads to adverse alterations of interconnected groundwater-surface water hydrology (e.g., saltwater intrusion, dropping aquifer levels) and landscapes (e.g., subsidence, loss of native vegetation).²²³ Private water companies calculate the value of source water protection lands in trade-offs between potential treatment costs savings and potential revenues from sale or development, without considering their other ecological and human values.²²⁴ Water diversions for consumption, dams, and other "replumbing" water works for water supplies take away instream flows that sustain aquatic species, alter basic stream hydrology and composition, and facilitate invasive species.²²⁵

²²¹ See FREYFOGLE, *supra* note 18; FREYFOGLE (1998), *supra* note 104; HOLLAND ET AL., *supra* note 153; POSTEL & RICHTER, *supra* note 142; GLENNON, *supra* note 142; Adler, *supra* note 153; Arnold, *supra* note 153; Arnold, *supra* note 144; Klein, *supra* note 8; Klein, *supra* note 153; Neuman, *supra* note 153.

²²² See Craig Pittman, *On the Gulf: Too Little, Too Late: A Wetlands Buffer Could Have Made a Difference to New Orleans*, PLANNING, Nov. 2005, at 10.

²²³ See GLENNON, *supra* note 142.

²²⁴ See NATIONAL RESEARCH COUNCIL, *supra* note 20, at 104; Vitale, *supra* note 20, at 1392; Matthew Futterman, *Watershed's Development Rekindles Fight*, STAR-LEDGER (Newark), Feb. 4, 1999, at 17.

²²⁵ See POSTEL & RICHTER, *supra* note 142, at 13-14; Klein, *supra* note 8, at 1019-29;

Privatization and commodification fail to achieve *temporal integrity and sustainability* in waters and water systems. In the U.S. culture of private property management and market behavior, short-term profits, quick returns, and immediate consumption are valued over long-term investments, patient stewardship, and conservation of financial, human, and natural capital.²²⁶ Of course, government decision making, driven by concerns about short-term political benefits and costs, can also fail to pursue the long-term viability of waters and water systems.²²⁷ However, these political processes are essentially about the commodification of public policy and decisionmaking to meet political consumers' demands. Decision makers fail to engage in long-term planning and investments in infrastructure, development, preservation, and conservation activities that will sustain water supplies, facilities, natural waters, and watersheds for overall public benefit far into the future.

Privatization and commodification fail to achieve *geographic integrity and sustainability*. When water is treated as an abstract bundle of private property rights or as a fungible, marketable, and transferable commodity, it is disconnected from its physical and social place of origin.²²⁸ Waters and watersheds shape the social, cultural, and political characteristics of communities that define themselves with respect to special water-based places.²²⁹ Private rights to divert surface waters or pump

McCool, *supra* note 144, at 1908-11; Neuman, *supra* note 153, at 130-34.

²²⁶ See Steven A. Ramirez, *American Corporate Governance and Globalization*, 18 BERKELEY LA RAZA L.J. 47, 53-55 (2007); Neil Gunningham, *Environmental Management Systems and Community Participation: Rethinking Chemical Industry Participation*, 16 UCLA J. ENVTL. L. & POL'Y 319, 394-95 (1998); see also Salzman, *supra* note 155, at 134 ("ecosystem services provide both the conditions and processes that sustain human life," but these services are rarely given value in the marketplace). See generally Salzman, *supra* note 155 (discussing the services provided by ecosystems, the problem of valuing these services, and the role of environmental law in promoting widespread comprehension of ecosystem services).

²²⁷ See Zygmunt J.B. Plater, *Environmental Law and Three Economies: Navigating a Sprawling Field of Study, Practice, and Societal Governance in Which Everything is Connected to Everything Else*, 23 HARV. ENVTL. L. REV. 359, 366 (1999) (discussing the impact of short-term economic interests on inducing short-term policy decisions); McCool, *supra* note 144, at 1912. See generally GLENNON, *supra* note 142.

²²⁸ See POSTEL & RICHTER, *supra* note 142, at 204; Klein, *supra* note 8, at 1011. See generally FREYFOGLE, *supra* note 18, at 191-92; Arnold, *supra* note 153; Klein, *supra* 153; Neuman, *supra* note 153.

²²⁹ See Arnold, *supra* note 144, at 29; Ken Conca, *Environmental Governance After Johannesburg: From Stalled Legalization to Environmental Human Rights?*, 1 J. INT'L L. & INT'L REL. 121, 132-33 (2005) (referring to site-specific conflicts over special socio-ecological systems, such as rivers, that "are, at once, foundations of local livelihood and culture, critical ecosystems, and extractable commodities with transnational market

groundwater have the potential to ruin river cities, dry up local springs, destroy fishing communities, or make lake regions mere targets of water exports. Moreover, surface water systems are organized geographically, for the most part, by watersheds, in which smaller areas that drain to a common point are nested within larger areas that drain to a common point, which are nested in still larger areas that drain to a common point, and so forth.²³⁰ Private ownership and control of water, though, usually occurs at spatial scales that have nothing to do with hydrology or watershed functioning.²³¹ In addition, private markets for water tend to transcend watershed boundaries, often moving water from watershed to watershed or even large-scale basin to large-scale basin in order to meet economic demand.²³² As a result, the watershed of origin loses return flow on which its hydrology and ecological functioning (and often also human communities in the region) depend, in addition to reduced instream flows or lowered groundwater levels.²³³

Privatization and commodification fail to achieve *socio-ethical integrity and sustainability*. Private control of water puts communities at risk of over-consumption, failed private ventures, and lack of adequate planning for the future. The economic failure of private water suppliers in public water could have disastrous consequences for local communities depending on these water supplies for both livelihoods and life. In reality, the public sector serves as a subsidizer and guarantor of both private sector profit in water and consumption patterns to meet private wants and interests; the government facilitates private interests and trade in water and then steps in to manage failed systems and scarcity when private control and markets cease to be profitable. More generally, though, defining water as a consumer good or service distributed by market trade for private consumption disconnects water from its part in society, community, and religion. This trend also removes water from society's ethical choices and moral development about the use, conservation, stewardship, security, and preservation of water in human communities and natural communities, including the ways in which water use shapes the relationships

value"); Klein, *supra* note 153, at 260-61; Klein, *supra* note 8, at 1033; Salzman, *supra* note 50, at 94-98.

²³⁰ See Arnold, *supra* note 153, at 313-14.

²³¹ See *id.* at 302; Klein, *supra* note 8, at 1044; A. Dan Tarlock, *The Potential Role of Local Governments in Watershed Management*, 20 PACE ENVTL. L. REV. 149, 162-63. See generally J.B. Ruhl et al., *Proposal for a Model State Watershed Management Act*, 33 ENVTL. L. 929 (2003).

²³² See Klein, *supra* note 153, at 252-54.

²³³ See *id.* at 272-73.

between humans and nature (e.g., landscapes, ecosystems, watersheds, ecological processes)²³⁴ and among humans (e.g., distributive, procedural, restorative, and social justice).²³⁵ It fails to engage the public as a deliberative, participatory, ethical, and decision making corpus in directly wrestling with difficult choices about sustainability of water resources, conservation policies and behaviors, and the protection of those in society with few or declining resources, power, and opportunities.

Privatization and commodification also fail to achieve *policy integrity and sustainability*. Water law, policy, and markets have complex, multi-faceted interdependence with other areas of public policy, such as land use,²³⁶ disaster preparation and management,²³⁷ climate change,²³⁸ biodiversity,²³⁹ and energy.²⁴⁰ Strong private rights to control and use water based on maximizing one's self-interest impede the coordination of water use and management with other policy areas and goals, such as growth management, flood control, biodiversity conservation, reducing greenhouse gases and adapting to climate change, and achieving "green energy" objectives.

Finally, privatization and commodification fail to achieve *economic integrity and sustainability*. Many calls for privatization—and some calls for market-based mechanisms to achieve water allocation and

²³⁴ See Arnold, *supra* note 148, at 46-49; Arnold, *supra* note 144, at 28-30; Eckstein, *supra* note 179, at 965-66. See generally Freyfogle, *supra* note 129.

²³⁵ For this taxonomy of justice, see Robert R. Kuehn, *A Taxonomy of Environmental Justice*, [2000] 30 *Envtl. L. Rep. (Envtl. L. Inst.)* 10681, 10681-82.

²³⁶ See Arnold, *supra* note 148, at 1, 7; Lincoln L. Davies, *Just a Big, "Hot Fuss"?: Assessing the Value of Connecting Suburban Sprawl, Land Use, and Water Rights Through Assured Supply Laws*, 34 *ECOLOGY L.Q.* 1217 (2008).

²³⁷ See DANIEL A. FARBER & JIM CHEN, *DISASTERS AND THE LAW: KATRINA AND BEYOND* 213 (2006); JOHN R. NOLON & DANIEL B. RODRIGUEZ, *LOSING GROUND: A NATION ON EDGE* (2007).

²³⁸ See Noah D. Hall, Bret B. Stunz, & Robert H. Adams, *Climate Change and Freshwater Resources*, *NAT. RES. & ENV'T*, Winter 2008, at 30, 30; PETER H. GLEICK ET AL., *U.S. GLOBAL CHANGE RESEARCH PROGRAM, WATER: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE FOR THE WATER RESOURCES OF THE UNITED STATES* 5-9 (2000); Kathleen A. Miller & Steven L. Rhodes, *Water Allocation in a Changing Climate: Institutions and Adaptation*, 35 *CLIMATIC CHANGE* 157, 157 (1997); Jonathan Adler, *Water Marketing as an Adaptive Response to the Threat of Climate Change* (Case Western Reserve Univ. Sch. of Law, Working Paper 08-08, 2008), available at <http://ssrn.com/abstract=1097594>.

²³⁹ See Holly Doremus, *Water, Population Growth, and Endangered Species in the West*, 72 *U. COLO. L. REV.* 361, 361 (2001).

²⁴⁰ See Allan R. Hoffman, *The Connection: Water and Energy Security*, *ENERGY SEC. (Inst. for the Analysis of Global Sec., Potomac, Md.)*, Aug. 13, 2004, at 1, 1, available at <http://www.iags.org/n0813043.htm>; Burleson, *supra* note 199, at 212.

conservation—tend to conflate decision making based on human and organizational economic behavior (for example, response to incentives, costs, and pricing, or policy models that anticipate economically self-interested behavior) with private control and private market transactions.²⁴¹ One need not treat humans solely as economically self-interested actors to recognize that economic behavior is at least part of the human and institutional reality of society and its management of natural resources. Therefore, the government must use economic principles, such as pricing mechanisms, financial benefits, and return-on-investment incentives, to achieve conservation and investment, at least in coordination with non-economic values and goals.²⁴² However, use of market-based or market-imitating mechanisms—or perhaps more accurately, mechanisms assuming economic behavior—is not the same as private control of water and the use of purely private market transactions to allocate, manage, and distribute water. Public sector water system operators can and do use pricing structures to encourage conservation.²⁴³ Most, or perhaps even all, large-scale “market” transfers of water rights have been facilitated or even accomplished by government action.²⁴⁴ Strong and secure protections of private property rights in water turn out not to promote wealth-creating investments in water, but instead impede wealth-creating innovations and result in costly intransigence in resolving water problems or conflicts.²⁴⁵ In addition, given that water is a necessity for life, the market system’s foundations in an ability-to-pay distributional principle violates fundamental human values that all people should be provided basic minimum amounts of water for survival, regardless of socio-economic status.²⁴⁶ These values require government action to effectuate them.

²⁴¹ For examples of works that include both private markets for trading water rights and economic incentives (for example, pricing) to conserve water as being related, see Adler, *supra* note 238; see also Benedykt Dziegielewski, *Strategies for Managing Water Demand*, WATER RES. UPDATE, Nov. 2003, at 29; TERRY L. ANDERSON & PAMELA SNYDER, *WATER MARKETS: PRIMING THE INVISIBLE PUMP* (1997).

²⁴² See Dziegielewski, *supra* note 241, at 31-32; Thompson, *supra* note 139, at 103; Frank A. Ward, Ari M. Michelsen, & Leeann DeMouche, *Barriers to Water Conservation in the Rio Grande Basin*, 43 J. AM. WATER RESOURCES ASSN. 237, 238-39 (2007).

²⁴³ See Thompson, *supra* note 139, at 103; see also U.S. ENVIRONMENTAL PROTECTION AGENCY, *CASES IN WATER CONSERVATION: HOW EFFICIENCY PROGRAMS HELP WATER UTILITIES SAVE WATER AND AVOID COSTS*, EPA REP. 832-B-02-003 7-48 (2002).

²⁴⁴ See Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myth of Markets for Water*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 317, 320 (2000).

²⁴⁵ See Arnold, *supra* note 144, at 37-39.

²⁴⁶ See *supra* Part II.

B. *The Case for Reconceptualization*

The problems posed by water privatization in the United States require a reconceptualization of the public and private nature of water in the U.S. The current system trending towards private consumptive rights in water is not working. Human rights principles and national security policies, though, are insufficient to protect the American public's essential interests in water for human life, ecological life, socio-cultural life, economic life, and political life.

As discussed in Part IV.A, privatization and commodification of water are unsustainable and fragmenting forces ecologically, temporally, geographically, socially, ethically, politically, and even economically. The examples are a legion: Atlanta's water privatization debacle;²⁴⁷ failed privatization ventures in Laredo, Texas, Felton, California, and East Cleveland, Ohio;²⁴⁸ the severely stressed Colorado River;²⁴⁹ the conflict-ridden Upper Klamath Basin in Oregon and northeastern California;²⁵⁰ the unresolved and unsustainable demands on the Apalachicola-Chattahoochee-Flint River System in the Southeastern U.S.;²⁵¹ the once-declining but now-recovering Mono Lake;²⁵² excessive groundwater pumping in Tucson, Arizona, Tampa, Florida, San Antonio, Texas, and Massachusetts' Ipswich River Basin;²⁵³ and even emerging water crises.²⁵⁴ We need a system of water law that achieves, or at least facilitates, healthy, sustainable, and integrated water planning and management.

Moreover, the legal system reconceptualizes property rights, limits, and duties when changed social conditions necessitate new legal principles for the viability of society, government, and law.²⁵⁵ As U.S. Supreme Court Justice Oliver Wendell Holmes, Jr., wrote:

²⁴⁷ See *supra* Part IV.A.3.

²⁴⁸ See *supra* notes 80-86.

²⁴⁹ See ADLER, *supra* note 104.

²⁵⁰ See DOREMUS & TARLOCK, *supra* note 202.

²⁵¹ See Ruhl, *supra* note 10.

²⁵² See Arnold, *supra* note 144.

²⁵³ See GLENNON, *supra* note 142, at 35-50, 71-111.

²⁵⁴ See CHRIS WOOD, DRY SPRING: THE COMING WATER CRISIS OF NORTH AMERICA 23-108 (2008) (discussing problems to water supply resulting emerge from both increased flooding and lack of snow).

²⁵⁵ See GILLILAN & BROWN, *supra* note 104, at 9-43; CHARLES F. WILKINSON, THE EAGLE BIRD: MAPPING A NEW WEST 45-60 (1992); Joseph William Singer, *The Reliance Interest in Property*, 40 STAN. L. REV. 611, 674-75 (1988); see also Holly Doremus, *Takings and Transitions*, 19 J. LAND USE & ENVTL. L. J. 1 (2003); Eric T. Freyfogle, *Context and Accommodation in Modern Property Law*, 41 STAN. L. REV. 1529 (1989); Ling-Yee Huang,

The life of the law has not been logic: it has been experience. The felt necessities of the time, the prevalent moral and political theories, institutions of public policy, avowed or unconscious, even the prejudices which judges share with their fellow-men, have had a good deal more to do than the syllogism in determining the rules by which men should be governed.²⁵⁶

Moreover, water law in the U.S., in particular, has been characterized by change:

Water law is characterized by what I call a principle of legal fluidity: water law changes as needed to adapt to changing social and natural conditions. For example, the first land-owners in the Western United States would have expected that the riparian doctrine of water rights would apply, just as it did in the Eastern United States and in the English common law. However, a change in the status quo was needed if the arid West was to be settled and made economically productive. Likewise, in the East, the traditional natural flow doctrine had to give way to the doctrine of reasonable use in light of changing economic and social needs. . . . And although the public trust doctrine is ancient and theoretically has always limited water rights in California, new ecological knowledge and changing social needs dictate that prior appropriation rights cannot be so immutable as to allow destruction of an essential ecosystem and habitat.²⁵⁷

We are in the midst of dramatically changing social conditions with respect to water and its control and management.²⁵⁸ Scarcity in particular locations and at particular times has become a major problem, not only in the traditionally arid West but also in the traditionally humid East. Population growth, sprawl, and consumption patterns create increasing demands for water, change the locations at which and the purposes

Fifth Amendment Takings and Transitions in Water Law Compensation (Just) for the Environment, 11 U. DENV. WATER L. REV. 49 (2007).

²⁵⁶ OLIVER WENDELL HOLMES, JR., *THE COMMON LAW* 1 (1923).

²⁵⁷ Arnold, *supra* note 144, at 38-39 (internal citation omitted).

²⁵⁸ This paragraph summarizes changing social and ecological conditions that have been discussed throughout this article.

for which water is sought, and degradation of watershed lands. Climate change will contribute substantially to increasing water stress and scarcity. Terrorism poses risks to water supplies and infrastructure. Extraction and exports of both groundwater and surface water increasingly harm source waters, watersheds or aquifers, and communities. Inter-jurisdictional conflicts over water have proven persistently unresolved under current dispute resolution and inter-jurisdictional allocation methods. Our water consumption practices are unsustainable, and public policies and norms to protect natural and human environments increasingly conflict with water rights and use. We also are beginning to understand how ecological harms and modifications to watersheds' functioning pose human health risks and harms. We also now understand that both nature and society are complex, adaptive systems that are interdependent, dynamic, and require integrated, adaptive management of natural resources.²⁵⁹ Water, in particular, is the subject of "wicked" problems that require adaptive governance because decisions (and conflicts) over policy goals cannot be separated from decisions (and conflicts) over methods of achieving these goals.²⁶⁰ At the same time, our faith in the private sector to act in the public interest and regulate itself has greatly eroded.²⁶¹ Moreover, our understandings of democracy's legitimacy has shifted from faith in interest group pluralism to the imperative that policy making result from participatory, deliberative, transparent processes.²⁶² The current system

²⁵⁹ See GARY J. BRIERLEY & KIRSTIE A. FRYIRS, GEOMORPHOLOGY AND RIVER MANAGEMENT: APPLICATIONS OF THE RIVER STYLES FRAMEWORK 15-363 (2005); C.S. HOLLING, ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (1978); JOHN H. MILLER & SCOTT E. PAGE, COMPLEX ADAPTIVE SYSTEMS: AN INTRODUCTION TO COMPUTATIONAL MODELS OF SOCIAL LIFE 3-32 (2007); Ronald D. Brunner & Tim W. Clark, *A Practice Based Approach to Ecosystem Management*, 11 CONSERVATION BIOLOGY 48 (1997); R. Edward Grumbine, *What is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27 (1994); A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 LOY. L.A. L. REV. 1121 (1994); Jonathan Baert Wiener, *Colloquium, Beyond the Balance of Nature*, 7 DUKE ENVTL. L. & POL'Y F. 1 (1996).

²⁶⁰ ADAPTIVE GOVERNANCE, *supra* note 202, at vii-viii.

²⁶¹ See Marvin D. Jones, *Narratives of the Fall: Bubbles, Bailouts and the Social Construction of Economic Crisis* 2 (Univ. of Miami Legal Studies Research, Paper No. 2008-40 (Nov. 25, 2008)), available at <http://ssrn.com/abstract=1307077>.

²⁶² See JOHN S. DRYZEK, DELIBERATIVE DEMOCRACY AND BEYOND: LIBERALS, CRITICS, CONTESTATIONS v-vii (2000); JOHN FORESTER, THE DELIBERATIVE PRACTITIONER: ENCOURAGING PARTICIPATORY PLANNING PROCESSES 115-116 (2001); Eileen Gauna, *The Environmental Justice Misfit: Public Participation and the Paradigm Paradox*, 17 STAN. ENVTL. L. J. 3, 4-5 (1998).

of privatized, commodified water control and use is not working. We need new institutions, governance methods, and concepts of water law.

It may be a misnomer, though, to label legal principles treating water as an essentially public resource as a reconceptualization, because water law is a highly contested and confused area of law. Despite privatization trends and practices, the foundations of water as a public resource, such as the state ownership doctrine and the public trust doctrine, are strong in the U.S. legal tradition. Even though some would argue that public and public sector rights in water merely set some outer boundaries on private water rights in a very limited set of circumstances, there are many counter-examples of the public nature of water being essential to the definition of property and regulatory interests in water. At the least, the legal conceptualization of the public and private characteristics of water is confused, contested, and badly needing systematic resolution.

C. *The Principles and Duties of Public Stewardship of Water*

Therefore, I propose a reconceptualization of water, which I call "public stewardship of water." It has three core principles. First, water and water services should be under public ownership and control, yet subject to recognized private interests that are usufructuary in nature and regulated by the government for the public interest. Second, because of the unique characteristics of water, private property rights in water should be characterized as property interests in water that are part of interconnected webs of interests. Third, the government should have fiduciary stewardship responsibilities to the public for management and governance of water, water systems, and watersheds: a broadly based trustee role facilitated by all members of the public—the beneficiaries of this trust—having correlative duties or responsibilities to their fellow beneficiaries in the public at large.

First, the basic legal and policy premise in the United States is that water is a public resource, owned and controlled by the government, subject to the limits and fiduciary duties discussed below. This principle effectuates foundational legal theories in the United States concerning the state ownership of water,²⁶³ the limits that the public trust and the

²⁶³ See OR. REV. STAT. ANN. § 537.110 (West 2009); W. VA. CODE ANN. § 20-3-3 (West 2008); *Shively v. Bowlby*, 152 U.S. 1, 2-8 (1894); *Bamford v. Upper Republican Natural Res. Dist.*, 512 N.W 2d 642, 647-52 (Neb. 1994); Blumm & Ritchie, *supra* note 105, at 350-51 n.193.

public interest impose on private water rights,²⁶⁴ and the provision of public water supplies as a municipal or governmental function.²⁶⁵ Defining water as a public resource, subject to government ownership or control, does not mean that private property interests in water are not recognized and protected, but simply that these interests are inherently subject to the public's interests and therefore can be limited and regulated as needed to protect the public's interests. In addition, the public sector can contract with private companies to provide certain public water system functions or to design, build, and/or operate such systems, if private sector involvement would upgrade systems or improve service to the public. These contracts should provide the companies with satisfactory performance-based returns on their investments and/or management expertise, but all water supply system contracts with private entities should be subject to conditions and safeguards to protect the public's interests and to ultimate government ownership and control of the water systems and supplies themselves.

Second, private property interests in water are defined by the unique characteristics of water, which is not merely an economic commodity protected by abstract legal rights, but is also an element of nature with physical, chemical, biological, and ecological characteristics, and an element of society with social, cultural, political, religious, and ethical characteristics.²⁶⁶ In contrast, the trend towards privatization of water in the United States is grounded in a concept of water rights as ownership rights, much like land. This concept uses a once-dominant metaphor of property as a bundle of rights or bundle of sticks that can be treated abstractly as discrete commodities in private markets.²⁶⁷ Nonetheless, distinctions

²⁶⁴ See IDAHO CODE ANN. § 42-203A(5)(e) (2009); NEB. REV. STAT. § 46-289 (2008); N.C. GEN. STAT. ANN. § 143-215.22L (West 2008); UTAH CODE ANN. § 73-3-8 (West 2008); *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469, 479-82 (1988); *Ill. Cent. R.R. v. Illinois*, 146 U.S. 387, 473-75 (1892); *Nat'l Audubon Soc'y v. Superior Ct.*, 658 P. 2d 709, 732 (Cal. 1983); *In re Water Use Permit Applications*, 9 P.3d 409, 439-56 (Hawai'i 2000); *United Plainsmen Ass'n v. N.D. State Water Conservation Comm'n*, 247 N.W.2d 457, 460-62 (N.D. 1976); GILLILAN & BROWN, *supra* note 104, at 37; Sherk, *supra* note 114, at 5, 47-49.

²⁶⁵ SAX ET AL., *supra* note 109, at 681-746.

²⁶⁶ See Eckstein, *supra* note 179, at 963 (exploring the variety of water values and ethics); Charles W. Howe, *Protecting Public Values in a Water Market Setting: Improving Water Markets to Increase Economic Efficiency and Equity*, 3 U. DENV. WATER L. REV. 357, 361-64 (2000) (exploring the non-economic values and characteristics of water); Salzman, *supra* note 50, at 94-97; Wade, *supra* note 47, at 192-94 (recommending a new water management system that takes a broad, integrated approach to "the multiple characteristics and functions of water relative to human beings, ecosystems and economies").

²⁶⁷ See Craig Anthony (Tony) Arnold, *The Reconstitution of Property: Property as a Web of Interests*, 26 HARV. ENVTL. L. REV. 281, 284-91 (2002).

between public control and private control of land, water, and other natural resources exist far more clearly in theory or ideology than in social and legal reality.²⁶⁸

A more accurate metaphor for property is that of a "web of interests," which I developed and described in a 2002 *Harvard Environmental Law Review* article.²⁶⁹ With the web-of-interests metaphor, many different persons, entities, and even communities can be recognized as holding varying types of recognizable interconnected interests in the object of the property interests, and each interest can be legally recognized and protected based on the nature of the relationship between the interest-holder and: a) the object of the interest, and b) the other interest-holders and their relationships with the object.²⁷⁰ Moreover, the characteristics of the object at the center of the web are critical in defining the nature and scope of the property interests in the object.²⁷¹ In particular, property rights in water are defined with respect to the unique characteristics of water and the shared interests in water, serving

to define property rights [in land and water] with respect to good stewardship, not just consumptive, autonomous entitlements. . . . The owner has duties of care to the object itself and the natural and human environment to which the land or water is integrally connected. The owner also has duties of care to others who share interests in the land or water, particularly given the interconnections of natural resources, extending beyond property lines.²⁷²

Sandra Zellmer and Jessica Harder have applied this web-of-interests concept to property interests in water.²⁷³ They believe that the concept should be used to determine whether water should even be private

²⁶⁸ See FREYFOGLE (1998), *supra* note 104, at 145; FREYFOGLE (2006), *supra* note 104, at 189; GILLILAN & BROWN, *supra* note 104, at 37; WILLIAM JOSEPH SINGER, ENTITLEMENT (2000) (explicating a social relations concept of property based in social conditions and practices); Dellapenna, *supra* note 104, at 545-54; Getches, *supra* note 104, at 183-233; Tarlock, *supra* note 104, at 527-30; Zellmer & Harder, *supra* note 104, at 691-99. See FREYFOGLE, *supra* note 18, at 157-201 (analyzing public and private interests in land with its ecological and community characteristics, with a particularly thoughtful critique of the privatization of landscapes).

²⁶⁹ See Arnold, *supra* note 267.

²⁷⁰ See *id.* at 283, 316-331.

²⁷¹ See *id.* at 335-37.

²⁷² *Id.* at 351-52.

²⁷³ See Zellmer & Harder, *supra* note 104, at 715-24.

property.²⁷⁴ In analyzing the characteristics of water and nature of the many interests held in water, Zellmer and Harder conclude that water should be treated only partially as property: property for procedural due process and common law purposes, but not property for which compensation is due when it is limited by regulation (i.e., regulatory takings property).²⁷⁵ They argue that the public trust doctrine is the frame of the web of interests in water, and that the communal and natural characteristics of water prevent it from being fully property.²⁷⁶

Other analyses of property interests in water have also focused on the characteristics of water and the nature of multiple interests in water to address problems of private control and use. For example, Jim Salzman has pointed out that one of the primary problems with water privatization is that it has focused solely on the economic characteristics of water, while ignoring the social, cultural, political, physical, and natural characteristics of water.²⁷⁷ Christine Klein argues against trans-basin transfers and trade in water, because water is connected to and a part of particular watersheds.²⁷⁸ She observes that allowing trans-basin diversions of water facilitates and stimulates unsustainable growth in areas not meant for large water-consuming populations.²⁷⁹

Third, we should be less focused on abstract human rights and national security fears *per se* and more focused on public stewardship of water. The state government primarily, but also the federal government to the extent of federal responsibilities and interstate jurisdiction and local governments to the extent that states have delegated authority or control over water resources to localities, should be charged with fiduciary responsibilities for the ownership, management, conservation, and supply of water as a trustee for the public. This trust concept is broader than the traditional public trust doctrine, yet is more focused than a guardianship/non-ownership concept. It contains six specific duties: security, conservation, sustainability, equity, investment, and long-range, place-based planning. In addition, the duty contemplates public responsibilities, not just government responsibilities. I will address each of these points.

²⁷⁴ See *id.* at 724.

²⁷⁵ See *id.* at 732-45.

²⁷⁶ See *id.* at 744-45.

²⁷⁷ Salzman, *supra* note 50, at 97; see also Conca, *supra* note 229, at 132-33 (referring to site-specific conflicts over special socio-ecological systems, such as rivers, that "are, at once, foundations of local livelihood and culture, critical ecosystems, and extractable commodities with transnational market value").

²⁷⁸ See Klein, *supra* note 153, at 259-74.

²⁷⁹ See *id.* at 275-78.

The public trust doctrine is a partial conceptual and legal foundation for the public stewardship concept that I begin to sketch in this essay. The public trust doctrine imposes fiduciary duties on the state government to hold, manage, and regulate navigable and tidal waters and their submerged lands for the benefit of the public, who hold an equitable interest in these resources.²⁸⁰ Grounded in ancient Roman law doctrines that came to the U.S. from English legal tradition, the public trust doctrine serves as a significant inherent limit on private property interests in water and aquatic land, as well as a source of authority for the government to regulate private property without owing just compensation.²⁸¹ The California Supreme Court has extended the public trust doctrine to the state's ongoing fiduciary obligation to balance water appropriation and use rights with the public's enduring interest in the ecological conditions of flowing waters in their natural water courses.²⁸² The Hawaii Supreme Court has extended the public trust doctrine to groundwater.²⁸³ The New Jersey Supreme Court has limited the public transfer of public water supplies based on the public trust in public water supplies.²⁸⁴ The public trust doctrine has proven capable of evolution.²⁸⁵

However, the public trust doctrine, as it is currently defined, is far too limited to ensure the kind of government stewardship of water, water supplies and systems, and watershed functions for the public that we now need. In many states, there are substantial limitations on the waters and

²⁸⁰ See *Nat'l Audubon Soc'y v. Superior Court*, 658 P.2d 709, 726-28 (Cal. 1983); J.B. Ruhl & James Salzman, *Ecosystem Services and the Public Trust Doctrine: Working Change From Within*, 15 SE. ENVTL. L.J. 223, 224-26 (2006); Jack Tuholkse, *Trusting the Public Trust: Application of the Public Trust Doctrine to Groundwater Resources*, 9 VT. J. ENVTL. L. 189, 214-21 (2008); Erin Ryan, Comment, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resources Management*, 31 ENVTL. L. 477, 478 (2001).

²⁸¹ See *Nat'l Audubon Society*, 658 P.2d at 718-19, 723; *Just v. Marinette County*, 201 N.W.2d 761, 767-72 (Wis. 1972); Blumm & Ritchie, *supra* note 105, at 350-52 & n.193; Ruhl & Salzman, *supra* note 280, at 223-24, 235-36; Tuholkse, *supra* note 280, 214-21, 234 n.299; Ryan, *supra* note 280, at 492.

²⁸² See *Nat'l Audubon Soc'y*, 658 P.2d at 728.

²⁸³ *In re Water Use Permit Applications*, 9 P.3d 409, 445 (Hawaii 2000).

²⁸⁴ *City of Clifton v. Passaic Valley Water Comm'n*, 539 A.2d 760, 765-67 (N.J. Super. 1987) ("While the original purpose of the public trust doctrine was to preserve the use of the public natural water for navigation, commerce and fishing, . . . it is clear that since water is essential for human life, the public trust doctrine applies with equal impact upon the control of our drinking water reserves." (internal citation omitted)).

²⁸⁵ See Michael C. Blumm & Thea Schwartz, *Mono Lake and the Evolving Public Trust in Western Water*, 37 ARIZ. L. REV. 701, 720-38 (1995); see also *Matthews v. Bay Head Improvement Ass'n*, 471 A.2d 355, 365 (N.J. 1984).

lands to which it applies, the scope and enforceability of government duties, the specific public trust purposes or rights that the public enjoys under the doctrine, and the doctrine's impact on private rights and interests in water or land.²⁸⁶ As Robin Craig has pointed out, the public trust doctrine's meaning varies from state to state.²⁸⁷ Moreover, even where courts issue bold opinions expanding the scope of the public trust doctrine, the practical application of this doctrinal development depends on non-legal factors, such as environmental activism, public education and engagement, political power, funding and other resources, collaborative problem-solving processes, and available conservation methods.²⁸⁸

Carol Brown has made a strong and thoughtful argument for a substantial expansion of the public trust doctrine's scope.²⁸⁹ Mary Wood has argued that the law should recognize a core state trust responsibility for natural resources generally, because of the public's strong interest in these resources and the unalterable peril that our environment now faces without enforceable government responsibilities to safeguard it.²⁹⁰ Embracing the basic foundations of the arguments that both Professors Brown and Wood articulate, I urge a broadly defined public trustee responsibility for water, water supplies and systems, and other aquatic resources, emerging out of both the public trust doctrine and emergent and urgent social needs, but not unduly limited by the parameters of the public trust doctrine as applied historically in the United States. In fact, the concept of the government as a trustee of resources for the public is not confined to the public trust doctrine and water-related resources. Courts treat the government as trustee of public streets, parks, and sidewalks for the benefit of the public and its expressive activities.²⁹¹ An insightful analysis by Gerald

²⁸⁶ See Carol Necole Brown, *Drinking From a Deep Well: The Public Trust Doctrine and Western Water*, 34 FLA. ST. U. L. REV. 1, 6-30 (2006); Robin Kundis Craig, *A Comparative Guide to the Eastern Public Trust Doctrine: Classifications of States, Property Rights, and State Summaries*, 16 PENN. ST. ENVTL. L. REV. 1, 14-24 (2007); Ruhl & Salzman, *supra* note 280, at 224-29.

²⁸⁷ See Craig, *supra* note 286, at 26-113.

²⁸⁸ See Arnold, *supra* note 144, at 33-44.

²⁸⁹ See Brown, *supra* note 286.

²⁹⁰ See Mary Christina Wood, *Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological Realism and the Need for a Paradigm Shift*, 39 ENVTL. L. ____ (forthcoming 2009); Mary Christina Wood, *Law and Climate Change: Government's Atmospheric Trust Responsibility*, [2008] 38 ENVTL. L. REP. NEWS & ANALYSIS (Envtl. L. Inst.) 10652 (2008); Mary Christina Wood, *Nature's Trust: Reclaiming an Environmental Discourse*, 25 VA. ENVTL. L.J. 243 (2007).

²⁹¹ See Timothy Zick, *Space, Place, and Speech: The Expressive Topography*, 74 GEO. WASH. L. REV. 439, 444-45 (2006).

Torres makes the case for treating the atmosphere—the skies, clean air—as a common asset held in trust by the government for the public.²⁹² John Locke's compact theory of government, influential in U.S. political theory, conceives of the government as a trustee with obligations to the public.²⁹³

The trust concept that I outline here bears some similarities to Bob Adler's concept that the government has guardianship duties for water and related lands that are part of aquatic ecosystems.²⁹⁴ However, Professor Adler's concept is premised on a distrust of the law of trusts to hold the government accountable for responsibilities to environmental interests, and not just to human interests.²⁹⁵ It is integrally tied to a non-ownership classification for water and aquatic lands and ecosystems.²⁹⁶ While the conceptual foundations of Professor Adler's non-ownership doctrine have certain ecological and ethical appeal, I have practical concerns about the capacity of the U.S. legal system—and the system of water management, allocation, and use—to implement such a doctrine. It is not clear what the duties of the government as a non-owner "guardian" of aquatic ecosystems would be and how they would be enforced by the public and the courts. The concept has a strong preservation element, which is much needed, but it does not have much content related to the management of the existing water infrastructure, distribution systems, and allocation patterns that we have, including security and investment concerns. Government ownership of water and water systems provides the government the authority to act affirmatively, not just to protect against harm. Of course, non-ownership might help people to think about their responsibilities for aquatic ecosystems, but it also might be used by people, institutions, and even courts to treat water as if no one has responsibility for it. Moreover, I am not as skeptical as Professor Adler that ecological responsibilities cannot or will not be integrated into enforceable duties to the public under a trust doctrine.

In particular, the government's fiduciary duties with respect to water should include six duties: 1) the duty of security; 2) the duty of conservation; 3) the duty of sustainability; 4) the duty of equity; 5) the duty of investment; and 6) the duty of long-range, place-based planning. I will attempt to sketch out each of these six duties to the extent practical in an Article of this nature, recognizing that further development is required.

²⁹² See Gerald Torres, *Who Owns the Sky?*, 19 PACE ENVTL. L. REV. 515, 533 (2002).

²⁹³ See Donald L. Doernberg, *"We the People": John Locke, Collective Constitutional Rights, and Standing to Challenge Government Action*, 73 CAL. L. REV. 52, 63 (1985).

²⁹⁴ Adler, *supra* note 153, at 201-269.

²⁹⁵ *Id.* at 268-69.

²⁹⁶ *Id.*

First, the government should have the duty to maintain the security of waters and water supplies and infrastructure. This duty should, of course, include the government's responsibility for measures to safeguard the public's water supplies and infrastructure from acts and risks of terrorism, as discussed previously in Part IV.C. These measures should include government control of water supplies and infrastructure, precautionary measures, new security technology, new or upgraded infrastructure, and adaptive coordination between law enforcement and water managers. However, it should also include the government's use of its planning, management, regulatory, and enforcement powers to secure public water supplies from the threats of scarcity and long-term unsustainability, whether from over-consumption, waste, drought, flood damage, degradation and pollution, or other sources. Moreover, the government should have a duty to the public to resolve or at least diligently seek to resolve major conflicts over water resources, because such conflicts can be a threat to water security. A particularly good example of ideas about adaptive governance that integrate water allocation and management issues with water security issues is a report issued by the Guelph Water Management Group at the University of Guelph in Canada: *Water Allocation and Water Security in Canada: Initiating a Policy Dialogue for the 21st Century*.²⁹⁷

Second, the government should have a duty to conserve water resources and to induce consumers' conservation of water. Water is not just a good for human consumption. It is also a resource that can be or can become non-renewable due to the locations, methods, rate, and degree of its use. In addition, water is natural capital that supports all biological life, natural processes, communities, the economy, society, and future generations.²⁹⁸

A good conservation policy must embrace the economic characteristics of water and the role of market—not necessarily privatized—mechanisms for inducing conservation by consumers.²⁹⁹ For example, we know that when water consumers do not pay the actual costs of water, or pay decreasing or flat rates as their water consumption rises, they tend to waste water, and that both price and metering can be used to reduce

²⁹⁷ ROB DE LOËE ET AL., WATER ALLOCATION AND WATER SECURITY IN CANADA: INITIATING A POLICY DIALOGUE FOR THE 21ST CENTURY (Guelph Water Management Group 2007), available at http://sustsci.aaas.org/files/de_Loe_et_al_2007_Final_Report.pdf.

²⁹⁸ See Harold A. Mooney & Paul R. Ehrlich, *Ecosystem Services: A Fragmentary History*, in NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 13 (Gretchen C. Daily ed., 1997).

²⁹⁹ See DE LOËE ET AL., *supra* note 297, at 12.

water demand.³⁰⁰ Marginal-cost pricing principles, metering, increasing block rate pricing structures, seasonal rates, excess-use penalties, avoidance of volume discounts normally should be used as means to promote water conservation.³⁰¹ To the extent that low-income members of the public, or even all members of the public, need or should be entitled to minimum amounts of water for basic human needs (i.e., the amount needed to sustain a human life), the government could partially or totally subsidize up to 13 gallons of water per person per day, and price all the remaining amount at rates to encourage conservation. According to Robert Glennon, this would result in only 3.8 billion gallons of free or subsidized water per day, out of over 408 billion gallons of water per day used for all purposes in the United States in 2000.³⁰²

However, regulation of water use may also be necessary, particularly in times of drought or emergencies, to achieve conservation when pricing mechanisms by themselves may not produce sufficiently rapid change in consumption or does not change certain price-inelastic behaviors. In addition, equity, social ethics, and public perception may require that all water consumers share in the responsibility of reducing consumption in times of drought or emergency, even if some wealthy consumers are willing to pay for high-use, even wasteful, practices. Regulation of this sort might include date or time restrictions on lawn watering or car washing, or requirements that fountains be turned off.

More importantly, public entities need to develop comprehensive, multi-faceted conservation policies that achieve maximum conservation outcomes, especially in light of the severe challenges that many communities face or will face. The Pacific Institute, in its evaluation of Atlanta's conservation policies, lists forty-seven conservation measures water districts commonly use to conserve water by reducing demand, including: conservation rates/pricing; water audits (both systemic and specific uses); retrofitting various water uses with more efficient equipment or materials (e.g., toilets, car washes, turf); rebates for more water-efficient appliances; regulations governing landscaping, water waste, retrofitting, water recycling, and water pressure; public and professional education programs; use of specific low-tech methods such as rain barrel catchment

³⁰⁰ Dziegielewski, *supra* note 241, at 29-34; Thompson, *supra* note 139, at 103-04; Ward et al., *supra* note 242, at 247-50; Adler, *supra* note 238.

³⁰¹ See TERRY L. ANDERSON & PAMELA SNYDER, WATER MARKETS: PRIMING THE INVISIBLE PUMP (Cato Institute 1997); Thompson, *supra* note 139, at 98, 103-04; see also Dziegielewski, *supra* note 241, at 29-39; Holly Stallworth, Conservation Pricing of Water and Wastewater (Apr. 10, 2000), available at <http://www.wrb.ri.gov/wapacmeetings/fees/epapricing.pdf>.

³⁰² See Glennon, *supra* note 18, at 1896.

or swimming pool and spa covers; public sector use efficiencies (including xeriscaping public properties); metering, sub-metering, and dedicated metering water budgets; and others.³⁰³

Third, the government should have a duty to control and manage water for the long-term sustainability of all human life, biological life generally, watersheds and hydrologic processes, local communities, and society. The core of this duty is the concept that all life depends on water for survival. Moreover, this sustainability duty contemplates that the individual human, the social system, and nature are interdependent on one another for long-term sustenance, vitality, and viability. With respect to water, ecological sustainability and social sustainability should not be framed as inherently in conflict, even if specific choices and water uses may involve tensions between anthropocentric and ecocentric goals and values.³⁰⁴

Several scholars provide valuable guidance about what sustainability in water resource control, management, and use might mean. At the broadest level, Eric Freyfogle, Christine Klein, Bob Adler, Sandra Postel, and others have articulated a public and private stewardship responsibility for the health and integrity of the ecological communities, of which water is a critical and integrated component, and human communities, for which water is an essential element with multiple meanings and functions.³⁰⁵ At a slightly more specific level, Jeffry Wade urges the use of a tool known as “integrated water resources management” (“IWRM”), which contains fourteen principles, including integration of water management, environmental management, and land use planning “conjunctively with codependent natural resources, namely soil, forests, air and biota;” use of a systems approach that is attentive to individual components, interdependent linkages, and the role of disturbances and resilience; “full participation by all stakeholders” in transparent, accountable, adaptive, and locally-based decision making; attention to the social impacts of water policies; improvement of information availability, information use, and institutional

³⁰³ See PACIFIC INSTITUTE FOR STUDIES IN DEVELOPMENT, ENVIRONMENT, AND SECURITY, A REVIEW OF WATER CONSERVATION PLANNING FOR THE ATLANTA, GEORGIA REGION 34-35, tbl.7 (2006), available at http://www.pacinst.org/reports/atlanta/atlanta_analysis.pdf.

³⁰⁴ For a brief but solid assessment that a perceived conflict between anthropocentric and ecocentric perspectives on sustainability “is merely a pseudo-problem,” see Smagadi, *supra* note 179, at 259.

³⁰⁵ FREYFOGLE, *supra* note 18; FREYFOGLE, *supra* note 104; POSTEL & RICHTER, *supra* note 142; Freyfogle, *supra* note 129; Klein, *supra* note 8; Klein, *supra* note 153; Adler, *supra* note 153; Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973 (1995). See also HOLLAND ET AL., *supra* note 153; Arnold, *supra* note 153.

capacity; equitable allocation of water resources; and regard for the "hydrological, bio-physical, economic, social and environmental characteristics of a catchment" when making decisions, among others.³⁰⁶ Even more specifically, Dan Tarlock has identified nine characteristics of an environmentally sustainable water use policy:

- (1) the allocation or reallocation of water for the maintenance of aquatic ecosystems and the restoration of degraded riverine environments;
- (2) the reallocation of water from marginal agriculture to more efficient uses, both urban and environmental;
- (3) the protection of rural, generally poor, areas that may face the loss of water and livelihood opportunities;
- (4) the protection of minority groups such as indigenous peoples and others who have developed sustainable customary practices;
- (5) the limitation of the mining of aquifers;
- (6) the provision of water in times of scarcity for a wide range of uses at a time when there is less support for large-scale subsidized supply augmentation (e.g., dams);
- (7) the integration of water quality;
- (8) the adaptation to global climate change, which threatens to alter rainfall patterns and create more extreme cycles of flood and drought; and
- (9) the development of more adaptive and inclusive decision-making processes.³⁰⁷

Fourth, the government should have a duty of equity with respect to water control, management, and allocation. This duty requires that water policies meet basic principles of social justice. Three particular principles are especially important. The first is the principle that every person in the United States should receive enough water to meet the basic needs of life, regardless of ability to pay. This could be accomplished by public water suppliers, through the imposition of a fiduciary duty, and by private water suppliers, through utility regulation, having to provide a minimal amount of water per person per month without charge, and then charge for amounts exceeding this amount. Alternatively, the government could provide water utility bill subsidies to those water customers

³⁰⁶ Wade, *supra* note 47, at 192-96.

³⁰⁷ Tarlock, *supra* note 104, at 530.

who demonstrate financial need. The second principle is the government's responsibility to protect vulnerable or disadvantaged communities from exploitation. One manifestation of this responsibility is community-of-origin protections in the regulation of water transfers.³⁰⁸ Another manifestation is protecting traditional communal water systems, such as the American Southwest's *acequias* in traditional rural Hispanic communities, from displacement or erosion by state water rights regimes.³⁰⁹ The third principle is that water policies, plans, and allocation decisions should be made through full, meaningful, and transparent public participatory and deliberative processes, including efforts to seek the input of low-income and minority communities, which have been traditionally excluded from the exercise of power over water.³¹⁰

Fifth, the government should have a duty to invest resources in the development, management, maintenance, security, sustainability, and conservation of water supplies, water distribution infrastructure, and the restoration and preservation of waterways and critical watershed features. As discussed previously in Part I.A.2, public water systems require substantial new investments for capital improvements to replace aging infrastructure and meet safe drinking water regulatory standards. In the area of water security, experts identify emerging and potential new technologies, infrastructure, scientific knowledge, public health responses, and risk management methods to reduce potential risks to water supply and infrastructure security.³¹¹ States and localities should be investing in these emerging tools and methods to improve water security. In addition, the policies of water conservation and long-range planning identified in this part require significant public resources if they are actually to occur.

Finally, the government should have a duty to engage in long-range, place-based planning for the sustainability, security, and conservation of water supplies and watersheds. The other five duties will not be achievable without planning. Short-sighted, fragmented, narrowly-focused water planning must be replaced by long-range, holistic, broadly-framed water planning.³¹² It must be broadly inclusive, participatory,

³⁰⁸ See Klein, *supra* note 153, at 268-72; Glennon, *supra* note 18, at 1889.

³⁰⁹ See Gregory A. Hick & Devon G. Peña, *Community Acequias in Colorado's Rio Culebra Watershed: A Customary Commons in the Domain of Prior Appropriation*, 74 COLO. L. REV. 387, 399-404 (2003); Glennon, *supra* note 18, at 1889.

³¹⁰ See Eileen Gauna, *Environmental Justice in a Dryland Democracy: A Comment on Water Basin Institutions*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 171-201 (Craig Anthony (Tony) Arnold ed., 2005).

³¹¹ See Ruhl, *supra* note 212, at 222.

³¹² See Getches, *supra* note 104, at 200-02.

transparent, and accountable. It must be integrated with other types of planning, such as land-use planning, emergency planning, and environmental conservation planning.³¹³ It should focus on the health, integrity, and sustainability of entire watersheds, landscapes, and regional communities, not just on narrow engineering or distributional matters. Watersheds offer a functional scale at which to engage in planning, although one must be aware of the variable scales and functions of nested watersheds and the complex ways in which watersheds relate to the geographic scale of other decision making activities, such as land use.³¹⁴ Moreover, the planning should be connected to the water-based or water-related places that people value and find special, which serve as geographically, socially, psychologically, politically, and ecologically organizing frames of community and identity.³¹⁵ One must be careful not to assume that the process of planning necessarily means that we can presume to create a workable static plan that anticipates all forces, changes, or processes working on a particular watershed, water supply, water system, or socio-ecological dynamic. Instead, watershed planning and management institutions must engage in adaptive management.³¹⁶ However, the process of engaging in long-range, place-based planning contributes to the development of institutions and their capacities to engage in healthy adaptive management and stewardship of water.

These six duties identify the government as the entity with fiduciary responsibility to act on them. However, unlike typical trusts, these duties must also be shared by every member of the public and the public as a whole. While each of us is a beneficiary of the government's ownership, control, management, allocation, conservation, and stewardship of water, each of us also profoundly affects how the government's responsibility for water is effectuated by the ways we use water, influence water decisions, demand water, and affect water quality and watersheds through

³¹³ See WET GROWTH, *supra* note 142; Arnold, *supra* note 153.

³¹⁴ See Arnold, *supra* note 153.

³¹⁵ See, e.g., Craig Anthony (Tony) Arnold, *The Structure of the Land Use Regulatory System in the United States*, 22 J. LAND USE & ENVTL. L. 441, 468-70 (2007); Arnold, *supra* note 144, at 26-32; Arnold, *supra* note 153, at 328-336; Klein, *supra* note 153, at 260-63, 268. See generally, Klein, *supra* note 8.

³¹⁶ BRIERLEY & FRYIRS, *supra* note 259; C.S. HOLLING, ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (1978); MILLER & PAGE, *supra* note 259; Ronald D. Brunner & Tim W. Clark, *A Practice-Based Approach to Ecosystem Management*, 11 CONSERVATION BIOLOGY 48 (1997); R. Edward Grumbine, *What is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27 (1994); Tarlock, *supra* note 259; Wiener, *supra* note 259; see also ADAPTIVE GOVERNANCE, *supra* note 202.

a myriad of activities. We are co-beneficiaries but we are also co-trustees or co-managers of waters, water supplies and systems, and watersheds. The term “public stewardship” aims to capture this sense in which the government and the public share responsibility for being good and wise stewards of limited water resources that are essential to life, society, and nature.

CONCLUSION

Water privatization in the United States raises a variety of human, community, national, and ecological concerns as water scarcity becomes a more significant issue in many parts of the U.S. and the world. As the legal system and public institutions wrestle with the control, management, and improvement of public water supply systems, waters, and the aquatic infrastructure that supports both society and nature, they are essentially wrestling with two different conceptions of water control, management, and allocation. One—the current trend in many ways—is based in fragmented private property rights in water, market transfers of water to those most able and willing to pay, and a commodification of water that serves primarily or solely to satisfy ever-increasing self-serving consumer demands. The other—the one represented by the public stewardship concept identified here—is based in public ownership of water with recognition and protection of private interests in water but subject to limits necessary to achieve the security, conservation, sustainability, equity, support, and integrated planning of water, water supplies, water infrastructure, and watersheds. It requires both the government and the public—as individuals and as a collective—to assume responsibilities of stewardship for our water resources. This model is the one most likely to protect human life and interests, national security, and the social and ecological communities that depend on water.