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The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States' Role?

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I. INTRODUCTION

Over the last two decades, there has been a quiet, unanticipated revolution in western water policy. In the early 1980s, western water law seemed outmoded. Urbanization and expanding environmental consciousness have put new demands on an old, unyielding system of western water law, and states promised reform to satisfy changing public demands and values. Although the 1990s brought change, it came largely through initiatives of the federal government and local communities. Meanwhile, state law evolved haltingly at best.

Until recently, the water distribution regime was dominated by assertions of legal rights rooted in prior appropriation and by construction of physical facilities—mostly federal dams and reservoirs astride the West's waterways. These utilitarian laws and water projects left a legacy of environmental insult, and today they abrade dynamic new expressions of public values. Attempts by water

developers to meet expanding water demands were continually frustrated as they collided with a suite of federal environmental protection laws passed in the 1970s. When federal water project subsidy policies abruptly collapsed in response to public environmental sentiment and economic constraints, outraged states argued that the dual impediments of regulation and reduced subsidies for development undermined their control over the future.

In the 1980s, progressive leaders in the West urged states to assume the pivotal role in responding to emerging public values in water. They recognized that the West was changing and that state responses could defuse the growing federal influence on western water policy. Their policy reform agenda included greater efficiency and conservation, conjunctive use of groundwater, protection of instream flows, more comprehensive planning, and inclusive public participation at the level closest to the resource.

Despite the efforts of reform-minded leaders, state water law and policy in the West remained essentially static though the 1990s. Yet there were significant changes in the way important water decisions are made. The most impressive innovations, however, were produced by federal regulatory pressure and locally based problem-solving efforts, often supported by federal participants. Instead of coming from within the state establishment, water reform in the 1990s resulted from unconventional, often place-specific approaches. In other words, change has come from "outside the box" of traditional institutions.

Western water policy undoubtedly will continue evolving to meet new public demands. Major stresses on the system—demographics, competing policy demands, climate variability—will combine to create crises. In crisis there is opportunity for broader reform at the state level. As these windows of policy-making opportunity open, state officials may institutionalize new policies that draw upon the experience of the place-specific problem solving that is now occurring apart from traditional water institutions. These outside-the-box approaches, therefore, can serve as laboratories for incubating proposals for systemic change at the state level.

Part II of this article illustrates that, even though the states have determined the laws governing allocation of water rights, the federal government has always had a powerful influence on western water policies. Part III reviews the apparent state agenda for water policy reform offered by the western governors in the mid-1980s,

then summarizes the comparatively modest state law changes made during the 1990s, and concludes that the most significant changes were those that were made "outside-the-box" of traditional state water institutions. Part IV discusses the future of state water policy reform. Stresses on water resources caused by demographic changes, the effects of current policies, and climate variability are likely to lead to water crises that will offer opportunities to institutionalize the lessons learned from "outside-the-box" reforms.

II. THE HISTORY OF WESTERN WATER LAW: A MYTH OF FEDERAL DEFERENCE TO STATE CONTROL OF WESTERN WATER

When most of the country, and virtually all of the West, was federal public land, the federal government theoretically could have dominated the allocation and control of water rights on its lands. Yet exercising this power would have been practically impossible because the federal presence in the West was too thin. Just as the federal government tolerated, and later encouraged settlers, who were little more than trespassers on the public land, to seek out and develop minerals, it also let them take and use water found there for mining, agricultural, and domestic uses.[1]

In the era of western expansion, national economic and social policy favored development—principally mining and agriculture—and the establishment of communities by settlers, all of which demand water. Water was an instrument for realizing that policy.[2] If the settlers in the new territories and states could avoid or resolve disputes over water by dividing up use rights among themselves, the federal government was pleased to defer, first by silence on the subject and later by oblique language in mining and homesteading laws.[3] The Supreme Court ultimately held it was the states' prerogative to allocate water on public lands by any system they chose.[4] But the seminal *Rio Grande Irrigation Company* case[5] made clear that state-authorized water use must not interfere with federal rights to protect the flow of the stream and can be superseded by the exercise of federal powers over commerce and public land.[6]

1. SAMUEL C. WIEL, WATER RIGHTS IN THE WESTERN STATES 88 (3d ed. 1911).

2. *See* SARAH F. BATES ET AL., SEARCHING OUT THE HEADWATERS 31-33 (1993).

3. *See* Desert Land Act of 1877, 43 U.S.C. § 321 (1994); Mining Act of 1866, 43 U.S.C. § 661 (1994).

4. California-Oregon Power Co. v. Beaver Portland Cement Co., 295 U.S. 142, 163-65 (1935); *see also* Andrus v. Charlestone Stone Products Co., 436 U.S. 604, 614 (1978).

5. United States v. Rio Grande Irrigation Co., 174 U.S. 690 (1899).

6. *Id.*

In general, states adopted the doctrine of prior appropriation, a laissez-faire system based on the simple notion of first-in-time, first-in-right.[7] Some states employed the appropriation doctrine in its purest form, where anyone who initiated a beneficial use of water received a water right good against anyone whose use was initiated later. Others modified the doctrine with requirements for administratively granted permits. Still other states used a mix of western prior appropriation law and the riparian law that was more typical of the Eastern states.[8] It was in this context that the Supreme Court validated state autonomy to fashion any type of water rights system chosen by the state, even for allocating water from the public lands.[9] The Court thus honored, at least in word, the idea that states deserve deference in allocating water according to their own laws.

The western states relied on decisions recognizing their freedom to choose an allocation system to apply within their boundaries to support an "expectation of exclusive and perpetual state control over water resources."[10] But virtually every iteration of the policy of deference was accompanied by citations to *Rio Grande*, which had subordinated state control to federal supremacy,[11] and early cases made it clear that federal preemption of state water law did not require express legislation. It could be accomplished by implication, simply by setting aside federal land for purposes that required water.[12] Nevertheless, direct federal interference with state-granted water rights was rare.[13]

States included claims to "ownership" of all the water within their boundaries in their constitutions and statutes.[14] In effect, this

7. *See* DAVID H. GETCHES, WATER LAW IN A NUTSHELL 75 (3d ed. 1997).

8. *See generally, id.* at 80-82.

9. *See California-Oregon Power Co.*, 295 U.S. at 163-65.

10. Charles T. DuMars & A. Dan Tarlock, *New Challenges to State Water Allocation Sovereignty*, 29 NAT. RESOURCES J. 331, 334 (1989).

11. *See, e.g.*, California v. United States, 438 U.S. 645, 662 (1978); United States v. Appalachian Electric Power Co., 311 U.S. 377, 298 (1940); *California-Oregon Power Co.*, 295 U.S. at 155.

12. Winters v. United States, 207 U.S. 564, 577 (1908); *see also* Arizona v. California, 373 U.S. 546 (1963).

13. *See* B. Abbott Goldberg, *Interposition Wild West Style*, 17 STAN. L. REV. 1 (1964) (arguing that political forces forestalled the exercise of federal preemption); Charles F. Wilkinson, *Western Water Law in Transition*, 56 U. COLO. L. REV. 317, 325 (1985) (recognizing the need to accommodate legitimate state and federal interests when shaping water policy).

14. 1 WELLS A. HUTCHINS, WATER RIGHTS LAWS IN THE NINETEEN WESTERN STATES 5-13 (1971).

was an assertion of state authority to supervise the allocation of water, usually made in the context of protecting the public's interest in achieving maximum benefit from the use of a public resource.[15] It was this function that the courts firmly acknowledged, without a hint that federal laws or policies would have any less preemptive force in water resource management than in any other field. Yet the states seemed to assume greater autonomy, and references to "state primacy" that dominated discussions of the federal role in water matters conveniently ignored the reality of federal supremacy.[16]

The myth of state control has always been precarious, depending as it does on congressional forbearance in the exercise of federal preemption. Federal legislation routinely recited that it shall not "be construed as affecting or intended to affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water."[17] Even where federal laws appeared to preserve state water laws, the overriding purpose of the federal law controlled. The Supreme Court has held, in case after case, that such disclaimers mean nothing in the face of a federal purpose that conflicts with state water rights.[18] Thus, federal programs ranging from dam-building to environmental regulations can inhibit or preclude the operation of state water law and state-granted water rights whenever there is a conflict between the state legal system and the federal purpose.[19] Most federal environmental laws have allowed citizen suits, giving a voice to environmentalists who had been excluded from water decisions in the past.[20] The expansion of federal environmental laws and the increasing scarcity of water for all uses in a growing West has made such conflicts more frequent and sometimes bitter.

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15. *Id.*

16. *See* DuMars & Tarlock, *supra* note 10, at 332-36.

17. Reclamation Act, 43 U.S.C. § 383 (1994). *See also* 16 U.S.C. § 821 (1994); Clean Water Act, 33 U.S.C. § 1251(g) (1994).

18. California v. Fed. Energy Regulatory Comm'n, 495 U.S. 490 (1990); Arizona v. California, 373 U.S. 546 (1963); City of Fresno v. California, 372 U.S. 627 (1963); Ivanhoe Irrigation Dist. v. McCracken, 357 U.S. 275 (1958). *But see* California v. United States, 438 U.S. 645 (1978) (noting that the legislative history of the Reclamation Act of 1902 indicates Congress intended to defer to state water law not in direct conflict with the Act).

19. *E.g.*, Riverside Irrigation Dist. v. Andrews, 758 F.2d 508 (10th Cir. 1985).

20. *E.g.*, Clean Water Act, 33 U.S.C. § 1365(a)(1) (1994). *See generally* Jeannette L. Austin, *The Rise of Citizen Suit Enforcement in Environmental Law: Reconciling Private and Public Attorneys General*, 81 Nw. U. L. Rev. 220 (1987).

A. *The Traditional Role of State Water Institutions in the West*

Water policy was straightforward in the early days of the West. It dealt initially with water allocation and later with water development, distribution, and related planning. Accordingly, state water institutions made and enforced allocation decisions and developed and delivered supplies of water. State legal regimes committed water to uses that prevailed early in the century, primarily mining and agriculture. The dams and other structures that were built, mostly with federal dollars, fixed distributional patterns and further tied water to particular uses and places. These two phenomena—state appropriation doctrine and federal water development—combined to create an inflexible system that was designed to serve narrow purposes.

Because prior appropriation was conceived as a self-help system, the allocation function required little institutional support. Beginning in the mid-nineteenth century, appropriators claimed rights to quantities of water they would develop and use beneficially, and the appropriator who was first in time had the better right to use water. No local institutions were available to make adjudicative or administrative decisions.

As rivers became fully appropriated early in the twentieth century and competition for water intensified, the prior appropriation system needed more institutional support. Prior appropriation was a free-for-all system and water rights records were inadequate and scattered. States soon felt the need for centralized record keeping.[21] By the twentieth century, the western states had all expanded the role of water agencies to ensure water was used lawfully. The relatively specific and narrow functions of water institutions were to recognize property rights carved out of public resources and protect them against interference from other water interests. Thus, water agencies existed primarily to serve the users and occasionally to mediate conflicting claims.[22] In an era when the key issues could be refereed by an official who enforced simple priorities among rights holders, institutions were unencumbered by considerations of multiple issues and interests.

Some state laws and institutions were modified to encompass a

21. On the deficiencies of early record keeping, which led to creation of state agencies, see Michael V. McIntire, *The Disparity Between State Water Rights Records and Actual Use Patterns–"I Wonder Where the Water Went?,"* 5 LAND & WATER L. REV. 23 (1970).

22. *See* CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN 240-41 (1992) (describing western water agencies as "captured").

limited consideration of the "public interest," a concept whose meaning varied from state to state.[23] This discretion allowed the agencies to decide what quantities of water were needed for new uses and whether new or proposed changes in use were consistent with the public interest.[24] Until recently, however, state engineers rarely inquired seriously or comprehensively into the public interest, simply determining whether the water would be put to a beneficial use.[25] Their determinations were reached with little, if any, input or participation by members of the public.

B. *The Rise and Fall of Big Dams*

In the arid West, where rainfall is infrequent and distances between streams are great, dams and canals were needed to store and transport water to meet the demands of rising population. Because they often "appropriated" water far in excess of average annual flows, water users had rights to water that, without storage, were only actually available in extraordinarily wet years.[26]

In the old West, development and distribution of water by building dams and ditches were initially tasks for an appropriator acting independently. But water users generally lacked sufficient capital to build elaborate facilities as well as the cooperation that was needed to make collective use of resources. Even when private irrigation enterprises were formed to serve an area, they often failed for lack of capital and because there was no legal means to force potential beneficiaries to participate in sharing the cost.[27] California enacted a law permitting the formation of irrigation districts empowered to impose compulsory taxes on landowners. Yet failures continued because of economic inefficiencies and lack of

23. *E.g.*, Shokal v. Dunn, 707 P.2d 441 (Idaho 1985) (finding that the state engineer can consider "any locally important factor" such as water quality, fish and game, health, economics, etc. as part of the "local public interest"); Tanner v. Bacon, 136 P.2d 957 (Utah 1943) (finding that the "public welfare" requirement allows the state to prefer a junior applicant for water rights with the "more beneficial use" over a senior applicant); Young & Norton v. Hinderlider, 110 P. 1045 (N.M. 1910) (finding that "public welfare" includes consideration of costs of projects for protection of investors as well as consideration of public health and safety).

24. *See* WILKINSON, *supra* note 22, at 240; Susanne Hoffman-Dooley, *Determining What Is In The Public Welfare in Water Appropriations and Transfers: The Intel Example*, 36 NAT. RESOURCES J. 103 (1996).

25. *See* WILKINSON, *supra* note 22, at 240.

26. Donald J. Pisani, TO RECLAIM A DIVIDED WEST: WATER, LAW, AND PUBLIC POLICY 1848-1902 37-38 (1992).

27. *See* John D. Leshy, *Special Water Districts—The Historical Background, in* SPECIAL WATER DISTRICTS: CHALLENGE FOR THE FUTURE 11, 14 (James N. Corbridge ed., 1983).

expertise.[28] States tried several other approaches, but entities for collective irrigation in the arid West, other than in early Spanish, Indian, and Mormon communities, generally did not succeed.[29]

The United States Congress established the federal reclamation program in 1902 to provide federal assistance for water development projects and thereby promote the settlement of the West. Originally, the United States attempted to collect repayment of its costs of constructing project facilities from the individual irrigators who used them. Eventually, Congress altered this approach and recognized special water districts as the exclusive entities with which it would deal when authorizing and building water projects.[30] These districts typically contracted with the Bureau of Reclamation to operate the projects and to repay the government's costs with revenues collected from users and property owners in the district. The districts were endowed with powers normally reserved for governments, such as the prerogative to tax land.[31] State law created these special water districts to handle water development, supply, and management at a regional or local level. Today, some districts perform functions well beyond the provision of irrigation water. Their quasi-governmental status and independence from state control has caused considerable controversy, but states have done little to curb their autonomy.[32]

For most of the twentieth century, the United States Bureau of Reclamation was the largest single provider of capital in the form of subsidized loans and grants for major water development throughout the West.[33] Major decisions about size and design of facilities were left to experts, usually engineers. The day-to-day tasks of managing and distributing water were conducted by special districts according to federal regulations and contracts.

The federal government's entry into water development tended to eclipse the importance of state water law.[34] Competition for

28. *Id.* at 16.

29. HUTCHINS, *supra* note 14, at 160.

30. *See* Leshy *supra* note 27, at 11-22.

31. *See* TERRY L. ANDERSON, WATER CRISIS: ENDING THE POLICY DROUGHT 46 (1983); BATES ET AL., *supra* note 2, at 34-35.

32. *See generally*, SPECIAL WATER DISTRICTS: CHALLENGE FOR THE FUTURE (James N. Corbridge ed., 1983).

33. *See* JOHN R. MATHER, WATER RESOURCES: DISTRIBUTION, USE AND MANAGEMENT 294-97 (1984); WESTERN WATER POLICY REVIEW ADVISORY COMM'N, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 2-9 (1998) [hereinafter ADVISORY COMM'N, WATER IN THE WEST].

34. *See* LAWRENCE J. MACDONNELL, FROM RECLAMATION TO SUSTAINABILITY: WATER, AG-

large, federally-funded water facilities was keen and decisions about the timing and siting of dams became politically charged. This provided an incentive to do whatever was necessary to participate in federal dam-building programs, including subordination of state water rights and conforming state policies to comply with federal goals. The primary water policy objective of western politicians for most of the twentieth century was aimed at capturing federal assistance for water projects. Development of public works is an attractive arena for politicians because they can deliver tangible results ostensibly for the benefit of their constituents.

Although political rhetoric claimed state authority over water resources, states and their leaders appeared willing to sacrifice legal and institutional control in exchange for construction of facilities that enabled physical control of water. The states passed enabling legislation for the districts to be organized so they could operate the federal projects, but the districts were locally-controlled, enjoyed considerable autonomy under state laws, and typically took control of all water rights in areas to be served by a project.[35] Besides requiring subordination of the state-granted water rights of individual landowners to be served by federal projects, authorizations occasionally superseded state water law. These measures were necessary to centralize control over sufficient water sources to justify the project.

Historically, it is fair to say that most state water planning was initiated in response to federal programs and the inducement of federal largesse.[36] Many "plans" were used simply to identify and expedite federal water development projects.[37] Because planning was supply-oriented, it focused on where to build and how to use large reclamation projects with little regard for environmental, social, or economic costs. Only a few states adopted comprehensive approaches to planning that did more than justify federal projects.[38]

A 1965 federal law attempted to promote better, more inte-

RICULTURE, AND THE ENVIRONMENT IN THE AMERICAN WEST 273-80 (1990); PISANI, *supra* note 26, at 273-336.

35. *See* ROBERT G. DUNBAR, FORGING NEW RIGHTS IN WESTERN WATERS 36-45 (1983).

36. *See* D. Monte Pascoe, *Plans and Studies: The Recent Quest For a Utopia in the Utilization of Colorado's Water Resources*, 55 U. COLO. L. REV. 391, 398 (1984).

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

38. *Id.* at 25.

grated planning at the river basin level.[39] States resisted, although many complied insofar as necessary to secure federal support for water projects.[40] As hopes for federal funding waned with a change in federal policy in the 1980s, motivation for state water planning diminished. In 1981, the federal effort to promote a more comprehensive approach at the river basin level was abandoned.[41]

By the time the federal government demanded a fuller consideration of economic feasibility and environmental impacts as part of the justification for federal water projects, funding had seriously declined. Not until the 1970s did a federal law, the National Environmental Policy Act, require federal agencies to prepare an environmental impact statement before undertaking a major federal action.[42] In 1983, the government adopted principles and guidelines that gave significant weight to balancing costs and benefits and to environmental consequences,[43] but by then most of the big federal projects were already completed or underway.[44]

In retrospect, the federal dam-building era resulted in states abdicating much control over water within their boundaries to the federal government.[45] Instead of truly comprehensive planning that considered the panoply of uses and values inherent in water, states often did the minimum "planning" necessary to get federal subsidies. For many years federal law required no more, and therefore most federal projects were constructed without concern for their environmental consequences. Purely natural values, without utilitarian focus, were generally neglected. If fish and wildlife, recreation, and flood control were considered at all in planning a federal project, these uses were included as project purposes purely incidental to agricultural, municipal, and industrial purposes.[46]

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39. Water Resources Planning Act, 42 U.S.C. §§ 1962 (1994).

40. *See* HUTCHINS, *supra* note 14; Getches, *supra* note 37, at 25-28.

41. Ludwik A. Teclaff, *Evolution of the River Basin Concept in National and International Water Law*, 36 NAT. RESOURCES J. 359, 371 (1996).

42. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331-4344 (1994).

43. UNITED STATES WATER RESOURCE COUNCIL, ECONOMIC AND ENVIRONMENTAL PRINCIPLES AND GUIDELINES FOR WATER AND RELATED LAND RESOURCES IMPLEMENTATION STUDIES (1983) [hereinafter ECON. AND ENVTL. PRINCIPLES].

44. *See* RODNEY T. SMITH, TROUBLED WATERS: FINANCING WATER IN THE WEST 2 (1984); D. Craig Bell et al., *Retooling Western Water Management: The Park City Principles*, 31 LAND & WATER L. REV. 303 (1996).

45. *See* Pascoe, *supra* note 36, at 399.

46. RICHARD W. WAHL, MARKETS FOR FEDERAL WATER: SUBSIDIES, PROPERTY RIGHTS, AND THE BUREAU OF RECLAMATION 189 (1989).

C. *The Awakening of Environmental Consciousness and Economic Rationality*

The first half of the twentieth century was an era of rapid population movement, expansion of agriculture, and growth of new cities. The accompanying water development left an indelible mark on the western landscape. Irrigating arid lands and supplying cities far from rivers were not simple tasks. They required transporting water across large expanses of dry land and storing enough water to make up for erratic flows from season to season and from year to year. Today, some 75,000 water storage reservoirs dot the West.[47] The United States Bureau of Reclamation constructed 355 of the largest reservoirs plus 16,000 miles of canals.[48] The United States Army Corps of Engineers expanded its role as a navigation protection agency to include flood control and water supply. Although the Corps' presence was felt mostly in the east and southwest, it took on new responsibilities, especially in the Pacific Northwest and the Missouri River basin. Altogether, Reclamation reservoirs store over 119 million acre-feet of water and Corps reservoirs in the West store 103 million acre-feet.[49]

American water development included many remarkable engineering achievements and produced impressive economic rewards. Bureau of Reclamation hydroelectric facilities generate power that sells for $700 million per year and irrigation water from the projects contributes to crop production valued at $9 billion per year.[50] The projects also produce significant indirect benefits, such as flood control.

Water development has also had its failures. The anticipated benefits to agriculture have often fallen short of expectations because the soils and climates of areas served by some projects were unsuited for intensive irrigation.[51] Subsidies of up to 90% of the

47. Christine A. Klein, *On Dams and Democracy*, 78 OR. L. REV. 641 (2000) (public and private dams at least six feet in height).

48. CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST 259 (1992).

49. ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at 2-9.

50. *See id.*

51. For example, impermeable clays create poor soil drainage in a district along Arizona's Gila River causing saline groundwater to destroy crops. The Bureau of Reclamation undertook multiple, expensive, and ultimately ineffective projects to try to remedy the situation. *See* David H. Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 U. COLO. L. REV. 573, 587 (1997). *See also* MARC REISNER, CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER 7, 481 (1986). Also, the Kesterson Project in California's Central Valley caused leaching of naturally occurring

project costs notwithstanding, many farmers could not produce enough to repay the balance.[52] And despite the considerable benefits of development, it is now widely understood that the unintended consequences of water projects were enormous and far-reaching:

> Dams have flooded valleys and displaced farmers and communities, blocked or disrupted fish migrations, reduced naturally occurring flood frequencies and magnitudes, disrupted natural temperature fluctuations, altered low flows . . ., reduced sediment and nutrient loads, changed channel-sediment characteristics . . ., narrowed and shrunk river channels, changed channel patterns and eliminated flood plains.[53]

Moreover, a recent report concluded that water development has created the single most significant threat to survival of species.[54]

During the period when most extensive water development was occurring, the environmental impacts were not formally assessed and discussed in advance of development as they would be today. By the 1970s, however, most observers recognized the nature of the adverse effects of water projects.[55] Environmentalists had long decried the damage caused by dams and had won historic battles in the 1950s and 1960s by stopping three major dams planned for the Colorado River.[56] While these early victories helped to define the environmental movement, the official government policy continued to favor subsidized water development. This remained so even after Congress had passed an impressive array of environmental protection legislation in the early 1970s.[57]

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selenium from irrigated farmlands and accumulation of selenium in the Kesterson Wildlife Refuge. The water in the refuge eventually became toxic to migratory birds, which incited costly, yet still not totally effective, responses. *See* Getches, *supra* note 37, at 20; Laura H. Kosloff, Comment, *Tragedy at Kesterson Reservoir: Death of a Wildlife Refuge Illustrates Failings of Water Law*, 15 ENVTL. L. REP. 10386 (1985).

52. *See* BATES ET AL., *supra* note 2, at 36.

53. ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33,. at 2-13.

54. Elizabeth Losos et al., *Taxpayer-Subsidized Resource Extraction Harms Species*, 45 BIOSCIENCE 446, 448 (1995). The researchers examined the impacts of a variety of resource extraction activities on endangered species, including grazing, mining, logging, recreation, and water development. Water development was found to be the activity that affected the greatest number of species.

55. *See* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at 2-12 to 2-13; Lawrence J. MacDonnell, *Managing Reclamation Facilities for Ecosystem Benefits*, 67 U. COLO. L. REV. 197, 200 (1996).

56. *See* REISNER, *supra* note 51, at 300; BATES ET AL., *supra* note 2, at 43-47.

57. *See, e.g.*, Clean Water Act, 33 U.S.C. §§ 1251-1387 (1994); Clean Air Act, 42 U.S.C. §§ 7401-7671(q) (1994); Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701-1784 (1994); National Forest Management Act, 16 U.S.C. § 1600 (1994); Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1994).

In 1977, Jimmy Carter became President and initiated inexorable changes in federal water policy. For westerners interested in water issues, the hallmark of Carter's presidency was the infamous "hit list," targeting thirty-three water projects of the Bureau of Reclamation and Corps of Engineers for elimination from the federal budget.[58] Congress had already approved construction of these elaborate systems of dams, irrigation, and hydropower facilities in the West, and they had taken on an aura of birthright for the states involved. When the new Administration announced that the projects were doomed by intolerable environmental impacts or unacceptable benefit-cost ratios there was an outcry from western politicians and development interests. Governor Richard Lamm wrote in his book, *The Angry West*:

> However well-intentioned it may have been, the Carter hit list was a study in federal arrogance. Its assumptions were questionable, its conclusions were faulty; it was riddled with anti-western prejudice and wrapped in anti-western ignorance. It reflected no understanding of western conditions, of western people, of the nature of their lives, or of the relentless crushing aridity that shapes their land and everything in it.[59]

Lamm's unvarnished criticism of the Carter hit list was consistent with antagonism toward federal policies being voiced by many of his fellow governors, including then-Governor Bruce Babbitt.[60]

Carter's message was clear. Because the proposed federal projects could not be economically justified and would cause environmental problems at least as serious as their predecessors, they must not be built. The Bureau of Reclamation touted its program as one that paid its own way, but in reality most projects were heavily subsidized.[61] Several of the projects on the hit list had benefit-cost ratios less favorable than 1:1.[62] Subsidized federal water projects had originally been accepted in order to promote the Reclamation Act's purpose of aiding growth in the West,[63] but by the 1980s that goal had been realized. Moreover, benefit-cost analyses had understated the full costs to the rest of the nation. In addition

58. *See* Alexandra M. Shafer, *The Reclamation Reform Act of 1982: Reform or Replacement?*, 45 U. PITT. L. REV. 647, 666 (1984).

59. RICHARD D. LAMM & MICHAEL MCCARTHY, THE ANGRY WEST 188-89 (1982).

60. *See* Dan Balz, *Democrats Feel a Cold Politic al Wind Blowing From the West*, WASH. POST, Sept. 21, 1981, at A1; William E. Schmidt, *3 Governors in the West Weighing "New Federalism,"* N.Y. TIMES, Feb. 18, 1982, at A10.

61. *See* WAHL, *supra* note 46, at 27-46.

62. *Id.* at 58.

63. *Id.* at 13-23.

to monetary costs, inefficient land use and water use led to costs that were less quantifiable, but no less real. Damage to natural systems was enormous. The public was becoming deeply concerned about major environmental problems, many of which were traceable to federal water projects.[64] Moreover, the Reclamation program raised questions of interregional equity, as crop production was promoted by federal expenditures in the irrigated areas of the West rather than in other, more fertile and humid regions.[65]

President Carter's bold initiative put an end to many proposed water projects and ultimately prevailed as national policy. Although Congress defeated a few of Carter's requests to eliminate projects, the thrust of the policy was maintained in the policies of the Reagan and Bush Administrations. As a result, federal water projects that did not meet very conservative criteria and did not have significant state or local funding were effectively dead.[66] The hit list was, at the time, considered a political blunder of epic proportions, but history should rightly mark it as signaling the end of the era of federal dam-building in the United States and perhaps a visionary policy.

The demise of the federal government's role in dam building did not, however, decrease federal influence on water policy.[67] The same national environmental consciousness that emboldened the Carter administration to produce the hit list had also inspired a wave of law-making in the early 1970s that accounts for most of the environmental laws on the books today. The Clean Water Act,[68] Clean Air Act,[69] Federal Land Policy and Management Act,[70] Na-

64. *See, e.g.*, BATES ET AL., *supra* note 2, at 5-8. In the "new West" an increasingly urban populace favors protecting water quality and environmental uses of water, even where it conflicts with development of water for urban uses. *Id.* at 73-89.

65. *Id.* at 22.

66. *See* SMITH, *supra* note 44, at 143; ECON. AND ENVTL. PRINCIPLES, *supra* note 43; State *ex rel.* Martinez v. Lewis, 861 P.2d 235, 249 (N.M. App. 1993) (noting that the principles and guidelines were "so conservative that . . . no project was ever approved"). Although the Reagan Administration, under the banner of the "New Federalism," promised to remedy the trend toward greater federal control, it actually shifted burdens to the states for cost-sharing for construction of water resources projects and reduced the federal share of grants for waste-water treatment facilities, with little devolution of control to the states. *See* Peter Rogers, America's Water: Federal Roles and Responsibilities 179-80 (1993).

67. Although the government is involved in fewer major water projects than in the past, controversy continues over its role in projects that are considered to be environmentally destructive and wasteful. *See generally*, JEFF STEIN ET AL., TROUBLED WATERS: CONGRESS, THE CORPS OF ENGINEERS, AND WASTEFUL WATER PROJECTS (2000).

68. 33 U.S.C. §§ 1251-1387 (1994).

69. 42 U.S.C. §§ 7401-7671(q) (1994).

70. 43 U.S.C. §§ 1701-1784 (1994).

tional Forest Management Act,[71] Endangered Species Act,[72] and many others were passed into law in the space of a few years. These laws created a new kind of federal presence. In the preceding half century, the federal government had profoundly influenced where western water was used and for what purposes. With water project funding being curtailed even as its regulatory presence loomed larger, the federal government was left holding all sticks and no carrots.

Even before these historic changes "state primacy" was, in truth, never much more than a shibboleth of western politicians. Most important decisions and responsibilities were ceded to or assumed by the federal government or by special districts. State water law was simply a framework for allocating rights in the first instance, so unembellished by rules and so inflexible that it did not effectively serve modern needs or help solve water problems.

III. The Movement to Reform Western Water Policy: A Record of Unsatisfied Ambition

Western water law as manifested in prior appropriation law had served the purposes of an earlier era of western settlement and utilitarian goals, but had not kept pace with evolving social and economic values. Federally subsidized water development had assisted in distributing water more widely, but created problems of its own. The state role remained essentially administrative and did not address those problems. These deficiencies were recognized in reports and studies beginning in the 1950s.[73] By the 1990s, the literature in the field created a chorus of reform ideas and recommendations with remarkable similarities.[74] The principles that

71. 16 U.S.C. § 1600 (1994).

72. *Id.* §§ 1531-1544.

73. *See, e.g.*, S. Rep. No. 87-29 (1961); H.R. Doc. No. 84-315 (1956); H. R. Doc. No. 84-208 (1955); H.R. Doc. No. 81-122 (1949); National Academy of Sciences, Water and Choice in the Colorado Basin: An Example of Alternatives in Water Management (1968); National Water Commission, Water Policies for the Future: Final Report to the President and to the Congress of the United States (1973).

74. *See, e.g.*, Bates et al., *supra* note 2; Long's Peak Working Group on National Water Policy, America's Waters: A New Era of Sustainability (1992), *reprinted in* 24 Envtl. L. 125, 128 (1994); Marc Reisner & Sarah Bates, Overtapped Oasis: Reform or Revolution for Western Water (1990); Water Quality 2000, A National Water Agenda for the 21st Century: Final Report (1992) [hereinafter Water Quality 2000]; Water Science and Technology Board of the National Academy of Sciences, National Research Council, Water Transfers in the West: Efficiency, Equity, and the Environment (1992); Zach Willey & Tom Graff, *Federal Water Policy in the United States—An Agenda for Economic and Environmental Reform*, 13 Colum. J. Envtl. L. 325 (1988).

animated the water policy reform movement were conservation, equity, ecology, and the need for balancing these values within established water allocation and management regimes.[75]

Public consciousness of the need for reform expanded, but calls to satisfy changing demands and newly appreciated values met the inflexibility of the system. Popular concern for environmental quality was continually manifested in opinion polls and had been codified in federal laws.[76] It was widely understood that the era of federally subsidized water projects had ended and that the principal role of the federal government in water had been transformed from water development to setting and enforcing environmental standards. Nevertheless, official forums for integrating the public's views into state water decisions were lacking. State law continued to deal primarily with rules for allocation and administration of rights to use water. In fact, beyond leaving appropriators free to do as they pleased, state water law reflected little true "policy." Some growing western cities and industries, however, could see the advantages of supporting the new concern for quality, if only as a means of alleviating supply problems and facilitating more inclusive solutions to environmental conflicts, and they joined in the call for reform.[77]

The states jealously resisted any threat to the central role they had always asserted in western water matters. Aiming to forestall an increased federal regulatory presence, they proposed to make changes in their own systems sufficient to satisfy an expanding public demand for protection of environmental and social values, while also responding to the demands of a growing urban population. At the same time, the states pressed the federal government to become involved and to furnish financial support for negotiated settlements of Indian water rights claims.[78]

Instead of seizing the opportunity to use state-initiated reforms to supplant the need for federal regulation, states made mostly ad hoc responses that were provoked by perceptions of a threat or crisis, often related to urban growth and federal regulatory requirements. The most innovative problem-solving by-passed established state water institutions and sometimes led to the establishment of

75. *See* BATES ET AL., *supra* note 2, at 178-98 (urging that these principles are the ingredients of a "water ethic").

76. *See Id.* at 73-89, 156.

77. *See* WATER QUALITY 2000, *supra* note 74 (report sponsored by industry group).

78. DANIEL MCCOOL, COMMAND OF THE WATERS 239 (1987).

new, ad hoc institutions or processes. Moreover, the federal government—either by its participation in or support of these efforts, or by virtue of federal regulatory pressures—became a catalyst in the evolution of western water policy and today is the single most powerful force for change. Consequently, the importance of traditional state water institutions in the water policy in the 1990s declined markedly.

A. *The Promise of the 1980s: Western Governors Sow Seeds of Reform*

The Western Governors Association, led by Bruce Babbitt of Arizona and Richard Lamm of Colorado, recognized that times had changed and that in order for state policies to remain relevant, they had to be reformed.[79] The trends were clear. If dams were going to be built, it would have to be with state or private funds. However, even if the states could raise the money to build their own dams—and this was a time of declining state revenues—they would face significant regulatory obstacles.

Although some governors had criticized the abrupt shift in the federal role, they realized that these federal policy changes were inexorable and that water policy needed to address evolving social values. Consequently, progressive governors first accepted that it was no longer feasible to respond to water scarcity by expanding supplies; instead, demand for water had to be controlled. Second, they recognized that the unspoiled resources defining the West's essential character had to be protected. Finally, they perceived that states had an opportunity to supplant the need for widening federal regulation.

The governors assumed leadership in a growing movement for reform of western water policy. The movement included the Western Governors Association (WGA) and eventually the Western States Water Council (WSWC), an association of water officials and professionals from the western states.[80] The WGA passed formal

79. *See* WESTERN GOVERNORS' ASSOCIATION WATER EFFICIENCY WORKING GROUP, *Resolution 86-011 (July 8, 1996), in* WATER EFFICIENCY: OPPORTUNITIES FOR ACTION app. A (1987). The resolution was signed by Governors George Deukmejian (California), Richard Lamm (Colorado), George Ariyoshi (Hawaii), Ted Schwinden (Montana), Bob Kerrey (Nebraska), Toney Anaya (New Mexico), George Sinner (North Dakota), Vic Atiyeh (Oregon), William Janklow (South Dakota), Norman Bangerter (Utah), and Booth Gardner (Washington).

80. WSWC consistently urged deference to state water laws, but became a progressive voice, suggesting innovations and reforms. WESTERN STATES WATER COUNCIL, ANNUAL REP., POSITION NO. 208 (1995).

resolutions committing themselves and their states to a vision of change.[81] The new coalition of western state water experts and political leaders proposed improved water conservation, protection of instream flows, the integration of quality and quantity management, and the use of markets and pricing mechanisms to make water allocation more efficient in serving the West's needs. In addition, they began to accept the idea that water decision-making needed to include a broader variety of interests and fuller public participation.

These were not truly new ideas; many of them are traceable to studies and reports initiated by governmental and academic groups over the preceding thirty years.[82] Yet it was revolutionary for state officials to embrace them. No one doubted that the prior appropriation doctrine had served reasonably well to promote development in the old West, but it was becoming apparent that without some reforms, the doctrine was too simple to meet the complex and multiple demands being put on water law in the new West. Moreover, the processes for administering the system excluded participation by members of the public who would represent interests beyond the utilitarian purposes of agricultural, industrial, and municipal water users.

In 1986, a path-breaking report commissioned by the WGA called for governors to take the lead in promoting water conservation by working with federal agencies, water users, and others.[83] It made the case for management of demand, rather than development of new supplies, as the best way to satisfy water needs while maintaining quality of life. Specific reforms discussed in the report included the salvage and transfer of water and the substitution of alternative supplies of water for senior users through exchanges and other measures. The report found that water marketing was a means of improving efficiency, but recognized the need for governmental protection of public, community, and environmental values. A later WGA report elaborated on the need for efficiency-enhancing laws and policies and pressed for federal agencies to be more active in developing information to facilitate water markets and protecting environmental values in water.[84]

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81. *See* BATES ET AL., *supra* note 2, at 178-98.

82. *See* sources cited *supra* notes 73-74.

83. BRUCE DRIVER, WESTERN WATER: TUNING THE SYSTEM, REPORT TO THE WESTERN GOVERNOR'S ASSOCIATION FROM THE WATER EFFICIENCY TASK FORCE 25 (1986).

84. WESTERN GOVERNORS' ASSOCIATION WATER EFFICIENCY WORKING GROUP, WATER EFFICIENCY: OPPORTUNITIES FOR ACTION (1987) [hereinafter WGA ON WATER EFFICIENCY].

The WGA, even as its membership and leadership changed, remained a leader in recognizing the importance of water reform. Together with the Western States Water Council, in 1991, WGA sponsored three workshops on western water management in Park City, Utah, bringing together a diverse group of water experts who developed a manifesto for western water management known as the "Park City Principles."[85]

The Park City Principles boldly insisted that the states should play a pivotal role in bringing about major changes in western water policy. They called for state laws and policies to recognize a broader range of interests in water resource values through fuller public involvement, to take a holistic approach to water problems, and to develop a framework responsive to economic, social, and environmental considerations. This would enable broader state participation in federal policy development and administration, and change the federal agency role in local problem solving from prescription to participation. Along with more negotiated and market-like approaches, these measures sought to minimize the need for command and control regulation. It is interesting to note, however, that recommendations for reform usually did not press the rather obvious linkage between land use and water demand, or the effects of land use on the availability and quality of water resources.[86]

The governors and others urging reform were out in front, and were sometimes at odds with many traditional voices in water policy. Proposals for nearly *any* change in western water law were controversial and the constituency supporting change was limited. In the past, state laws had incorporated departures from the strict doctrine of prior appropriation in the course of providing incentives for development and creating elaborate statutory programs for permitting.[87] When it came to reforms that could result in

85. *See* Bell et al., *supra* note 44.

86. For an important article on the need to integrate water resources planning and local land use planning and management, see A. Dan Tarlock & Sarah B. Van de Wetering, *Growth Management and Western Water Law From Urban Oases to Archipelagos*, 5 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 163 (1999). *See also* David H. Getches, *From Ashkabad, to Wellton-Mohawk, to Los Angeles: The Drought in Water Policy*, 64 U. COLO. L. REV. 523 (1993); Kevin M. O'Brien & Barbara Markham, *Tale of Two Coasts: How Two States Link Water and Land Use Planning*, 11 NAT. RESOURCES & ENV'T 3 (1996).

87. For instance: (1) An early modification of the doctrine altered the most basic requirement of prior appropriation—that water needs to be diverted before a legal right exists—and allowed a later diversion to relate back to the time the intent to appropriate was formed. The purpose was to provide security for investments in water development. *See*

sharing decision-making for allocation and use of water, some observers expressed substantial suspicion and resisted almost any change.[88] But by the beginning of the 1990s reform seemed inevitable and less ominous. The Park City Principles, as well as the conclusions of other reports of the WGA and WSWC, coincided with many of the ideas expressed by earlier task forces as well as the reform-oriented scholarship of the era.[89]

B. *The Record of the 1990s: States Produce Little Change*

The 1990s began with the states expressing their intentions to adapt water law and administration to the West's rapidly changing needs. State politicians apparently embraced the essential reform proposals, raising expectations for new legislation and aggressive administrative initiatives that would, in turn, be tested in court. The stage seemed set for action to encourage greater efficiency and conservation, such as enacting statutes that promote water reuse and salvage or requiring low-flow plumbing fixtures. Groundwater law in many states had long needed revision to provide for conjunctive management with surface waters.[90] The public was insisting on more effective protection of flowing streams and promo-

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GETCHES, *supra* note 7, at 101. (2) Another innovation was the use of the interstate compact when a single state's laws proved inadequate to deal with development and use of waterways that crossed state lines. *See* JEROME C. MUYS, INTERSTATE WATER COMPACTS: THE INTERSTATE COMPACT AND FEDERAL-INTERSTATE COMPACT (National Water Commission, Legal Study No.14, 1971). (3) All states enacted laws providing for administratively issued permits to use water, except Colorado which uses specialized water courts to perform a similar function. *See* A. DAN TARLOCK, JAMES N. CORBRIDGE & DAVID H. GETCHES, WATER RESOURCE MANAGEMENT: A CASEBOOK IN LAW AND PUBLIC POLICY 236-37 (4th ed. 1993). (4) At least some changes in the basic state water laws in the West, such as laws to protect instream flows, responded to demands for change that were not primarily development oriented. *See* A. Dan Tarlock, *Appropriation for Instream Flow Maintenance: A Progress Report on 'New' Public Western Water Rights*, 1978 UTAH L. REV. 211.

88. *See* PAT O'TOOLE, A BLUEPRINT FOR EFFECTIVE WATER POLICY IN THE WEST: AN ALTERNATIVE TO THE FINAL REPORT OF THE WESTERN WATER POLICY ADVISORY COMMISSION, *in* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at B-14; Gregory J. Hobbs, Jr., *Ecological Integrity, New Western Myth: A Critique of the Long's Peak Report*, 24 ENVTL. L. 157 (1994); Gregory J. Hobbs, Jr., *The Reluctant Marriage: The Next Generation (A Response to Charles Wilkinson)*, 21 ENVTL. L. 1087 (1991).

89. *See* sources cited *supra* notes 79-80.

90. *See* KENNETH J. BURKE, ET AL., INTERSTATE ALLOCATION AND MANAGEMENT OF NONTRIBUTARY GROUNDWATER: A DISCUSSION PAPER PREPARED FOR THE WESTERN GOVERNORS' ASSOCIATION 129; UNITED STATES ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, COORDINATING WATER RESOURCES IN THE FEDERAL SYSTEM: THE GROUNDWATER-SURFACE WATER CONNECTION 27-49 (1991). "The term 'conjunctive use' refers to the joint use or management of groundwater and surface water sources." GETCHES, *supra* note 7, at 276; *see generally, id.* at 276-87.

tion of other elements of the public interest. Some states had already begun efforts to improve state water planning to make it more comprehensive and inclusive.[91] The states' agenda also included easing barriers to water transfers and marketing.[92]

As the governors apparently understood, and other state political leaders should have appreciated, a key to replacing federal controls was the creation of innovative state programs to respond to the public's demands for water reform. When states had gone beyond, but not conflicted with, federal programs in attempting to protect public values, their efforts had been sustained. For example, the Supreme Court upheld state requirements for releases of water from a federally licensed dam to protect water quality[93] and state water right permit limitations on filling a federal reservoir in order to protect fish, wildlife, and recreation below the dam.[94]

Actual political and legal developments at the state level in the 1990s, however, fell short of the expectations that seemed realistic in the late 1980s. Instead of staying ahead of federal regulatory pressures, the states responded with modest adjustments when they faced controls that seemed intolerable or when they thought that growth was creating imminent shortages. As this section shows, most changes in state law and policy were far from visionary; rather, they were necessary responses to immediate problems.

State systems now risk obsolescence as some of the most important water issues in the West are being entrusted to unconventional federally and locally-driven processes. The decline in the influence of state water institutions is ironic not only because of the time-honored myth of "state primacy" in water, but because at the beginning of the decade, the states seemed ready to take leadership in promoting change. The following summary of state legislation and court decisions concerning each of the major areas of water policy that were targeted for reform in the 1980s reveals the rather modest results produced from 1989-1999.[95]

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91. *See* Getches, *supra* note 37, at 28-32.

92. *See* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at 3-22. *See also* BONNIE G. COLBY ET AL., TRANSFERRING WATER RIGHTS IN THE WESTERN STATES—A COMPARISON OF POLICIES AND PROCEDURES (U. Colo. Nat. Resources L. Center, Occasional Paper Series, Feb. 1989).

93. *See* Public Util. Dist. No. 1 v. Washington Dep't of Ecology, 511 U.S. 700 (1994) (finding that Clean Water Act purposes are served by state instream flow requirements for fish).

94. *See* California v. United States, 438 U.S. 645 (1978) (finding that a state can impose permit limits on the federal government that are consistent with Reclamation Act).

95. Data in this section were compiled as follows. First, all western state statutory en-

1. *Conservation and efficiency.*

The inefficient use of huge quantities of water in agriculture is notorious, and the documented benefits of conserving water are great.[96] In addition, cities have opportunities to save water through pricing methods and improved plumbing. Yet after the western governors identified a concrete agenda for legal changes, most states did little to promote water use efficiency. It is, however, the area where, at least in the aggregate, the most state reform has taken place through legislative actions and judicial decisions.

Kansas, for example, passed a law requiring water conservation plans of all water users,[97] and Texas now requires a state water conservation plan.[98] The Washington Supreme Court has held that when rights are adjudicated they can be limited to the amount used over time in a reasonably efficient manner.[99] This allows a court to reduce the quantity of a water right from the original amount to the amount used *with reasonable efficiency*, even if the full amount of the water right has been used.

A few states passed laws encouraging salvage of wasted irrigation water. Montana's law allows appropriators who conserve water to make use of the salvaged water, i.e., the reduction in the amount

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actments and appellate court decisions for the period that apparently dealt with water law were compiled for the period 1989-1999. Data from 1989 were included in order to cover slightly more than a ten year period (rather than covering slightly less than ten years, since the research was conducted during 1999). Second, the resulting list was checked against three secondary sources that periodically report on recent developments in water law: (1) American Bar Association's Natural Resources, Energy, and Environmental Law (University of Tulsa College of Law); (2) Water Strategist (Analysis of Water Marketing, Finance, Legislation and Litigation) (Stratecom, Inc., Claremont, Cal.); and (3) Rocky Mountain Mineral Law Foundation Water Law Newsletter (Denver, Colo.). These sources were consulted to identify any omissions (e.g., an uncodified appropriation of funds in connection with interstate water marketing), and to utilize the reporters' expertise in evaluating the significance of the legislation. Finally, a subset of these legal developments that, in the author's view, constitute "reform" were identified. Undoubtedly, some developments that others would have included have been omitted. Court decisions are included because courts implement and sometimes even make water policy by interpreting and enforcing legislative and administrative decisions.

96. *See* DRIVER, *supra* note 83, at v, 4-6; David H. Getches, *Water Use Efficiency: The Value of Water in the West*, 8 PUB. LAND L. REV. 1, 12-13 (1987); Steven J. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 OR. L. REV. 483 (1982).

97. 1991 Kan. Sess. Laws, 292 § 4 (amending KAN. STAT. ANN. 82a-732 (1989)) (stating that annual water use reports are required to use existing water rights).

98. TEX. WATER CODE ANN. § 16.051(a) (Vernon 2000) (describing state plan for water conservation).

99. State of Washington v. Grimes, 852 P.2d 1044, 1051-52 (Wash. 1993) (limiting quantity of adjudicated rights by "reasonable efficiency").

of water they consume.[100] This reform had been urged in Montana and elsewhere.[101] Oregon liberalized the definition of salvaged water, which had been confined to water that was irretrievably lost,[102] and amended its conservation incentive program to allow water users who had begun conserving but had not applied to be in the program to be included retroactively.[103] New Mexico stopped short of allowing transfers of salvaged water, but declared that conserved water will not be forfeited for nonuse.[104] Washington authorized counties to create boards to undertake water conservation and efficiency improvements and to pursue redistribution and transfer of salvaged water.[105] Arizona and Colorado passed laws promoting low flow plumbing fixtures.[106] Nevada enabled Clark County to regulate the artificial lakes that have proliferated at golf courses and casinos around Las Vegas.[107] Utah's actions were essentially hortatory, such as a resolution encouraging conservation[108] and a requirement that water providers update conservation plans periodically.[109]

California's water conservation efforts and results during the 1990s stand out in comparison to those of other states. During this time, it produced the most significant legislation in the West and freed up enough water for millions of additional people. As the state continues growing well beyond the capacity of its water resources, reuse becomes an ever more pressing necessity. The understandable distaste that people may have for drinking water that they might have flushed down the toilet the day before has been overcome by the scientific reality that water can be cleaned and recycled without sacrificing health or aesthetics. California lawmakers passed new laws almost every year in the decade to en-

100. MONT. CODE ANN. §§ 85-2-102(15), 85-2-402(2)(e), 85-2-419 (1999) (stating that salvaged water can be used by appropriators who conserve).

101. *See* WGA ON WATER EFFICIENCY, *supra* note 84; *see also* DRIVER, *supra* note 83.

102. 1993 Or. Laws 641 (amending OR. REV. STAT. §§ 537.470, 537.480, 537.485, 537.490, 537.495, 540.510).

103. 1999 Or. Laws 3.94 (amending OR. REV. STAT. §§ 537.463-500) (allowing water rights holder to retain 75% of conserved water for use or sale and reverts 25% to state).

104. 1998 N.M. Laws 37 (H.B. 460) (amending N.M. STAT. ANN. § 72-5-28 (Mitchie 1998) (protecting conserved water rights from forfeiture due to nonuse).

105. 1996 Wash. Laws 320 §11(2).

106. ARIZ. REV. STAT. ANN. §§ 45-311 to 45-319 (West 1994 & Supp. 1999); COLO. REV. STAT. § 9-1.3-102 (Supp. 2000)).

107. NEV. REV. STAT. § 533.030 (YEAR).

108. S.J. Res. 4, 54th Leg., 1st Sess (Utah 1999).

109. UTAH CODE ANN. § 73-10-32 (Supp. 1999).

courage water recycling.[110] For example, the Legislature required that standards for gray water—bath and wash water—be set for residences.[111] Another law declares that using potable water is wasteful if reclaimed water is available.[112] And districts in southern California have designed programs that generate hundreds of thousands of acre-feet of water per year by reclaiming wastewater and using it to replenish groundwater.[113]

2. *Groundwater.*

States made some minor advances in laws dealing with groundwater. Perhaps the most significant was the long-awaited legislation in Nebraska recognizing that water pumped out of wells which are hydrologically connected to a surface stream must be conjunctively managed with the water from the stream.[114] That is, the legislature finally conceded hydrologic reality and joined most other states by managing water coming from the same source, whether it is diverted above ground directly from a stream or by a well tapping a connected aquifer. Farther west, the Arizona Supreme Court recognized that the state's policy of treating water that is subflow of a stream as groundwater subject to prior appropriation, while governing percolating underground water under the rule of reasonable use, was an artifice that had been rejected by most other

110. A.B. 609, 1997-98 Leg., Reg. Sess., 1998 Cal. Legis. Serv. ch. 164 (amending CAL. WATER CODE §§ 13,575-13,576, 13,579-13,581) (authorizes feasibility study of providing recycled water for groundwater replenishment and allows agreements between groundwater replenishment agencies and recycled water wholesalers for the use of recycled water for groundwater replenishment); A.B. 541, 1997-98 Leg., Reg. Sess. (Cal. 1997) (amending CAL. WATER CODE § 13271, and adding CAL. WATER CODE §§ 13529, 13529.2, 13529.4) (treated recycled water exempt from the definition of "sewage," allowing it to be used to supplement water supplies); 1994 Cal. Legis. Serv. 733 (West) (amending CAL. WATER CODE §§ 13575, 13576 and adding CAL. WATER CODE §§ 13579, 13580, 13581, 13582) (water suppliers must identify potential recycled water uses within their service areas); 1993 Cal. Legis. Serv. 980 (West) (amending CAL. WATER CODE §§ 13552.4 and 13552.8 (reclaimed water use must be considered in planning); 1993 Water Recycling Act, 1991 Cal. Legis. Serv. 187 (West) (amending CAL. WATER CODE §§ 13050 and 13241 and adding ch. 7.5 (commencing with § 13575)) (use of new water is waste if reclaimed water available).

111. 1992 Cal. Legis. Serv. 226 (West) (adding CAL. WATER CODE § 14875) (agency can adopt graywater standards for residential systems).

112. 1993 Cal. Legis. Serv. 980 (West) (amending CAL. WATER CODE § 13554.2 and adding §§ 13552.2, 13552.6) (using potable water).

113. *See, e.g.*, San Diego Area Waste Water Management District Act, ch. 803, § 1, Stats.)1992) (codified as amended at CAL. WATER CODE APP. § 133-415(h) (West 1992)).

114. L.B. 108, 94th Leg., 2nd Sess. (Neb. 1996) (amending various water statutes, and specifically NEB. REV. STAT. § 46-656) (groundwater hydrologically connected to surface water to be conjunctively administered if use of that water is affecting or is likely to affect surface water supplies).

states.[115] The Court refused, however, to change the rule judicially because of reliance interests.

Texas law has always held to the antiquated idea that an overlying landowner has absolute ownership of groundwater,[116] ignoring the fact that pumping can affect surface flows and rights to use them.[117] The "rule of capture," allowing pumpers the right to virtually unregulated pumping from beneath their property, has resulted in some odd and inequitable results in disputes between surface and groundwater users. The Texas Supreme Court has even called the rule "harsh and outmoded."[118] Still, it took years of litigation and the threat of placing a major urban water source under federal management to motivate effective administrative and legislative action to correct the situation.

Depletion of the Edwards Aquifer, which supplies San Antonio, Texas, caused flows to decline in springs that feed the Guadalupe River. The springs are the habitat of eight federally-listed threatened or endangered species and the city's water use created a serious conflict with the federal Endangered Species Act (ESA).[119] The Sierra Club filed a lawsuit under the ESA[120] and while the suit was pending, the Texas legislature passed the Edwards Aquifer Act.[121] The new law set up an authority to regulate groundwater withdrawals from the Edwards Aquifer, and to account for the impacts on surface waters. But the act was declared unconstitutional and it was 1996 before the state supreme court upheld the constitutionality of the special regulatory system for the aquifer.[122]

During the resulting delay in implementation of the act, the Sierra Club sued again, alleging a taking of endangered species

115. *In re* General Adjudication of All Rights to Use Water in the Gila River System and Source, 989 P.2d 739 (Ariz. 1999).

116. *See* Houston & Texas Cent. Ry. Co. v. East, 81 S.W. 279 (Tex. 1904).

117. TEX. WATER CODE ANN. § 36.002 (Vernon Supp. 2000) (recognizing landowners' rights in groundwater beneath their land).

118. Friendswood Dev. Co. v. Smith-Southwest Indus., Inc., 576 S.W.2d 75 (Tex. 1978) (announcing a prospective rule imposing liability for negligent pumping that causes subsidence).

119. *See* Todd H. Votteler, *The Little Fish That Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Texas Edwards Aquifer*, 28 ENVTL. L. 845 (1998).

120. Sierra Club v. Babbitt, No. Mo-91-CA-069 (W.D. Tex. 1991).

121. Act of May 30, 1993, ch. 626, § 1.06, 73d Leg., Reg. Sess., 1993 Tex. Gen. Laws 2350, 2355 (amended 1995).

122. Barshop v. Medina County Underground Water Conservation Dist., 925 S.W.2d 618 (Tex. 1996) (reversing lower court and upholding constitutionality of statute).

based on the state's failure to manage the aquifer to prevent deaths, emaciation, and population declines of endangered fish. The district court enjoined pumping, limited municipal water use, and expressed doubts about the readiness of the Edwards Aquifer Authority to manage the aquifer.[123] The Texas legislature then mandated that the state agency in charge of reviewing applications for new surface water rights consider the effects of proposed uses on groundwater and groundwater recharge.[124] This scheme still leaves gaps in conjunctive management: It does not address pre-existing surface uses that affect groundwater or the effects of groundwater uses on surface uses. Ultimately, the Texas Supreme Court considered, in other litigation, whether to apply the doctrine of reasonable use to all aquifers. In the absence of affirmative legislation, however, the court declined to do so, perpetuating the old rule of capture in all but the troubled Edwards Aquifer.[125]

In Nevada the legislature set up a new program directing a local water authority in the Las Vegas area to establish a groundwater management program designed to protect long-term supply and prevent contamination.[126] In 1999, the state engineer was empowered to revoke groundwater permits temporarily in overdrafted areas.[127]

Conjunctive management can cause practical problems for senior users with old, inefficient means of diversion (either surface diversions or shallow wells) that become ineffective after modern, efficient wells are installed by junior users. Even if there is enough water available to satisfy senior rights, seniors may argue that they should not be required to build efficient diversion works to replace their old methods of diversion. Idaho has addressed this problem by enabling special districts to organize so that junior groundwater users will develop and pay for mitigation plans to alleviate the impacts on seniors.[128]

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123. Sierra Club v. San Antonio, No. MO-96-CV-097 (W.D. Tex. Aug. 23, 1996). The injunction was eventually vacated by the Court of Appeals in an opinion recounting much of the history of the litigation. *See* San Antonio v. Sierra Club, 112 F.3d 789 (5th Cir. 1997).

124. TEX. WATER CODE ANN. §11.151 (Vernon 2000).

125. Sipriano v. Great Spring Waters of America, Inc., 1 S.W.3d 75 (Tex. 1999) (finding that landowner has right under the "rule of capture" to pump the groundwater under owned land without regard to impacts on others; decision whether to make changes in this principle left to the legislature).

126. 1997 Nev. Stat. 572.

127. 1999 Nev. Stat. 534.120 (AB 408).

128. IDAHO CODE § 42-5201 to -5244 (Michie Supp. 2000) (adding ch. 52 to provide for Ground Water Districts).

Most other state groundwater legislation during the period merely dealt with the details of existing groundwater statutes. During an era of growth pressures and enlightened management, one might have expected states to address the use of aquifers for storage and to establish legal protection for aquifer recharge. Idaho has taken steps to encourage recharge by recognizing that underground storage is a beneficial use.[129] New Mexico also has legislated to promote aquifer recharge.[130] But other than the efforts in California to encourage recharge with reclaimed water discussed earlier,[131] state legislatures have been inactive in this area.

3. *Instream flow.*

The most serious and immediately noticeable environmental impact of water development and use is the depletion of streamflows. By the end of the 1980s, all but the two western states had created some type of instream flow protection programs to deal with lost fish and wildlife habitat and diminished recreational opportunities.[132] One of the states that lacked an instream flow program, Nebraska, enacted a law permitting instream flow appropriations during the 1990s and the courts upheld its constitutionality.[133] The other, New Mexico, struggled with the issue but failed to enact a statute, leaving it as the only western state without some type of instream flow law.[134]

The existing instream flow protection laws varied in their effectiveness and a few states improved their programs in the 1990s. Utah broadened its law to allow the Division of Parks, as well as the

129. IDAHO CODE § 42-4201A (Michie 1996) (recognizing the appropriation and storage of water underground to be a beneficial use of water). Some states have administratively provided for storage of recharged waters. *E.g.*, 2 COLO. CODE REGS. § 402-11 (1995) (allowing evacuated aquifer space to be recharged and used as underground storage reservoirs, upon approval of state engineer).

130. N.M. STAT. ANN. § 72-5A-1 to -17 (1999) (HB 2162) (establishing a permit program for groundwater storage and recovery). *Cf.* ARIZ. REV. STAT. ANN. §45-2401 to 2472 (West Supp. 1999) (Arizona water banking legislation depends on groundwater storage. *See infra* notes 198-99 and accompanying text.)

131. *See* sources cited *supra* note 110.

132. *See* DAVID M. GILLILAN & THOMAS C. BROWN, INSTREAM FLOW PROTECTION: SEEKING A BALANCE IN WESTERN WATER USE (1997).

133. *In re* Application A-16642, 463 N.W.2d 59 (Neb. 1990) (upholding NEB. REV. STAT. §§ 46-2, 107 to 46-2, 110).

134. The state engineer has said, however, that he will recognize public agency rights to flow if a proper application is received. *See* Tim DeYoung, *Instream Flow Protection In A Water Market State: The Case of New Mexico, in* INSTREAM FLOW PROTECTION IN THE WEST 331-56 (Lawrence J. MacDonnell et al. eds., 1989).

Department of Wildlife, to acquire existing appropriations and convert them to flow rights.[135] Montana fought for years over whether to allow experimental leasing of water rights for instream flows and finally authorized it on five streams.[136] In Washington, a court held that the state Department of Ecology could condition groundwater permits on maintenance of streamflows.[137] Oregon now provides for unused hydroelectricity rights to be converted to instream uses.[138]

Most developments during the decade, however, illustrate state resistance to instream flow protection and some states have retreated from their earlier efforts. Under considerable federal pressure, Idaho enacted legislation in 1991 and 1995 authorizing water use for flows needed for fish protection.[139] The state had failed to respond to demands for better protection of endangered salmon and recognition of Indian treaty rights to water that would sustain those fish.[140] One means of making more water available for salmon habitat in the Snake River was to release water from federal Bureau of Reclamation reservoirs. There is little doubt that the government has legal authority to release water.[141] However, the state objected, arguing that although the water was not legally committed to or needed by any particular water users, it should not be released for fishery purposes because it would then no longer be available for agriculture. The federal government negotiated with the state to procure its consent to the releases and the Secretary of the Interior promised—to the extent the releases would interfere with any water contracts—to "lease" rights from the contractors. The state legislature finally enacted two temporary laws giving the federal government "permission" to release the water. Idaho also

135. UTAH CODE ANN. § 73-3-3 (Supp. 1999) (establishing that the Division of Parks, as well as the Department of Wildlife, can change existing water rights to benefit fish, recreation, and environmental preservation).

136. MONT. CODE ANN. §§ 85-2-102, 85-2-402, 85-2-404 (1999) (allowing experimental leasing on five streams); MONT. CODE ANN. § 85-2-408 (1999) (increasing opportunities for temporary changes or leases of existing water rights for instream flow).

137. Hubbard v. State, 936 P.2d 27 (Wash. Ct. App. 1997).

138. 1999 Or. Laws 873 (amending OR. REV. STAT. §§543A.005 to 543A.415).

139. IDAHO CODE §§ 42-1501 to 42-1505 (Michie 1996).

140. On Indian treaty rights to water, see Snake River Basin Adjudication, Nez Perce Consolidated Subcase 03-10022 (Nov. 11, 1999) (granting motions for summary judgment).

141. *See* Carson-Truckee Water Conservancy Dist. v. Clark, 741 F.2d 257 (9th Cir. 1984), *cert. denied*, 470 U.S. 1083 (1985) (holding that Endangered Species Act obligations empowered Secretary of the Interior to release water from federal project to protect endangered fishes).

passed legislation in 1999 to protect the Payette River from future hydropower development.[142]

In Wyoming, the State Supreme Court reversed a special master's finding that Indian tribes should be able to dedicate water rights allocated to them in a general stream adjudication to instream flows.[143] The court upheld the state engineer's refusal to enforce tribal instream flow permits that allowed amounts of water quantified for future tribal agricultural uses to be left in the stream to maintain the fishery instead of being diverted by non-Indian irrigators.[144]

Colorado has one of the oldest and ostensibly most flexible laws for establishing instream flow rights,[145] but the agency in charge of administering the law, the Colorado Water Conservation Board, as well as the legislature and the courts, have curtailed some of the statute's flexibility and effectiveness.[146] On the other hand, although the legislature declared that only the Board can hold instream flow rights, the state supreme court effectively allowed the City of Fort Collins to protect instream flows by a creative interpretation of existing law that treats structures like boat chutes that nominally "control" flowing water as a "diversion."[147]

State courts have thwarted most federal attempts to assert instream flow rights under the federal reserved rights doctrine. Colorado courts have rejected claims for water to protect flows for national monuments and national forests.[148] The Idaho court ad-

142. 1999 Idaho Acts Ch. 364 (SB 1151).

143. *In re* General Adjudication of All Rights to Use Water in the Big Horn River System, 835 P.2d 273 (Wyo. 1992).

144. *Id.*

145. COLO. REV. STAT. § 37-92-102(3) (Supp. 2000).

146. 1994 Colo. Sess. Laws 766 (amending COLO. REV. STAT. § 37-92-102(3) (Supp. 2000)) (establishing that the state may not acquire conditional rights for instream flows); COLO. REV. STAT. § 37-92-102(3) (Supp. 2000) (establishing that the state board must hold administrative hearing to relinquish instream flow rights; enacted in reaction to *Aspen Wilderness Workshop, Inc. v. Colorado Water Conservation Board*, 901 P.2d 1251 (Colo. 1995) (holding that power to appropriate a minimum stream-flow imposes a fiduciary duty between the state board and the people of the state)).

147. City of Thornton v. City of Fort Collins, 830 P.2d 915, 931 (Colo. 1992) (holding that appropriation is by a diversion if structures for "use" of water right are built at each end of stretch of river to be protected). The court found that Fort Collins' channelizing dam at the beginning of a stretch of stream and boat chute at the end of the same stretch of stream that it hoped to protect were equivalent to diversion dams. Therefore, the court found the dams were actually protecting an appropriation by a diversion and were not appropriating an instream flow.

148. *In re* Application for Water Rights of the United States, No. W-85 (Colo. Dist. Ct. Div. 6 March 14, 1985) (regarding Dinosaur National Monument); *In re* the Amended

judicating water rights in the Snake River system likewise denied federal reserved water rights claims for national forests but found that the purposes of federally designated wilderness areas necessitated a reservation of the unappropriated waters within and above streams flowing into those areas.[149] The latter development caused the state Department of Water Resources to declare a moratorium on all pending water rights applications, including those that would not necessarily be affected by the federal claims.[150] After a political backlash, the state supreme court reversed itself in 2000.[151]

4. *Public interest.*

For many years, virtually all states have required some type of public interest review of all new appropriations.[152] These laws ostensibly reflected the principle that unappropriated water is a public resource and, therefore, any grant of private rights to use it should be consistent with the public welfare.[153] Application of the laws was uneven among states, however, and rarely was forceful enough to protect social and environmental values. Moreover, most states lacked clear standards for evaluating the public interest and needed better procedures for public involvement in the process. Some public interest review was no more than a cursory determination by the state engineer.[154]

Application of the United States for Reserved Water Rights in the Platte River, No. W-8439-76 (Colo. Dist. Ct. Div. 6 Feb. 12, 1993) (regarding national forest lands).

149. United States v. City of Challis, 988 P.2d 1199 (Idaho 1999); *In re* SRBA, No. 39576, 1999 WL 778325 (Idaho, 1999).

150. The Governor publicly declared that "the lives and livelihoods of tens of thousands of Idahoans could be affected." Given the rather limited opportunities for water development upstream of wilderness areas, this statement and the moratorium appear to be tactical moves to attract publicity and influence the state supreme court in the State's appeal of the decision. The political reaction against the decision recognizing federal reserved rights for wilderness areas led to the justice who wrote the opinion being voted out of office. Mark Warbis, *Power of GOP Machine, Water Rights Drive Election Victories*, ASSOCIATED PRESS NEWSWIRES, BOISE, IDAHO, May 24, 2000.

151. The political reaction against the decision recognizing federal reserved rights for wilderness areas led to the justice who wrote the opinion being voted out of office. *Id.* On rehearing, the court then reached an opposite conclusion. *In re* SRBA, No. 39576, 2000 WL 1604001 (Idaho, 2000) (Wilderness Act does not create reserved rights for wilderness areas).

152. Douglas Grant, *Public Interest Review of Water Right Allocation and Transfer in the West: Recognition of Public Values*, 19 ARIZ. ST. L.J. 681 (1987).

153. *See supra* notes 23-25.

154. *Id. See generally* Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347 (1989).

Apart from the public interest requirement specific to water allocation, some states require environmental impact reports (EIRs) on major developments, including water projects and water allocation decisions.[155] The environmental assessment process provides a forum for raising public interest factors in particularly controversial cases.[156]

During the 1990s, states gave little attention to improving public interest consideration in water decisions. A few states extended their public interest requirement to changes and transfers of existing rights, recognizing that limiting such review to new appropriations would undermine the law's purpose because a subsequent transfer or change of use could occur without considering the public interest.[157] Montana has integrated water quality concerns into water rights decisions by requiring that a proposed change of use must not adversely affect the water quality of another appropriator or interfere with the ability of a discharge permit holder to satisfy effluent limitations in the discharge permit.[158] Oregon now allows changes of use away from land where water use was originally authorized if it is for the purpose of benefiting endangered species,[159] and allows new uses for public benefit without amending basin plans.[160]

The public trust doctrine is a forceful common law basis for infusing public interest concerns into water decisions, even without an express state statutory or constitutional requirement. It became

155. *E.g.*, WASH. REV. CODE ANN. §§ 43.21C.030 (West 1998); *See* CAL. PUB. RES. CODE §§ 21000-21781 (West 2000); Stempel v. Dept. of Water Resources, 508 P.2d 166 (Wa. 1973) (requiring the Department to investigate potential pollution problems before proceeding with water use plan). *See also* County of Inyo v. City of Los Angeles, 139 Cal. Rptr. 396, 408 (1977) (Cal. Ct. App. 1977) (finding that the EIR for a proposal to increase groundwater extraction by Los Angeles from Inyo County should consider a water conservation program alternative).

156. *See* Galante Vineyards v. Monterey Peninsula Water Mgmt. Dist., 71 Cal. Rptr. 2d 1 (1997).

157. IDAHO CODE § 42-211 (Michie 1996); 1993 Mont. Laws 244, 445 (codified as amended at MONT. CODE ANN. § 85-2-319 (1999)) (requiring changes to conform with water quality protection goals); Bonham v. Morgan, 788 P.2d 497 (Utah 1989) (changing of use application subject to public welfare standard though requirement was explicit only as to new applications); Hardy v. Higginson, 849 P.2d 946 (Idaho 1993) (applying local public interest standard to application to amend a water permit even though not explicitly required by statute).

158. MONT. CODE ANN. § 85-2-402 (1999).

159. 1999 Or. Laws 611 (amending OR. REV. STAT. § 537.2.11).

160. 1999 Or. Laws 703 (amending OR. REV. STAT. § 536.295) (allowing new public uses, including non-consumptive uses, public health and safety, avoiding extreme hardship, and other uses providing public benefits).

a major topic of discussion in the 1980s after the Mono Lake litigation in which the California Supreme Court held that the public trust doctrine could be applied to force re-evaluation of longstanding rights.[161] The concept is that the state holds water in trust for the people and cannot convey it for private uses without considering the impact on public uses like fish, wildlife, and recreation. The case that gave life to the doctrine in the field of water allocation was concluded in 1994 by amending Los Angeles' water rights to maintain instream flows and restore channels in tributaries to Mono Lake.[162]

It appears that the ideals in the *Mono Lake* decision respecting public values in water will remain a regular part of California water law, influencing administrative practices and statutory interpretation. For instance, an appellate court subsequently found that the State Water Resources Control Board must condition use of water rights on release of sufficient water from a dam licensed by the Board to restore and maintain fisheries as they existed prior to the diversion of water.[163] Some commentators decried the California court's mandate to revisit established water rights in the *Mono Lake* case as the greatest threat ever to the prior appropriation doctrine while others hailed it as a godsend necessary to protect a public resources.[164] Whatever fears there may have been about the doctrine's potential to undermine western water law, the public trust doctrine as applied to water rights in the *Mono Lake* case has not been adopted in other states.

States have done virtually nothing in recent years to improve public interest review of water decisions. Indeed, some states have taken steps backward. In Idaho, the Supreme Court pulled back from its earlier announcement,[165] that the public trust doctrine ap-

161. National Audubon Society v. Superior Court, 658 P.2d 709 (Cal. 1983).

162. California State Water Resources Control Board, Decision 1631 (Sept. 28, 1994) (amending Los Angeles' water rights to require water releases and limits on exports as necessary to provide instream flows and a channel restoration program to protect fish and other public trust resources).

163. California Trout, Inc. v. Superior Court, 266 Cal. Rptr. 788 (Cal. Ct. App. 1990).

164. *See* various perspectives expressed in Michael C. Blumm & Thea Schwartz, *Mono Lake and the Evolving Public Trust in Western Water*, 37 ARIZ. L. REV. 701 (1995); Timothy J. Conway, *National Audubon Society v. Superior Court: The Expanding Public Trust Doctrine*, 14 ENVTL. L. 617 (1984); Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631 (1986); Charles F. Wilkinson, *Symposium on the Public Trust and the Waters of the American West: Yesterday, Today and Tomorrow*, 19 ENVTL. L. 425 (1989).

165. *See* Kootenai Envtl. Alliance v. Panhandle Yacht Club, Inc., 671 P.2d 1085 (Idaho 1983).

plied to waters of that state. The State Supreme Court did not disavow the doctrine entirely, but held that it does not apply to the massive Snake River Basin adjudication.[166] The Idaho legislature then went farther by prohibiting application of the public trust doctrine in water appropriations and other matters related to water rights.[167]

Colorado is the only state that has implemented no requirement for public interest considerations or protections. Although the state constitution declares that water is "property of the public, and [is dedicated] to the use of the people,"[168] the Colorado Supreme Court has refused to require water courts, when deciding whether a large new water right is for a "beneficial use," to accept or consider evidence of impacts of the proposed water uses on the environment, local economies, farming, rural communities, or other public values.[169]

5. *Planning.*

Because water law traditionally has encouraged independent appropriators to make key development decisions, and because most of the water in the West is tied to uses or physical structures designed for specific purposes, comprehensive planning is needed to address changing demands. Indeed, many of the goals for water reform—efficiency, conjunctive use of groundwater, protecting instream flows, respecting the public interest—seek to reverse conditions created by incentives embedded in the old system.[170] Subsidies and a policy of free water have created wasteful and environmentally destructive projects and contributed to inefficient land use. Moreover, water planning has often been a guise for justifying water development.[171]

Basic rules in water law also defied the goals of reform. Endowing water users with property rights to all the water they could divert and use rewarded depletion of streams and frustrated

166. Idaho Conservation League, Inc. v. State of Idaho, 911 P.2d 748 (Idaho 1995).

167. IDAHO CODE §§ 58-1201 to -1203 (Michie 1996) (doctrine is solely a limit on state's alienation of title to beds of navigable waters).

168. COLO. CONST. art. XVI, § 5.

169. *In re* Board of County Comm'rs of County of Arapahoe, 891 P.2d 952, 971-74 (Colo.1995).

170. *See* BATES ET AL., *supra* note 2, at 128-51.

171. *See* Getches, *supra* note 37, at 2. Some state "planning" continues to be development-focused. *See* 1999 N.D. Laws 535 creating a "comprehensive state wide water development plan" as a means of justifying expenditures of $84.8 million in bond proceeds. *See also* 1999 Wyo. Sess. Laws 81, a water planning bill that focuses on water development.

protection of flowing water and other public values. The rule of capture as applied to groundwater disconnected pumpers from responsibility for the impacts of their actions.

Many states imposed legal obligations on water suppliers, like municipalities and districts, to serve new demand, unquestioningly clearing the way for growth whether or not it was the result of any conscious plan.[172] Growth was further facilitated by a special exception to the anti-speculation, use-oriented ideal of prior appropriation. State courts and legislators sanctioned the early acquisition of water rights by growing cities, dubbed by some the "great and growing cities doctrine," long before actual demand materialized.[173] The Colorado Supreme Court recently reiterated its license for a city to accumulate water rights to meet its future growth projections by acquiring sufficient water for nearly a fivefold increase in population.[174] Idaho, however, has authorized the Department of Water Resources to decide whether it is necessary to change water to a municipal use and for how long a municipal provider can "hold water rights to meet reasonably anticipated future need."[175] California has continued its history of subsidizing the use of imported water for suburban sprawl in the megalopolis spreading from Los Angeles to San Diego,[176] by using public funds to create an incentive to transfer agricultural water to the San Diego area.[177]

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172. *See* A. Dan Tarlock, *Western Water Law, Global Warming, and Growth Limitations*, 24 LOY. L.A. L. REV. 979, 1010-11 (1991).

173. *E.g.*, City and County of Denver v. Northern Colo. Water Conservancy Dist., 276 P.2d 992, 997 (Colo. 1954) ("[W]hen appropriations are sought by a growing city, regard should be given to its reasonably anticipated requirements."); City and County of Denver v. Sheriff, 96 P.2d 836 (Colo. 1939); *See* Janis E. Carpenter, *Water for Growing Communities: Refining Tradition in the Pacific Northwest*, 27 ENVTL. L. 127, 128 (1997); J. Gregory J. Hobbs, Jr., *Colorado Water Law: An Historical Overview*, 1 U. DENV. WATER L. REV. 1, 15-17 (1997).

174. Thornton v. Bijou Irrigation Co., 926 P.2d 1 (Colo. 1996).

175. IDAHO CODE § 42-202B (Michie 1949). The section also requires a determination that there will not be a significant effect on agriculture and states that determination of future need should exclude demand in areas where there are conflicting land use plans. *See Id.* § 42-202B(5)-(6).

176. Water supplies for growth of suburban communities in Southern California were provided by financing delivery systems from the Colorado River with taxes on already developed areas (i.e., City of Los Angeles). *See* ROBERT GOTTLIEB, A LIFE OF ITS OWN: THE POLITICS AND POWER OF WATER (1988); Steven P. Erie & Pascale Joassart-Marcelli, *Unravelling Southern California's Water/Growth Nexus: Metropolitan Water District Policies and Subsidies for Suburban Development, 1928-1996*, 36 CAL. W. L. REV. 267 (2000).

177. *See* Erie & Joassart-Marcelli, *supra* note 176, at 290. *See also infra* note 185 and accompanying text. The arrangement commits statewide tax revenues and may mandate the growth area from growth-based fees.

During the 1980s a few states had planning processes that attempted to integrate water supply, quality, and other related issues such as environmental protection and flood control.[178] Presumably, planning continued during the 1990s in those states, though it is not revealed by our survey of legislation and court decisions. The majority of western states had no water planning programs or limited their planning to supply issues, and they did not make their planning any more comprehensive during the 1990s. To the extent that states addressed the subject, they dealt with piecemeal planning to address specific issues such as groundwater,[179] conservation,[180] or drought.[181] Instead of leading to more integrated water decisions, this approach further divides consideration of related factors and impacts inherent in water development and use.

Water planning remains segregated from land use planning. Given the serious and widespread concern in the West about population growth and urban sprawl,[182] it is surprising that water planning has not been considered in connection with land use management efforts.[183] It seems obvious that land use patterns drive water demand. For instance, since about half of all current urban water demand in the West is for watering lawns and gardens, land use choices can have a dramatic effect on future water demand.[184] By forgoing sprawling subdivisions in favor of denser development, population growth can be accommodated with far less water. Conversely, the type and extent of infrastructure that is available influences growth and development patterns. Indeed, there is mounting evidence that water policy can contribute to suburban development and sprawl.[185]

California alone made some advances in the water planning process in the 1990s by connecting it to land use planning. Now

178. Kansas, Montana, Oregon, and Washington have the most comprehensive planning processes. *See* Getches, *supra* note 37.

179. *See supra* notes 114, 126-27.

180. *See supra* notes 97-98, 100, 102-07.

181. MONT. CODE ANN. § 2-15-3308 (1999); OR. REV. STAT. § 536.720 (1998); TEX. WATER CODE ANN. §§ 16.051(a), 11.1272 (Vernon 2000); WASH. REV. CODE ANN. § 43.83B.410 (West 1998).

182. *See* Brad Knickerbocker, *USA, What City Dwellers Really Want*, CHRISTIAN SCIENCE MONITOR, Feb. 16, 2000, at 3 (announcing results of opinion polls declaring sprawl and growth as top concerns of the public); DRIVER, *supra* note 83.

183. *See* DRIVER, *supra* note 83 and accompanying text.

184. *See* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at 2-27.

185. *See* Erie & Joassart-Marcelli, *supra* note 176 (showing the correlation of suburban growth in Southern California with availability of subsidized water supplies).

factors such as water conservation, evaluation of supply, and pollution control are required elements of land use plans.[186] In 1995, it passed a law requiring cities to determine that there is a firm water supply before approving major new developments.[187] This determination does not necessarily connect with any state or regional land use or water plans or the plans of any neighboring municipality. The courts have shown some willingness to enforce the California Environmental Quality Act requirement that municipalities produce an environmental impact report evaluating the effects of growth in water demand, including the impacts on an area from which water would be exported.[188]

States have not seized opportunities to soften or head off the federal regulatory presence by instituting strong land use planning and control programs. Federal air and water pollution controls, solid waste regulation, wetlands protection, and endangered species preservation laws all affect the way land is used. If the states sought to ameliorate impacts of land use decisions on water quality, wetlands, and fish and wildlife habitat by considering these impacts in planning, and by permitting development and growth, there would be less need for federal regulation.

The failure of states to relate growth management to water planning is commensurate with the paucity of state-level land use planning and management programs. Only Oregon and Hawaii have assumed any significant level of statewide growth management land use controls.[189] They have reasonably effective controls on land use, although even they do not integrate water resource planning in the state-mandated planning responsibilities. Most states have deferred to local governments in land use regulation, resulting in widespread public dissatisfaction with the lack of effective, coordinated planning. The appealing assumption that local communities are in the best position to determine and regulate land use patterns may be valid for relatively isolated and slow-growing municipalities. But the ideal gives way when intense economic

186. CAL. GOV'T CODE § 65302 (West 2000).

187. CAL. WATER CODE §§ 10910-10914 (West 2000).

188. *See* Stanislaus Natural Heritage Project v. County of Stanislaus, 55 Cal Rptr .2d 625 (Cal. Ct. App. 1996) (rejecting subdivision plan for failure to consider long-term water supply availability).

189. *See* DAVID L. CALLIES, ROBERT H. FREILICH & THOMAS E. ROBERTS, CASES AND MATERIALS ON LAND USE 610 (3d ed. 1999); HAW. REV. STAT. § 205-1 to -18 (1998); OR. REV. STAT. § 197.005-197.860 (1998). Outside the West, Vermont has one of the strongest state land use planning programs. *See* 10 VT. STAT. ANN. §§6001-6104 (2000); RICHARD O. BROOKS, TOWARD COMMUNITY SUSTAINABILITY: VERMONT'S ACT 250 (1997).

pressure comes to bear on local governments that lack the resources or will to enact and enforce effective plans, and does not work in any event if some municipalities in a region have the will and foresight to control growth and neighboring municipalities do not. Thus, without statewide or regional programs, it is unlikely that there will be effective land use planning and growth management, let alone a framework for integrating water planning.

6. *Transfers and marketing.*

Free transferability of water rights facilitates movement of water to higher valued economic uses and promotes greater efficiency and conservation. These are goals touted by economists and water reformers with which western states apparently agree in principle. One of the few new laws that promotes water marketing is a California statute to encourage efficient transfers.[190] However, most state activity in the area of transfers during the decade has tended to restrict rather than encourage freer water markets as proposed in the 1980s.[191]

States are subject to political pressure to control transfers between basins, from out of state, and from agricultural to urban uses, and it is reasonable to expect them to attempt to ameliorate adverse effects of transfers. States could respond with legislation requiring analysis and mitigation of environmental impacts and inequities caused by transfers.[192] But rather than developing programs that would enable beneficial transfers, nearly all recent legislation has simply added procedural barriers that impede or increase the cost of transfers. Colorado, however, has focused on the impacts of transfers out of agricultural uses by requiring revegetation when farmland has dried up.[193] Oregon and Kansas added requirements for major appropriations by subjecting them to a special level of review.[194] Oregon, Nevada and Texas placed controls on transbasin diversions.[195] Finally, six states enacted measures at-

190. 1999 Cal. Legis. Serv. 1584 (West) (amending CAL. WATER CODE §§ 1011, 1707, 1726, 1727, 1728, 1732, and adding §§ 1014-1017).

191. *But see* MONT. CODE ANN. § 85-2-402 (1999) (removing legislative approval requirement for changes in in-state use of large appropriations).

192. *See* Charles W. Howe, *Protecting Public Values in a Water Market Setting: Water Markets to Increase Efficiency and Equity*, 3 U. DENV. WATER L. REV. 357, 368-72 (2000).

193. COLO. REV. STAT. §§ 37-92-305(4.5), 37-92-103(10.4) (Supp. 2000).

194. OR. REV. STAT. § 537.810 (1989) (appropriations greater than 50cfs subject to legislative approval); KAN. STAT. ANN. §§ 82a-1501 to -1506 (1989) (special procedures apply to transfers greater than 2000 AF/year or greater than 35 miles).

195. NEV. REV. STAT. § 534.120 (Supp. 1999) (groundwater); NEV. REV. STAT.

tempting to control interstate transfers without running afoul of dormant commerce clause limitations.[196]

The only significant state effort to promote intrastate transfers was based on subsidy, not liberalization of the market. Under pressure to reduce dependence on water imported from the Colorado River, the California legislature appropriated $235 million in 1998 to facilitate an agricultural to urban transfer.[197] This effort would move water from the Imperial Irrigation District to San Diego through existing facilities of the Metropolitan Water District. Apparently, the transfer of presently wasted, low value water to high value uses needed political, more than economic impetus; as of this writing the project still has not been implemented.

One development that ostensibly encouraged water marketing among states on the Colorado River was the creation of the Arizona Water Banking Authority in 1996.[198] Upon further examination, however, it appears less progressive. The law was motivated by Arizona's desire to capture presently unneeded Colorado River water to which it is legally entitled so that California would not be able to continue to use surplus water to meet demands in excess of its legal entitlements. Rather than being motivated by market forces, the "banking" proposal required imposing taxes to subsidize the expensive pumping and transport of water from the river so that it could be stored underground in Arizona.[199] The logic is

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§§ 533.345, 533.530 (1995) (surface water); OR. REV. STAT. §§ 537.801, 537.803, 537.805, 537.809, 537.830 (1989); TEX. WATER CODE ANN. § 11.085 (Vernon 1997) (requiring assessment of impacts and alternatives).

196. ALASKA STAT. § 46.15.035 (Michie 1998) (also fee for export); ARIZ. REV. STAT. ANN. §§ 45-291 to -294 (West 1994) (requiring Director of Water Resources to consider effects on water conservation, availability of alternative sources, current water supply and future demands); IDAHO CODE § 42-401 (Michie 1996) (standards for exports generally similar to requirements for in-state appropriations); NEV. REV. STAT. §533.520 (1991) (similar to Idaho statute); OKLA. STAT. ANN. tit. 82, § 1085.2(2) (West 1990) (requiring legislative approval); UTAH CODE ANN. §§ 73-3a-101 to -109 (Supp. 1999) (enabling exports on conditions designed to protect state interests).

197. California had for years been using much more than its legal allocation of water from the Colorado River, and other states in the Colorado River Basin insisted on a reduction of use. *See* Getches, *supra* note 51, at 611. By using less Colorado River water in agriculture it could theoretically satisfy demand and reduce imports. S.B. 1765, 1997-98 Reg. Sess. (Cal. 1998) (codified as amended at CAL. WATER CODE § 12,560-65 (West 2000)). This reportedly would be the largest water transfer agreement in the history of the United States. *See California: The Metropolitan Water District of Southern California Endorses Colorado River Water Transfer Agreement Between San Diego County Water Authority and Imperial Irrigation District*, 2 W. WATER L. & POL'Y REP. 191 (1998).

198. ARIZ. REV. STAT. ANN. §45-2401 to -2402 (West 1994). *See also* ARIZ. REV. STAT. §§45-291 to 294 (Supp. 1999) (enabling interstate marketing of water).

199. *See* Getches, *supra* note 51, at 610-15.

that in dry years Arizona can rely on this stored groundwater and market the right to use the quantity to which it is entitled directly from the river to Nevada and possibly California. Acceptance by the Colorado River basin states of the scheme nevertheless marks a significant departure from their former unyielding opposition to interstate water marketing.[200]

C. *Water Reform Moves Outside-the-Box*

The most important innovations in water policy in the 1990s have occurred in response to federal pressure and local initiatives, and almost entirely outside the legislatures and courts of the western states. Instead of being produced within the traditional western water institutional framework, changes were generated "outside-the-box." These approaches, more than official state programs, carry forward the kinds of reform-minded ideas that characterized the rhetoric of western governors in the 1980s. Broad segments of the public have gotten involved in solving water problems and have addressed them with attention to their interrelationships with other issues. They have employed solutions that promote more efficient use, market mechanisms, and conjunctive use. Although they are usually ad hoc responses to particular problems, many of these efforts are better examples of a comprehensive approach to planning than state-sponsored water planning.

Although sweeping state institutional reforms are theoretically possible, the experience of the recent past suggests that the most promising advances in the foreseeable future will continue to be ad hoc, outside-the-box, responses to problems arising in specific geographic areas. Unless states can muster the will to embrace reform when the opportunities arise, the federal government along with these local groups will continue to foment constructive change.

1. *Macro-watershed initiatives.*

In the watersheds of several major rivers, place-specific problem solving efforts are being conducted by representatives of diverse

200. The Secretary of the Interior has proposed rules to facilitate the Arizona plan. *See* Colorado River Interim Surplus Criteria, 64 Fed. Reg. 68373 (1999). These rules are far more limited than ones allowing interstate water marketing that were proposed by the Department of the Interior several years earlier. A similar, but more comprehensive approach to banking and marketing had also been proposed earlier by California, but it met hostile opposition from Arizona and the other basin states. *See* Getches, *supra* note 51, at 610.

interests. Although some of these efforts have been supported by state legislation, they generally operate outside traditional water institutions as particularized responses to issues that could not or were not being addressed successfully by existing institutions. Typically, they have tackled a wide range of issues and assembled a diverse group of parties to participate in seeking solutions.

The most notable macro-watershed effort is "CALFED." In this effort, representatives of agricultural, business, environmental, and urban concerns, along with representatives of sixteen state and federal agencies,[201] are cooperatively trying to solve the problems growing out of the so-called Bay-Delta dispute in California.[202] Originally the Bay-Delta matter appeared to be a problem of controlling water quality in the delta of the Sacramento and San Joaquin Rivers at San Francisco Bay. However, it was soon found to implicate water use and protection throughout the state of California. Environmental and supply problems and operations of water diversion facilities were causing serious, ongoing violations of the federal Clean Water Act and Endangered Species Act. State institutions were not equipped to deal comprehensively with the related problems of water quality, watershed protection, ecosystem restoration, water use efficiency, water transfers, instream flow maintenance, flood control, and managing water storage and conveyance facilities. This panoply of issues, formerly addressed in a piecemeal fashion by state legislation, agencies, and courts, became CALFED's portfolio. The participants are now engaged in what amounts to comprehensive statewide water planning to ensure more reliable water supplies, new management practices to improve water quality for the environment, cities, and farms, and ecosystem restoration efforts, including removal of small dams.

Elsewhere, the operations of Glen Canyon Dam, on the Colorado River, are now subject to ongoing review by an "adaptive management work group."[203] A group of states, Indian tribes, power purchasers, recreational users, federal agencies, and environmen-

201. *See* AMERICAN BAR ASSOCIATION & THE NATIONAL ENERGY ENVIRONMENT LAW & POLICY INSTITUTE, UNIVERSITY OF TULSA COLLEGE OF LAW, ENVIRONMENT, ENERGY, AND RESOURCES LAW 1999: THE YEAR IN REVIEW 166 (2000).

202. *See* Elizabeth Ann Rieke, *The Bay-Delta Accord: A Stride Toward Sustainability*, 67 U. COLO. L. REV. 341 (1996); A. Dan Tarlock, *Federalism Without Preemption: A Case Study in Bioregionalism*, 27 PAC. L. J. 1629 (1996).

203. *See* Warren T. Coleman, *Legal Barriers to the Restoration of Aquatic Systems and the Utilization of Adaptive Management*, 23 VT. L. REV. 177, 187 (1998); Getches, *supra* note 51, at 609.

tal organizations is charged with monitoring the effects of policies and plans for operating Glen Canyon Dam. In the past, release of water from the dam, primarily for power generation, has caused serious environmental and social problems. The group now evaluates such issues as the consequences of dam operations for Grand Canyon National Park, and goals such as fulfilling recreational and environmental purposes and recovery of endangered fish species. It then recommends changes in the dam's operating regime to meet various management objectives consistent with the public interest, such as proposing releases necessary to maintain flows required for ecosystem restoration and recreation.

Another macro-watershed effort is underway on the Platte River. After twenty years of conflict over the effects of water development projects on endangered species in the central Platte River, the states of Colorado, Nebraska, and Wyoming have signed a cooperative agreement with the United States Department of the Interior to implement a joint program of restoration and improved management of the river. Environmental groups as well as water users and governments at all levels participate in the program. The agreement addresses endangered species concerns and various collateral issues and is expected to result in delivery of the flows that are needed for habitats of several species.[204]

In the case of the Truckee River-Pyramid Lake issue in Nevada, the results of long and complex negotiations among diverse interests were codified in federal legislation.[205] The legislation resolved many issues, ranging from tribal water rights to interstate allocation of waters between California and Nevada. Important wildlife issues were addressed, including water rights to benefit the Stillwater National Wildlife Refuge and implementation of recovery plans for the Pyramid Lake's imperiled cui-ui and Lahontan cutthroat trout. The act also called for negotiation among all the interested parties of an operating agreement for federal facilities on the Truckee River which, supplies Pyramid Lake. The resulting agreement led to increased efficiencies for the Newlands Reclamation Project that had sapped the river of water needed to maintain the level of the lake and sustain its fishery.

204. *See* J. David Aiken, *Balancing Endangered Species Protection and Irrigation Water Rights: The Platte River Cooperative Agreement*, 3 GREAT PLAINS NAT. RESOURCES J. 119, 144 (1999).

205. Truckee-Carson-Pyramid Lake Water Rights Settlement Act of 1990, Pub. L. No. 101-618, 104 Stat. 3289; A. Dan Tarlock, *The Creation of New Risk Sharing Water Entitlement Regimes: The Case of the Truckee-Carson Settlement*, 25 ECOLOGY L.Q. 674 (1999).

Finally, representatives from Arizona, California, and Nevada have come together with various water and power agencies to form a regional partnership to develop the Lower Colorado River Basin Multi-Species Conservation Program.[206] It is intended to comply with the Endangered Species Act by conserving endangered species and their critical habitat in the 100-year floodplain of the Colorado River within the United States. In addition, it will facilitate further development of Colorado River water. Because species that become endangered in the future may lie in the path of development, the program will attempt to conserve eighty-eight, mostly non-listed, species in the lower Colorado River basin. This will allow present development to proceed as part of an approved habitat conservation plan under provisions of the ESA that allow some incidental harm to endangered species if the plan can provide overall benefits to habitat that otherwise might not be attained.[207]

2. *Local watershed efforts.*

In addition to macro-watershed efforts, there are hundreds of local efforts that involve people in neighborhoods, watersheds, and communities in solving water and other resource problems that affect them. As with the macro-watershed efforts, the approach they follow is far different from the traditional state agency approach to water problems. Instead of looking narrowly at specific projects and limited considerations to address particular issues or problems, these efforts attempt to include as many issues and interests as possible.

In these watershed groups, people and entities representing varied interests may be drawn together by different concerns emanating from use of a common resource. When a river runs through a town or community, for instance, some residents' concerns about pollution caused by an upstream mine may motivate them to seek solutions to the problem, while others may be concerned because an endangered species issue inhibits development. By coming together, disparate interests—from a mine owner to local citizens, business owners to environmentalists, and scientists to school children—become involved in developing multi-faceted solutions,

206. *See* Robert Wigington & Dale Pontius, *Toward Range-Wide Integration of Recovery Implementation Program for the Endangered Fishes of the Colorado River, in* THE COLORADO RIVER WORKSHOP: ISSUES, IDEAS, AND DIRECTIONS 63 (1996).

207. *See* 16 U.S.C. § 1539(a) (1994). *See also* 61 Fed. Reg. 63854 (1996); DEPARTMENT OF THE INTERIOR, HABITAT CONSERVATION PLANNING HANDBOOK (1996) [hereinafter HCP HANDBOOK].

often employing a holistic, or systems approach.[208]

The Animas River Stakeholder Group is typical of collaborative problem solving at the watershed level. Local residents, who shared a common concern for the quality of the Animas River in southern Colorado, convened after water quality studies by the state Department of Health confirmed contamination of the river by cadmium, lead, and other metals leaching from several abandoned mines.[209] Encouraged by a federal Environmental Protection Agency (EPA) policy favoring watershed-based solutions to water quality problems, the state agency hired a facilitator and helped obtain a United States Department of Energy grant to set up the stakeholder group. Participants were attracted to the group for reasons ranging from an altruistic desire to restore the fishery to attempts to avoid Superfund listing and liability. Members included two towns, a county, three state agencies, two federal agencies, a tribe, landowners, mining companies, environmental activists, and other concerned citizens. The group has undertaken monitoring, identification of pollution hot spots, prioritizing sources of contamination, and planning solutions consistent with a comprehensive view of the public interest.[210]

The Natural Resources Law Center at the University of Colorado School of Law has been studying local watershed groups and has published a collection of profiles of many of them.[211] These groups typically are "grass-roots" efforts, created and operated from the ground up. Although Oregon[212] and Washington,[213] have passed enabling legislation to encourage and provide funding

208. *See generally* MACDONNELL, *supra* note 34, at 280-86; William E. Taylor & Mark Gerath, *The Watershed Protection Approach: Is the Promise About to be Realized?* 11 NAT. RESOURCES & ENV'T 16 (1996).

209. For a study of the Animas River Stakeholders Group, see Sean T. McAllister, *The Confluence of a River and a Community: An Experiment with Community-Based Watershed Management in Southwestern Colorado,* 3 U. DEN. WATER L. REV. 287, 314-34 (2000). *See generally* DOUGLAS S. KENNEY, RESOURCE MANAGEMENT AT THE WATERSHED LEVEL: AN ASSESSMENT OF THE CHANGING FEDERAL ROLE IN THE EMERGING ERA OF COMMUNITY-BASED WATERSHED MANAGEMENT 12-16 (1997).

210. KENNEY, *supra* note 209.

211. *See* NATURAL RESOURCE LAW CENTER, UNIVERSITY OF COLORADO, THE NEW WATERSHED SOURCE BOOK: A DIRECTORY AND REVIEW OF WATERSHED INITIATIVES IN THE WESTERN UNITED STATES (2000).

212. Watershed Management Act, OR. REV. STAT. § 541.384 (1998) (requiring Water Resources Department to cooperate with other state and federal agencies, local watershed councils, non-profits and citizen's groups to administer watershed management programs); 1995 Or. Laws 404, §4 (allocating funds from state lottery revenue to Governor's Watershed Enhancement Board).

213. 1998 Wash. Laws 247 (codified at WASH. REV. CODE ANN. § 90.82.060 (West

to such groups, most watershed groups in the West operate outside-the-box of traditional state institutions.

3. *Dam removal.*

For many years, dam-building was a centerpiece of water policy and was encouraged by water law. Breeching or tearing down dams therefore is a revolutionary and controversial idea that surely must be considered an outside-the-box approach. Some experts have urged a less drastic measure that alters the way dams are operated from their originally authorized purposes. Indeed, re-operation of major dams and facilities, especially Bureau of Reclamation projects, to fulfill new environmental purposes and satisfy emerging demands on water resources has considerable potential for ameliorating the adverse effects of water development.[214] But outright removal of some dams to restore natural flows appears to be the most appropriate action in many cases.

During relicensing proceedings several years ago, the Federal Energy Regulatory Commission (FERC) began considering removal, or "decommissioning," of antiquated dams that were doing little good and much harm.[215] The Edwards Dam on the Kennebec River in Maine was ordered to be removed to restore Atlantic salmon runs that had been impeded for almost 200 years.[216] The Elwha and Glines Canyon Dams, which have blocked salmon spawning on the Elwha River in Washington, are likely to be taken out in the near future.[217] American Rivers has reported that at least ninety-seven dams have been removed across the country as of April 1999.[218] The dam removal movement seems to be directly linked to heightened public participation in solving water problems unencumbered by the "box" of traditional institutions and a narrow class of decision makers.[219]

Surprisingly, there is also serious discussion of removing some of the nation's biggest dams. A study is underway assessing the

1998)) (Watershed-planning act providing for local governments, Indian tribes, and local citizens to prepare and adopt watershed plans through a consensus process).

214. *See* MacDonnell, *supra* note 55.

215. Klein, *supra* note 47, at 694.

216. *Id.* at 712-13.

217. *See A New Era for Hydropower*, AM. RIVERS, Winter 1998, at 3. *See also* John McPhee, *Farewell to the Nineteenth Century*, THE NEW YORKER, Sept. 27, 1999, at 44.

218. AMERICAN RIVERS ET AL., DAM REMOVAL SUCCESS STORIES: RESTORING RIVERS THROUGH SELECTIVE REMOVAL OF DAMS THAT DON'T MAKE SENSE (1999).

219. *See* Klein, *supra* note 47 (linking dam removal to the democratization of environmental decision making).

consequences of breeching four major dams on the Snake River.[220] The plan would remove impediments to fish passage, thereby improving the possibility of fulfilling Indian treaty fishing and water rights. At least one Northwest governor has spoken in support of the controversial plan.[221]

There are also proposals for removal of the Glen Canyon Dam.[222] The idea was first raised casually at a Sierra Club meeting. Eventually, though, several members of Congress called hearings on the idea, which elevated public attention and the seriousness of the proposal. Since then, the public has become more intrigued and the proposal remains viable at least as a vehicle for studying the impacts of the dam's operations.[223]

4. *General stream adjudications.*

At least four states have initiated general stream adjudications to determine water rights of users throughout an entire river basin. This is arguably not truly an outside-the-box approach, inasmuch as stream adjudications are created by state legislative action and occur in state courts or agencies. Nor is the idea of bringing a single lawsuit to determine all rights within an entire river system new. But there has been a recent resurgence in using complex, multi-party litigation to determine water rights. Creating such special procedures and rules to govern a proceeding before a special purpose court, master, or agency tends to remove policy making for entire watersheds from ordinary processes for several years while rights are determined. At least procedurally, then, general

220. Michael C. Blumm et al., *Saving Snake River Water and Salmon Simultaneously: The Biological, Economic, and Legal Case for Breaching the Lower Snake River Dams, Lowering John Day Reservoir, and Restoring Natural River Flows*, 28 ENVTL. L. 997, 1004 (1998).

221. *See* Sam Howe Verhovek, *Oregon's Governor Favors Breaching 4 Major Dams*, N.Y. TIMES , Feb. 19, 2000, at A9.

222. *See* Steven W. Carothers & Dorothy A. House, *Decommissioning Glen Canyon Dam: The Key to Colorado River Ecosystem Restoration and Recovery of Endangered Species?* 42 ARIZ. L. REV. 215 (2000); Scott K. Miller, *Undamming Glen Canyon: Lunacy, Rationality, or Prophecy?* 19 STAN. ENVTL. L.J. 121 (2000); David L. Wegner, *Looking Toward the Future: The Time Has Come to Restore Glen Canyon*, 42 ARIZ. L. REV. 239 (2000); Patrick Graham, *Idea of Draining Lake Makes Waves: (A Movement to Empty Lake Powell is Gaining Ground, Albeit Slowly, Despite Harsh Effects)*, PORTLAND OREGONIAN, March 7, 1999, at A-21.

223. *See Oversight Hearing on the Sierra Club's Proposal to Drain Lake Powell or Reduce its Water Storage Capability: Hearings Before the Subcomm. on National Parks and Public Lands, and Water and Power Resources of the House of Representatives*, 105th Cong. (1997); Ed Marston, *Sierra Club Moves to Fortify its "Drain Lake Powell" Campaign*, HIGH COUNTRY NEWS, Oct. 15, 1997, at 5.

stream adjudications may correctly be viewed as an outside-the-box approach.

Basin-wide adjudications can be massive in scope. In Idaho, the Snake River basin adjudication involves approximately 185,000 claims and has been in active litigation since 1987.[224] The Gila River adjudication in Arizona began in 1974 and seeks to resolve the claims of 24,000 water users.[225] In Oregon, the Department of Water Resources began an adjudication process in 1990, joining 25,000 claimants to determine federal and pre-1909 water rights in the Klamath Basin.[226] Washington has been adjudicating rights in the Yakima River basin since 1977, with as many as 40,000 water users' interests at stake.[227]

Revisiting water rights and claims in the context of entire watersheds and modern values can alter long-standing expectations, which in turn can result in political reactions. If general stream adjudications view all the claims in a basin, senior and junior, with the same level of concern for equity and efficiency, rights to older, typically larger and less efficient uses may be imperiled. Because changes like this can disrupt settled expectations of the parties, state legislatures responded by amending the procedures and altering the substantive rules applied by the courts to determine water rights of the parties. For example, in Idaho, newer, more efficient groundwater uses were in competition with senior, inefficient surface water uses. When the court in the Snake River basin adjudication applied a standard of reasonable efficiency it disadvantaged some of the most senior users whose uses depended on old surface diversion works. Consequently, the state legislature tried to change the rules of decision after the special master and court had ruled in favor of the junior users.[228]

Similarly, the Arizona legislature attempted to revise the rules

224. *See* John E. Thorson, *State Watershed Adjudications: Approaches and Alternatives*, 42 ROCKY MTN. MIN. L. INST. 22-1, 22-39 (1996).

225. *Id.* at 22-37.

226. United States v. Oregon, 44 F.3d 758, 762 (1994); *see also* Reed D. Benson, *Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite the Rules of Prior Appropriation*, 28 ENVTL. L. 881, 902 (1998).

227. *See* Thorson, *supra* note 224, at 22-40 to 22-41.

228. Idaho v. United States, 912 P.2d 614 (1995) (overturning in part Act of April 12, 1994, chs. 454-55, 1994 Idaho Sess. Laws 1443-91) (codified at IDAHO CODE 42-1401 to -1428 (Supp. 1994)). *See also* Robert E. Bakes, *The Snake River Basin Adjudication. . . From the Beginning to the Present*, 38 Advocate (Idaho) 10 (1995); A. Lynn Krogh, *Water Right Adjudications in the Western States: Procedures, Constitutionality, Problems and Solutions*, 30 LAND & WATER L. REV. 9, 39 (1995).

for findings of forfeiture and abandonment, adverse possession, and the filing requirements for water rights applications that were established for the Gila River adjudication. Challenges by the United States and Indian tribes led to striking down these revisions to the enabling legislation for the adjudication.[229] The legislature intended for the new rules to apply retroactively, in order to benefit senior users in the adjudication. For instance, the amendments would have eliminated the need for seniors to pursue more efficient alternative to their surface diversions. But the court found that this change would affect the vested rights of the competing junior users, violating due process guarantees under the state constitution.[230]

It appears that legislatures have tried, though with limited success, to rein in the courts in general stream adjudications by changing their mandates and the rules under which they operate when the courts have moved away from traditional approaches or risked upsetting settled expectations. The unwillingness of state legislatures to tolerate independence of these special purpose courts illustrates the necessity to move outside conventional state institutions to find effective solutions to modern water problems.

5. *Indian water rights settlements.*

One of the areas targeted for reform in the 1980s was the handling of Indian water rights claims. At the time, the federal government had begun in earnest several efforts to negotiate resolutions of tribal claims, and the states were generally cooperating.[231] Unlike many of the other areas discussed, federal leadership faltered in the 1990s. Nevertheless, the model of convening all the affected parties and negotiating a practical resolution to water problems illustrates again the necessity of removing problems from conventional institutions to find effective solutions.

Under venerable Supreme Court precedent, Indian tribes and the United States hold impliedly reserved rights to water in sufficient quantities to fulfill the purposes of their reservations.[232]

229. San Carlos Apache Tribe v. Superior Court, 972 P.2d 179 (Ariz. 1999) (striking down over twenty attempted legislative alterations of general water law to be applied in the stream adjudication, H.B. 2276 based on Constitution and McCarran Amendment); *see also* Thorson, *supra* note 224, at 22-37.

230. *Id.*

231. *See* John E. Thorson, *Proceedings of the Symposium on Settlement of Indian Water Rights Claims*, 22 ENVTL. L. 1009 (1990).

232. Winters v. United States, 207 U.S. 564 (1908).

These rights are superior to the rights of most water users, who depend on rights to use water under state prior appropriation laws because they date from the time a federal or Indian reservation was established rather than from when the water was first put to use. Unless they are specifically quantified for particular uses, reserved rights can cast a cloud of uncertainty over later, state-created rights.

The desire to quantify federal and Indian reserved water rights in order to provide greater certainty for non-Indian water users was the motivation for most states to commence general stream adjudications. The federal government and Indian tribes, however, tried to keep actions to quantify reserved water rights for federal and Indian lands out of state courts by arguing that the McCarran Amendment,[233] a federal law consenting to the adjudication of federal water rights claims in state courts, did not apply to reserved rights. Although the legislation does not mention reserved rights, the courts uniformly ruled that Congress intended to include these rights under the McCarran Amendment's consent to suit.[234] The states then seized the opportunity to quantify federal and Indian reserved rights in their own courts and several western states initiated some type of judicial or quasi-administrative proceeding for this purpose.[235]

Proving reserved rights claims requires the court to quantify future needs, not simply present usage. In the case of a reservation set aside for agricultural purposes, the court must determine the number of practicably irrigable acres on the reservation and then set the amount of water needed to irrigate all of those lands.[236] In the only reserved rights case that has been fully adjudicated under the McCarran Amendment, quantification of water rights under the practicably irrigable acreage proved enormously expensive and time consuming.[237] Some experts had long urged that such claims

233. 43 U.S.C. §666 (1994).

234. Arizona v. San Carlos Apache Tribe, 463 U.S. 545 (1983); Colorado River Water Conservation Dist. v. United States, 424 U.S. 800 (1976).

235. The United States and Klamath Tribe unsuccessfully challenged application of the McCarran Amendment to quasi-administrative proceedings in *United States v. Oregon*, 44 F.3d 758 (9th Cir. 1994), *cert. denied*, 516 U.S. 943 (1995).

236. *See* Arizona v. California, 373 U.S. 546 (1963).

237. *In re* General Adjudication of all Rights to Use Water in the Big Horn River System, 753 P.2d 76 (Wyo.), *aff'd sub nom.*, Wyoming v. United States, 492 U.S. 406 (1989). *See also* Teno Roncalio, *The Big Horns of a Dilemma*, *in* INDIAN WATER IN THE NEW WEST 209, 211 (Thomas R. McGuire et al. eds., 1993).

should be settled, rather than litigated,[238] and states as well as the federal government embraced the idea.[239] The Indian water settlement process stagnated, however, following a flurry of activity in the 1980s, when a dozen or more settlements were concluded. The Clinton Administration concluded no settlements in its first term, except one that was in the works when it came into office in 1993.[240] Eventually, an agreement was reached for a settlement on the Warms Springs Reservation.[241] Congress approved a settlement on the Rocky Boy's Reservation in the closing days of 1999,[242] and for the Shivwits Paiute in 2000.[243]

D. *Forces for Change: Federal Regulation and Local Action*

The wave of good intentions for state water policy reforms that swept us into the 1990s yielded only limited progress. Decisions on major water development proposals now tend to include a more diverse group of interests than in the past and to consider explicitly environmental, fish and wildlife, social and economic impacts. In addition to having a voice in development decisions, local groups are also finding creative solutions to problems caused by past decisions.

These changes, however, have not resulted from systemic reforms in state law or policy. In fact, state legislative and judicial records for the last decade show, with the possible exception of California, a remarkable lack of reform at the state level. Some interesting efforts are scattered among the western states, but even

238. *See* Susan D. Brienza, *Wet Water v. Paper Rights: Indian and Non-Indian Negotiated Settlements and Their Effects*, 11 STAN. ENVTL. L.J. 151 (1992); Joseph R. Membrino, *A Federal Perspective*, *in* INDIAN WATER IN THE NEW WEST 57, 59 (Thomas R. McGuire et al. eds., 1993).

239. *See* Thorson, *supra* note 231, at 1009.

240. *E.g.*, Yavapai-Prescott Indian Tribe Water Rights Settlement Act of 1994, Pub. L. No. 103-434, 108 Stat. 4526 (1994); States continued to ratify settlements that had been essentially concluded before the Clinton Administration. *E.g.*, MONT. CODE ANN. §85-20-301 (1999) (ratifying Northern Cheyenne-Montana Compact). The Montana Legislature also ratified a compact with the Crow tribe quantifying the tribe's water rights. MONT. CODE ANN § 85-20-901 (1999).

241. *See* Jonathan Brinckman, *Water Rights Pact Comes Peacefully*, PORTLAND OREGONIAN, Nov. 18, 1997, at E07.

242. Chippewa Cree Tribe of the Rocky Boy's Reservation Indian Reserved Water Rights Settlement and Water Supply Enhancement Act of 1999, Pub. L. No. 106-163, 113 Stat. 1778. *See* Barbara A. Cosens, *The 1997 Water Rights Settlement Between the State of Montana and the Chippewa Cree Tribe of the Rocky Boy's Reservation: The Role of Community and of the Trustee*, 16 UCLA J. ENVTL. L. & POL'Y 255, 257 (1997-98).

243. Shivwits Band of the Paiute Indian Tribe of Utah Water Rights Settlement Act of 2000, Pub. L. No. 106-263, 114 Stat. 737.

if all of them were concentrated in a single state, the record would fall short of the needs for reform that were identified in the 1980s.

Because the states failed to take the initiative in reshaping water policy, most water policy reforms of the 1990s occurred outside established state institutions. An examination of the outside-the-box efforts that have advanced water policy reveals that these reforms have been driven mostly by two interrelated forces: increased activity within federal regulatory programs, and the growth of watershed or other place-specific citizen efforts.

1. *The influence of federal regulation.*

Today, the two most powerful legal influences on water use and development are the Endangered Species Act (ESA)[244] and section 404 of the Clean Water Act.[245] The ESA requires all officials who grant federal permits or approvals to assure that the proposed actions do not jeopardize the continued existence of any species listed by the US Fish and Wildlife Service as threatened or endangered.[246] Because the construction, alteration, or operation of virtually every major water facility, whether public or private, requires some kind of federal permit, and much of the undeveloped water in the West affects sensitive habitat, the ESA is often implicated. Even non-federal actions that result in habitat modification on private lands can invoke Section 9 of the ESA, which prohibits "taking" endangered species.[247]

Because the ESA can effectively block new development and uses of water, parties seeking practical solutions that comply with the ESA have created many of the "voluntary" collaborative processes at the macro and local watershed levels.[248] The Fish and Wildlife Service can propose "reasonable and prudent alternatives" that allow the federal government to approve actions that do some harm to endangered species.[249] The agencies can also approve habitat conservation plans (HCPs) that allow some incidental taking of endangered species by private parties in exchange for pro-

244. Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1994).

245. Clean Water Act, 33 U.S.C. §§ 1251-1387 (1994).

246. 16 U.S.C. § 1536(2).

247. *E.g.*, Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 515 U.S. 687 (1995).

248. Lee P. Breckenridge, *Nonprofit Environmental Organization and the Restructuring of Institutions for Ecosystem Management*, 25 ECOLOGY L.Q. 692, 697 (1999).

249. 50 C.F.R. § 402.02 (1999).

viding other substantial environmental benefits.[250] Local groups are attractive because they provide a forum to develop more flexible plans than the alternatives sometimes offered by the United States Fish and Wildlife Service, and HCPs can be designed to satisfy diverse interests. By including parties who might otherwise raise legal objections, the processes of developing reasonable and prudent alternatives or a habitat conservation plan can also make the action less susceptible to challenge.

Several examples illustrate how fear of ESA enforcement has motivated outside-the-box approaches to solving western water problems. Colorado, Nebraska, and Wyoming were brought to the table on the Platte River over endangered species issues because the central Platte is habitat for whooping cranes and other endangered species.[251] In the Snake and Columbia Rivers, the listing of seven species of salmon as threatened or endangered[252] provided a catalyst for major changes in water management and hydropower generation throughout the Northwest. Local watershed groups are contributing to the search for solutions to the complex problems of fisheries and hydropower facilities.[253] The Bay-Delta problems that led to the CALFED process arose under the Endangered Species Act and the Clean Water Act.[254] That, in turn, is causing California to rethink almost every aspect of water use statewide. Colorado River management is heavily influenced by the need to protect endangered species of fish. Nearly every stretch of the river has been designated as critical habitat for one or more species of endangered fishes,[255] limiting the scope and type of water use and the extent of power generation on the river and through the seven states that share the river.[256]

Section 404 of the federal Clean Water Act also places signifi-

250. 16 U.S.C. §1539(a) (1994); *see also* HCP HANDBOOK, *supra* note 207; Frederico M. Cheever, *An Introduction to the Prohibition Against Takings in Section 9 of the Endangered Species Act of 1973: Learning to Live With a Powerful Species Preservation Law*, 62 U. COLO. L. REV. 109, 169 (1991).

251. J. David Aiken, *Balancing Endangered Species Protection and Irrigation Water Rights: The Platte River Cooperative Agreement*, 3 GREAT PLAINS NAT. RESOURCES J. 119 (1999).

252. *See generally*, THE NORTHWEST SALMON CRISIS: A DOCUMENTARY HISTORY (Joseph Cone & Sandy Ridlington eds., 1996).

253. *See* Michael C. Blumm & Greg D. Corbin, *Salmon and the Endangered Species Act: Lessons From the Columbia Basin*, 74 WASH. L. REV. 519 (1999).

254. *See* Elizabeth Ann Rieke, *The Bay-Delta Accord: A Stride Toward Sustainability*, 67 U. COLO. L. REV. 341, 356 (1996).

255. James H. Bolin, Jr., *Of Razorbacks and Reservoirs: The Endangered Species Act's Protection of Endangered Colorado River Basin Fish*, 11 PACE ENVTL. L. REV. 35 (1993).

256. *See* Wigington & Pontius, *supra* note 206.

cant limitations on water development. The law requires a permit for dredging and filling waters of the United States, and is applied by the United States Army Corps of Engineers (the Corps) to ensure protection of adjacent wetlands.[257] The Corps accordingly requires a permit for placing fill material, such as earth or concrete, in a stream or a wetland in the process of building a dam.[258] Thus, the permitting process can be used to reshape and place conditions on the construction of a new dam, or even to prevent its construction.

The courts have validated the role of the Corps and of the EPA, which can veto permits granted by the Corps,[259] in applying section 404 to deny permits for new dams and water facilities.[260] For example, the EPA vetoed a permit for the proposed Two Forks Dam in Colorado after it was disclosed that the project would have substantial environmental impacts, including flooding miles of an extraordinary trout stream, eliminating elk habitat, and degrading water quality.[261] The EPA identified less harmful alternatives that were not considered by the dam's proponent, the City of Denver, including water conservation, groundwater use, water exchanges, and leasing water rights. Because no agency is empowered by Colorado law to consider, let alone protect, the public interest when someone seeks to develop a water right, intervention by the Corps, with its broad mandate, was the only means to account for public values in the decision-making process.[262]

2. *Involvement of multiple interests in localized decisions—an unexpected federal role.*

Nearly all the outside-the-box approaches that characterize the most important water policy reforms of the 1990s depend on inclu-

257. United States v. Riverside Bayview Homes, Inc., 474 U.S. 121 (1985) (upholding Corps's definition of the waters of the United States as extending to adjacent wetlands)

258. 33 U.S.C. § 1344 (1994).

259. *Id.* § 1344(c).

260. Riverside Irrigation Dist. v. Andrews, 758 F.2d 508 (10th Cir. 1985); Sierra Club v. Sigler, 695 F.2d 957 (5th Cir. 1983).

261. *See* Daniel F. Luecke, *Two Forks: The Rise and Fall of a Dam*, 14 NAT. RESOURCES & ENV'T. 24 (1999).

262. Indeed, because the section 404 permitting process is a major federal action that has a significant effect on the human environment, an environmental impact statement must be prepared under National Environmental Policy Act, 42 U.S.C. § 4332(2)(c) (1994), and the effects of permitting on endangered species must be assessed under Endangered Species Act, 16 U.S.C. § 1536(2) (1994). *See also* Riverside Irrigation District v. Andrews, 758 F.2d 508 (10th Cir. 1985).

sive processes. They generally include, at the watershed or community level, representatives of many interests that were historically excluded from formal state processes. The resulting shift in governance promotes local initiative and activism. Moreover, parties who had in the past influenced decisions by elevating disputes to the courts can now avoid litigation by using these new problem-solving institutions. Environmentalists, for instance, can participate in these processes in place of litigation, or after getting the attention of regulated parties by bringing a lawsuit.

Several states have recognized the value of watershed-based decision making. Only Washington and Oregon have gone so far as to pass laws to encourage and materially assist these groups in addressing a variety of watershed issues.[263] More typical are Idaho and Montana, which have authorized watershed councils to work with state agencies in developing watershed protection strategies.[264] Today, watershed-level programs are included as part of the water quality programs in at least ten states.[265] Water quality issues dominate the attention of most local watershed groups because the United States Environmental Protection Agency's watershed policy provides assistance and financial incentives, as well as a way to avoid blanket federal regulation under the Clean Water Act.[266]

Federal agencies deserve a measure of the credit for the proliferation of both macro and local watershed efforts. First, the force of federal regulation induced the collaborative efforts of local interests in many cases. To the extent that local watershed efforts are designed to respond to the need for compliance with the Endangered Species Act, the Clean Water Act, or other federal mandates, and federal agencies agree to participate and to accept outcomes, the groups depend on federal cooperation for their success. In addition, much of the progress made by many watershed groups results directly from the financial support provided by fed-

263. OR. REV. STAT. § 541.345 (1997); 1998 Wash. Laws 247 (codified at WASH. REV. CODE ANN. § 90.82.060 (West 1998)).

264. IDAHO CODE § 39-3615 (Michie 1996); MONT. CODE ANN. §§ 75-5-702 (1999).

265. NATURAL RESOURCES LAW CENTER, UNIVERSITY OF COLORADO SCHOOL OF LAW, RR-18, THE STATE ROLE IN WESTERN WATERSHED INITIATIVES, 37-54 (1998).

266. OFFICE OF WATER, U.S. ENVTL. PROTECTION AGENCY, EPA840-S-96-001, WATERSHED APPROACH FRAMEWORK (1996) *available at* http://www.epa.gov/OWOW/watershed/framework.html. *See also* OFFICE OF WATER, U.S. ENVTL. PROTECTION AGENCY, EPA800-F-96-001, WHY WATERSHEDS? (1996) *available at* http://www.epa.gov/OWOW/watershed/why.html.

eral agencies and the participation of federal agency personnel.[267]

Federal support for collaborative processes is surprising because the applicable federal statutes unyieldingly demand compliance while providing no statutory support for the collaborative approach. Certainly the most direct response by federal agencies to a state's failure or refusal to respond to relatively clear federal mandates, such as those provided by the ESA, would be to assume a tougher regulatory stance. Indeed, if the agency is too compliant, it risks suit by environmental groups who take a dim view of protracted collaboration in the face of apparent violations of the law. Nevertheless, instead of meeting state resistance to federal regulation in the 1990s with greater force, the federal government displayed surprising agility and creativity by encouraging and participating in alternative processes.[268]

The federal agencies also face practical constraints and institutional disincentives to embrace multi-interest collaboration. Collaborative efforts can be protracted and expensive, and their outcomes are always uncertain. They require agencies to commit limited resources and personnel to seemingly endless meetings instead of simply enforcing the law. Moreover, officials must be open to outsiders' suggestions for experimental approaches to compliance, and they may become involved in solving problems that go beyond the federal mandate. For instance, benefits to sport fishing, aesthetics, and tourism may be urged as part of a consensus solution to an endangered species problem.

Notwithstanding several constraints, the federal agencies have actually become more flexible and innovative in accommodating multiple interests. Policies have changed within the federal establishment; federal officials have been encouraged, at least by the Clinton Administration, to participate in these processes.[269] This change has required agency employees to learn new skills. Representatives of the BLM, the EPA, the Fish and Wildlife Service, the Bureau of Reclamation, and the Forest Service are now actively participating in collaborative processes.[270] Notably, the Bureau of

267. *See* KENNEY, *supra* note 209, at 61-63 (finding that "[t]he Federal Government plays a significant and essential role in the effective functioning of most watershed initiatives").

268. *See* Tarlock, *supra* note 202, at 1641-44.

269. *See* Nancy Perkins Spyke, *Public Participation in Environmental Decisionmaking at the New Millennium: Structuring New Spheres of Public Influence*, 26 B.C. ENVTL. AFF. L. REV. 263 (1999).

270. *See* Coleman, *supra* note 203.

Reclamation has redefined itself as a water management agency committed to a broad range of purposes, not simply irrigation, power generation, and other uses historically associated with the agency.[271]

The agencies' willingness to enable and participate in collaborative approaches may be seen as a politically expedient way to avoid potential congressional backlash for pursuing tougher enforcement. It may also simply reflect the Clinton Administration's approach to natural resources policy—an approach that may not survive in subsequent administrations. Whatever the explanation, the federal establishment has been a definitive force in the trend toward localized and multi-interest water decision making.

3. *Problems with Depending on Federal Motivation*

There are two problems with the current federal role. One is a criticism by environmentalists, soundly based in the law, that federal agencies are supposed to enforce the laws rather than facilitate compromise.[272] When a federal agency plays the role of a facilitator, it can blur the bright line of what should and should not be permitted under federal law. The federal government has unique missions in protecting species and habitats under federal law, protecting navigable waters, asserting Indian water rights and water rights for public lands, and dealing with international and interstate water allocation. Matters like setting standards for clean water or preventing loss of endangered species were the subject of national legislation precisely because they were too important to be left to the states or compromised for the sake of locally important interests.[273]

The other problem with ceding responsibility to federal agencies for convening and implementing local and watershed-based solutions to water problems is the converse of the first. Federal programs inherently risk substituting national determinations of the public interest for state or local judgments, even on local matters. Just as federal standards best protect and represent broad fed-

271. Reed D. Benson, *Whose Water Is It? Private Rights and Public Authority Over Reclamation Project Water*, 16 VA. ENVTL. L.J. 363 (1997).

272. *See* Michael McCloskey, *Problems With Using Collaboration to Shape Environmental Public Policy*, 34 VAL. U. L. REV. 423 (2000).

273. Reed D. Benson, *Recommendations for an Environmentally Sound Federal Policy on Western Water*, 17 STAN. ENVTL. L.J. 247 (1998).

eral interests, some state and local interests need to be defined and dealt with at a political level closer to the physical resource.

The best argument for federal deference to states in water allocation and policy is that it fosters practical approaches that tailor water uses to local needs, customs, and conditions. But because the states have not taken the lead in reconciling demands for more diverse economic uses and competing demands to account for ecological, social, and aesthetic values, the federal government has filled the void. So far, it appears that the federal agencies are committed to facilitating local problem solving through the macro and local watershed approaches without substituting their judgment for that of local people. But there is no assurance that this approach will survive future administrations or that federal agencies will not simply lose patience with these lengthy collaborative processes.

IV. The Future of State Water Policy Reform

States may yet assert greater leadership in responding to public demands for change in water policy. In doing so, they could supplant much of the federal role in water use and development decisions and move decision-making power to the parties closest to the affected ecosystems. If so, they may yet achieve the objectives set by western governors in the 1980s. The question is whether and when conditions will ever be ripe for change.

A. *It Takes a Crisis*

The experience of the 1980s and 1990s cautions against expecting the states to initiate water policy reform without the pressure of a crisis. The four Park City Workshops led to solid agreement on the Park City Principles but consensus on good policy was not enough to ensure political action,[274] and the governors' call for change was not matched with significant action.

Recently, the western governors embraced a set of principles, in a policy statement creatively named "Enlibra," that in many respects parallel the Park City Principles.[275] The components of Enlibra include collaboration, use of local solutions to meet national

274. *See* Bell et al., *supra* note 44.

275. *See generally*, Richard Halvey & Karen Deike, *Unleashing Enlibra*, 17 Envtl. Forum 20 (2000). For commentary on Enlibra, see David J. Hayes, *Old Wine in New Bottles*, 17 Envtl. Forum 24 (2000); Robert Wiygul, *Principles Ignore Realities*, 17 Envtl. Forum 26 (2000). *See also*, Sarah B. Van de Wetering & Robert W. Adler, *New Directions in Western*

standards, recognition that solutions cannot be limited by political boundaries, and use of markets instead of mandates.[276] Although not specific to water, these Enlibra principles could be used to guide water policy reform. Again, though, the experience of the 1990s cautions against optimism and teaches that political rhetoric, even by an apparently committed coalition of state governors, is not enough to produce political action.

To provoke change, there must be tangible and relatively immediate consequences to inaction, and nothing galvanizes political will like a crisis.[277] For example, changes in California water law during the 1990s arose from relatively immediate threats of actual water shortages from limited supplies for a rapidly growing population. In addition, California faced restrictions under federal regulations that could curtail existing water uses. Federal regulatory pressures also accounted for many of the modest changes elsewhere in the country. Crises furnish a window of opportunity—a moment when it is politically feasible for states to address place-specific problems and broader policy issues through legislation as well as administrative and judicial decisions.

Inevitably, there will be crises. Three of the most obvious sources of stress that may provoke crises in the near future are demographics, the impacts of present policies such as federal environmental statutes, and climate variability. The extent and success of future reforms in state water law and policy will depend on how well prepared the states are to act when these or other stresses provide opportunities for change.

1. *Demographic changes.*

The West is the fastest growing, most urbanized region in the country. Policies embedded in western water law were designed to promote rapid settlement and development. Today, however, the dominant problem for the West is not how to promote growth, but how to manage it.[278] Nevertheless, few states have adopted effective land use controls.[279] Most of them leave the task to local gov-

Water Law: Conflict or Collaboration, 20 LAND, RESOURCES & ENVTL. L. 15, 28-29 (2000) (comparing Park City Principles with Enlibra).

276. See Halvey & Deike, *supra* note 275.

277. The perception that crisis is a prerequisite to political action is commonly held. Moreover, it is not uncommon for "crises" to be concocted in order to draw attention to the need for change. *See* FRANK WELSH, HOW TO CREATE A WATER CRISIS 3, 4 (1985).

278. *See* Tarlock & Van de Wetering, *supra* note 86.

279. *See* sources cited *supra* note 189.

ernments, and none have integrated water planning with land use planning.

California and Texas show large population increases from births and immigration. Those states alone will account for about half of the nation's total growth from 1995-2025. Growth in the interior West will be concentrated in what some researchers have termed "urban archipelagos"—dense, metropolitan areas surrounded by sparsely populated rural areas.[280] The urban areas that will drive most of the West's expansion in water demand are distant from water sources and are already confronting the limits of their existing supplies. Water sources presently available in the West will be sufficient to accommodate growth in the foreseeable future only if water is moved from existing agricultural uses into urban uses.[281] Making these shifts in water use portends economic and social dislocation and may require a proliferation of proposals for new facilities—dams and pipelines—as well as pressures for further depletion of streamflows. The impacts resulting from attempts to satisfy the demands of population growth consequently will create major environmental challenges and contribute to the kinds of crises that may be necessary to force the political action needed to make real changes in water policy.

2. *Impacts of current use and policy.*

The application of water law and policy can itself put pressures on the system, contributing to the likelihood of a crisis. This is, of course, true when old policies are inflexible and fail to respond to broader values and changing conditions, but it is also true of apparently progressive policies that demand environmental protection and more services from existing supplies.

The law's chronic inattention to degradation and depletion of supplies can create stresses as it has in the past. Take the example of groundwater laws. The failure to respond to problems of aquifer depletion and contamination can curtail production from present sources and create problems that cannot be solved within the planning horizon of most water managers. In some aquifers, recharge occurs slowly, or only over geologic time making it critical to manage the pace of depletion. Eventually, groundwater mining can ruin the economies of entire regions, such as the threat faced

280. *See* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at 2-14 to 2-18.

281. *See* Lawrence J. MacDonnell & Teresa A. Rice, *Moving Agricultural Water to Cities: The Search for Smarter Approaches*, 2 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 27 (1994).

by the several states overlying the Ogallala Aquifer, whose economies are based on irrigated agriculture.[282]

Pollution of surface or groundwater can also render some sources of water useless for the foreseeable future. Contaminated groundwater sources are especially difficult to rehabilitate. One specific groundwater problem needing attention in many areas is salt water intrusion that is caused when pumping in coastal areas draws sea water into a freshwater aquifer.[283] If present supplies are diminished as a result, especially as demand increases, it will accelerate and exacerbate water crises.

The application of environmental laws and ostensibly progressive water laws can also create significant pressures. Although intended to add balance to the system, they effectively impose new demands on a fixed supply. The provision of additional services (such as legal requirements that protect fish and wildlife, wetlands, wilderness values, water quality, and flowing streams) limits the amount of water that can be extracted and the ways and places in which water can be developed. When the government or a citizens' group moves to enforce requirements under laws like the Endangered Species Act,[284] Clean Water Act §404,[285] the Federal Power Act,[286] and the Grand Canyon Protection Act,[287] it can create "shortages" and contribute to conditions that form a crisis.

Similarly, while laws promoting efficiency and conservation are generally salutary and are part of the law reform agenda, their implementation can cause stresses. Historically, most water in the West was allocated to inefficient agricultural uses and some states adopted apparently irrational barriers to transferring water to more efficient uses. One response has been to liberalize market transfers to take advantage of overly generous (or wasteful) appropriations for agriculture.[288] The efficiency gains resulting from transfers, however, can remove a margin of safety from the system and reduce streamflows that were incidentally maintained by the

282. *See* SANDRA POSTEL, PILLAR OF SAND: CAN THE IRRIGATION MIRACLE LAST? 77 (1999).

283. JAMES WILSON, ACADEMY OF NATURAL SCIENCES, GROUNDWATER: A NON-TECHNICAL GUIDE 48, 50 (1982).

284. 16 U.S.C. §§ 1531-1544 (1994).

285. 33 U.S.C. §§ 1251-1387 (1994).

286. 16 U.S.C. § 791a-828c.

287. Reclamation Projects Authorization and Adjustment Act of 1992, Pub. L. No. 102-575, 106 Stat. 4600.

288. *See supra* Part II.B.6.

"slack" in the system. The pressures of shortages may be more sharply and immediately felt by water users as the system becomes more efficient. In fact, the "inefficiencies" of over-stating rights and applying excessive quantities of irrigation water, much of which seeps back to surface or groundwater, has provided a cushion to ameliorate environmental impacts of consumptive uses.

Generally speaking, the most efficient application of water to consumptive uses tends to be at odds with non-consumptive uses, like fishing and boating. When transfers move water out of one geographic area or economic sector for the sake of another, such as a trans-basin diversion or a transfer from agricultural to urban uses, they can cause pressures on the system. If purchasers of old agricultural rights for urban uses divert the same quantities of water, they may actually decrease the amount of water that was returned to streams and aquifers by "inefficient" agricultural applications. Similarly, lining irrigation ditches saves water, but may incidentally dry up wetlands sustained by excess seepage of wastewater.

In addition, transfers can cause economic and social dislocations. As with problems caused when greater accuracy and precision in using water removes the buffer against environmental impacts of present uses, the solution is not to perpetuate inefficiency but to account for the consequences more completely and thoughtfully in decision-making processes.

3. *Climate variability.*

Climate impacts inevitably will contribute to future water crises. While demographics and the impacts of policy create stresses that set the stage for water crises, the perceptions of a crisis will almost always be triggered by a climate event. Although the timing and extent of climate variability are uncertain, the occurrence of climate events is a certainty. These events will be the most readily identifiable antecedents to crisis situations of a magnitude sufficient to attract the political attention needed for significant water policy reform.

There are three distinct kinds of climate variability that can affect water supply: cyclical variations, severe drought, and long-term climate change. Seasonal and annual cycles cause precipitation, snowpack, and river flows to vary widely in the West. The extent of these cyclical variations, which can be enormous, are predicted based on historical records. Planners project the "safe

yield" of supply sources and available reservoir storage based on long-term statistical averages. They attempt to secure sufficient supplies to satisfy demand projections. Cyclical variations are unlikely to trigger crises unless they coincide with other stresses.

Severe droughts, like major floods, are inevitable but infrequent events, and they cause significant challenges for water planning. These extreme events are included in the long-term statistical averages used to project safe yield. Planners who design water storage and distribution systems generally focus only on the normal ranges, leaving open the possibility of shortages from droughts. Drought, therefore, can cause impacts severe enough to constitute a crisis and thereby arouse public concern and political action.

Long-term climate change may exacerbate the impacts of cyclical variations and severe droughts.[289] Identifying and predicting climate change is a developing field and, while there is broad consensus among scientists that human activities are altering the global climate, significant uncertainty remains about the likely effects of climate change on regional water resources.[290] In practice, long-term climate change has not generally been considered or reflected in water managers' plans, let alone in the decision-making framework of institutions charged with shaping water policy. This is perhaps to be expected in light of the apparent uncertainty in the data. Even if different climate models agree on the range of expected changes in temperatures, they may disagree on the impacts it will have on runoff and on water supplies. Moreover, most research has produced gross predictions that are for large areas of the globe but which may not be reliable for a region or specific watershed. The risks of over-reacting or under-reacting to the data are equally troubling. Although the evolving science of climate change can be perplexing, it is possible for scientists to interpret

289. *See generally,* JOHN FIROR, THE CHANGING ATMOSPHERE: A GLOBAL CHALLENGE (1990); KENNETH D. FREDERICK & PETER H. GLEICK, WATER AND GLOBAL CLIMATE Change: Potential Impacts on U.S. Water Resources (1999); Nigel W. Arnell, *Climate Change and Global Water Resources,* 9 GLOBAL ENVTL. CHANGE S31 (1999); William W. Kellogg, *Human Impact on Climate: The Evolution of an Awareness, in* SOCIETAL RESPONSES TO REGIONAL CLIMATIC CHANGE: FORECASTING BY ANALOGY (Michael H. Glantz ed., 1988); William E. Riebsame, *Adjusting Water Resource Management to Climate Change,* 13 CLIMATIC CHANGE 69 (1988); Ernest T. Smerdon, *Impact of Global Change on Water Resources,* 9 ARIZ. J. INT'L & COMP. L. 155 (1992).

290. *See* Martin Parry, et al., *The Global Impact of Climate Change: A New Assessment,* 9 GLOBAL ENVTL. CHANGE S1 (1999); *The Science of Global Change: Intergovernmental Panel on Climate Change,* 9 ARIZ. J. INT'L & COMP. L. 9 (1992).

the modeling results and to use the available data to develop realistic scenarios to guide the planning and problem-solving process.[291]

Episodes of actual or anticipated water shortage have always excited popular and political interest in water problems. The resulting attention to actual or anticipated supply problems opens a window of opportunity for water policy reform. This does not mean that a climate event or trend will effectively focus attention on the problem of how to anticipate or adapt to future problems of climate variability. In practice, legislatures may respond to a natural climate variation by initiating a politically popular project or program, such as building a dam. If the response addresses the climate event at all, it may be only temporary, as was a water marketing scheme implemented in California during the drought of the late 1980s.[292] Unlike other crisis-provoking stresses, climate variability is not human-induced, reasonably predictable, nor controllable by laws and institutions. These facts make climate variability a uniquely difficult issue for policy-makers to address.

Crisis response would be more likely and better able to account for climate variability, especially long-term climate trends, if policymakers consulted more directly and consistently with climate experts. In addition to assisting with data interpretation, these experts could help develop appropriate water policies. If successful water policy reform depends on advance formulation of sound proposals, then climate experts should be included in the place-specific, outside-the-box efforts that anticipate rather than respond to crises. They then will be better prepared to test approaches to solving water problems and to glean transferable experiences for application when the opportunity to institutionalize them arises.

The key to using crisis-driven opportunities for water reform is to engage people who can influence policy change. This will be the most difficult challenge for such projects. Unlike earlier changes in western water law, many of the latest reform proposals threaten established interests. In the past, changes in state water law and policy were relatively modest and designed to facilitate water allocation and development. Today's water decisions are far more complex and their resolution requires including a variety of

291. *Cf.* Richard W. Katz, *Statistics of Climate Change: Implications for Scenario Development, in* SOCIETAL RESPONSES TO REGIONAL CLIMATIC CHANGE: FORECASTING BY ANALOGY (Michael H. Glantz ed., 1988).

292. *See* Brian E. Gray, *The Market and the Community: Lessons From California's Drought Water Bank*, 1 West-N.W. 17 (1994).

previously unrepresented interests because of the panoply of interests the public has in the environmental, economic, and social consequences, and because the growth of municipal demands is testing the limits of available supplies. Well-established interests with great influence in state politics, such as special districts and state agencies, are rightly concerned by the prospect of change. The boards and employees of these districts and agencies perceive that changing policies may threaten their hegemony. Reform will result in reallocating some water rights, and interests who are favored by the status quo understandably will resist change. Indeed, these traditional institutions appear willing to risk gradual obsolescence rather than suffering an immediate marginal loss of economic and political influence by opening the process to other interests, values, and people.

B. *Between Crises: Outside-the-Box Approaches as Laboratories for Broader Reforms*

If sound state water policy reform proposals are developed in advance, they can be put forward when crisis arrives. Today's outside-the-box projects targeted at solving particular, local problems can be useful laboratories for developing and testing policies and approaches that could be applied more broadly. The proposals will then be ready when opportunities for broader reforms arise. Localized processes can provide opportunities for refining methods for including multiple parties and dealing with multiple issues. Because state water agencies, with rare exceptions, have not attempted to deal with such complexities, meaningful change in these institutions must involve procedural changes that open up the scope of issues and parties before them. The solutions developed in the outside-the-box approaches should also be catalogued for consideration by problem solvers in the future. Measures created to respond to place-specific issues may be transferable to comparable situations elsewhere.

Outside-the-box efforts have proliferated because people with a stake in a particular, localized issue or problem perceived the potential for developing a viable solution and understood that the consequences of failure could be grave and imminent. Apart from more pervasive crises, these multi-interest, place-specific problem-solving processes will likely continue producing the most significant changes in water policy, as they respond to the exigencies of localized problems.

There may always be a place for extraordinary, targeted efforts like CALFED or the Adaptive Management Work Group on the Lower Colorado River. However, states should build upon the local approach and formulate proposals for integrating some of the processes and solutions that have emerged in the several outside-the-box approaches of the 1990s into established institutions for water governance. The place-specific projects have experimented with encouraging more open and inclusive public participation and they represent attempts to address a wide range of interconnected issues ranging from environmental to economic, rather than focusing only on water allocation or development. Many of them involve integrated consideration of environmental preservation or restoration, habitat protection, demand-side management such as conservation measures, land use controls, and the use of markets and pricing.

The outside-the-box efforts also are worthy of special study and attention. In attempts to glean lessons that could reform and improve institutions, a host of questions needs to be asked to understand which aspects of the outside-the-box-approaches used during this period merit emulation. Inquiries must look at process—who participates, what motivates the participants, how problems are identified and framed, and how the effort is organized. They must also examine the kinds of solutions that emerge and identify ubiquitous or typical elements.

Potential research topics include assessing the importance of leadership, asking whether consensus decision making or majority rule is more effective, determining if the presence, absence or type of federal participation correlates to the success or failure of the effort, and assessing how the availability or lack of scientific and technical expertise has influenced group effectiveness. The answers to these questions will inform efforts to improve local groups, and also provide information on how to reshape permanent institutions to make them more effective in making water decisions.

Efforts to solve water problems benefit from access to sound technical and scientific information and judgment. Thus, if outside-the-box approaches are to serve as laboratories to incubate components of water reform, they should not be handicapped by inadequate scientific and technical expertise. Scientific experts, from within and outside state agencies, including hydrologists, biologists, agronomists, foresters, and meteorologists can bring essential information and valuable insights to water policy

discussions. Yet, it has been rare for these experts to participate in formulating, or even advising on the wisdom or timing of policy initiatives. In the past, their involvement in water policy decision-making has been limited to addressing narrow issues or evaluating proposals already developed by policy-makers. There are, of course, impediments. It will be difficult to sustain sufficient interest and effort among experts who do not know whether and when the results of their input and efforts will be seriously considered. And it may be impossible to engage "establishment" water interests who are threatened by the prospect of any change.

Climate experts, in particular, have been consulted infrequently and, indeed, have made little effort to relate their data and research to actual problems or policies. I have suggested that climate variability is the stress most likely to trigger crises offering policy reform opportunities. Given the endemic uncertainty in climate models and predictions, scientists are especially needed to interpret and assist in the rational application of the best data available. Failing to consider and react appropriately to emerging information on long-term trends could be a fatal flaw in any solutions that are developed. This argues for involving, or at least consulting, climate experts in most aspects of water policy and planning, from local and macro-watershed efforts to formulation of broader policies. They should assist in both preparing for the physical manifestations of climate variations as well as in predicting when there may be a coincidence of stresses that creates the crisis-driven opportunity for reform.

Greater involvement of scientific experts in policy making requires not only expanding the decision-makers' appreciation of the value of scientific input. It also requires that scientists recognize the value of applying their work to influence better solutions to real world problems. Because the immediate material and professional rewards are often small, scientists may not find it attractive to become committed to long-term involvement in solving the problems of a single, local group. Experts may, however, be attracted to working with local groups if their contributions to solving immediate and local problems may also contribute significantly to broader policy reform.

Political leaders, administrators, and academics interested in water reform, as well as the immediately affected participants, should become involved in these efforts because of the potential for transferring specific solutions, and approaches to finding solu-

tions, to other situations. Indeed, these local efforts are the proving grounds for the solutions and approaches suggested by reformers and embraced by the western governors in the 1980s.

The continuing need for creative institutional responses was emphasized in the recent report of the Western Water Policy Review Advisory Commission, which called for improved governance of water through "integration of federal programs with state, tribal, and local efforts."[293] Although it is possible to reinvigorate the state role in water policy, it is unrealistic to expect that pervasive policy development will proceed rationally and at an even pace. The light of political attention shines on water issues only episodically, typically in times of stress, when there appears to be a crisis in the availability or condition of resources. And producing carefully considered, well-informed solutions in a crisis atmosphere is awkward and unpromising. In the midst of a perceived crisis, however, states can seize opportunities for making incremental changes by institutionalizing the reforms pioneered by groups involved in outside-the-box efforts. They can assimilate these experiences as models for alleviating broader problems and reforming out-dated state laws and institutions at the same time as they contribute to coordinating various place-specific efforts. Even when reform legislation does not succeed, the state legislative debate may incite action and agreements by others.[294]

V. CONCLUSION

The issues in western water today are far more complex than in the days when the West's outmoded policies were being formed. Initially, policies simply allowed users to do as they pleased, and state water laws and institutions were created to facilitate and mediate productive use of water as a tool for expanding the economy of the West. Water could be developed without considering the impacts on anyone or anything but the uses of other water rights holders.

Later, the essential goal became finding and developing new supplies. Financial support was needed for building structures to transport or store water and this aspect of water policy became cen-

293. *See* ADVISORY COMM'N, WATER IN THE WEST, *supra* note 33, at xxxi.

294. *See* LARRY MORANDI, RETHINKING WESTERN WATER POLICY: ASSESSING THE LIMITS OF LEGISLATION (1994) (concluding, based on several case studies, that the legislative process can be valuable in resolving differences and promoting better water use and other progressive goals).

tralized, often at the federal level. The beneficiaries of projects and the states accepted conditions and controls in exchange for federal funding. They and the federal government focused almost entirely on engineering feasibility and not on the economic, environmental, or social impacts of the projects.

A plethora of problems resulting from unregulated appropriation and subsidized development are now widely acknowledged, including inefficient use, damage to natural systems, social and economic impacts of moving water from agricultural to urban uses, and pollution caused by return flows and depletions. The unconsidered or unintended environmental consequences of past development decisions have become current problems, especially with the rise in public demand for environmental quality. But solutions to these problems have been frustrated by the physical and legal commitment of resources to particular uses. Dams and canals tied water to places and uses, and vested property rights in water made changes more costly. Now, public preferences for conserving resources for both economic and ecological reasons are respected in laws that confront head-on the old, inflexible water laws and policies.

As national environmental goals were asserted in federal laws and as federal funds grew more scarce, the national government retreated from major water development subsidies. Eventually, the best sites for dams were used up and most proposals for developing major new supplies encountered environmental conflicts. Federal agencies became more active in enforcing environmental laws that frustrated both public and private water development attempts. Meanwhile, state laws changed little to adapt to the new situation of the West.

Today there is greater competition than ever for water. Dramatic demographic changes are occurring in the West because of unprecedented population growth and concentration of human settlements in urban areas. Demands for water for urban uses are expanding, although much of the West's water is still committed legally to agricultural uses. At the same time, we understand the limits of nature better than ever. The public increasingly appreciates the value of protecting ecosystems as well as conserving natural amenities for human enjoyment, and there are strong political constituencies that oppose environmentally damaging construction or operation of water facilities. Nearly all the practicably developable supplies are fully committed or unavailable because of the environ-

mental damage that would be caused by developing it. These concerns substantially limit the option of increasing water supplies through construction of new dams and canals. Existing supplies therefore must be stretched through demand management and some water must be moved from old to new uses.

These phenomena have combined to incite advocacy for policy reform. The suggested solutions include integrating water planning with other interests, such as land use; using market forces to enable efficient water transfers; allowing greater public participation; regulating to protect instream flows needed for fish and wildlife and recreation and to prevent pollution; and satisfying the public interest in water decisions. Public officials in the West embraced these approaches in the 1980s and seemed to have an agenda for state water policy reform.

During the 1990s, however, the western states made little progress on the water reform agenda. Yet changes did occur, largely because the federal government pressed its regulatory requirements and local interests responded with a combination of civic responsibility and practicality to find place-specific solutions. Thus, water reform along the lines proposed by state leaders in the 1980s advanced in the 1990s in spite of the states' inaction.

Although the reasons for reform persist and are better understood than ever, existing state legal and institutional frameworks endure virtually unchanged. Vocal interests with expectations or vested rights rooted in old policies typically resist proposals to widen the interests represented in water decisions or to dedicate more water to instream uses. Proponents of reform, ranging from environmentalists to urban suppliers to commercial recreational users to scientists, are numerous, but are not part of a unified political movement. Consequently, measurable progress in dealing with the inadequacies of water policy has tended to be particularized to situations where the stakes of success or failure remained clearly in view, where the reasons for alliances among diverse proponents seemed obvious, and where opponents saw the inevitability of change. Apart from these outside-the-box efforts, water law and policy remain largely unaltered.

Developing wise policies is a long-term, ongoing process. However, opportunities to implement broad changes in water policy are likely to occur only episodically and, therefore, thoughtful and workable policies need to be ready when the opportunities to institutionalize change arise. Outside-the-box approaches, like those

that emerged in the 1990s, can be valuable laboratories for cultivating the elements of broadly applicable institutional reforms. If states recognize this opportunity, they can play a role in institutionalizing these efforts. States can and should formulate integrated water policies and new institutions that are relevant to the issues of the twenty-first century. If they do not, western water policy will continue to change—but it will change in spite of, rather than because of, states' efforts.