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Water Law Reform in West Virginia: The Broader Context

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WATER LAW REFORM IN WEST VIRGINIA: THE BROADER CONTEXT

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I. INTRODUCTION

“[W]ater is the basis of life . . . and the foundation of civilization.”¹ Our dependence and consequent reverence for water have long inspired both fear of its absence and of its excess abundance.² Drought is a familiar biblical curse on the Israelites. One can read in Leviticus: “I will make the sky above you as hard as iron, and your soil as hard as bronze, so that your strength shall be spent in vain and your land will bear no crops, and its trees no fruit.”³ Likewise, the fear of flood starts with the story of Noah and persists throughout history. During the golden age of Holland, criminals were publicly placed in a glass water cage to remind society of the imminent danger of inundation that the nation faced should it fail to maintain the dykes that held back the North Sea.⁴ The end product of this fear and respect for water’s functions is the widely recognized need for some level of state control over its use.

State control can be asserted directly or indirectly. Direct control involves state construction of water works and the distribution of water. Indirect control limits the state to the establishment of the ground rules for private water access and use. Societies have long concluded that water use can never simply

¹ THOMAS V. CECH, *PRINCIPLES OF WATER RESOURCES: HISTORY, DEVELOPMENT, MANAGEMENT, AND POLICY* 2 (2001).

² “The Babylonian god also called Num personified the idea that water was the source of all life, that historically the earth came forth from water, and that water was the quickening element of all creation.” MARQ DE VILLIERS, *WATER: THE FATE OF OUR MOST PRECIOUS RESOURCE* 51 (Mariner Books 2001).

³ *Leviticus* 26:19-20.

⁴ SIMON SCHAMA, *THE EMBARRASSMENT OF RICHES: AN INTERPRETATION OF DUTCH CULTURE IN THE GOLDEN AGE 15-24* (1987).

be a matter of individual choice and have long asserted a governmental interest in how water is used and who should enjoy access to it.⁵ Few countries rely on a single strategy, but instead use a mix of direct and indirect controls to insure that water is used in ways consistent with broader public objectives. The need for state control can be traced to ancient Mesopotamia and China,⁶ and was initially reflected in the construction of state public works to support irrigation and to prevent floods, and then extended to control private water use. Spain recognized the need for state control when it applied its irrigation experience in the arid Mediterranean littoral, inherited from the Moors,⁷ to the colonization of the New World. The famous Recopilacion de leyes de los Reynos de las Indias, which organized town planning in North and South America, included the protection of water supplies. The law provided that individuals could divert small streams for irrigation and other uses, but that such use must be done “without prejudice of the communal use.”⁸

Today, the question of what system of water use entitlements and management a state should follow is becoming an increasingly important issue as many states, especially those east of the Missouri River, are asking whether existing water allocation and management regimes are adequate to cope with numerous challenges. Such challenges range from the possibility of more frequent, if short-term, droughts to the longer-term pressures being placed on their water resource base, as well as the growing demand for the restoration of degraded aquatic ecosystems.⁹ West Virginia, along with its northern neighbor, Pennsylvania,¹⁰ has long been a pure common law allocation state, but questions

⁵ FOOD & AGRIC. ORG., UNITED NATIONS, LEGIS. STUDY 73, *Water, in* LAW AND SUSTAINABLE DEVELOPMENT SINCE RIO – LEGAL TRENDS IN AGRICULTURE AND NATURAL RESOURCE MANAGEMENT 147-61.

⁶ Karl Wittfogel was one of the first to draw attention to the relationship between control of water use and the type of government organization. KARL A. WITTFOGEL, *ORIENTAL DESPOTISM: A COMPARATIVE STUDY OF TOTAL POWER* (1957). Wittfogel’s thesis that state control leads to despotism has been influential, *see* DONALD WORSTER, *RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST* 22-30 (1985), but has not described the United States water experience, and it has even been questioned as an explanation of subsequent flood control in China. States can control rivers through extensive public works, but the cost often becomes too high. Late imperial China was unable to bear the costs of maintaining the Yellow River system as a result of the rise in the height of the riverbed caused by earlier public works and the fiscal and political decay of the Qing dynasty. *See* RANDALL A. DODGEN, *CONTROLLING THE DRAGON: CONFUCIAN ENGINEERS AND THE YELLOW RIVER IN LATE IMPERIAL CHINA* (2001).

⁷ Thomas F. Glick, *Irrigation and Society in Medieval Valencia*, LIBR. IBERIAN RESOURCES ONLINE, at <http://libro.uca.edu/irrigation/irrigation13.htm> (last visited Apr. 1, 2004).

⁸ CECH, *supra* note 1, at 181.

⁹ Lee P. Breckenridge, *Maintaining Instream Flow and Protecting Aquatic Habitat: Promise and Perils on the Path to Regulated Riparianism*, 106 W. VA. L. REV. 595, 612-19 (2004).

¹⁰ *See* Joseph W. Dellapenna, *Pennsylvania*, in 6 WATER AND WATER RIGHTS 713, 713-26 (Robert E. Beck ed., 1991 ed., repl. vol. 1994). Large withdrawals are regulated by the Susquehanna River Basin Commission and the Delaware River Basin Commission. Two compacts allow

of alternative allocation regimes are slowly beginning to surface in the two states.¹¹ Given the state's abundance of water, the lack of regulation is not surprising. The most serious water issues in West Virginia have long been too much water¹² and pollution abatement.¹³ However, the state is discovering that there may be potential long-term costs to the failure to control access to water.¹⁴ Water use remains under regulated in West Virginia compared to her immediate neighbors such as Kentucky and Virginia, as well as other eastern and south-eastern states. West Virginia's legislature took the first step toward greater regulation in 2003 by requesting the creation of a water policy commission.¹⁵ The commission was created in March of 2003.

As competing demands for different uses intensify, the lack of an effective regulatory scheme makes it increasingly difficult to accommodate new competing demands and to create a framework to adjust to shortages. Shortages have generally been relatively short-lived in the East, but a recent survey of state water managers listed West Virginia as one of sixteen states which expect regional shortages to occur.¹⁶ The lack of an effective regulatory policy also encourages intra-state jurisdictional conflicts, which may result in the inefficient allocation of water.¹⁷ In addition to these relatively immediate problems, the lack of a regulatory framework makes it more difficult for the state to develop

the commissions to issue withdrawal permits in protected areas if the state does not have a permit system. *See* Delaware River Basin Compact, DEL. CODE ANN. tit. 7, § 6501 (2001); Susquehanna River Basin Compact, Pub. L. No. 91-575, art. 11, 84 Stat. 1509, 1523-24 (1970). In 2002, Pennsylvania passed a Water Resources Planning Act, which requires the preparation of a state water plan. *See* 27 PA. CONS. STAT. ANN. §§ 3101-3136 (West 1997 & Supp. 2003).

¹¹ *See* 27 PA. CONS. STAT. ANN. §§ 3101-3136.

¹² *See, e.g.,* Uhl v. Ohio River R.R., 49 S.E. 378 (W. Va. 1904) (finding the railroad liable for construction of embankment that caused flooding because ordinary flood overflow determined to be part of the river; thus, the rule that a riparian cannot interfere with the flow of a watercourse if it causes flood or erosion damage to other riparians applied).

¹³ For example, as of December 2002, West Virginia had 722 impaired waters. EPA, TOTAL MAXIMUM DAILY LOADS, *reprinted in* ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION LAW AND POLICY 586-87 (4th ed. 2003); *see also* M. Ann Bradley & Joseph M. Dawley, *West Virginia's Antidegradation Policy for State Waters: From Theoretical Construct to Implementation Procedures*, 103 W. VA. L. REV. 331 (2001). By June 20, 2003, the number of impaired waters reported in West Virginia equaled 1,152. EPA, TOTAL MAXIMUM DAILY LOADS, at <http://www.epa.gov/OWOW/tmdl/index.html> (approved June 20, 2003).

¹⁴ Dr. Robert Behling, Professor of Geology, West Virginia University, Address at the Water Issues in the Appalachian Region Symposium (Oct. 2, 2003).

¹⁵ *See* S. Con. Res. 27, 78th Leg. Sess. (W. Va. 2003).

¹⁶ *See* Joan Lowy, *Most States Predict Water Shortages in Next Decade*, July 10, 2003, at <http://www.awwaneb.org/articles/2003%20news/watershortage.html>.

¹⁷ Local communities in Pennsylvania are increasingly enacting anti-export ordinances. *See* Levin v. Bd. of Supervisors, 669 A.2d 1063 (Pa. Commw. Ct. 1995), *aff'd per curiam*, 689 A.2d 224 (Pa. 1997).

and implement a water resources policy that ensures that the resource will be effectively conserved for the use and enjoyment of future generations.

This Article approaches the question of water law reform in West Virginia from a broad, future-oriented perspective by putting the traditional eastern water reform issues in the larger context of national and international trends in water policy. I argue that water policy and law will be increasingly based on the ethic of environmentally sustainable water use and development.¹⁸ This emerging principle will ultimately inform the balance among competing water uses, the recognition and administration of water use entitlements, the design of new water projects, and the re-engineering and operation of existing facilities. The principle of sustainable water use has not yet progressed from a vague, aspirational principle to an operational legal rule.¹⁹ However, one can state with considerable confidence that environmentally sustainable water use represents a fundamental paradigm shift in society's attitude toward the function of rivers, lakes, and aquifers.²⁰ This paradigm shift is, however, occurring at different rates around the world, and this shift will influence national water laws and policies.

The consequences of this paradigm shift are substantial because the achievement of environmentally sustainable water use will require abandoning the idea that rivers and aquifers are simply commodities to be used to the maximum extent possible through exploitation and manipulation of natural hydrologic regimes. Environmentally sustainable water use is the product of more than four decades of "environmental accounting" that has led to a more radical ecological ideal of managing river systems to maximize ecological services, as well as to support necessary human uses.²¹ As a result, future water policy will

¹⁸ Sustainable development was proposed as a construct to engage developing countries in the task of protecting the global environment. WORLD COMM'N ON ENV'T & DEV., OUR COMMON FUTURE 43 (1987). The terms of sustainable development and ecologically sustainable development are often used interchangeably because sustainable development can be defined as "human development that is ecologically sustainable. Its aims are human freedom, opportunity, and higher quality of life. It is not another name for economic development, although it includes economic development." John C. Dernbach, *Synthesis*, in ENVTL. LAW INST., STUMBLING TOWARD SUSTAINABILITY 1, 5 (2002).

¹⁹ For an analysis of how a "soft" aspirational principle has progressed to "hard law," see generally J.B. Ruhl, *The Seven Degrees of Relevance: Why Should Real-World Environmental Attorneys Care Now About Sustainable Development Policy?*, 8 DUKE ENVTL. L. & POL'Y F. 273 (1998).

²⁰ This shift is reflected in the United Nations Conference on Environment and Development (UNCED) or Earth Summit, which was convened in Rio de Janeiro, Brazil, in 1992. The Earth Summit was the biggest and most important environmental conference in history. It sought to give expression to sustainable development and fulfill its goals of addressing the dual problems of environmental protection and socio-economic development by producing two treaties: the Convention on Biological Diversity, *opened for signature* June 5, 1992, 1760 U.N.T.S. 79, 31 I.L.M. 818, and the United Nations Framework Convention on Climate Change, *opened for signature* June 5, 1992, 1771 U.N.T.S. 107, 31 I.L.M. 849.

²¹ See *infra* notes 25-33.

be guided by three general principles: (1) the more efficient use of existing supplies; (2) the use of more sophisticated, less environmentally intrusive technologies to develop new supplies; and (3) the restoration of degraded aquatic ecosystems and the re-operation of existing projects to maintain and re-capture valuable ecosystem services and hydrologic regimes.²² It will also be characterized by more inclusive stakeholder participation as water policy is no longer a closed dialogue among engineers and hydrologists.²³

There is a growing international consensus about the problems that the planet is facing with respect to water use and how these should be addressed. This consensus may ultimately filter down to the federal and state level and influence state water policies and plans. This Article examines three interrelated aspects of this paradigm shift and speculates about their potential legal impacts. Part II examines the relevant mega international and national changes that are now occurring. Part III summarizes the legacy of the common law of riparian rights for modern reform efforts. Part IV takes another look at the long-running "eastern" water law reform debate and offers a perspective that is somewhat broader than the conventional one. Part V focuses on the under reformed state of West Virginia and offers some general guidelines for water resources reform in a lightly-stressed humid state consistent with the paradigm shift to environmental sustainability. It also briefly discusses some possible reform models based on the experience of her neighbors.

These mega trends may have substantial, if long-term, legal implications beyond the traditional issue in eastern water law reform. Namely, what kind of permit system should the eastern states adopt: prior appropriation or a more flexible, discretionary permit system? The form of any regulatory regime is, of course, an important issue. However, reform questions must be addressed in the context of broader national and international trends in water management. The issue is not simply what kind of permit system a state should adopt, but what kind of planning, management, and control regime is appropriate to promote the environmentally sustainable use of the state's resources for the foreseeable future in a fair and efficient manner. In addition, the trends suggest that water use entitlements must be reconceptualized to support any reform effort.

²² Peter Gleick has proposed a similar list for global water sustainability. Sustainable water management must include: (1) a human right to the minimum amount of water to sustain human health, (2) the recognition of the need for water to maintain and restore ecosystems, (3) the decreased reliance on structural solution such as supply augmentation, (4) the application of efficiency principles to water use, (5) the more efficient design of new water supply and distribution systems, and (6) increased non-governmental organization ("NGO") and stakeholder participation in decision making. Peter H. Gleick, *The Changing Water Paradigm: A Look at Twenty-First Century Water Resources Development*, 25 WATER INT'L 127, 131 (2000).

²³ See WORLD COMM'N ON DAMS, DAMS AND DEVELOPMENT: A NEW FRAMEWORK FOR DECISION-MAKING, 169-83 (2000) [hereinafter DAMS AND DEVELOPMENT].

II. THE END OF THE RIVER MANIPULATION ERA BUT NOT OF STRESSES ON WATER USE

Interest in water law reform is driven by the fact that the demand for water is shifting and growing throughout the United States, but the competition for this essential resource is taking place in a radically different political and legal environment than it did in the past. In brief, we view water resources in a more complex manner at a time when the traditional federal role in the construction of large-scale public works is shifting and shrinking and new demands are intensifying. This section examines four fundamental changes in water policy that are occurring both in the United States and throughout the world that will influence future water allocation choices, and suggests some first-order implications of these changes.

A. *The New River Use Paradigm: Fish Parity*

Today, two visions of a river are competing for dominance: the managed and the natural or “normative river.”²⁴ From the nineteenth century to the mid-twentieth century, the dominant view of rivers was that they were imperfect examples of nature that could and should be improved by human intervention. We first removed navigation impairments, confined and tamed the flow, and during the “Big Dam Era” dammed many of them for irrigation and municipal supply, flood control, and the generation of hydroelectric power.²⁵ In the process, we commodified them.²⁶ This policy produced great local and national benefits as well as substantial environmental and social costs.²⁷ The environmental movement triggered a comprehensive accounting of these costs. United States water policy is slowly moving from the dominant twentieth-century paradigm of multiple-purpose development through alteration of river hydrographs to a new, although less well articulated, one of the normative river, which seeks to use water in more environmentally sustainable ways and to respect the river’s natural hydrograph.²⁸

²⁴ See generally Jack A. Stanford et al., *A General Protocol for Restoration of Regulated Rivers*, 12 REGULATED RIVERS: RES. & MGMT. 391 (1996).

²⁵ West Virginia still has considerable undeveloped hydroelectric potential. ALISON M. CONNER & JAMES E. FRANCFORT, U.S. DEP’T OF ENERGY, U.S. HYDROPOWER RESOURCE ASSESSMENT FOR WEST VIRGINIA (1998), available at <http://hydropower.id.doe.gov/resourceassessment/wv/wv.pdf>.

²⁶ The leading articulation of this thesis is WILLIAM CRONON, *CHANGES IN THE LAND: INDIANS, COLONISTS, AND THE ECOLOGY OF NEW ENGLAND* (1983).

²⁷ See RICHARD N.L. ANDREWS, *MANAGING THE ENVIRONMENT, MANAGING OURSELVES: A HISTORY OF AMERICAN ENVIRONMENTAL POLICY 189-91* (1999).

²⁸ See generally Chris Bromley, *A Political and Legal Analysis of the Rise and Fall of Western Dams and Reclamation Projects*, 5 U. DENV. WATER L. REV. 204 (2001); Christine A. Klein, *On Dams and Democracy*, 78 OR. L. REV. 641 (1999).

The reasons for the paradigm shift are scientific, philosophical, and economic. Science, environmental ethics, and economics have contributed to a new understanding of rivers. As a result of the environmental movement and the scientists influenced by it, we now see rivers as integral parts of a natural landscape that can provide valuable ecosystem services²⁹ along with the historic benefits of water supply and hydroelectric power. As the great American geographer Gilbert White has written,

People around the world in the 1990s are perceiving the earth as more than a globe to be surveyed, or developed for the public good in the short term, or to be protected from threats to its well-being both human and natural. It is all of those to some degree, but has additional dimensions. People in many cultures . . . recognize a commitment to care for it in perpetuity.³⁰

Rivers are also now seen not only as functioning ecosystems, but also as natural ribbons of awe and grandeur to be enjoyed in the wild or restored state. The passage of the Wild and Scenic Rivers Act in 1968³¹ marked the beginning of the end of the Big Dam Era by withdrawing many of the best remaining dam sites and ushering in a new era of resource stewardship and a recognition that free flowing rivers are important economic resources.³²

The major winners of the Big Dam Era were cities, which received increased water supplies and flood plain protection, and farmers, who received subsidized water as well as flood protection. The major losers were fish and aquatic ecosystems.³³ Dams, diversions, and levees destroyed fish habitats, but this was considered an acceptable price to pay for progress, and little, if any, attention was given to the idea of conserving the benefits of the river's natural hydrograph. Fish and wildlife conservation meant the creation of refuges adja-

²⁹ See NAT'L RESEARCH COUNCIL, *THE MISSOURI RIVER ECOSYSTEM: EXPLORING THE PROSPECTS FOR RECOVERY* 58-62 (2002), for a description of the ecosystem benefits provided by the flood pulses on the Missouri prior to the construction of six mainstem dams from the 1940s through the 1960s.

³⁰ Gilbert F. White, *Reflections on Changing Perceptions of the Earth*, 19 ANN. REV. ENERGY & ENV'T 1, 9 (1994).

³¹ 16 U.S.C.A. §§ 1271-1287 (West 2000 & Supp. 2003). The Act creates a three-tiered classification of rivers: wild, scenic, and recreation. 16 U.S.C. § 1273(b) (2000). As of 2003, there are 161 designated rivers. West Virginia has one designated river, the Bluestone from two miles upstream of the Summers and Mercer county lines to the maximum summer pool of Bluestone Lake. 16 U.S.C.A. 1274(a)(65).

³² See JOHN PASSMORE, *MAN'S RESPONSIBILITY FOR NATURE* 32 (1974) (identifying stewardship as the opposite of nature domination and arguing that it demands "an active concern for the earth's fertility").

³³ See Breckenridge, *supra* note 9.

cent to a river³⁴ and the construction of fish ladders,³⁵ rather than habitat conservation.

The newer ecological integrity vision is less clearly articulated than the multiple use one because it rests on a more complex view of the human role in the functioning of natural systems. It starts from the premise that we must try to integrate human uses of a river system with the maintenance of its natural environmental sustainability both in the design of new projects and in the re-engineering and operation of existing facilities. The current focus is on restoration because even modified river systems are dynamic, ever-changing, functioning ecosystems that serve a variety of functions from the maintenance of consumptive uses to the production of ecosystem services. This emerging vision is not a simple river preservation concept because it will be realized, if at all, within the framework of environmentally sustainable use and development. River use must always accommodate a sustainable, non-wasteful level of consumptive use,³⁶ but the conservation of species and of the ecosystem services that rivers and lakes provide must be recognized as being of equal importance to traditional water uses, and in many cases their value may be greater than existing or proposed consumptive uses.³⁷

³⁴ This "mitigation" approach led to the marginalization of environmental values, and this legacy is still with us. For example, wildlife refuges can assert water rights to sustain them, but these rights are hard to claim. The Supreme Court held in 1962 that federal wildlife refuges could claim implied federal non-Indian reserved rights. *Arizona v. California*, 373 U.S. 546 (1963). Subsequently, the Court limited the federal government's power to claim these rights by requiring that the government prove that the denial of water would frustrate the primary purpose of the refuge. *United States v. New Mexico*, 438 U.S. 696 (1978). When the federal government tried to claim reserved rights for a refuge in the Snake River, the Idaho Supreme Court found the argument that President Franklin D. Roosevelt intended to support a refuge with federal water "inconceivable":

The reclamation projects . . . assured that there would be sufficient water to maintain the islands without a federal reserved right. . . . The only way that this reality fails is if there is a catastrophic drought or other natural disaster that threatens to dry up the river. . . . It is inconceivable that President Roosevelt in 1937, in the context of the dust bowl years, intended to give preference to waterfowl, or any other migratory bird, over people.

United States v. Idaho (In re Srba Case No. 39576), 23 P.3d 118, 128-29 (Idaho 2001).

³⁵ The power to construct fish passages around federal projects dates from 1888, but the major act is the Fish and Wildlife Coordination Act of 1934, 16 U.S.C. § 661-666c (2000). *See generally* 3 WATER RES. POLICY COMM'N, WATER RESOURCES LAW: THE REPORT OF THE PRESIDENT'S WATER RESOURCES POLICY COMMISSION 327-30 (1950).

³⁶ This concept was endorsed in W. WATER POL'Y REV. ADVISORY COMM'N, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 3-2 to -3 (1998) [hereinafter WATER IN THE WEST].

³⁷ The Klamath Basin in southern Oregon has been the scene of an intense conflict between the preservation of endangered species and the support of a traditional, but economically marginal, irrigation community. *See* Holly Doremus & A. Dan Tarlock, *Fish, Farms, and the Clash of Cultures in the Klamath Basin*, 30 ECOLOGY L.Q. 279, 295-300 (2003).

Federal and state environmental laws are slowly redressing this neglect of the aquatic environment, but in a very ad hoc, piecemeal, and unsatisfactory fashion. The Endangered Species Act ("ESA") is the major federal environmental constraint on water use.³⁸ The ESA can preempt pre-existing and federal and state entitlements, but it is not a comprehensive biodiversity statute. Efforts to stabilize or restore aquatic ecosystems create substantial pressures to leave water in place, often quite far down the river reaches. In the end, states will bear the primary responsibility to do this because they have the primary responsibility to create and administer water rights. The demand to dedicate more water for ecosystem maintenance and recovery is likely to increase in the future and could constrain the traditional ability of cities to dewater watersheds, put pressures on existing entitlement holders, and, more generally, increase pressures for more active state water management.

B. The Decline and Decentering of Federal Power

During most of the last century, the federal government immunized water rights holders and states from the responsibility to make many hard water use choices. In the twentieth century, the federal government built large-scale water projects, and with few exceptions, it deferred to state allocation law. This was the best of both worlds for the states. They were free to control water use, but the multiple-purpose federal reservoirs took the pressure off of all but the most arid states to have to worry too much about competition among users and more efficient water use alternatives.

Until the 1970s, federal and state water agencies along with the major water users controlled the water agenda, but this is no longer the case. This tight control depended on the politics of distribution practiced by the federal government and a few states such as California. The politics of distribution led to the "pure doctrine of river basin management," which posited the need to construct and manage comprehensively planned, integrated federal projects on the nation's large rivers to promote regional development. Proponents of comprehensive watershed and river basin planning assumed that large-scale water resources projects were necessary to promote the efficient (non-wasteful) use of water through multiple-purpose projects that would provide widespread benefits to the nation, or at least stimulate regional growth. The economic assumptions behind this model were always doubtful, and today water resources development no longer commands the widespread bi-partisan political support that it once did, although vigorous proponents of the reclamation era remain.

The party is now over. The era of large-scale dam building appears to be over.³⁹ Some new, "smarter" storage projects will be built, but they will be

³⁸ See Holly Doremus, *Water, Population Growth, and Endangered Species in the West*, 72 U. COLO. L. REV. 361, 378-98 (2001) (noting that the ESA may require water to be left in streams to conserve listed species during periods of peak summer irrigation and municipal demands).

³⁹ E.g., JOHN R. FERRELL, *BIG DAM ERA: A LEGISLATIVE AND INSTITUTIONAL HISTORY OF THE*

smaller and more environmentally friendly.⁴⁰ The United States is moving from the era of big dams to an era of reallocation of existing supplies and the sustainable management and restoration of previously modified aquatic ecosystems.⁴¹ In the future, water resources policy will be an important component of a larger environmental-social equity agenda. The traditional government roles of flood control through dams and levees and supply augmentation remain important, but they no longer define the governmental interest in water resources use as they did in the past. These developments will not necessarily directly, immediately impact state water allocation law and policy, but ultimately they will because they undermine many of the assumptions behind state water laws and pressure states to become more proactive than they have been in the past.⁴²

Federal largesse is shrinking, and the federal government's regulatory role appears to be following suit.⁴³ The downward trend of Bureau of Reclamation and Corps of Engineer budgets has been constant in both Republican and Democratic administrations and Congresses for over three decades. The shrinking fiscal support for water development and the devolution of power has created a more fluid water policy environment. Power is now more diffused, and the institutions that have managed and allocated this country's water resources are less able to perform their historic functions of mediating competing demands for water and buffering all major uses against the vagaries of climate. Today, growing cities compete with proponents of aquatic ecosystem restoration and other traditional users such as agricultural irrigators struggling to maintain an often economically irrational, but deeply valued, way of life. All of these old and new interests or "stakeholders" now demand a seat in the multi-party bargaining processes that characterize many allocation conflicts. One consequence of this is that the old idea of static water plans has been rejected. These plans were prepared primarily by engineers and were often project construction blueprints or wish lists.⁴⁴ State water planning, for better or worse, must become a

PICK-SLOAN MISSOURI BASIN PROGRAM 147-71 (1993) (noting that the focus on Missouri has shifted from new project construction to long-term management of existing infrastructure).

⁴⁰ DAMS AND DEVELOPMENT, *supra* note 23, at 236-39. I have sketched some of the possible legal implications of the report in A. Dan Tarlock, *What the Report of the World Commission on Dams Might Mean for the United States Water Community*, 5 U. DENV. WATER L. REV. 225 (2001).

⁴¹ See WATER IN THE WEST, *supra* note 36, at 3-51 to -52.

⁴² David H. Getches, *The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States' Role?*, 20 STAN. ENVTL. L.J. 3, 59-69 (2001).

⁴³ See Christopher H. Schroeder, *Environmental Law, Congress and the Court's New Federalism Doctrine*, 78 IND. L.J. 413 (2003).

⁴⁴ Highly water-stressed states such as New Mexico have begun the difficult process of confronting the question of whether reliable, available supplies pose real limits to future growth. See Lora Lucero & A. Dan Tarlock, *Water Supply and Urban Growth in New Mexico: Same Old, Same Old, or New Era*, 43 NAT. RESOURCES J. 803 (2003).

more open, multi-objective process that considers the trade-offs among alternative uses.⁴⁵

The federal agencies have responded by changing their missions from project construction to "management." The Bureau of Reclamation has formally changed its mission from water development to water management, and budget priorities reflect this change.⁴⁶ The United States Army Corps of Engineers is undergoing a similar but more complex and uneven transition and is pinning its hopes for future survival on playing a large role in restoring the aquatic ecosystems that it previously modified.⁴⁷ The federal government continues to operate and manage the infrastructure heritage of the twentieth century, but with increasingly limited ability to augment supplies and sometimes to control the allocation of the stored water. In the future, the federal water agencies will function more as project managers and as stakeholders in multi-party negotiations rather than as *the* major policy maker and distributor of federal largesse.

The force of the federal government's shrinking role is illustrated by the Department of Interior's Water 2025 initiative.⁴⁸ In response to growing populations fighting for increasingly fixed supplies and the growing number of endangered species versus farmers and cities conflicts, the Department issued a strategy entitled *Water 2025: Preventing Crisis and Conflict in the West*.⁴⁹ The strategy proposes six principles for managing water in the future including enhanced water conservation, the greater use of water markets, and improved treatment technology.⁵⁰ The most striking features of the strategy are the absence of a promise of major new supply projects and the reliance on strategies in which the federal role is limited. In short, the federal government's diminishing role in water resources management places new pressures and responsibilities on the states to manage their water resources without the level of federal support that was available in the past.

⁴⁵ See David H. Getches, *Water Planning: Untapped Opportunity for the Western States*, 9 J. ENERGY L. & POL'Y 1, 18-25 (1988).

⁴⁶ See BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, RECLAMATION'S STRATEGIC PLAN: A LONG-TERM FRAMEWORK FOR WATER RESOURCES MANAGEMENT, DEVELOPMENT AND PROTECTION (1992).

⁴⁷ See NAT'L RESEARCH COUNCIL, MANAGING THE NATIONAL WATER RESOURCES INFRASTRUCTURE (2004) (on file with law review).

⁴⁸ BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, WATER 2025: PREVENTING CRISES AND CONFLICT IN THE WEST, available at <http://www.doi.gov/water2025> (last visited Apr. 1, 2004).

⁴⁹ *Id.*

⁵⁰ *Id.*

C. *Growing Cities, Fewer New Reservoirs*

Time does not stand still; many urban and rural areas keep growing and new demands arise. There are four basic categories of water use that will shape future allocation choices. These are agriculture, municipal and industrial ("M&I"), instream flows, and hydroelectric power generation.

Nationwide, agriculture has historically claimed the largest share of developed supplies, but this use is declining. The story is different for M&I uses. Nationally, domestic use withdrawals more than doubled between 1960 and 1990, while population only increased by seventy-five percent.⁵¹ Domestic use's growth reflects the new sprawling landscape of office campuses, gated communities, and golf courses, as well as continued rapid United States population growth, much of it concentrated in warm, water-stressed areas. Nationally, domestic demands rose from five percent of the total in 1960 to eight percent in 1990, and water used for thermoelectric power generation rose from four percent of the total in 1960 to nine percent in 1990.⁵² Thus, both domestic use demands and the per capita use appear to be rising.

The end of the dam-building era therefore heightens rather than lessens competing demands for water. In addition to the demands of urban interests, more interests will compete for a relatively fixed, even perhaps diminished, pie in a fragmented decision-making authority environment. Public agencies, non-governmental organizations ("NGOs"), and water entrepreneurs are all gaining greater power to control the allocation of water. In addition, water markets and litigation, rather than federal and state water development projects, will determine the allocation of scarce supplies. However, these will be highly constrained or imperfect markets because of the complexity of legitimate alternative demands. Nonetheless, they diffuse decision-making authority downward and stress many state water allocation laws.

The new devolution is on display in Arizona and California. These states have shifted greater responsibility to local governments and developers to become active participants in water policy decisions that were previously considered exclusively federal or state functions. Arizona was the first state to shift direct responsibility to local governments to secure sufficient water to keep Arizona in town homes and malls. The state's 1980 Groundwater Management Act imposes a duty on all new developments, and thus on their municipal suppliers, to establish that there will be "[s]ufficient groundwater . . . to satisfy the water needs of the proposed use for at least one hundred years."⁵³

California has passed similar legislation that more directly links growth management and water planning, and shifts even more responsibility to cities

⁵¹ WAYNE V. SOLLEY ET AL., U.S. GEOLOGICAL SURVEY, CIRCULAR 1200, ESTIMATED USE OF WATER IN THE UNITED STATES IN 1995 (1998), <http://water.usgs.gov/watuse/pdf1995/html>.

⁵² *Id.*

⁵³ ARIZ. REV. STAT. ANN. § 45-576(I)(1) (West 2003).

and developers to find adequate supplies to support new growth. In 2001, California passed legislation that prohibits approval of tentative subdivision maps, parcel maps, or development agreements for a subdivision of more than 500 units unless there is a "sufficient water supply."⁵⁴ The legislation also requires cities and counties to prepare detailed "water supply assessment reports"⁵⁵ as part of the environmental review process.⁵⁶ Other areas are considering a formal link between water supply and land use planning.⁵⁷

D. *Global Climate Change*

Global climate change further complicates water allocation by increasing the inherent risks in water rights and hydrologic forecasts. In the water community, global climate change has been a subject of intense discussion but no action. There are two basic policy options to deal with the possibility of substantially and adversely altered weather patterns. First, we can mitigate the cause by reducing greenhouse gas emissions and carbon sequestration. Second, we can adapt to adverse consequences. Water management falls in the second category. States are beginning to take the possible hydrologic consequences of the global climate more seriously⁵⁸ as recent weather patterns more closely resemble projected scenarios.

Under our present understanding of the probable fine-scale impacts, adaptation is a daunting task because the hydrological, economic, and political consequences of global climate change in a given watershed or river basin are uncertain⁵⁹ even as our understanding of the forces that influence climate increases. No consensus exists about the long-term patterns at regional scales. Some models predict that global climate change may alter precipitation and run-

⁵⁴ CAL. GOV'T CODE § 66473.7(2) (Deering Supp. 2004).

⁵⁵ CAL. WATER CODE §§ 10910-10911 (Deering Supp. 2004).

⁵⁶ *E.g.*, Santa Clarita Org. for Planning the Env't v. County of Los Angeles, 131 Cal. Rptr. 2d 186 (Ct. App. 2003) (not certified for publication).

⁵⁷ See SMART GROWTH AM., PAVING OUR WAY TO WATER SHORTAGES: HOW SPRAWL AGGRAVATES THE EFFECTS OF DROUGHT, at <http://www.smartgrowthamerica.org/waterexecsum.html> (last visited Apr. 1, 2004). In 2002, Carroll County, Maryland officials halted all home construction until 2008 due to a near capacity treatment plant which could support only 62 new hookups. Mary Gail Hare, *Carroll Officials Call Halt to New Houses*, BALT. SUN, May 17, 2002, at 3B.

⁵⁸ In 2002, the California Department of Water Resources became the first state water resources agency to include potential global climate change impacts in its forecast. See CAL. ENERGY COMM'N, CALIFORNIA STATE CLIMATE CHANGE ACTIVITIES, at http://www.energy.ca.gov/global_climate_change/state_roles.html (last visited Apr. 1, 2004).

⁵⁹ The gap between what we know and need to know about the relationships between climate change and human and natural systems is set out in COMM. ON GLOBAL CLIMATE CHANGE RESEARCH, NAT'L RESEARCH COUNCIL, CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME KEY QUESTIONS (2001).

off patterns throughout the world. One possible scenario is increased extremes of wet and dry years.⁶⁰ Global climate change's adverse impacts are likely to be most severe in arid and semi-arid areas because historically variable rainfall patterns may be altered; increased precipitation may actually exacerbate efforts to provide reliable water supplies. Warmer average temperatures may cause spring runoffs to come earlier and evaporate faster, snowpacks to melt earlier, and more precipitation to fall as winter rain rather than snow. Increased, but out-of-cycle, rainfall is the projected pattern for parts of the western United States. Wetter, warmer weather could strain existing storage systems that currently provide reliable regional water supplies and increase flooding. Existing reservoirs may not be able to capture the increased winter runoff, causing serious shortages in the summer.⁶¹

The impact of global climate change for water-rich areas such as West Virginia may be subtler but could be significant. The most comprehensive assessment of the possible impacts of global climate change in the United States remains the Clinton Administration's National Assessment. West Virginia is grouped in the Northeastern United States. Both the two major models, the Hadley and the Canadian, predict lower than average temperature increases compared to other regions of the country.⁶² However, West Virginia is projected to have the largest winter temperature increases, as much as twelve degrees Fahrenheit, although the United States Environmental Protection Agency has a more conservative two to seven degree Fahrenheit range.⁶³ The models also differ on the projected rainfall. The EPA scenario for the West Virginia region is surprisingly similar to the one for California, which is causing great concern in California's water community. California and other arid states are concerned because increased precipitation could be offset by an earlier spring runoff. This would increase the risk of lower (and more contaminated) summer flows, which could be serious in states, such as West Virginia, with substantial water pollution problems.

⁶⁰ Joel B. Smith et al., *Potential Consequences of Climate Variability and Changes for the Western United States*, in NAT'L ASSESSMENT SYNTHESIS TEAM, U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE CHANGE IMPACTS ON THE UNITED STATES: POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE ch. 8, at 219 (2001), available at <http://www.usgcrp.gov/usgcrp/Library/nationalassessment/foundation.htm>.

⁶¹ An early study by an Environmental Defense Fund economist concluded that water deliveries for federal and state water projects that serve California's San Joaquin Valley could be reduced by as much as twenty-five to twenty-eight percent. DANIEL J. DUDEK, ENVTL. DEF. FUND, CLIMATE CHANGE IMPACTS UPON AGRICULTURE AND RESOURCES: A CASE STUDY OF CALIFORNIA (1989).

⁶² Eric Barron, *Potential Consequences of Climate Variability and Changes for the Northeastern United States*, in CLIMATE CHANGE IMPACTS ON THE UNITED STATES, *supra* note 60, ch. 4, at 109.

⁶³ EPA, CLIMATE CHANGE AND WEST VIRGINIA GLOBAL WARMING IMPACTS (1998), <http://yosemite.epa.gov/OAR/globalwarming.nsf/content/ImpactsStateImpacts.html>.

III. THE COMMON-LAW LEGACY OF EASTERN WATER LAW

Water lawyers are inherent economists; they are only interested in the process of competition for scarce resources. For this reason, eastern water has never been interesting. All states have faced the problems of competing demands and the risks associated with a variable or overused water supply, but these problems have only been acute in the western states, and only these states developed “hard” property rights and strong regulatory systems designed to achieve widespread access to limited supplies and to limit the risks of non-availability. Eastern states have faced some of the same problems but in a less intense fashion, and thus developed only “soft” property rights and weak or incomplete regulatory systems. While the western states had to develop a water law adapted to the region’s harsh climate, eastern states have had the luxury of leisurely pondering the question of whether water law reform was in fact needed.

Reform has been both hard and easy for the eastern states. Reform has been difficult because of the nineteenth century legacy of limited government interference with the use of water. The eastern states adopted the common law of riparian rights and left the task of allocation to the courts, although there is a strong tradition of legislative modification of the common law. This created the expectation that water was an open access commons. Paradoxically, reform is easier in the East than the West because the East does not have the strongly entrenched entitlements that the West has. Thus, it will be easier to draw on the long tradition that posits that private use is subordinate to the public interest and that rights do not vest for constitutional purposes until water is used.⁶⁴

A. *The Nineteenth Century Quasi-Laissez Faire Legacy*

In the United States, the state interest in water use has been consistent, but it has often been muted, especially from the mid-nineteenth century forward. Eastern water law long rested on the assumption that a system of judicially created and enforced entitlements that permit the private and public use of water will serve society well by encouraging sufficient investment in water-dependent activities. The primary reliance on private entitlements was a logical outcome

⁶⁴ The switch from the common law of prior appropriation to a permit system for unused rights has generally been upheld against takings challenges because almost all claimants end up with more secure rights, or a long period of non-use negates any legitimate expectations of a water right. See, e.g., *State Dep’t of Ecology v. Acquavella*, 51 P.3d 800 (Wash. Ct. App. 2002) (holding that a final adjudication decree bars unclaimed riparian rights even if they were subsequently revived before the previously announced cut-off date); *In re Deadman Creek Drainage Basin in Spokane County*, 694 P.2d 1071 (Wash. 1985) (finding forfeiture of riparian rights was not a taking); cf. *Texaco, Inc. v. Short*, 454 U.S. 516 (1982) (concluding that unexploited mineral interests may be terminated for failure to re-register). But see *Franco-American Charolaise, Ltd. v. Okla. Water Res. Bd.*, 855 P.2d 568 (Okla. 1990) (holding that the legislature may not constitutionally terminate unexercised riparian rights). See generally Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257 (1990).

of the role that water played in eighteenth and nineteenth century America and the preference for private rather than public development.⁶⁵ Until the last decades of the nineteenth century, the major water uses were non-consumptive: navigation and small-scale hydropower. Initially, the role of the state was substantial because the common law threatened to retard the desired level of private investment in mill power, but after earlier barriers were removed, the need for state intervention diminished.

Starting in the eighteenth century, private choice was limited to promote the efficient use of water to insure that the benefits of water use were widely distributed in society.⁶⁶ The common law of riparian rights developed during the time in which the most valuable use of water was to power mills, and thus the most valuable attribute of the right was the natural flow of the river.⁶⁷ The common law initially appeared to adopt a natural flow or restricted use rule, which required that every riparian, except those at the mouth of the sea, maintain the current for all other riparians.⁶⁸

The traditional story is that most states replaced the natural flow rule with a reasonable use rule to allow the retentions and withdrawals necessary to promote larger mills, irrigation, and municipal and industrial use.⁶⁹ The basic strategy of eighteenth and nineteenth century water law reform was to preserve the common law, but to eliminate undesirable, inefficient features. The natural flow or restricted use rule appeared to prevent all impoundments and modifications of the river's hydrograph, and thus would have prevented the development

⁶⁵ See DONALD J. PISANI, *TO RECLAIM A DIVIDED WEST: WATER, LAW, AND PUBLIC POLICY 1848-1902* (1992); Donald J. Pisani, *Enterprise and Equity: A Critique of Western Water Law in the Nineteenth Century*, 18 W. HIST. Q. 15 (1987).

⁶⁶ For an important counter example, see generally John F. Hart, *Property Rights, Costs, and Welfare: Delaware Water Mill Legislation*, 27 J. LEGAL STUD. 455 (1998), discussing state's protection of existing mills at expense of more efficient mills that promoted consumer welfare.

⁶⁷ This legacy is still with us. In *Dorey v. Estate of Spicer*, 715 A.2d 182 (Me. 1998), the claimant asserted flowage rights acquired from the purchase of various parcels adjacent to the original mill property to flood lands on a pond partially maintained by a dam, which dated from an 1839 sawmill. *Id.* at 183. The court held that flowage rights arose under the Maine Mill Act of 1821, modeled on the Massachusetts Mill Act of 1796. *Id.* at 185-86. The claimant argued that flowage rights were a unique type of easement appurtenant, which could be severed from the original cite. *Id.* The original mill was no longer in operation and the claimant did not own the land on which it originally stood, and the court held that any flowage rights that still exist are appurtenant to the original sawmill lots "and cannot exist apart from those lots." *Id.* at 186.

⁶⁸ In recent decades, the natural theory was occasionally asserted to claim recreational and instream flow rights for aesthetic enjoyment. See *Collens v. New Canaan Water Co.*, 234 A.2d 825 (Conn. 1967). Connecticut abandoned the natural flow theory by statute in 1982, in favor of regulated riparianism. See *City of Waterbury v. Town of Wash.*, 800 A.2d 1102, 1149 (Conn. 2002).

⁶⁹ See MORTON HOROWITZ, *THE TRANSFORMATION OF AMERICAN LAW 1780-1860*, at 35-37 (1977).

of industry. To promote industrial development, Mill Acts⁷⁰ were enacted giving riparians the power to condemn flowage easements and in some states creating a priority regime to allocate the right to use the flow.⁷¹ Subsequently, the common law was modified to allow water to be used consumptively and in some cases away from the river corridor when there was no substantial injury to other users.⁷² West Virginia is conventionally classified as a reasonable use state.⁷³ The recently (and not so recently) decided cases, however, all deal with the law of surface drainage rather than the right to use water⁷⁴ for consumptive uses. The state took the first steps to modifying the common law by creating a water policy commission in 2003 and passing a progressive water registration and planning statute in 2004.⁷⁵

California is the classic case study of this change. The merits of riparian rights were extensively debated in California in the late nineteenth and early twentieth century as the state's irrigation economy developed and threatened to block industrial and urban development. California courts vacillated between the reasonable use and natural flow theories and ultimately adopted the natural

⁷⁰ The Mill Acts date to early colonial America and were an early extension of the power of eminent domain to private parties to advance a public objective. The Acts allowed a riparian proprietor to dam a river to create a source of power for a mill. In some cases, the acts provided for the condemnation of riparian land by a private party. *See, e.g.*, 2 Va. Hening's Stat. 260 (1667). Upstream riparians were damaged either because of a loss of current or because a portion of their lands was flooded, or downstream riparians who lost power were entitled to a statutory remedy of damages. Common-law remedies were preempted. *Fiske v. Framingham Mfg. Co.*, 29 Mass. (12 Pick.) 68 (1831). Virginia and later West Virginia adopted Mill Acts, but since the eighteenth century, these seem to have been used more as a dam licensing procedure to protect navigation and fish passage than as a compensation mechanism. *See* Larry W. George, *Public Rights in West Virginia Watercourses: A Unique Legacy of Virginia Common Lands and the "Jus Publicum" of the English Crown*, 101 W. VA. L. REV. 407, 441-45 (1998).

⁷¹ *See* Hart, *supra* note 66, at 461-69.

⁷² *E.g.*, *Pyle v. Gilbert*, 265 S.E.2d 584 (Ga. 1980). However, the watershed rule continues to surface in new contexts. In 1994, Florida created a commission to review its water management law, which has liberal transbasin transfer rules. Water-rich counties convinced the commission to recommend to the legislature that local sources be favored. Before a transbasin diversion could be authorized, the water management district with authority to authorize the transfer would have to consider the proximity of the source to the proposed destination and the availability of alternative sources of water. Two commentators have characterized the recommendation as "a partial revival of the common-law rule that prohibited the diversion of water to use on nonriparian lands." Marcia Penman Parker & Sally Bond Man, *Water Management Reform: Mission Impossible?*, FLA. B.J., Oct. 1996, at 20, 28.

⁷³ NAT'L WATER COMM'N, A SUMMARY-DIGEST OF STATE WATER LAWS 789 (Richard Dewsnap & Dallin W. Jensen eds., 1973); Marilyn E. Lugar, *Water Law in West Virginia*, 66 W. VA. L. REV. 191, 197-201 (1964).

⁷⁴ The reasonable use rule for surface drainage was adopted in *Morris Associates, Inc. v. Priddy*, 383 S.E.2d 770 (W. Va. 1989). *See also* *Graham v. Beverage*, 566 S.E.2d 603 (W. Va. 2002); *Whorton v. Malone*, 549 S.E.2d 57 (W. Va. 2001).

⁷⁵ *See infra* notes 197-202.

flow.⁷⁶ Utilities were afraid that the natural flow theory would block access to water by preventing the construction of dams and reservoirs, and contribute to the monopolization of the resource by downstream users. California voters amended the constitution to adopt the reasonable use theory. The reasonable use doctrine replaced the natural flow doctrine and allowed the appropriation of surplus water, water beyond that used by riparians, for storage and use outside the watershed.⁷⁷ Today, it is doubtful if the natural flow theory still survives,⁷⁸ although the United States Forest Service, as a riparian landowner, has been awarded instream flow rights in California.⁷⁹

Apart from navigation enhancement, the federal government played a limited role in the nineteenth century. The federal role in water use expanded in the twentieth century when the ravages of floods and the failure of the states and private capital to sustain an irrigation society resulted in the federal reclamation program in the West and the construction of flood control levees and reservoirs throughout the country. However, the federal role had a limited impact on state law. Irrigation and flood control projects were constructed “over” the existing superstructure of state-created water rights, and the assumption was that the public interest in water use was best served by the federal government backstopping state water rights. During the dam building era, which lasted until the late 1960s, the lesson that private choice must always be measured against the standard of social utility remained embedded in water law. However, it was largely submerged because supply augmentation solved most potential conflicts through dams and reservoirs and immunized states from making hard uses.

B. *The Common-Law Legacy*

The Mill Acts represented the major legislative reform in the East until the 1950s when states began a round of legislative modification. Until the mid-twentieth century, the state government interest in water was primarily to the creation of entitlements and to insure that water was never an impediment to

⁷⁶ *Herminghaus v. S. Cal. Edison Co.*, 252 P. 607 (Cal. 1926).

⁷⁷ CAL. CONST. art. X, § 2; see Clifford W. Schultz & Gregory S. Weber, *Changing Judicial Attitudes Towards Property Rights in California Water Resources: From Vested Rights to Utilitarian Reallocations*, 19 PAC. L.J. 1031 (1988).

⁷⁸ There is no right to the natural flow under the reasonable use theory. Recreational use and a limited right to view are reasonable uses, but, to prevail against other users, a riparian must prove that there has been a total destruction of the use. *City of Los Angeles v. Aitken*, 52 P.2d 585 (Cal. Ct. App. 1935) (loss of view). Under the reasonable use theory, a riparian may not claim a right to the natural or uninterrupted or unaltered flow for recreational use or view. See *Intracoastal N. Condominium Ass’n v. Palm Beach County*, 698 So. 2d 384 (Fla. Dist. Ct. App. 1997); *Dunlap v. N.C. Power & Light*, 195 S.E. 43 (N.C. 1938); *In re Buttolph*, 527 A.2d 1147 (Vt. 1987). But see *Alburger v. Phila. Elec. Co.*, 535 A.2d 729 (Pa. Commw. Ct. 1988) (holding that discharge of imported water into stream violated rights of down-stream riparians to unaugmented flow).

⁷⁹ *In re Water of Hallett Creek Stream Sys.*, 749 P.2d 324 (Cal. 1988).

growth. When the states did reform, they retained the common law as the background and default rule. West Virginia has not yet joined the reform movement and therefore is a classic example of a pure common-law state. This section examines the basic structure of the common law of riparian rights with emphasis on West Virginia. Riparian rights are often criticized as unsuited for the needs of water allocation for two reasons: (1) rights are too inchoate to induce long-term investment, and (2) rights are too tightly tied to land.

1. Inchoate Rights

Riparian rights are generally characterized as inchoate because it is difficult to predict in advance whether a use will be classified as reasonable or unreasonable. They are inherently unstable because they arise by virtue of the ownership of land bordering a watercourse, and thus do not have to be put to use. In theory, a riparian can exercise the right at any time⁸⁰ and displace prior uses.⁸¹ Riparian rights are also difficult to measure in advance because they are correlative; the amount of water to which a riparian is entitled is a function of the uses being made by other riparians. Thus, each individual right must be exercised with due regard for its impact on other users. Starting in the nineteenth century, per se property rules, which presumed injury from any diminution in flow, were replaced with tort-like rules, which compare the reasonableness of competing uses and limit relief to proof of substantial injury. Thus, reasonableness, like nuisance law, is entirely contextual.⁸² A use only becomes potentially unreasonable when another user is substantially injured.⁸³ The balancing test articulated by courts is seldom actually used because it can lead to unfair or incoherent results. For example, the California Supreme Court once held that a dam could wipe out a downstream gravel business because it “sub-serves *no* public policy.”⁸⁴

The situation with respect to groundwater is worse because the common-law rules all encourage unlimited capture. Most states replaced the “Eng-

⁸⁰ Because riparian rights may be exercised at any time, it is theoretically possible for a present upstream riparian use to be enjoined in order to protect the future needs of a downstream riparian use, *see* *Pyle v. Gilbert*, 265 S.E.2d 584 (Ga. 1979), but the few dual riparian-appropriation systems are limiting this possibility. *See, e.g., In re Water of Long Valley Creek Sys.*, 599 P.2d 656 (Cal. 1979). The natural flow has generally been replaced by regulated riparianism.

⁸¹ *Harris v. Brooks*, 283 S.W.2d 129 (Ark. 1955).

⁸² RESTATEMENT (SECOND) OF TORTS § 850A (1979).

⁸³ The importance of injury is illustrated by *Edmondson v. Edwards*, 111 S.W.3d 906 (Mo. Ct. App. 2003). The court affirmed an injunction against an upstream recreational dam that dried up a stream used by a downstream riparian for livestock watering because “[t]he use to which defendants sought to put the stream was not reasonable in that it diverted the natural watercourse on defendants’ property to the exclusion of its long-standing use on plaintiff’s property.” *Id.* at 910.

⁸⁴ *Joslin v. Marin Mun. Water Dist.*, 429 P.2d 889, 894 (Cal. 1967) (emphasis in original).

lish rule,” which allows unlimited pumping except in rare cases of malicious or totally wasteful pumping, with the “American” reasonable use rule.⁸⁵ In theory, use is limited to land overlying an aquifer,⁸⁶ but in practice the rule allows cities to transport water away from the aquifer, provided that they compensate small pumpers whom they dewater. The Restatement (Second) of Torts § 858 modified the reasonable use rule and requires large private pumpers to compensate smaller users when the water table is substantially lowered.⁸⁷

2. Water Tied to Land

The common law of water rights is conventionally characterized as a land-based water allocation system. A riparian right is a natural,⁸⁸ usufructuary property right to use a portion of the natural flow of a watercourse. Such rights are limited to the ownership of land that abuts a stream.⁸⁹ The core idea of riparianism holds that in situ uses are the norm and ex situ ones the exception, if permitted at all.⁹⁰ A 1913 West Virginia case held that the use of water on non-riparian land was per se unreasonable, even though the complaining riparian could not prove any actual damage.⁹¹

⁸⁵ West Virginia adopted the groundwater reasonable use rule, which is different from the surface water reasonable use rule, in 1905. *Pence v. Carney*, 52 S.E. 702 (W. Va. 1905). The reasonable use groundwater rule is not a sharing rule. It gives overlying pumpers the right to make unlimited, non-malicious withdrawals. Extraction for use on non-overlying land is subject to either an injunction or the compensation of overlying pumpers.

⁸⁶ *Higday v. Nickolaus*, 469 S.W. 2d 859 (Mo. Ct. App. 1971).

⁸⁷ See, e.g., *Cline v. Am. Aggregates Corp.*, 474 N.E.2d 324 (Ohio 1984). The *Restatement* provides in pertinent part as follows:

- (1) A proprietor of land or his grantee who withdraws ground water from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water by another, unless
 - (a) the withdrawal of ground water unreasonably causes harm to a proprietor of neighboring land through lowering the water table or reducing artesian pressure,
 - (b) the withdrawal of ground water exceeds the proprietor's reasonable share of the annual supply or total store of ground water, or
 - (c) the withdrawal of the ground water has a direct and substantial effect upon a watercourse or lake and unreasonably causes harm to a person entitled to the use of its water.

RESTATEMENT (SECOND) OF TORTS § 858 (1979).

⁸⁸ NAT'L WATER COMM'N, *supra* note 74, at 32.

⁸⁹ The leading West Virginia case is *Roberts v. Martin*, 77 S.E. 535, 536 (W. Va. 1913), declaring that the right exists *jure naturae* as an incident to ownership of a parcel of the land.

⁹⁰ See Lynda Butler, *Allocating Consumptive Water Rights in a Riparian Jurisdiction: Defining the Relationship Between Public and Private Interests*, 47 U. PITT. L. REV. 95 (1987).

⁹¹ *Roberts*, 77 S.E. 535.

The in situ preference is reinforced by the watershed rule, which limits uses to those within a stream's watershed, or at least gives users in the watershed a preference over users outside the watershed. The watershed rule historically limited use to riparians within a watershed. As a corollary to the natural flow rule, courts distinguished between riparian and non-riparian uses. All uses outside the watershed were per se non-riparian and could be enjoined without a showing of actual injury. The prohibition, which barred each riparian from diminishing the natural flow of the stream to the detriment of riparians downstream from the impairment, has increasingly eroded. Two important New Deal Supreme Court precedents illustrate. First, *Iowa Hydro-Electric Cooperative v. Federal Power Commission*⁹² held that the Federal Power Act impliedly preempted state water law, and thus Iowa could not apply a watershed protection statute to bar an FPC licensee from making a trans-watershed diversion. *Connecticut v. Massachusetts* held that there was no per se watershed rule in the law of interstate equitable apportionment.⁹³ Today, non-riparian uses are generally prohibited only if they injure a riparian use.

3. West Virginia: The Merits of Underdevelopment

The consistent theme of the limited analysis of West Virginia water law is that the common law is undeveloped and derivative of other states but consistent with the general common law of riparian rights.⁹⁴ In addition, West Virginia case law has remained relatively static.⁹⁵ This lack of under-legal development is usually perceived as a detriment because uncertainty deters investment in water-dependent activities. However, West Virginia's undeveloped law need not be a detriment for two related reasons. First, the lack of clarity and paucity of cases mean that few investment-backed expectations to use water could have arisen. Thus, the state has a great deal of flexibility to redefine entitlements through a permit system. Second, the lack of firm, existing entitlements gives the state great flexibility to allocate its water between consumptive and non-consumptive uses.

⁹² 328 U.S. 152 (1946). The result was foreshadowed in *Oklahoma ex rel Phillips v. Guy F. Atkinson Co.*, 313 U.S. 508 (1941), which held that Congress could construct a multi-purpose reservoir with disproportionate benefits to the down rather than upstream state.

⁹³ 282 U.S. 660 (1931).

⁹⁴ See, e.g., NAT'L WATER COMM'N, *supra* note 73, at 783; Lugar, *supra* note 73.

⁹⁵ In 1964, Professor Lugar described the West Virginia law of artificial watercourses as "not settled." Lugar, *supra* note 73, at 205. In 1991, the Supreme Court held that the littoral owner of ninety-eight percent of an artificial lake had the right to exclude the owner of two percent from the use of his portion of the lake. *Ours v. Grace Properties, Inc.*, 412 S.E.2d 490 (W. Va. 1991).

IV. EASTERN WATER LAW REFORM

A. *Drought and Water Law Reform*

Prolonged drought cycles in the East usually set off a round of water law reform. The specter of prolonged drought is not a fact of life in the East as it is in the West,⁹⁶ but drought episodes do occur.⁹⁷ Since the 1950s, many eastern states have modified the common law by adopting some, usually weak, form of regulation. Over time, the patchwork of new laws has been called regulated riparianism.⁹⁸ At the present time, the approaches taken in the East range from that of states such as Illinois and West Virginia, which remain primarily common law states, to that of states such as Connecticut,⁹⁹ Florida,¹⁰⁰ Iowa,¹⁰¹ Minnesota,¹⁰² and Virginia,¹⁰³ which have adopted relatively comprehensive permit systems. Many other states have more limited, incomplete regulation. Eastern water law reform inevitably raises the question of whether the eastern states should adopt the harder property regimes and comprehensive regulation that characterize the West. The questions in eastern water law reform have traditionally been limited to: (1) whether the state should switch from judicial to permit allocation, and (2) if so, what kind of permit system the state should adopt.¹⁰⁴ This section addresses the first issue, and the next section addresses the second. The case for a permit must be addressed from the perspective of the user community and the state as trustee for the public interest. The primary case for a permit system is that it benefits both the user community and the state. Permits, or water licenses, as they are often called, transform an inchoate and completely uncertain water right into a more secure one. They also give the

⁹⁶ For an extensive analysis of the history of drought in the Great Plains and related areas, see Connie A. Woodhouse & Jonathan T. Overpeck, *2000 Years of Drought Variability in the Central United States*, 79 BULL. AM. METEOROLOGICAL SOC'Y 2693 (1998).

⁹⁷ West Virginia experienced drought conditions in 2001-2002. See Press Release, U.S. Geological Survey, U.S. Dep't of the Interior, Drought Extends to West Virginia (Mar. 13, 2001) <http://www.wv.er.usgov/drought/marpress.htm>.

⁹⁸ The term has begun to have judicial acceptance. See, e.g., *City of Waterbury v. Town of Wash.*, 800 A.2d 1102, 1149 (Conn. 2002).

⁹⁹ CONN. GEN. STAT. ANN. §§ 22a-365 to -380 (West 1995 & Supp. 2004).

¹⁰⁰ FLA. STAT. ANN. §§ 373.216 to .229 (West 2000).

¹⁰¹ IOWA CODE ANN. §§ 455B.261 to .281 (West 1996 & Supp. 2003).

¹⁰² MINN. STAT. ANN. §§ 103G.001 to .315 (West 1997 & Supp. 2004).

¹⁰³ See *infra* notes 180-81 and accompanying text.

¹⁰⁴ The existence of a permit system is the central feature of regulated as opposed to common-law riparianism. See generally Joseph W. Dellapenna, *Regulated Riparianism*, in 1 WATERS AND WATER RIGHTS ch. 9 (Robert E. Beck ed., 1991 ed., repl. vol. 2001).

state control over new water uses, especially those that threaten to disrupt established use patterns or ecosystems.

1. The User Community

Given the uncertainty and incoherence of riparian rights, the merits of a permit system for users ought to be self-evident. As previously discussed, it is impossible to predict the amount of water each riparian is entitled to use in the abstract. Groundwater rights are even more uncertain because in many states there are either no or only minimal restraints on pumping. In contrast, permits enhance rather than impair correlative rights by firming them up.¹⁰⁵ Judicially enforced water rights permit users to withdraw water first and then face the risk of a lawsuit that seeks to curtail the use. Permit rights provide greater assurance that future claimants will not be able to curtail or displace an existing use and better define the drought risks that a permit holder may face. In the West, the benefits of a permit system have long been accepted and their constitutionality firmly established.¹⁰⁶ Nonetheless, the adoption of permit systems has been controversial in the East because the risk of a curtailed common-law water right has been minimal and the costs of compliance high relative to the perceived benefits. For this reason, major user groups such as agriculture have long resisted permit systems.

2. The State Interest

States gain four direct advantages from a permit system: (1) information about alternative water uses, (2) control over alternative water uses, (3) the ability to balance supply with demand to prevent over-use of stressed supplies, and (4) the ability to decide what percentage of the state's waters are open to consumptive use and which are reserved for heritage conservation. State control can take many forms, from monitoring use to planning and management. The first step in rational water planning is good data that includes the state's average annual supply and the amount of consumptive and non-consumptive use. For some states, this may be a sufficient use of a permit system. The most aggressive use of a permit system is to subject new uses and major re-allocations to public interest review, which is a fairer way to assert the state interest than ad hoc lawsuits asserting the California-Hawaii public trust doctrine.

The public trust doctrine hovers over many water rights because it permits a court to displace prior uses. Some states, notably California¹⁰⁷ and Ha-

¹⁰⁵ See *Ohio Oil Co. v. Indiana*, 177 U.S. 190 (1900).

¹⁰⁶ See *Farm Inv. Co. v. Carpenter*, 61 P. 258 (Wyo. 1900) (finding the state permit system was not an unconstitutional delegation of judicial power to a non-judicial agency).

¹⁰⁷ See *Nat'l Audubon Soc'y v. Superior Court*, 658 P.2d 709 (Cal. 1983).

waii,¹⁰⁸ hold that vested water rights are subject to the public trust. This judicial doctrine permits a court to balance the environmental and consumptive values of water use and, in some states, to require that consumptive uses of navigable waters be subordinated to the ecosystem maintenance if it considers an administrative balancing inconsistent with trust obligations. The celebrated Mono Lake case invoked the trust to reduce the Los Angeles Department of Water and Power's diversions from a tributary of the lake, and Hawaii invoked it to limit potentially Honolulu's use of water from an abandoned sugar ditch.

A strong permit system also helps shore up state control of transboundary waters, although it can not guarantee such control. West Virginia is a headwaters state. Its seven river basins, the Kanawha, Monongahela, Potomac, Guyandotte, Big Sandy, Tug Fork, and Ohio, drain all points of the compass and flow into five states. However, "higherority" is not priority. States have only partial control over waters originating or flowing through their boundaries. Under the law of equitable apportionment, interstate rivers must be shared with co-riparians. Thus, each state has a right to use a percentage of the waters. Like riparian rights, interstate rights remain inchoate until they are quantified by Supreme Court decree through an equitable apportionment, an interstate compact, or Congressional apportionment.¹⁰⁹ Equitable and compact apportionments are governed by federal law. However, the Supreme Court starts from the assumption that existing uses should be respected. Thus, a strong, effective state regulatory program can help to define the state's equitable share, although this is no guarantee that a state claim will be recognized by the Supreme Court or Congress.

Finally, a permit system can also help a state defend against Dormant Commerce Clause challenges to its water allocation decisions. The Supreme Court has further held that water rights are articles of interstate commerce, and thus are subject to the Dormant Commerce Clause.¹¹⁰ *Sporhase v. Nebraska ex rel. Douglas* invalidates any statute that flatly prohibits all interstate transfers,¹¹¹

¹⁰⁸ *In re Water Use Permit Applications*, 9 P.3d 409 (Haw. 2000) (regarding sugar irrigation ditches in Hawaii). See CAROL WILCOX, SUGAR WATER: HAWAII'S PLANTATION DITCHES 98-113 (1976), for a history of the Waiahole Ditch. My good friend David Callies, Benjamin J. Kudo Professor of Law at the University of Hawaii, believes this administrative decision poses a substantial risk to urban water suppliers in the state, in effect substituting a preference for aquatic ecosystems for domestic use. See David L. Callies & J. David Breemer, *Selected Legal and Policy Trends in Takings Law: Background Principles, Custom and Public Trust "Exceptions" and the (Mis)Use of Investment-Backed Expectations*, 36 VAL. U. L. REV. 339 (2002).

¹⁰⁹ See A. DAN TARLOCK, ET AL., WATER RESOURCE MANAGEMENT ch. 10 (5th ed. 2002).

¹¹⁰ *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941 (1982).

¹¹¹ El Paso, Texas applied for a permit to export New Mexico groundwater; New Mexico denied it because state law prohibited out of state transfers. To defend the constitutionality of its law, the state raised a sophisticated "conservation" defense based upon confusing language in Justice Stevens' opinion in *Sporhase* that suggested states could hoard water in cases of necessity. No immediate shortages existed in the state, but New Mexico argued that it could retain all water within its borders to protect future generations' community value defense. "Outside of fulfilling

but it does not per se invalidate all decisions to prefer in-state versus out-of-state uses.¹¹² If a state wishes to defend giving in-state users preference over out-of-state users, it must have a strong rationale supported by an effective conservation regime.

B. Why Can't the East Be More Like the West?

Western water law has often been proposed as the model for eastern water law reform. Until the post World War II boom, the West had a massive inferiority problem. The East looked down on it as a semi-civilized place. However, water policy was a different story. Westerners have long believed that their long, hard trial and error experiments with water allocation give them an exclusive monopoly on water management and law, and have articulated this position with religious zeal. All other legal systems are heresy or false religions. To a Westerner, eastern water law regimes are faux permit systems. They do not create secure property rights because the terms are short and there is a theoretical risk of a sudden reduction in the amount, which, in contrast to a priority right, is difficult to calculate in advance.¹¹³ The law of prior appropriation was seen as the only true legal doctrine. All water issues in the humid East

human survival needs, water is an economic resource.” *City of El Paso v. Reynolds*, 563 F. Supp. 379, 389 (D.N.M. 1983). No “demonstrably arid” state can meet this narrow standard, so New Mexico amended its statute to permit extensive public interest review of both intra and interstate appropriation and transfer applications. N.M. STAT. ANN. §§ 72-6-3, 72-12B-1 (Michie 1997 & Supp. 2003).

¹¹² El Paso persevered in its challenge and New Mexico earned a *second federal district court decision*, which suggested that public interest review may preserve some degree of state sovereignty. *City of El Paso v. Reynolds*, 597 F. Supp. 694 (D.N.M. 1984). El Paso argued against allowing for the risks of shortages; the state again defended its action as the protection of community water values. *Id.* at 696-99. The district court refused to equate Justice Stevens’ necessity defense with the conservation of supply for future demand and rejected the argument that a state determination whether the proposed transfer is contrary to “the conservation of water within the state and is not otherwise detrimental to the public welfare of the citizens of New Mexico” was unconstitutional. *Id.* at 697 (quoting N.M. STAT. ANN. § 72-12B-1). The district court took a more generous view of the state’s power to prefer its own citizens: “New Mexico need not wait until the appropriate time and place of shortage arises to enact a statute limiting exports.” *Id.* at 701. El Paso prevailed only on the argument that the statute discriminated against interstate commerce. *Id.* The court held that a state may not require interstate commerce to shoulder the entire burden of furthering conservation and other interests. *Id.* Thus, the application of conservation and public welfare standards only to out of state transfers discriminated against out of state users. *Id.* at 701. New Mexico eventually denied the application because El Paso had not demonstrated a need for the water. In 1989, El Paso started to back away from its policy that Hueco Bolson water is the only available source of supply, and the city is moving toward a more sophisticated water supply policy that relies more on the reallocation of local agricultural supplies. See A. Dan Tarlock & D’arcy Alan Frownfelter, *State Groundwater Sovereignty After Sporhase: The Case of the Hueco Bolson*, 43 OKLA. L. REV. 27, 35-44 (1990). In 1991, the litigation ended when El Paso withdrew its state applications. TARLOCK ET AL., *supra* note 109, at 101.

¹¹³ See, e.g., Richard Ausness, *Water Rights Administration in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547 (1983).

would be solved if the states would convert to prior appropriation. But the East has been a continual disappointment to the West. Mississippi converted in 1956 and then apostatized in 1985.¹¹⁴ Other states continually study prior appropriation, flirt with the idea, but never submit to the actual baptism. Influential easterners have long seen prior appropriation as the devil incarnate, or at least as a primitive, pagan system, and this tradition continues today.¹¹⁵

All permit systems reflect a tension between the interests of water users in secure, perpetual, and well-defined entitlements and the state, which may have a broader perspective. The West has always favored security over broader interests, while the East has had less need to resolve the tension, but remained convinced that the West had tilted too far in the direction of security. The heart of the traditional debate about Eastern water law reform is how to strike the balance between security and the broader state interest, and westerners and easterners continue to have sharp differences about how the balance should be struck.

In the 1960s and 1970s, two reigning titans of water law, Frank Maloney, Dean of the School of Law at the University of Florida, and Frank J. Trelease, the Dean of the College of Law of the University of Wyoming and dean of western water lawyers until his death in 1986, personified the debate. As an alternative to prior appropriation, Dean Maloney drafted a Model Water Use Code, which Florida largely adopted in the 1972 Water Resources Act.¹¹⁶ Dean Trelease harshly criticized it in his famous article, *The Model Water Code, the Wise Administrator and the Goddam Bureaucrat*.¹¹⁷ Dean Maloney dismissed prior appropriation as inefficient and unfair. He also anticipated the basic environmental criticism of western water law: Too much water is locked into low value agricultural uses through perpetual permits that give each user the right to take his full amount as long as senior users are not injured at the expense of in-stream values. Under prior appropriation, the fact that a stream is dewatered during periods of low flow is irrelevant; it simply shows the system at work. Instead, he proposed that water be allocated by twenty-year permits and that administrators be given the power to reallocate water in times of shortage. To Dean Trelease, this approach was simply “the substitution of . . . administrative uncertainties” for the widely admitted defects of the common law of riparian rights with no offsetting public benefits.¹¹⁸

¹¹⁴ MISS. CODE ANN. §§ 51-3-1 to -55 (Lexis 2003).

¹¹⁵ See Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 8, 21 (2002).

¹¹⁶ FRANK MALONEY ET AL., A MODEL WATER CODE (1972). Florida opted for a regional rather than state-wide regulatory and planning structure. See Charles R. Fletcher, *Florida Water Resources Development: A Call for Statewide Leadership*, 18 J. LAND USE & ENVTL. L. 113 (2002).

¹¹⁷ Frank J. Trelease, *The Model Water Code, the Wise Administrator and the Goddam Bureaucrat*, 14 NAT. RESOURCES J. 207 (1974).

¹¹⁸ *Id.* at 216.

The first major battleground of the flexible permit versus secure rights war was the *Restatement (Second) of Torts*. Most people would classify water rights as a sub-branch of property, but like nuisance, it is claimed by both teachers of torts and property, and the *Restatement of Torts* was awarded water. The case for including riparian rights in the *Restatement of Torts* is that the few riparian rights cases that involve conflicting claims are damage suits for the loss of a long enjoyed flow. The common-law reasonable use rule, codified in the *Restatement (First) of Torts*, permitted courts to engage in a broad balancing of the comparative social utilities of the two uses.¹¹⁹

Dean Trelease was appointed an Associate Reporter for water rights. Building on earlier scholarship,¹²⁰ he argued that, in fact, courts seldom engage in such a balancing, and when they do, they often reach arbitrary results¹²¹ or try to use categories such as natural versus artificial to avoid balancing.¹²² The real variable, he argued, was often the protection of established uses, and he persuaded the American Law Institute to adopt section 850A, which makes “the protection of existing values of water uses, land, investments and enterprises” a relevant factor in the determination of reasonableness.¹²³ He was subsequently attacked for the sin of sullyng the common law of riparian rights with prior appropriation.¹²⁴ However, reasonableness is no longer an open-ended and impossible balancing of the comparative utility of the competing uses, but rather focuses on the social and economic value of the plaintiff’s use.

The issue has become largely, but not completely, moot for three related reasons. First, courts have not embraced the principle of protection of existing values, although one can continue to find cases where this is done.¹²⁵ Neither the annotations to the *Restatement (Second) of Torts* nor a search of electronic databases has turned up a case where it was applied to protect an established

¹¹⁹ RESTATEMENT OF TORTS §§ 851-853 (1938), reprinted in FRANK J. TRELEASE, WATER LAW: CASES AND MATERIALS (1967).

¹²⁰ J.H. Beuscher, *Appropriation Water Law Elements in Riparian Doctrine States*, 10 BUFF. L. REV. 448 (1961).

¹²¹ The leading example remains *Joslin v. Marin Municipal Water District*, 429 P.2d 889 (Cal. 1967), which found no liability where an upstream dam reduced downstream gravel flow because use of the stream to carry gravel was an unreasonable use, as there was no public policy in favor of gravel mining.

¹²² See, e.g., *Kundel v. Vir-Jo Farms, Inc.*, 467 N.W.2d 291 (Iowa Ct. App. 1991) (holding that livestock watering was a natural use and thus preferred to creation of artificial wetland because the latter use was artificial).

¹²³ RESTATEMENT (SECOND) OF TORTS § 850A (1979).

¹²⁴ Joseph W. Dellapenna, *Introduction to Riparian Rights*, in 1 WATER AND WATER RIGHTS, *supra* note 104, § 6.01(c).

¹²⁵ See, e.g., *City of Waterbury v. Town of Wash.*, 800 A.2d 1102 (Conn. 2002) (stating that Connecticut became a regulated riparian state in 1982, but that a city may obtain prescriptive rights based on “mere presence” of a dam over twenty years because the state followed the natural flow theory prior to 1982, when the state modified the natural flow doctrine by statute).

use. Second, the common law of riparian rights is becoming less and less of a rule of allocating limited supplies among consumptive users. The law of riparian rights is increasingly a law of non-consumptive uses, a law of lakefront property rights and submerged land development. The cases deal with the reasonableness of pier location, the right to use lake surfaces,¹²⁶ and the right to develop submerged lands.¹²⁷ Third, the adoption of some type of permit system has shifted the venue for many conflicts from the courts to administrative agencies.

The increasing regulation of water use has nonetheless kept the debate alive. Professor Joseph Dellapenna has assumed the late Dean Maloney's role. Prior appropriation is portrayed as primitive, inflexible, vigilante law¹²⁸ that fosters premature development, results in an inefficient all-or-nothing result as opposed to a more efficient risk pooling,¹²⁹ and remains unsuited for "an economically mature, humid, eastern state."¹³⁰ It is conceptualized as a system fundamentally different from the regulated riparianism that the eastern states are adopting. Westerners have taken up the late Frank Trelease's role as the defender of prior appropriation, but the "post-modern" defense is more subtle. Modern defenders stress that both systems of water law are forms of administrative regulation that create incomplete property rights subject to public interest limitations.¹³¹ They also stress that prior appropriation is a flexible doctrine that permits sharing through transfers and water banks. However, the conclusion is the same. The East would be better off with prior appropriation compared to ad hoc administrative reallocation.¹³²

C. *The Deeper Lessons of the Appropriation Versus Regulated Riparianism Debate*

The appropriation versus regulated riparianism debate has broader lessons for the East once one moves beyond the fixation with priority. Many of these have already been adopted in the East, but there is value in stating them explicitly.

¹²⁶ See, e.g., *Beacham v. Lake Zurich Prop. Owners Ass'n*, 526 N.E. 2d 154 (Ill. 1988).

¹²⁷ See, e.g., *City of Orange Beach v. Benjamin*, 821 So. 2d 193 (Ala. 2001) (holding that dedicated street adjacent to cove vested riparian rights in city under statute providing that dedication of property to the public was a conveyance in fee simple, and thus pier constructed by property owner abutting road landward of cove was illegal).

¹²⁸ Dellapenna, *supra* note 115, at 21.

¹²⁹ *Id.* at 23-29.

¹³⁰ *Id.* at 31.

¹³¹ See, e.g., George A. Gould, *A Westerner Looks at Eastern Water Law: Reconsideration of Prior Appropriation in the East*, 25 U. ARK. LITTLE ROCK L. REV. 89, 92-98 (2002).

¹³² *Id.* at 104-08.

1. Geography is Destiny

Prior appropriation is often thought of as being similar to Swiss Wine: It does not travel well. There is considerable truth in this, but one must distinguish between adoption of the system in toto and adaptation of the underlying principles of the doctrine to a region of water abundance. Theories of geographical determinism have waxed and waned over the years, but the first lesson that western water law teaches is that law is a product of the experience of adapting to a specific climate and landscape. The West had to deal with a variable climate that posed, and continues to pose, substantial risk of long-term shortages. Intensive consumption was deemed necessary to sustain a region plagued by boom and bust cycles. The problem was how to develop a rule that allocated the risk of shortage in a predictable, and thus fair, manner. Drought is not unknown in the East, but it is much more short-lived.

The eastern states have always had large margins of reserves to offset the risk of overuse. Nature has endowed the East with sufficient water to maintain ecosystem service and to support considerable future growth. Humid states can be analogized to “super-clean” areas designed under the Prevention of Significant Deterioration program of the Clean Air Act.¹³³ The assumption should be that most of the water will be left in place, and that a relatively small increment will be consumed. In contrast, the West is a Clean Air Act Non-Attainment Area.¹³⁴ Too much water is consumed given the available supply, and existing uses must be “rolled-back” to achieve environmentally sustainable use patterns. The East faces, therefore, the subtler but equally challenging problem of what to do with its unconsumed increments. The lesson that should be drawn is that the East needs to replace indifference with a more sustainable allocation regime that recognizes that “use” includes both consumptive and non-consumptive uses, and that the baseline for water management should be the maintenance of existing flow functions.

The emerging “soft” regime that controls the use of the waters of the Great Lakes provides an example of the adoption of the existing hydrograph of a water body as the baseline. Since the 1980s, the Great Lakes governors, along with their Canadian provincial counterparts, have been trying to develop a regulatory regime to prevent or substantially limit out-of-basin diversions. In the late 1990s, they hired a western water lawyer who recommended that the states enter into an interstate compact to allocate the lakes among themselves. The recommendation viewed the lakes as an open access commons with highly uncertain entitlements and recommended a compact to create secure state entitlements. There is a legal regime in place, consisting of both hard and soft (non-binding) law, which has the net effect of allocating the lakes almost exclusively to the existing non-consumptive uses: navigation, recreation, and ecosystem

¹³³ 42 U.S.C. §§ 7470-79 (2000).

¹³⁴ *Id.* § 7407(d).

conservation. The regime imposes a high burden on new, especially large, consumptive users to justify a departure from the baseline.¹³⁵ As the 2000 International Joint Commission report on Great Lakes diversions concluded:

If all interests in the Basin are considered, there is never a 'surplus' of water in the Great Lakes system; every drop of water has several potential uses, and trade-offs must be made when, through human intervention, waters are removed from the system. Environmental interests, for example, require fluctuations between high and low levels to preserve diversity.¹³⁶

2. Harder Property Rights Are Needed in the East to Prevent the Tragedy of the Commons

The basic criticism of the common law of riparian rights is that its inchoate nature creates an open access commons. The common law encourages unlimited present use because the risk of a successful lawsuit by other riparians is generally small and worth assuming. All critics of the common law agree that water users and the state would be better off with more certain rules.¹³⁷ Secure water rights promote investment, provide clear default rules for the negotiated settlement of conflict, and permit the reallocation of water through the market. The argument that the prior appropriation system creates too inflexible rights is actually a debate about how best to incorporate the state interest. My argument is simply that if one accepts the need for some level of greater security in the form of a permit system, one cannot avoid some form of priority system.

If priority did not exist it would have to be invented. There are few instances in society where we think it fair to just to displace the first claimant with a subsequent one. First come, first served is a societal norm with deep roots. When we reject priority, we require a substantial justification. For example, late arriving elite frequent flyers can sometimes bump early arriving but lower or non-elite standbys because the airline can create strong investment-backed expectations in the former. Similarly, when we bump a prior water right, it is to correct a major flaw in the allocation system. The California-Hawaii public trust doctrines, discussed earlier, illustrate this. In the end, the trust is unlikely

¹³⁵ See A. Dan Tarlock, *How Well Can International Water Allocation Regimes Adapt to Global Climate Change?*, 15 J. LAND USE & ENVTL. L. 423, 437-43 (2000).

¹³⁶ INT'L JOINT COMM'N, PROTECTION OF THE WATERS OF THE GREAT LAKES: FINAL REPORT TO THE GOVERNMENTS OF CANADA AND THE UNITED STATES (2000), available at http://www.iigr.ca/pdf/documents/406_Protection_of_the_Waters.pdf.

¹³⁷ Miguel Solanes, *Water: Rights, Flexibility and Governance: A Balance That Matters?* 3 (2002) (unpublished manuscript prepared for Third World Water Forum, Kyoto, Japan 2003) (on file with the author) (reporting that the lack of secure water rights impeded investment in needed new agriculture in Zimbabwe long before the present political instability).

to be invoked only if a prior use threatens to destroy an entire aquatic ecosystem subject to the trust.¹³⁸

The adoption of any permit system will require the protection of prior uses. For example, Florida's Water Management Act expressly makes non-interference with the presently existing uses one of the three criteria for the issuance of a permit. A Florida intermediate court of appeals substantially reduced the amount of water granted to an agricultural user to protect pressure levels in an existing well field from a 1.7-foot drop. Existing users enjoyed "superiority" over new applicants.¹³⁹

3. Priority is a Default Rule, Not a Bright Line Rule

The role of priority in water allocation is often misunderstood. The debate about priority enforcement is like the nuclear war debates of the 1950s and '60s. Endless worst-case scenarios were constructed to plan for different contingencies. Actual cases of priority enforcement do exist, especially during periods of prolonged drought, but in most cases the market or custom is used to blunt the potentially harsh aspects of priority.¹⁴⁰ Front Range water users in Colorado are familiar with the need to introduce flexibility in the priority system. Most of Colorado's compact share of the Colorado River is diverted to the eastern slope to serve farmers and cities. However, these upstream water rights are junior to a western slope power plant near Glenwood Springs, and eastern slope diverters such as the Northern Colorado Conservancy District, which gets water from the Colorado Big Thompson project, are concerned that the senior will make a call in a low water year and deprive the project of needed upstream water. The project and the city of Denver have offered to pay the power plant's owner for the lost energy to avoid the call.¹⁴¹

¹³⁸ *State Water Resources Control Bd. Cases*, No. JC 4118 (Cal. Super. Ct. Feb. 27, 2003), Proposed Statement of Decision at 80 (noting that the public trust is limited to the failure of any responsible body to consider the impact of diverting the entire flow of a navigable stream).

¹³⁹ *Harloff v. City of Sarasota*, 575 So. 2d 1324, 1328 (Fla. Dist. Ct. App. 1991). See also the discussion of *Edmondson v. Edwards*, 111 S.W.3d 906, 910 (Mo. Ct. App. 2003), *supra* note 83.

¹⁴⁰ I developed this argument at length in A. Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881 (2001) and *The Future of Prior Appropriation in the West*, 41 NAT. RESOURCES J. 769 (2001). I now get e-mails from water lawyers all over the West with examples of priority enforcement. See, e.g., *Irrigators Cut Off from Canal Water*, OMAHA WORLD-HERALD, July 22, 2003, at 2D (reporting cutoff of post-1889 rights holders in Nebraska panhandle), 2003 WL 5277205.

¹⁴¹ *Northern Colorado Water Conservancy District*, WATER NEWS, Apr. 2003, at 19.

4. Water Rights Are Private Entitlements Subject to the Public Interest

The most important lesson about prior appropriation is that water rights are not exclusive private property rights; they are not even simply correlative rights, which require sharing among a limited number of users. Water rights are limited or incomplete private use entitlements subordinate to the public interest to a greater extent than other forms of property.¹⁴² The idea that water rights are different from other property entitlements is widely recognized. Water's special status is generally reflected in state regulation of the use of the resource. For historical reasons, these assertions usually take the form of state proprietary claims, but they are, in fact, assertions of state regulatory power. The public interest was initially reflected in the rule that all uses must be beneficial or non-wasteful. Non-wasteful use remains the core concept of western water law and is equally a core component of regulated riparianism.¹⁴³ The public interest is not limited to waste prevention. It is an evolving concept that increasingly requires the more efficient use of water in a variety of circumstances, as well as the consideration of the social and environmental impacts of water diversions¹⁴⁴ and transfers and the conservation of stressed aquatic ecosystems.

There is a great deal of confusion about the form and consequences of assertions of state ownership. The reason is the nineteenth century legacy of *laissez faire* and limited government. Modern water rights are a product of the nineteenth century, and state power to define and regulate property rights was much contested as either a violation of natural rights or classic liberal theories of exclusive, unfettered property. Because water was always incapable of full ownership, states declared themselves the owners of the resource to bolster their right to regulate,¹⁴⁵ and this tradition continues today. State ownership is claimed for three primary purposes: full proprietary ownership, the assertion of the sovereign power to regulate, and the assertion of the public trust.

The most extreme claim is to assert that the state is the sole source of the right to use. This can be accompanied by the right to charge for its use as states extract royalties for the privilege to extract state-owned minerals. However, in the western liberal tradition, state ownership is not traditionally con-

¹⁴² *In re Water Use Permit Applications*, 9 P.3d 409, 457-58 (Haw. 2000).

¹⁴³ See Dellapenna, *supra* note 104.

¹⁴⁴ IDAHO CODE § 42-202B(3) (Supp. 2002). The statute requires that the state engineer consider the local public interest in evaluating new diversions and transfers. After courts interpreted this provision to include secondary impacts, the legislature limited the local public interest to "the interests that the people in the area directly affected by a proposed water use have in the effects of such use on the public water resource." *Id.*

¹⁴⁵ See Frank J. Trelease, *Government Ownership and Control of Water*, 45 CAL. L. REV. 638, (1957); see also *Yanner v. Eaton*, [1999] HCA 53 (Austl. Oct. 7, 1999) (holding state ownership is not proprietary, but an historic fiction for the sovereign power to regulate), available at http://www.austlii.edu.au/au/cases/cth/high_ct/1999/53.html.

ceived of as a true proprietary claim but as a sovereignty claim.¹⁴⁶ Nonetheless, most states, including West Virginia, have used the ownership fiction to claim the power to regulate access to fish and aquatic life and water use.¹⁴⁷ However, the idea of taxing water extraction has been floated in West Virginia.¹⁴⁸ State ownership is best characterized as the assertion of state regulatory power, which confirms that water rights have always been incomplete property rights.¹⁴⁹ It normally asserts that (1) water rights are limited to the privilege to use water, as opposed to individual ownership of streams and aquifers; (2) access to water requires state permission in the form of a permit or license;¹⁵⁰ (3) access can be denied if the state determines that there is a “higher” or more efficient alternative use of the water; and (4) reallocations are subject to state review.

It is especially important for West Virginia to ground state control in state sovereignty rather than proprietary ownership because of the confusion between state proprietary claims and public rights to use the state’s waters. West Virginia inherited a law from Virginia that allowed the alienation of the beds and banks of a number of non-tidal but navigable rivers. Thus, public rights are limited to navigable and floatable rivers,¹⁵¹ and the state has broad discretion to alienate the beds of non-navigable waters that it acquired from Virginia as common or “waste or unappropriated” lands.¹⁵² However, state ownership was expanded when the West Virginia Supreme Court of Appeals held that all the beds of post-1863 navigable waters are owned by the state.¹⁵³ The net result is that the state’s regulatory power and public recreational rights are still

¹⁴⁶ See, e.g., *California v. Riverside Superior Court*, 93 Cal. Rptr. 2d 276 (2000). In this case, the court held that California was liable for the cost of cleaning up a contaminated aquifer, and the state sought reimbursement from its insurance carrier. The carrier invoked the “owned property” exclusion, but the court held that statutory declaration that the state owned the waters “in trust” for the people did not confer proprietary ownership. *Id.* at 285-87.

¹⁴⁷ W. VA CODE § 20-3-3 (2003).

¹⁴⁸ Legislation introduced in early 2003 to create a statewide water use plan was attacked by the state Chamber of Commerce and other business groups as a first step toward the taxation of water use. See Kris Wise, *Lawmakers Discuss State Water Use Study*, CHARLESTON DAILY MAIL, Jan. 13, 2004, at P1C. The issue seems to be dead for the immediate future. A statement issued by a Democratic candidate for Governor, Lloyd Jackson, calls for a state water policy, but not for taxation or the restriction of use by instate businesses. West Virginia Water Policy for the 21st Century (executive summary), <http://www.jacksonforgov.com/download/water.pdf>. (last visited Apr. 1, 2004).

¹⁴⁹ See *In re Water Use Permit Applications*, 9 P.3d 409 (Haw. 2000).

¹⁵⁰ See STEFANO BURCHI, FOOD & AGRIC. ORG. UNITED NATIONS, LEGIS. STUDY NO. 52, PREPARING NATIONAL REGULATIONS FOR WATER RESOURCES MANAGEMENT 5 (1994) (concluding that the non-regulated uses “represent an ever shrinking minority of water allocation decisions overall”).

¹⁵¹ *Gaston v. Mace*, 10 S.E. 60, 63 (W. Va. 1889).

¹⁵² See George, *supra* note 70.

¹⁵³ See *Campbell Brown & Co. v. Elkins*, 93 S.E.2d 248 (W. Va. 1956).

tied to the historic classification of the river,¹⁵⁴ rather than to the need for state regulation. This legal legacy should not be allowed to constrain state regulatory power over all the state's waters.

The third formulation of state ownership is the idea that all water use is subject to the public trust. The public trust is an American doctrine that expanded the Roman and English common-law¹⁵⁵ doctrine that navigable or public rivers were subject to a public servitude of navigation into a doctrine that limits the power of the states to grant private rights that threaten to destroy the resource. In contrast to the simple declaration of ownership in trust, which asserts the right to the rules for private and public use, the modern public trust doctrine asserts (1) that existing rights may be curtailed to prevent the destruction of aquatic ecosystem functions,¹⁵⁶ and (2) that the state has a duty to protect these values in all actions that allocate and reallocate water.¹⁵⁷ The American public trust is a judicial doctrine, but other nations have implemented the basic idea by statute or practice. South Africa has incorporated the public trust into its new water law by creating an environmental reserve or a cap on diversions. Australia-

¹⁵⁴ George, *supra* note 70, at 437-41, 446-67.

¹⁵⁵ George seems to suggest that West Virginia's public trust is more limited than the California-Hawaii doctrine. See George, *supra* note 70, at 456-58. The West Virginia public trust arises from Virginia's succession to the English Crown's *jus publicum* after the Revolution, see *Martin v. Wadell*, 41 U.S. 367 (1842), but it permits state alienation. However, the *jus publicum* is the source of California-Hawaii doctrine, see *Idaho v. Coeur d'Alene Tribe of Idaho*, 521 U.S. 261 (1997); *Ill. Cent. R.R. v. Illinois*, 146 U.S. 387 (1892), and a history of state alienation does not prevent the more aggressive assertion of the trust against water right holders whose rights are more contingent than those of owners of land subject to the trust.

¹⁵⁶ See *infra* note 157. The trust is a common-law principle and state regulation of trust resources are immune from a Fifth Amendment taking claim. For example, in *McQueen v. South Carolina Coastal Council*, 580 S.E.2d 116, 120 (S.C. 2003), the court held that the state can deny permits to build on two vacant lots (purchased for \$4,200.00) in North Myrtle Beach because the land had reverted to tidelands over the years due to erosion. The public trust applies to wetlands created by tidal erosion and thus there was no compensable taking. *Id.* For good measure, the court added that nature, not the state, took the land. *Id.*

¹⁵⁷ T.N. Narasimhan, *A Finite World, Earth Sciences, and Public Trust*, 41 GROUND WATER 11 (2003) ("Governments have a responsibility to protect natural resources from unacceptable changes as they are put to beneficial use."). The public trust literature is vast. Among the more important articles are William D. Ariza, *Democracy, Distrust, and the Public Trust: Process-Based Constitutional Theory, the Public Trust Doctrine, and the Search for a Substantive Environmental Valve*, 45 UCLA L. REV. 385 (1997); Richard L. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631 (1986); Erin Ryan, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resources Management*, 31 ENVTL. L. 477 (2001); and Joseph L. Sax, *The Public Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970). The leading cases are *National Audubon Society v. Superior Court*, 658 P.2d 709 (Cal. 1983) and *In re Water Use Permit Applications*, 9 P.3d 409 (Haw. 2000). See also WILCOX, *supra* note 108, at 98-112 (discussing Hawaii's sugar irrigation ditches).

lia is implementing a strategy to do this in the Murray-Darling basin, although there is no explicit mention of the public trust.¹⁵⁸

V. TOWARD A SUSTAINABLE FUTURE

The best guarantee that water will be used in an environmentally sustainable manner to serve the full range of uses from basic human consumption to aquatic ecosystem conservation is an effective state water law regime. The environmentally sustainable use of water resources can be broadly defined as one produced by resource decisions that set hydrologic baselines for individual basins to protect their ecological integrity and reflect the full range of consumptive and non-consumptive uses, including the conservation of equity services and the recognition of equity claims.¹⁵⁹ To implement this concept, national legal regimes face at least nine major challenges: (1) the allocation or reallocation of water for the maintenance of aquatic ecosystems services 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 use 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.¹⁶⁰ The system of entitlements that was built up by traditional allocation

¹⁵⁸ The agreement imposes detailed land use and water management duties on the basin states and is constantly amended by new agreements. It both allocates the flow among the basin states and vests the Commission with the power to control releases from specified upstream storage facilities. The Murray-Darling Commission now runs the river, overseen by the ministerial council and a stakeholder advisory board. See generally MURRAY-DARLING BASIN COMM'N, MURRAY-DARLING BASIN INITIATIVE, at <http://www.mdbc.gov.au> (last visited Apr. 1, 2004). The most important potential international precedent is the Commission's adoption of an artificial base flow regime and the imposition of the regime on existing users throughout the basin. The Commission has initiated a process to set environmental or base flows for ecosystem restoration based on the impacts of different flows on the riverine environment. To implement the base flows, in 1995 the Commission announced a "Cap," which is the cornerstone of a number of policies designed to better manage water resources. See Poh-Ling Tan, *Irrigators Come First: Conversion of Existing Allocations to Bulk Entitlements in the Goulburn and Murray Catchments, Victoria*, 18 ENVTL. & PLAN. L.J. 154, 169 (2001). The Cap imposes yearly diversion limits on the four basin states and the Australian Capital Territory. *Id.*

¹⁵⁹ This definition was adopted by the United States Western Water Policy Review Advisory. See WATER IN THE WEST, *supra* note 36, at 3-1 to 3-5.

¹⁶⁰ See FOOD & AGRIC. ORG., *supra* note 5, at 150-59, for a survey of recent legislation dealing with these issues.

regimes is seen as a barrier to this adjustment. Nonetheless, nations around the world are supplementing their traditional hard or soft property regimes with the following techniques.

A. *Limitations on Consumptive Use and the Redefinition of Entitlements*

The pressures for aquatic ecosystem conservation or restoration and the risk of supply and demand imbalances require that consumptive uses be capped or even rolled back. South Africa's reserved environmental flows and basic human needs and the cap imposed under the Murray-Darling management regime in Australia are significant examples of this trend. These new flow maintenance initiatives have been done within the framework of existing entitlement regimes, but they have the potential to modify and thus redefine them.

Any limitation regime adds a new element of incompleteness to water rights that should be explicitly recognized. Water rights have always been subject to the "laws of nature," to the fixed risks of established rules such as priority, and to the correlative rights of other users. These risks run from a complete loss through capture to post-use sharing. New demands on the system are another risk that entitlement holders face. The inherently incomplete or risky nature of property rights means that the focus should be on the actual expectations that lie behind a use rather than the perpetual enforcement of the entitlement. This permits regulators, users, and other stakeholders to explore alternative ways of satisfying those expectations.¹⁶¹ In some cases, it may be necessary to substitute "firm" rights for a risk-based physical solution that provides an adequate margin of safety, rather than an absolute entitlement in water-short years. These new regimes will be characterized by the greater reliance on physical solutions,¹⁶² which include adaptive management and water markets, rather than the anticipated enforcement of priorities and formal entitlements.

B. *Increased Alienability*

Water entitlements have often been viewed as tied to a specific parcel of land, but they are increasingly being made more alienable to correct prior misallocations, primarily the dedication of too much water to low value agricultural use. Alienation potentially makes water rights marketable commodities, but it is essential to recognize that water markets are not an end in and of themselves, but rather a means to the more efficient and sustainable use of water through fair reallocation procedures. The state should decide the amount of water that is subject to reallocation, and markets must be closely monitored to ensure that the

¹⁶¹ See *Pallazolo v. Rhode Island*, 533 U.S. 606 (2001) (finding this consistent with takings jurisprudence).

¹⁶² Technically, physical solution exchanges wet water for the right to assert water rights that would promote inefficiency. See Harrison Dunning, *The "Physical Solution" in Western Water Law*, 57 U. COLO. L. REV. 445 (1986).

transfer of water is not unduly disruptive of local economies and ecosystems, and that the transfer results in the actual application of water to a productive use. The Chilean experience with water markets is instructive. Water marketing was embraced as part of the government's enthusiasm for a full market economy. However, studies of the operation of water markets demonstrate "that in most parts of the country water markets have been inactive and have had a limited impact on the efficiency of water use and the reallocation of resources. These results are due to a variety of constraints and transaction costs."¹⁶³

C. *Integrated Basin Planning and Management*

Historically, engineers and hydrologists controlled water planning, but this is no longer the case. Former central water planning exercises, which were often no more than post-hoc justifications for large dams and diversions, are being replaced by open, comprehensive planning processes and more holistic, democratic decision-making structures that feature much more stakeholder participation than in the past and less reliance on a state plan. The report of the World Commission on Dams, *Dams and Development: A New Framework for Decision-Making*, articulates the new template for the future: integrated water resources management ("IWRM"). IWRM was included in the Agenda 21 – the environmental action plan for the twenty-first century agreed to at the 1992 United Nations Conference on Environment and Development ("UNCED") and re-affirmed at the World Summit on Sustainable Development ("WSSD") held in Johannesburg in 2002. In brief, IWRM calls for the holistic management of freshwater as a finite and vulnerable resource, and the integration of sectoral water plans and programs within the framework of economic and social policy.¹⁶⁴ The objectives of integrated water resources management, as authoritatively articulated in Agenda 21, are as follows:

- a. To promote a dynamic, interactive, iterative, and multisectoral approach to water resources management, including the identification and protection of potential sources of freshwater supply, that integrates technological, socio-economic, environmental, and human health considerations.
- b. To plan for the sustainable and rational utilization, protection, conservation, and management of water resources based

¹⁶³ Carl Bauer, *Marketing Water, Marketing Reform: Lessons from the Chilean Experience*, RESOURCES, Summer 2003 at 11, 13-14, available at <http://www.rff.org/Documents/RFF-Resouces-151-Marketingwater.pdf>.

¹⁶⁴ U.N. Conference on Environment and Development, June 3-14, 1992, Agenda 21, ch. 18 ¶ 18.6, U.N. Doc. A/CONF. 151/26 (1992), available at <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm> (last visited March 27, 2004).

on community needs and priorities within the framework of national economic development policy.

c. To design, implement, and evaluate projects and programmes that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people, and local communities in water management policy-making and decision-making.

d. To identify and strengthen or develop, as required, in particular in developing countries, the appropriate institutional, legal, and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.¹⁶⁵

D. *New Ground Water Conservation Regimes*

Groundwater conservation is a major problem in many areas because the resource is stressed by over pumping, but it is more difficult to regulate. First, the articulated conservation standard, safe yield of a basin or aquifer, is not a simple scientific standard but rather requires complex decisions about the long-term water budget of the system. Second, the adverse impacts of pumping on aquifers and related surface streams materialize over long-time horizons compared to the adverse impacts of many surface withdrawals. Third, and related, it is more difficult to incorporate use limitations into groundwater rights compared to surface rights.

The challenge for regulators is: (1) to assemble the necessary information to understand the impacts of groundwater pumping; (2) to integrate ground and surface rights; (3) to limit the excessive mining (i.e. extraction in excess of an agreed upon recharge rate) of aquifers, which may require that some basins be closed to new wells; and (4) to insure that groundwater pumping does not impair the quality of the aquifer. This is a particular problem in coastal areas where pumping may create a cone of depression, which causes salt water intrusion into an aquifer.¹⁶⁶ At a minimum, states need the authority to define the sustainable yield basins, to limit unsustainable withdrawals, and to coordinate ground and surface uses.¹⁶⁷

¹⁶⁵ *Id.*

¹⁶⁶ See TARLOCK ET AL., *supra* note 109, at 532-46.

¹⁶⁷ See, e.g., N.C. GEN. STAT. ANN. § 143-215.13 (2003).

E. The Integration of Water Quantity and Quality

The regulation of water quality has traditionally been considered a separate activity from water allocation.¹⁶⁸ Water quality regulation limits what can be put into a stream, and water allocation law limits what can be taken out of a stream. Of course, the two are connected. Justice O'Connor has characterized the distinction as "artificial."¹⁶⁹ Water quality is measured by compliance with water quality standards. The technology-forcing regulations are simply the most effective way to ensure compliance with these standards. The maintenance of water quality standards assumes some minimum flow levels, and thus withdrawals can compromise water quality.¹⁷⁰

The logic of the connection is clear, and a few courts have held that new withdrawals must be measured by their water quality as well as quantity impacts,¹⁷¹ but courts and legislatures have resisted incorporating water quality impacts into allocation decisions.¹⁷² When the progressive Washington Department of Ecology began to condition appropriation permits to maintain state water quality standards, the legislature quickly stopped this heresy.

VI. MODELS OF STATE REGULATION

Eastern water reform ranges from comprehensive water permit and planning regimes to more limited modifications of the common law to address specific problems. Several model comprehensive water codes have been proposed,¹⁷³ but only a few states such as Florida¹⁷⁴ and Iowa¹⁷⁵ have adopted detailed, comprehensive permit systems. However, only Florida has used its code

¹⁶⁸ See DAVID H. GETCHES ET AL., *CONTROLLING WATER USE: THE UNFINISHED BUSINESS OF WATER QUALITY PROTECTION* (1991).

¹⁶⁹ PUD No. 1 of Jefferson County v. Wash. Dep't of Ecology, 511 U.S. 700, 719 (1994).

¹⁷⁰ See *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011 (D.C. Cir. 1978) (holding that the Clean Water Act does not allow dischargers to obtain a credit for discharging into clean water).

¹⁷¹ The leading case is *United States v. State Water Resources Control Board*, 227 Cal. Rptr. 161 (Ct. App. 1986).

¹⁷² See, e.g., *City of Thornton v. Bijou Irrig. Co.*, 926 P.2d 1, 90-93 (Colo. 1996) (holding that appropriation has no basis to object to an exchange agreement that reduced flows available to dilute its discharge).

¹⁷³ See Joseph W. Dellapenna, *Adapting Riparian Rights to the Twenty-First Century*, 106 W. VA. L. REV. 539, 583-86 (2004).

¹⁷⁴ FLA. STAT. ANN. §§ 373.012 to .71 (West 2000 & Supp. 2004). Intense conflicts usually associated with the West have been created by the state's explosive growth, flat terrain, and the imbalance between the North as the source of most water and the South as the home to most people. See Abby Goodnough, *Developers Urge Support for Water Transfer to Populous South*, N.Y. TIMES, Sept. 27, 2003, at A8.

¹⁷⁵ IOWA CODE ANN. §§ 455B.261 to .281 (West 1997 & Supp. 2003).

for substantial water use regulation,¹⁷⁶ although such use of the codes is increasing. The 1997 *Regulated Riparian Model Water Code* drafted by the American Society of Civil Engineers remains the gold standard.¹⁷⁷ No state has adopted it, and most have elected to preserve the common law and deal with specific problems. For example, Virginia leaves riparian rights in place except as modified by the surface water management area permits.¹⁷⁸ State laws can be classified as follows.

A. *Information and Reserve Authority*

The major function of many eastern permit programs is to collect information about water use. They also function as reserve authority that can be used if needed to limit water uses. Kentucky's water code fits this model. During the perceived height of the dam building era, the state enacted a water permit system in 1966 as part of legislation intended to promote state water resources planning and development.¹⁷⁹ The permit system is incomplete because it exempts all agriculture, including irrigation, all domestic use, and withdrawals for certified steam electric power plants.¹⁸⁰ The chief purpose of the system is to gather accurate information about water use. For example, in 1998, the statute was amended to create a groundwater monitoring network.¹⁸¹ Maryland has a similar permit program that exempts agriculture withdrawals below 100,000 gallons per day and limits the duty to apply for a permit to "any plant, building, or structure which may appropriate or use any waters of the State"¹⁸² The permit program applies equally to surface and groundwaters.¹⁸³

¹⁷⁶ See FLA. STAT. ANN. §§ 373.042 (West 2000 & Supp. 2004); Richard Hamann, *Law and Policy in Managing Florida's Water Resources*, in WATER RESOURCES ATLAS OF FLORIDA (Edward A. Fernald & Elizabeth D. Purdam eds., 1998 (stating that the code has not fulfilled one of its original objectives, the establishment of minimum flows). The legislature amended the Code in 1997 to make it more difficult to establish minimum stream flows. See FLA. STAT. ANN. § 373.0831(3) (West 2000).

¹⁷⁷ AM. SOC'Y OF CIVIL ENG'RS, THE REGULATED RIPARIAN MODEL WATER CODE (Joseph W. Dellapenna ed., 1997); see also Robert E. Beck, *The Regulated Riparian Code: Blueprint for Twenty First Century Water Management*, 25 WM. & MARY L. ENVTL. L. & POL'Y REV. 113 (2000).

¹⁷⁸ VA. CODE ANN. § 62.1-253 (Michie 2001).

¹⁷⁹ KY. REV. STAT. ANN. §§ 151.10 to .990 (Michie 2001 & Supp. 2003). Tennessee adopted a water registration statute in 2002. TENN. CODE ANN. §§ 69-8-301 to -309.

¹⁸⁰ KY. REV. STAT. ANN. § 151.140.

¹⁸¹ *Id.* § 151.620 to .629.

¹⁸² MD. CODE ANN., ENVIR. § 5-502(n) (Supp. 2003). Agriculture users, however, have the option of applying for a permit. *Id.* § 5-502(c)(2).

¹⁸³ *Id.* § 5-502(n).

B. *Regulation Specific Problems of Basins*

Many states have selectively chosen to remove some of the per se barriers of the common law, such as the watershed limitation,¹⁸⁴ or to regulate only specific basins. For example, Kentucky has created a special authority for the Kentucky River Basin with the power to assess fees for water use.¹⁸⁵ The primary purpose of the fees is to maintain the navigation system, but the authority has broad planning powers, including the authority to develop drought management plans. Virginia has created commissions in several basins, such as the Roanoke, that have no regulatory authority¹⁸⁶ but are intended to “facilitate communication among stakeholders . . . and to maximize participation by all interested parties.”¹⁸⁷

C. *Short-Term Curtailment in Stressed Areas*

Many eastern states reserve regulation for drought conditions or stressed areas. These laws enable the state to identify areas where use may exceed available supplies, watersheds, and groundwater basins, and to limit withdrawals during drought periods or in basins where withdrawals may exceed the renewal rates. North Carolina authorizes the establishment of surface and groundwater “capacity use areas” when ground and surface uses require coordination or when withdrawals may exceed renewal or replenishment rates.¹⁸⁸ Virginia permits the establishment of ground water management areas.¹⁸⁹ Once an area is established, a permit is required for withdrawals in excess of 300,000 gallons per month.¹⁹⁰ Existing users are protected; permits must be issued based on past use,¹⁹¹ but the past use can be curtailed if there are demonstrated conservation savings.

¹⁸⁴ See George William Sherk, *Meeting of Waters: The Conceptual Confluence of Water Law in the Eastern and Western States*, NAT. RESOURCES & ENV'T, Spring 1991, at 3.

¹⁸⁵ See *Ky. River Auth. v. City of Danville*, 932 S.W.2d 374 (Ky. Ct. App. 1996) (holding that fees are dedicated to specific water conservation objectives and thus are not invalid taxes).

¹⁸⁶ See VA. CODE ANN. §§ 62.1-69.39 (Michie Supp. 2003).

¹⁸⁷ *Id.* § 62.1-69.40.

¹⁸⁸ N.C. GEN. STAT. ANN. § 143-215.13 (2003); see also *High Rock Lake Ass'n v. N.C. Envtl. Mgmt. Comm'n*, 276 S.E.2d 472 (N.C. Ct. App. 1981) (holding that the Commission has discretion not to declare a capacity use area when nuclear power plant's proposed withdrawals would have slight water quality impacts and no water supply impacts, assuming compliance with conditions imposed on permit).

¹⁸⁹ VA. CODE ANN. § 62.1-257(4)(B) (Michie 2001).

¹⁹⁰ Cf. *id.* § 62.1-259(i) (not requiring permit when withdrawing less than 300,000 gallons a month).

¹⁹¹ See *id.* § 62.1-261 (permitting consecutive twelve-month withdrawals for the past five years for all uses except agricultural withdrawals, which have a right to consecutive twelve-month with-

D. Minimum Stream Flow Protection

Virginia has gone further and has linked water use and aquatic ecosystem protection. In 1989, the state was given the power to designate surface water management areas. The designation criteria are broad. The State Water Control Board must only find that water levels are “potentially adverse to public welfare, health and safety.”¹⁹² Once an area is designated, the state may regulate withdrawals.¹⁹³ However, the authority is riddled with exemptions.¹⁹⁴ The most innovative part of the legislation is the state’s power to afford some protection to instream uses. Instream uses may be balanced against off-stream uses “so that the welfare of the citizens of the Commonwealth is maximized without imposing unreasonable burdens on any individual water user or water-using group.”¹⁹⁵ A similar regime for stressed groundwater-dependent areas was added in 1992.¹⁹⁶

VII. CONCLUSION

In March 2004, West Virginia passed a progressive “first step” water registration and planning statute.¹⁹⁷ The statute declares that “[t]he waters of the state of West Virginia are hereby claimed as valuable public natural resources held by the state for the use and benefit of its citizens. The state shall manage its waters effectively for present and future enjoyment and for the protection of the environment.”¹⁹⁸ The statute’s equal focus on consumptive and non-consumptive uses is embedded in the definition of beneficial use, which includes all the traditional consumptive uses as well as recreation, navigation, preservation of fish and wildlife habitat, and cultural and aesthetic values.¹⁹⁹ Water use is still governed by the common law of riparian rights,²⁰⁰ but users

drawals for the past ten years).

¹⁹² *Id.* § 62.1-242.

¹⁹³ *Id.* § 62.1-247.

¹⁹⁴ *Id.* § 62.1-243 (including as exemptions: (1) withdrawals less than 300,000 gallons per month, (2) municipal or privately owned water company withdrawals in existence in 1989 and which do not exceed the grandfathered rate, (3) future withdrawals that received a section 401 certification under the Clean Water Act, and (4) all beneficial consumptive uses in existence in 1989, provided that the grandfathered rate is not increased).

¹⁹⁵ *Id.* § 62.1-248.

¹⁹⁶ *Id.* § 62.1-254 to -270.

¹⁹⁷ Water Resources Protection Act, S. 163, 79th Leg. Sess., (W. Va. 2004) (to be codified at W. VA. CODE § 22-25-1 to -6 (2004)).

¹⁹⁸ *Id.* § 22-25-3 (to be codified at W. VA. CODE § 22-25-3).

¹⁹⁹ *Id.* § 22-25-2(a) (to be codified at W. VA. CODE § 22-25-2(a)).

²⁰⁰ *Id.* § 22-25-1(2) (to be codified at W. VA. CODE § 22-25-1(2)).

consuming over 750,000 gallons per month must register their use.²⁰¹ After withdrawal and other information about stream flow conditions has been collected, the Secretary of the Department of Environmental Protection must synthesize it, identify “any area of concern regarding historical or current conditions that indicate a low flow condition or where drought or flood has occurred or is likely to occur that threatens the beneficial use of surface water or groundwater in the area,”²⁰² and report to a newly created joint legislative water resources oversight commission.²⁰³

Water use has emerged as a major global issue because there is a great deal of worldwide concern about the sustainability of the planet’s water resources. In general, this attention is welcome because it helps to build support for more sustainable use strategies. However, the current attention has also produced a great deal of excess, abstract crisis rhetoric. The reality is that water use problems are place-specific. The geographic boundaries of the appropriate place are often vague, do not respect political boundaries, and are broader than users and regulators had traditionally assumed – but they exist. Water law reform must first define the geographical scope of the jurisdiction’s important, potential water use impacts and then craft appropriate regulatory responses to the problem at hand.

²⁰¹ *Id.* § 22-25-3(c) (to be codified at W. VA. CODE § 22-25-3(c)).

²⁰² *Id.* § 22-25-3(j)(4) (to be codified at W. VA. CODE § 22-25-3(j)(4)).

²⁰³ *Id.* § 22-25-5 (to be codified at W. VA. CODE § 22-25-5).