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Disputing Distributions in a Shrinking Commons: The Case of Drought in California

by

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INTRODUCTION

In 1808 Gabriel Moraga led a party of Spanish explorers up the northern half of California's Central Valley. There they found wetlands teeming with all manner of aquatic life, huge herds of elk, and flocks of migratory waterfowl stretching literally as far as the eye could see.

In combination with the rich alluvial soils and mild climate of the region, what made this abundance of life possible was the majestic river flowing southward down through the valley. One of the great freshwater resources of the world, it annually moved 22 million acre-feet (seven trillion gallons) of water from Sierra Nevada snowmelt and coastal range runoff down to the delta at the valley's base, and then westward to San Francisco Bay and the Pacific Ocean. The name Moraga gave the river was the Spanish Catholic term for the sacred expressed in material form: the Sacramento.[1]

Needless to say, that first European snapshot of the Sacramento Valley and its river delta bears scant resemblance to current conditions. Swamp and marsh have long since given way to drained and irrigated farmland, which is itself now yielding to rapid urban expansion. All of the elk and many of the fish, waterfowl, and other wildlife are gone, along with much of the water that used to flow to the sea.

About three fourths of California's average annual precipitation occurs north of the delta formed by the Sacramento and San Joaquin Rivers east of San Francisco Bay, just north of the state's geographic midpoint. Yet three-fourths of the human demand for water is to the south, in the croplands of the much drier San Joaquin Valley and in the sprawling metropolises of southern California.[2] To overcome what former governor and water mover Pat Brown called this "accident of people and geogra-

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1. W. A. Beck and D. A. Williams, California—*A History of the State* 213 (1972); W. Bean, California—*An Interpretative History* 43 (3rd ed. 1978).

2. Water Education Foundation, *California Water Map* (1991), col. 1.

phy,"[3] government engineers have, during this century, managed to reroute most of the water in the state from where nature was sending it to where the human population wanted it. As a result, the state is now served by what is certainly the largest and probably the most complex man-made water distribution system in the world.

Unfortunately, even after decades of effort exerted, billions of dollars expended, and hundreds of miles of concrete poured, the supply of water delivered is still not always equal to demand for its use. As evidenced especially in the droughts of the 1930s, the 1970s, and the 1980s, there seems to be no foreseeable end to the running competition between expanding demand for and artificially enhanced supplies of the state's surface waters. Rivaling in complexity and diversity the technology of surface water distribution in California is its institutional organization of that distribution. And just as the state's physical water allocation facilities have been stressed beyond their ability to perform reliably and efficiently during this latest drought episode, so too have the legal and regulatory mechanisms responsible for making those distribution decisions.

This article describes the findings of research conducted in California during the summer of 1991, in the fifth year of one of the most prolonged and severe droughts in the state's recorded history. The research project was designed to answer three questions. First, among competing users of a commonly held resource (in this case, water) how did a dramatic decline in the availability of that resource affect levels of user conflict in the governmental institutions responsible for its orderly distribution? Second, what theoretical perspectives best explain *why* the disputing behavior of resource users and user groups took the form it did? And third, what lessons does this application of theory to empirical observation have to teach us regarding the institutional management of conflicts over shrinkage in the size of common pool resources in the future?

In the following section of this article I briefly describe how surface waters are ultimately distributed to end-users and user groups in California; the emphasis in this sketch is on the public institutions responsible for making and enforcing allocation decisions, with particular reference to their dispute resolution processes. Then comes a discussion of the actual incidence of distributional disputes in these institutions, as portrayed in state agency files on administrative water rights complaints over the last 15 years (spanning two major droughts), and in a series of structured interviews I conducted with representatives of several large institutional user groups in coastal California.

Following that is a reflection on why the incidence of disputing behavior at different levels of the water distribution system assumed the pattern that it did during the most recent drought. Literature on the gov-

3. Bean, *supra* note 1, at 400.

ernance and management of common pool resources, from which this paper benefits and to which it contributes,[4] has proven especially useful for interpreting and understanding these field observations. Finally, the paper closes with a discussion of lessons to be learned from this study of institutional responses to drought, with special attention given to the problem of conflict management in governing the use of common pool resources during periods when the availability of that resource is in decline.

The most obvious application of these lessons will be to water shortages elsewhere in the western United States. If the best current estimates of global circulation modelers are correct,[5] over the next third of a century the American Southwest may experience a 20–30 percent drop in the flow of the Colorado River as a result of global warming. Like California, then, other western states may be forced to deal not only with sharply limited water supplies, but with equally precipitous declines in the availability of timber, livestock rangeland, fisheries, and hydroelectric power—other resources that are commonly held and competitively used. And even if the worst does not come to pass climatically, the habitat maintenance requirements of legislation such as the Endangered Species Act (if it survives the reauthorization process intact) and Marine Mammal Protection Act may pose increasingly significant restrictions on the ability of user groups to maximally exploit the natural resource commons. User groups in eastern states are also facing greater competition for finite surface and groundwater supplies, and a considerable amount of high-quality groundwater has been rendered unusable by toxic industrial contamination.

In short, we need to learn as much as we can as quickly as we can about the role of conflict in shrinking common pool resource management. As depicted below, the most recent experience of drought in California is rife with cases of reactive, paralytic, environmentally destructive disputing behavior; but it also includes examples of the institution of more efficient, less costly new water management practices adopted with a minimum of user conflict and which enjoy wide popular support. The drought of the late 1980s was not the first nor will it be the last time the state has been called upon to socially as well as technically manage shortages in its commonly held natural resources; and it is surely the kind of experience that other local and regional resource managing institutions will face more in the future than they have in the past.

4. Of particular relevance were Elinor Ostrom's *Governing the Commons* (1990) and Maass and Anderson's . . . *And the Desert Shall Rejoice* (1986).

5. Current findings are summarized and reinterpreted in P. Gleick and L. Nash, *The Societal and Environmental Costs of the Continuing California Drought*. Berkeley, CA.: Pacific Institute for Studies in Development, Environment, and Security (July, 1991).

DISTRIBUTION OF CALIFORNIA'S SURFACE WATERS: INSTITUTIONAL STRUCTURES, FUNCTIONS, AND INTERRELATIONSHIPS

Metaphorically, institutional relationships for distributing water in California can be likened to the root system of a large and growing tree. At the top of the root system—the tree trunk just below ground level—are the institutions responsible for making and enforcing all original surface water rights decisions in California: the State Water Resource Control Board (SWRCB) and the courts. At the next level down are those public institutions that acquire a very large water right from above, then build impoundment and diversion facilities to appropriate that water in order to sell and deliver it to end users and end user groups at the level below them. It is therefore a metaphorical root system than works in reverse—drawing water down through the institutions the people of California have constitutionally empowered to make all primary allocation decisions, and assigning rights both to end users and to those who will service end users.

Although there are many variations on and some exceptions to the simplified description given below, for the purposes of analysis in this study water distribution in California will be characterized as occurring principally at these three distribution levels or tiers (depicted in Figure 1). As shown, different combinations of functions are performed at different levels of the system. Tier 1 distributors (SWRCB and the courts) are responsible only for the assignments of rights and for overseeing the exercise of these rights. Tier 2 distributors acquire the right from Tier 1 institutions, assign subsidiary use interests to Tier 3 distributors (usually by means of delivery contracts), physically provide the water, and monitor contract compliance. Tier 3 distributors acquire water either by the assignment of a right from Tier 1 or contractual agreements with Tier 2 distributors (or, not infrequently, both); Tier 3 distributors then assign subsidiary use interests to end users (e.g., residential water users, businesses, farmers), deliver the water to them, and monitor its use. Unlike Tier 2 distributors, who acquire rights only for the purpose of delivering water to the next level down, Tier 3 distributors are mostly organizations of end users, such as municipal water companies or agricultural conservancy districts. Provided below is a more in-depth discussion of each of these distribution tiers and the ways in which the institutions at each level perform their authorized functions, including the handling of disputes over distributional decisions.

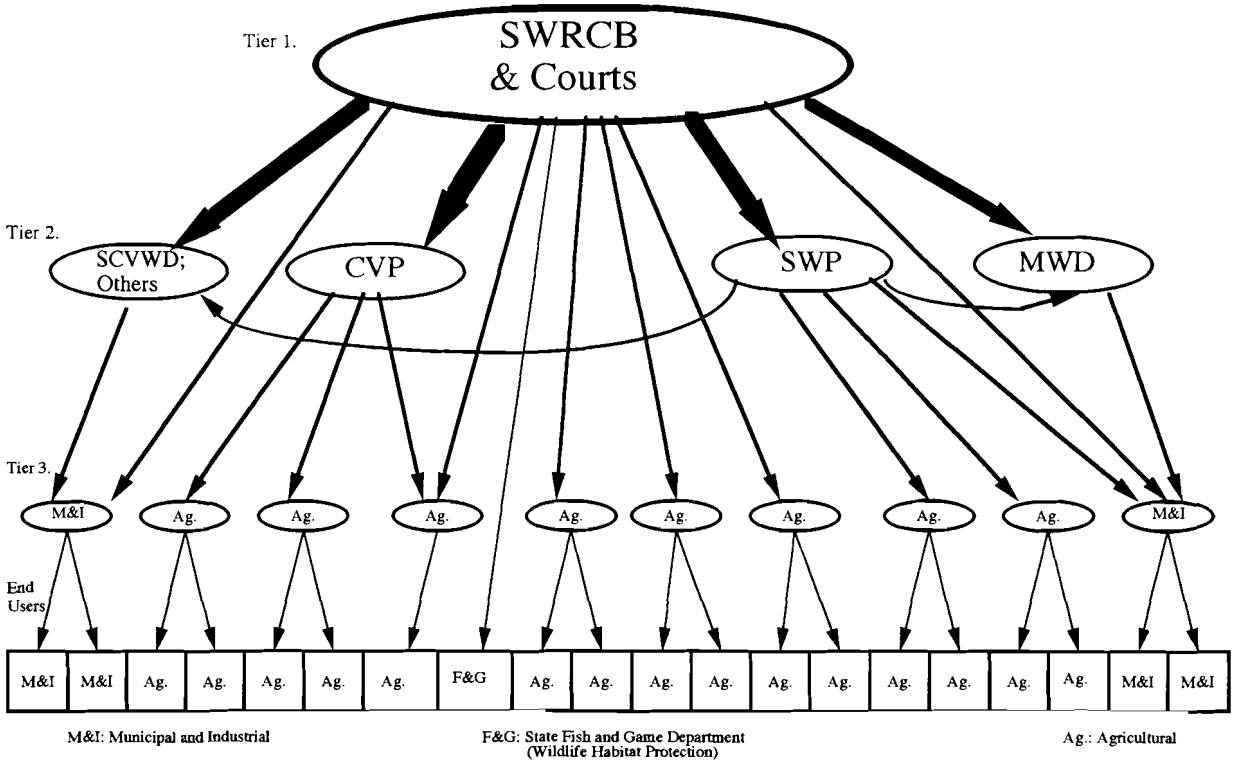

FIGURE 1. Distribution of Surface Waters in California

Tier 1 Distributors

The California Constitution declares that all surface waters appropriated and put to any use are subject to state regulation and control.[6] As early as 1913, the state legislature vested in one centralized administrative agency the authority to make primary allocations to applicants for a water right under the statutorily established principles of prior appropriation.[7] Under this doctrine, the first party to divert and reasonably, beneficially use a specified quantity of previously unappropriated water acquires a continuing right to its use; such rights are inferior to all those previously established on the same watercourse, and superior to those established later. All holders of an appropriative right from the same surface water source thus stand in an absolute chronological hierarchy in relation to each other; in dry years, the rights of the most senior appropriators must be fully honored before the more junior appropriators can take any water at all.[8] Furthermore, appropriative rights are subject to forfeiture for nonuse; any nonpublic appropriator that fails over time to use its allotted amount may involuntarily lose the unused portion of the right to another appropriator who claims it.[9]

Unlike many other arid western states, however, California also continues to recognize water rights established under the conflicting common law doctrine of riparianism.[10] A riparian right is acquired through the purchase of land bordering on a source of surface water. The water must be 'reasonably used' on the adjoining land; but unlike an appropriative right, a riparian water right is not specifically limited in quantity, is not lost through nonuse, and exists independently of the demands of appropriators. In times of short supply even the most senior appropriators may not harm the rights of riparians sharing the same source of surface water.[11]

Also unlike most other western states, the state regulation of groundwater in California is nearly as weak and diffuse as its control of surface water is centralized and pervasive. Except in instances where it can be shown that groundwater withdrawals are directly harming the rights of appropriators, state government has very limited authority to intrude upon the pumping practices of groundwater rights holders (a right generally acquired through the purchase of overlying land).[12] What the legislature has done, however, is to make statutory provision for local

6. Cal. Const art. XIV, §1.
7. 1913 Cal. Stat. 1012, 1923 Cal. Stat. 162, Cal. Water Code §1275 (West Supp. 1991).
8. See W. Attwater and J. Markle, *Overview of California Water Rights and Water Quality Law*, 19 Pac. L. J. 957 (1998).
9. *Id.*
10. Cal. Const art. XIV, §3 (West 1954).
11. See B. E. Gray, *A Primer on California Water Transfer Law*, 31 Ariz. L. Rev. 745, 763 (1989).
12. Attwater and Markle, *supra* note 8.

communities overlying a common groundwater basin to organize themselves into groundwater management districts and thereby to regulate withdrawals.[13]

In California, appropriative rights are further subdivided into those established prior to and after December, 1914, when the legislature made the acquisition of all new appropriative rights subject to application to and comprehensive regulation by a state administrative agency; state government is generally viewed as having much broader discretionary authority over the status of rights granted after 1914. Nonetheless, the California courts have recently held that even regarding 'pre-1914' rights, the state water board still has primary jurisdiction to make findings and rulings on how reasonably and efficiently these surface waters are being used.[14]

The agency that enjoys such broad discretionary authority over the assignment and regulation of surface water rights in California is the SWRCB, a powerful regulatory commission whose members are appointed to fixed terms by the governor, subject to the advice and consent of the state senate.[15] All applications for a new water right, proposed amendments to an existing one, or complaints against the holder of an appropriative right are filed with the Water Rights Division of the SWRCB. The Division's engineering staff does any investigatory work incidental to a filing; any contested findings of the Division are resolved at a hearing. This office oversees the status of more than 12,000 active permits, controlling to some degree the use of nearly all the surface water in the state (except for riparians).

The other institutions responsible for Tier 1 distribution are the courts. Findings and determinations of the SWRCB Water Rights Division are subject to a final ruling by the Board, whose final actions are in turn appealable to the California courts. In cases involving complaints of alleged violation of permit conditions, plaintiffs may file either with the Water Rights Division or initiate an action in superior court (i.e., state trial court of general jurisdiction).[16] In addition to hearing appeals from Board action, state court also provides the forum of first resort for disputes involving the exercise of riparian rights and groundwater withdrawals in areas not subject to the primary jurisdiction of groundwater management districts.[17] Depending on the specific issues raised, federal courts can

13. On the subject of groundwater management district organization, see Ostrum, *supra* note 4, Chapter 4.

14. *Imperial Irrigation District v. State Water Resources Control Board*, 186 Cal. App. 3d 1160, 231 Cal. Rptr. 283 (4th Dist. 1986).

15. Cal. Water Code §175 (West 1971 & Supp. 1991).

16. Cal. Water Code §275 et seq.; Cal. Water Code §1050 et seq. (West 1971 & Supp. 1991).

17. *See generally* Cal. Water Code §100 et seq. (West Supp. 1991); and State Water Resources Control Board, Information Pertaining to Water Rights in California (1990).

exercise concurrent jurisdiction in cases involving the interpretation of federal statutes or in which the United States is a party, although for a variety of reasons the trend over the last decade has been one of deference to primary action by the Board and review by the state judiciary.[18]

Ultimately, then, it is the SWRCB and the courts that make all initial water distribution decisions and process the disputes arising from those decisions. And as discussed above, it is the Water Rights Division that initially handles permit complaints involving by far the greatest quantity of surface water in that state, which is one of the reasons why the Division's drought-related dispute processing experience provides an important source of data for this study.[19]

Tier 2 Distributors

These are the organizations that obtain a water right from the SWRCB for the purpose of impounding and delivering water to Tier 3 distributors. In terms of the sheer volume of water they convey to Tier 3, the most important of these entities in California are the United States Bureau of Reclamation's Central Valley Project (CVP), the California Department of Water Resources' State Water Project (SWP), and the various facilities of the Metropolitan Water District of Southern California (MWD), a huge service district composed of approximately two dozen municipalities and other local jurisdictions in the Los Angeles-San Diego area. Smaller in scale but typical of many similarly situated regional water service agencies directly affected by the drought is the Santa Clara Valley Water District, at the southern end of the San Francisco Bay Region.

Although these institutions differ from each other considerably in their particulars, they nevertheless share similarities that make them distinguishable as a group. First, they are all client-oriented agencies whose principal statutory objective is to meet client demand—a demand which across the state and over time has inexorably risen. This places them in the position of vying against each other for ever-scarcer supplies of water available at Tier 1, just as it also has made them each other's clients as well as suppliers to Tier 3 (e.g., the Metropolitan Water District of Southern California is the State Water Project's largest single customer). Secondly, the nature of the distributional transaction between Tier 1 and Tier 2 is qualitatively different from that between Tier 2 and Tier 3. What all 12,000 holders of SWRCB permits in California received was a freely granted use

18. *See* R. E. Walston, *Federal-State Relations in California: From Conflict to Cooperation*, 19 Pac. L. J. 1299 (1988). More recently, however, the Supreme Court has reached the opposite conclusion regarding state water rights regulation at federally licensed hydropower facilities. California v. Federal Energy Regulatory Commission, 110 S.Ct. 2024 (1990).

19. Another reason is the near-impossibility of surveying by cause of action all the suits filed in each of the state's 58 trial court districts for the last five years (the period of the most recent drought) to determine what percentage of these filings were water rights-related and whether that percentage has changed appreciably.

right, accessing the waters of the state in accordance with public interest criteria established by the legislature. Once granted, the permit became a valuable and legally defensible use interest (although recent caselaw and statutory amendments have created considerable uncertainty over the nature of that interest), for which the holder bore only the investigatory costs of demonstrating the availability of unappropriated water and no undue harm to other public and private interests sharing the same surface water source.[20] In the view of many, the permit system is simply the mechanism by which the people of the State of California (with the exception of the CVP) give themselves their own water.

However, while the relationship between Tier 1 and Tier 2 distributors is investigatory and adjudicatory, resulting in the assignment of a valuable property interest, the relationship between Tier 2 and Tier 3 distributors is primarily contractual. Having acquired the right, Tier 2 distributors then sell the water for a valuable consideration to their Tier 3 clients. The terms and conditions of these contracts are set through the articles of government that created the Tier 2 distributors on the one hand, and by the preferences and willingness to deal of the Tier 3 distributors on the other. A quick review of the statutory origins of some of these institutions can therefore provide insight into the nature of their relationships with their customers.

The United States Bureau of Reclamation's Central Valley Project (BuRec) was created by act of Congress in 1935,[21] in the midst of the Great Depression and toward the end of one of the worst droughts in the documented history of the state. The CVP's original purpose was to impound the waters of the Sacramento River near its headwaters, and construct water diversion and delivery facilities throughout the arable portions of the Central Valley for the stimulation and sustenance of family farm agriculture. To accomplish this, BuRec built facilities such as the dam and reservoir at the base of Mount Shasta near the Oregon border, and the Delta-Mendota Canal, which transports the water the Sacramento River delivers to the Delta southward up the San Joaquin Valley to the much more arid farmlands located there.

There is now a considerable literature documenting (and criticizing) the CVP's transformation from a self-sustaining, family-farm-oriented public works project into a vast delivery system primarily servicing the huge corporate farms of the Central Valley, selling them water at subsidized rates far below current market prices (while of course supplying the nation with a consistent abundance of food at reasonable cost).[22] It is within neither the scope nor the intent of this study to participate in that

20. Cal. Water Code §1200 et seq. (West Supp. 1991).

21. Pub. L. No. 75-32, 50 Stat. 844, 850 (1937).

22. Representative of such literature (and a work that cites much of the rest of it) is M. Reisner's *Cadillac Desert* (1986).

debate; suffice it to say that Tier 3 distributors have for most of the life of the CVP managed to secure considerably more favorable delivery contract terms than those served by other Tier 2 distributors, and with far fewer restrictions than the authorizing legislation had originally contemplated.[23]

But by the mid-twentieth century political leaders in California had grown frustrated with what they saw as unreasonable restrictions on future CVP development. Congress authorized the CVP to service only farms, and not to support the explosive post-World War II growth of California's cities; and it was BuRec bureaucrats—not local farming interests—who would decide what lands were sufficiently arable to warrant the delivery of CVP water. Furthermore, federal reclamation policy stipulated—at least in theory—that subsidized CVP water be distributed only to small family farms, thus denying cheap federal water to the giant corporate landowners of the southern Central Valley.

To remedy this situation, in 1960 California voters supported a referendum creating the state Department of Water Resources' State Water Project (SWP), the two purposes of which were (1) to deliver water to southern Central Valley farms that were too big and too arably marginal to qualify for CVP water, and (2) to lift water thousands of feet up over the Tehachapi Mountains at the southern end of the Central Valley, for delivery to the cities of southern California.[24] Development of the SWP was begun immediately upon its authorization, and continues to this day; the Department of Water Resources has signed long-term contracts with MWD and others for the delivery of more water than current SWP facilities are capable of providing.[25]

In effect, then, the CVP and SWP are 'top-down' Tier 2 distributors; they are managed by executive branch agencies (the federal Bureau of Reclamation and the state Department of Water Resources, respectively), and any disputes with Tier 3 distributor-clients over contract terms and conditions are subject first to internal administrative procedures within these agencies and then ultimately to the courts, under principles applicable to contract law.

But the same is not true of organizations such as the Metropolitan Water District of Southern California and the Santa Clara Valley Water District. Although they received their public jurisdictional authority (e.g., the power to tax, spend, contract, condemn, sue and be sued) by virtue of state legislation, these districts are actually the creation of compacts among subordinate member jurisdictions. The MWD and SCVWD boards

23. Maass and Anderson, *supra* note 4, chapters 5 and 6.

24. *See* Bean, *supra* note 1.

25. The SWP's contractual obligations in excess of its present ability to deliver are discussed in Arthur Littleworth, *The Public Trust vs. the Public Interest*, 19 Pacific L. J. 1201, 1203 (1988).

of directors are made up of representatives of the various municipal and other jurisdictions who buy water from the district; these are basically organizations of governments selling water to themselves.

For instance, the MWD was created in 1927 through negotiations among several southern California communities, led by William Mulholland of the ever-thirsty Los Angeles Department of Water and Power.[26] On its formation, MWD set about assuring its members a water supply principally through the construction of an aqueduct to import water from the Colorado River. Then upon voter approval of the State Water Project in 1960, MWD (which had lobbied hard for the project) signed long-term contracts for the purchase of SWP water. The MWD sells water it imports from the Colorado River, from the SWP, and from rights held by its constituent jurisdictions, to the 27 member agencies and 270 sub-agencies within its service area; water distribution policies and practices are set by its constituent-composed board of directors.[27]

Like the MWD, the Santa Clara Valley Water District is a group of Tier 3 distributors banded together to share the formidable costs involved in securing and defending water rights, constructing impoundment and diversion facilities, and collectively managing their finite water resources. Created at a time when the Santa Clara Valley was still liberally dotted with orchards, vineyards, and vegetable fields, agriculture has since been nearly eliminated from the area. Rapid intense urbanization in and around San Jose and the aerospace-electronics industrialization of the region in the latter half of the twentieth century gave birth to the state and nation's micro-electronics industry and the area's new nickname: 'Silicone Valley.'

Today the SCVWD's board and staff continue to manage their aquifer for subsurface water storage, subsidence and intrusion control, and flood control, although its principal activities and expenses are now associated with procuring and delivering to its member jurisdictions an adequate supply of municipal-quality water.[28]

Procedures for resolving disputes between 'bottom-up' Tier 2 distributors (like the MWD and SCVWD) and their Tier 3 member governments differ from those in the 'top-down' bureaucracies discussed above. Unlike the classic contract disputes between Tier 3 customers and Tier 2 agencies like BuRec and DWR, which move from administrative review into the courts (if unresolved), most problems arising between regional Tier 2 special purpose districts and their Tier 3 constituent local governments are handled legislatively, by public debate and a vote of the district

26. *See generally* W. Kahrl, Water and Power (1982), for a description of the MWD's genesis.

27. Telephone interview with M. Puffer, Administrative Analyst, Metropolitan Water District of Southern California, Dec. 4, 1991.

28. Interview with J. H. Sutcliffe, Supervising Engineer, Santa Clara Valley Water District, July 24, 1991.

board of directors. The effectiveness of these self-organized and self-governed Tier 2 distributors is in fact predicated on their ability to make and keep the peace among their Tier 3 members; failure to do so ultimately means the failure of the organization to achieve its purposes.

Tier 3 Distributors

For the most part, these are organizations of end-users: municipal water companies, regional utility districts, private water companies, farmers organized into agricultural conservancy districts, and private agricultural water purveyors. Public entities among Tier 3 distributors adopt distribution rules legislatively and enforce them administratively, while privately held water companies in California are subject to business regulation by the California Public Utilities Commission. As depicted in Figure 1, most of the largest Tier 3 distributors (major cities, big agricultural conservancy districts) hold senior water rights assigned directly from Tier 1 distributors *and* buy water from Tier 2 distributors as well, when they can and if the price is right. Disputes between end-users in Tier 3 jurisdictions (i.e., between water users in the same city or farmers in the same conservancy district) over distribution rule compliance are resolved by complaint to the Tier 3 distributing authority; disputes between end-users and the authority are first addressed legislatively, by appeal to the rule-making body (water commissioners, city council, district board of directors), and—if not resolved—ultimately to the courts. Aggrieved private water company customers complain to the state Public Utilities Commission.

Tier 3 distributors surveyed in this research were chosen specifically because they are in a region of the state that was seriously affected by the drought, and in which institutions were compelled to make decisions resulting in supply cutbacks to the end-users they serve. The hardest-hit Tier 3 distributor in this survey (and among the most severely challenged districts in the state) was the Marin County Municipal Utility District, serving the affluent suburbs immediately north of San Francisco across the Golden Gate (see Figure 2). The Marin District is among those jurisdictions along the California coast that had earlier declined to expand its water supply at the same rate as its population growth, as an indirect means of controlling urban expansion. During the 1976–77 drought, the district had to build an emergency pipeline across the San Rafael Bridge to temporarily tap into the scarce but available water supplies of the Sacramento-San Joaquin Delta. When that drought ended the pipeline was removed, and district voters later rejected a bond initiative to permanently augment its water supply, after heated debate between growth and no-growth advocates.

An even more urbanized but less severely affected area was the eastern side of the San Francisco Bay region encompassing most of Contra

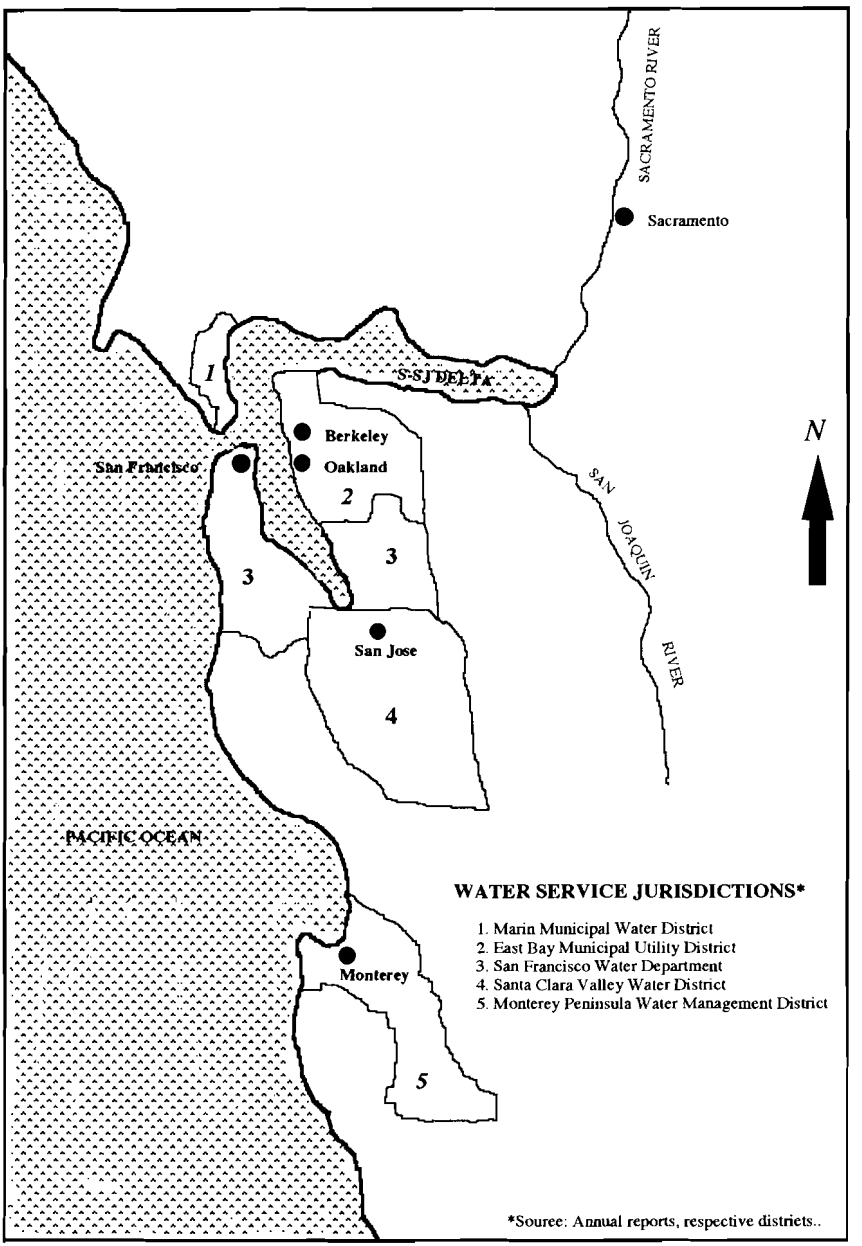

FIGURE 2. Central Coastal California, with Selected Water Service Jurisdictions

Costa and Alameda Counties, including the cities of Oakland, Berkeley, and the suburbs of the East Bay hills—all of which are served by the East Bay Municipal Utility District (EBMUD). Although its service area is larger than Marin's and it delivers water to a greater number of end-users, EBMUD's customers were not called upon to make conservation sacrifices as deep as Marin's, principally for three reasons: the capacity of EBMUD's impoundment and diversion facilities, their location, and their degree of interconnection with Tier 2 distributors.

East Bay voters created EBMUD in 1923; the District's principal water supply comes from a dam and reservoir on the Mokulumne River in the foothills of the Sierra Nevada Mountains across the Central Valley from its service area, along with a pipeline to deliver its water to the East Bay.[29] By contrast, Marin relies entirely on smaller reservoirs located on-site in its coastal hills. When in dry years coastal areas receive little rain, what moisture there is may be more likely to precipitate out as snowfall over the Sierras, where Spring runoff is captured in the reservoirs of Tier 2 distributors like the CVP and SWP, or well-financed Tier 3 distributors such as EBMUD. Smaller coastal districts like Marin must also have rainfall during a longer portion of the rainy season, since their reservoirs are smaller and they have less potential for long-term storage. Lastly, the older, larger districts like EBMUD that already have dams, reservoirs, and pipelines in or near the Central Valley also have the ability to interconnect their delivery systems with those of the CVP and SWP to facilitate water exchanges among these organizations; Marin and many of the other smaller coastal districts do not.

Whereas most Tier 3 distributors are set up simply to deliver water to residential and industrial customers, the Monterey Peninsula Water Management District was statutorily empowered as a comprehensive conjunctive use (i.e., surface and groundwater-coordinating) water resource management authority.[30] Voters on the peninsula (with the support of the state legislature) created the district in the aftermath of the 1976–77 drought, to attempt at the regional level what California government has so far been incapable of or unwilling to do statewide: engage in the unified, coordinated, hydrologic management of a defined geographic region to ensure that supply and demand are kept in balance, surface and groundwater users do not damage each other by their withdrawals, and current and future water resource management practices do not result in further deterioration of the natural environment.[31]

29. East Bay Municipal Utility District, *All About EBMUD*. Oakland, Calif. (1991).

30. Cal. Water Code Appendices 118-1–118-901.

31. Interview with D. Fuerst, Senior Hydrologist, Monterey Peninsula Water Management District, Monterey, California, July 18, 1991.

Also unlike Marin and EBMUD, the Monterey Peninsula District does not now own and operate diversion and distribution facilities. Rather, it regulates the actions of those who do so. As a result, the Monterey District represents something of an experiment in the regional governance of municipal water resources. In regulating service conditions of a private water company, it is performing some of the functions normally thought to reside with the state Public Utility Commission; and in seeking to regulate water acquisition, surface management, and relations among holders of appropriative water rights permits it is in some ways emulating the decisionmaking of the State Water Resources Control Board.

As is the case with most other public sector Tier 3 distributors, disputes over distribution policies and practices are brought to the Monterey Peninsula District board of directors (composed of representatives of constituent governmental jurisdictions and private water companies) for legislative resolution, if there is an appeal from an initial administrative ruling.[32]

Another somewhat unique jurisdiction surveyed in this study is the San Francisco Water Department. The SFWD's water supply is impounded at the Hetch-Hetchy Reservoir in Yosemite National Park, and shipped by pipeline across the Central Valley. The Department acts as a Tier 3 distributor in supplying water to end users in San Francisco; but it is also a major Tier 2 distributor, in that it wholesales two thirds of its water supply to Tier 3 providers on the lower San Francisco Peninsula and in the East Bay (see Figure 2).[33]

Collectively, these Tier 3 distributors in the San Francisco Bay-Monterey corridor, in combination with clients of the Santa Clara District and southern California's Metropolitan Water District, provide municipal and industrial water service to about three fourths of the state's population.

DISPUTING DISTRIBUTIONS IN TIMES OF DROUGHT

Characterizations of Disputing Behavior

Recounted below are the findings of field work and analysis conducted in the fifth year of the late 1980s California drought, when it was unclear to all respondents whether the upcoming water year would bring plentiful precipitation and a 'return to normalcy,' or a water emergency-become-crisis that would fundamentally and permanently alter water pol-

32. Monterey Peninsula Water Management District, *1990 Annual Report.*

33. Telephone interview with C. Davis, Manager, Customer Service Division, San Francisco Water Department, San Francisco, CA, Dec. 9, 1991.

itics and water use practices throughout the state. Respondents in every institution were visibly concerned, and expressed the view that whether the drought ended with that water year or not, managing the resource in the future would probably never be quite the same as it had been in the past. The perceived inequities and insufficiencies in the existing statewide distribution system had become too apparent, the conflicts too palpable, and the means of their resolution (to some) too obvious.

The research question posed in examining the disputing behavior of parties subject to allocation decisions at each distribution tier was whether there had been a rise in the volume of disputes co-incident with the occurrence of drought in California. The unit of measurement at each tier was the filing of a formal complaint, either against the distributing institution or against other parties subject to that institution's decisions.

Water Rights Complaints at the SWRCB

Figure 3 depicts the super-imposition of water rights disputing activity (i.e., complaints filed) on water supply for the period encompassing the two latest droughts in California. The bar graph represents the yield of the Sacramento River system (the Sacramento and its tributaries) as reported by the California Department of Water Resources.[34] The line graph illustrates the number of water rights complaints filed by holders of appropriative water rights permits or other interested parties against other appropriators before the Water Rights Division of the State Water Resources Control Board.

What these two data sets reveal is a significant inverse relationship between the availability of water and the incidence of complaints. The lowest flow in the recorded history of the river (1976–77) coincided with the highest incidence of permit violation complaints ever filed with the Board's Water Rights Division. (Because California's dry season occurs toward the end of the water year, during summer and early fall, disputes over water shortages filed with the Board usually appear in their fiscal year records as having been filed after the end of the water year in which the shortage occurred. Thus the highest complaint incidence experienced by the Board—over 150 filings—is expressed in the line graph as occurring during water years 1977–78, although these disputes are actually based on shortages occurring during water years 1976–1977.)[35]

SWRCB Water Rights Division investigators tend to view these complaints as falling into one of two broad categories, based on the issues

34. California Department of Water Resources, *California's Continuing Drought* 6, Figure 3 (1991).

35. Interview with Mark Stretars, Water Resources Control Engineer, Complaint Section, Division of Water Rights, State Water Resources Control Board, Sacramento, CA, July 29, 1991.

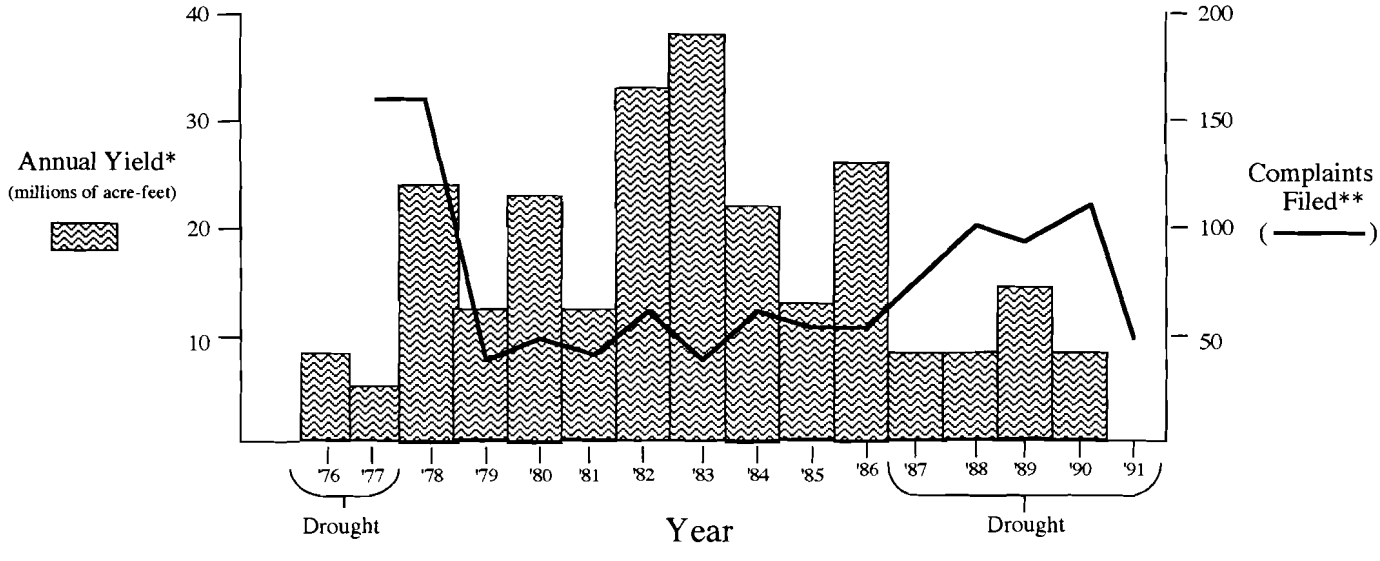

FIGURE 3. Annual Yield of the Sacramento River Basin and Complaints Filed with the Water Rights Division, S.W.R.C.B., 1976–1991

*Source: DWR, *California's Continuing Drought*, p. 6 (1991)

**Source: SWRCB Data Files

in dispute and the amounts of water in question.[36] Since complaint record keeping began (during the 1976–77 drought), the Board has been processing a baseline' of large-scale, long-term, policy-oriented disputes (several of which have ripened into subsequent litigation) involving conflicts between municipal/industrial water providers, agricultural conservancy districts, and public interest organizations seeking preservation of environmental quality generally and wildlife habitat in particular. The most serious and prolonged conflicts have focused on the impacts of the southward diversion of freshwater outflows from the Sacramento River system which would otherwise flow westward through the Sacramento-San Joaquin Delta and San Francisco Bay to the Pacific Ocean.

Conflicts over the environmental impacts of increased freshwater diversions from their natural course pre-dated the drought of the late 1980s-early 1990s. After years of wrangling between environmental groups and the city of Los Angeles, in 1983 the California Supreme Court for the first time used the public trust doctrine as a basis for directing the SWRCB to condition the exercise of *existing* water rights permits (as distinguished from rulings on new permit applications) on adherence to standards for the preservation of the integrity of the natural environment.[37]

Three years later California's First District Court of Appeals compelled the SWRCB to use the public trust doctrine as well as state and federal water quality laws to condition the existing permits of all major water rights holders on the Sacramento River system (including the Central Valley Project and State Water Project) on the maintenance of freshwater outflows westward through the Delta.[38] Research had demonstrated that reduced freshwater flows had allowed saltwater intrusion into the Delta, resulting in the degradation of fisheries, waterfowl habitat, and drinking water quality in the region.

Since the record in this litigation showed that the southward diversion of Sacramento River water was damaging the Delta ecosystem even during abnormally wet years, it came as no surprise when researchers learned that these diversions in combination with the drought of the late 1980's were having a profoundly more damaging effect on the area's natural environmental quality than earlier non-drought studies had shown.[39] As of this writing, issues involving Delta diversions and environmental quality being adjudicated before the SWRCB and the California courts continue to comprise the most serious long-term water distribution

36. *Id.*

37. National Audubon Society v. Superior Court of Alpine County, 33 Cal. 3d 419, 658 P.2d 709, 189 Cal. Rptr. 346, *cert. denied* 464 U.S. 977 (1983).

38. U.S. v. State Water Resources Control Board, 182 Cal. App. 3d 82, 227 Cal. Rptr. 161 (1986).

39. These severe drought-related impacts are documented and summarized in Gleick and Nash, *supra* note 5.

conflict in the state.[40] Thus, the drought appears to be having the effect of seriously exacerbating already existing conflicts over how water should be distributed in the state and for what purposes.

More localized but nonetheless major (in terms of water quantities involved and damage sustained) disputes have also been occasioned by the drought elsewhere in the state. Representative of these cases is an action brought by Friends of the Mokulumne River against the East Bay Municipal Utility District in response to a massive fish kill occurring at one of EBMUD's two reservoirs in the foothills of the Sierra Nevada, when inflows were insufficient to keep the water and dissolved oxygen levels high enough and temperatures low enough for the fish to survive.[41]

However, Board investigators ascribe at least half of the drought-associated increase in complaint filings to what they call 'Mom and Pop' inter-appropriator disputes, in which the only issue is whether an upstream appropriator is improperly withholding and diverting more water than the permit allows, and the amount of water in controversy is usually less than a thousand acre-feet.[42] Investigators first noticed this increase in 1986–87, and it rose steadily until 1990–91. What also rose was the geographic location of the dispute. In 1986–87, most conflicts were between appropriators at relatively low-lying areas of the Sierra Nevada foothills. With each year of continued drought, complaints were filed by appropriators higher and higher on each river or stream, until finally—in the view of investigators—it became apparent to all appropriators on the stream that shortages were being caused less by illegal upstream impoundments and diversions than they were simply by the drought itself.[43]

What rose as well was Water Rights Division response time to the filing of complaints. Whereas in years of normal rainfall and complaint filings averaging no more than 50 per year, Water Rights staff could usually investigate a complaint within 30–60 days and often have it resolved within three months, by 1990 the staff was so backlogged with complaints that it could seldom even acknowledge in writing the receipt of the complaint within 30 days, and couldn't expect to investigate it for about six months.[44]

Complainants had the option of filing an action for damages and injunctive relief in Superior Court. But in those circumstances, the plaintiff

40. For a thorough description and analysis of this conflict, see R. Robie, *The Delta Decisions: The Quiet Revolution in California Water Rights*, 19 Pac. L. J. 1111 (1988). Now a state trial court judge, Mr. Robie is also former director of the state's Department of Water Resources, and board member of the SWRCB.

41. EBMUD report, *supra* note 29.

42. Stretars interview, *supra* note 35.

43. *Id.*

44. *Id.*

bore all the transaction costs of carrying the burden of proof of showing that the upstream appropriator was guilty of unauthorized diversion, and discovery would usually take at least six months anyway, with a trial date set some time after that. In contrast, the state covers the cost of a SWRCB Water Rights Division complaint investigation, even if that inquiry could not be conducted until the end of the water year (by which time circumstances giving rise to the complaint had often changed).[45]

In summary, the incidence of water rights complaint filings with the Water Rights Division of the SWRCB more than tripled (above normal precipitation year filings) during the 1976–77 drought, and more than doubled during drought years 1987–90. Division case backlogs and response time went up sharply in reaction to these circumstances, as the dispute-settling institutions of state government were stressed every bit as much as the state's capacity for the physical distribution and delivery of water. Furthermore, since most of the lawsuits include an appeal from SWRCB rulings, the Board is a defendant in many of these actions, so staff time and expertise is consumed in the defense of its actions at the same time that it is attempting to resolve disputes among appropriators and other adversarial interested parties.

The Experience of Tier 2 Distributors

Compared to formal disputing activity before the SWRCB, respondents at Tier 2 allocating institutions reported a near-absence of formal disputes occasioned by their sometimes draconian drought response decisions. For instance, in February of 1991 the State Water Project cut off all water deliveries to its agricultural customers,[46] and up to 90 percent of its deliveries to the cities served by southern California's giant Metropolitan Water District.[47] Yet the legal staff at the state Department of Water Resources, which manages the SWP, reported no suits or formal administrative complaints filed by contractors against the Department in response to this action.[48] To be sure, the SWP Contractors Association did engage in prolonged negotiations with DWR directors in an attempt to mitigate the impacts of this action, but no legal conflicts between contractors and DWR had yet ensued by the end of 1991, nor were any anticipated.[49]

In normal-precipitation years, the Metropolitan Water District obtains most of its water from the State Water Project, the Colorado River, and via other water rights held by its member jurisdictions. In anticipation of the February, 1991 cutback from the State Water Project, the MWD

45. *Id.*

46. R. Reinhold, *Drought Forces Cutoff of Water to Vast Farmlands in California*, N.Y. Times, Feb. 5, 1991, p. A1, col. 2.

47. Puffer interview, *supra* note 27.

48. Telephone interview with N. Hill, Staff Attorney, Office of Legal Counsel, California Department of Water Resources, Sacramento, California, Dec. 4, 1991.

49. *Id.*

Board adopted a contingency plan mandating 31 percent conservation below pre-drought consumption levels for all of its member municipalities and other customers.[50] For every acre-foot of water conserved beyond the 31 percent reduction, MWD rebated the jurisdiction $100, while for every acre-foot short of the mandated conservation level, MWD fined the customer $394. As a result, MWD achieved a system-wide conservation level of 38 percent, due in part to conservation measures, but also to the fact that many member jurisdictions began pumping the groundwater from beneath their lands. Since they could pump groundwater for about $130 per acre-foot but were having to pay MWD $240 for surface water, they therefore made money on the MWD's rebate program, which had to be curtailed as a result.[51] No member jurisdiction has formally challenged implementation of the District's mandatory conservation program. The primary source of legal conflict at present is between the Board and one of its members, the San Diego County Water Authority, over the construction and operation of interconnection facilities, and not over the distribution of water per se.[52]

The Santa Clara Valley Water District likewise reported no formal disputes among its member water agencies or between members and the District arising from the 25 percent conservation goal it mandated in March of 1991;[53] the SCVWD actually achieved average conservation levels of nearly 32 percent among its member jurisdictions.[54] Because District revenue is based on the quantity of water sold, in 1991 it raised its wholesale water rates 50 percent to make up the shortfall; the rate hike was passed along in varying degrees by all member agencies to their retail customers.[55] In response, the agencies were beginning to report considerable consumer frustration, in that residential end-users voluntarily exceeded the District's conservation goals only to see their water rates rise sharply anyway. However, as of December, 1991, no formal challenges had been issued against the District either by member agencies or retail customers based upon mandatory conservation measures or the wholesale rate increase.[56]

The United States Bureau of Reclamation's Central Valley Project announced in February of 1991 that it was cutting delivery to CVP contractors by up to 75 percent, and its delivery to cities (a minor portion of CVP diversions) by up to 50 percent.[57] Since the cuts went into effect (and as of December, 1991), only two of the CVP's hundreds of contractors have

50. Puffer interview, *supra* note 27.
51. *Id.*
52. *Id.*
53. Sutcliffe interview, *supra* note 28.
54. SCVWD, *Santa Clara County Drought Status Report*, May, 1991 (Executive Summary).
55. Sutcliffe interview, *supra* note 28.
56. *Id.*
57. Water Cut Again for Californians, N.Y. Times, February 15, 1991, p. D15, col. 6.

filed suits naming the Bureau as a defendant.[58] One suit was brought by the Central California Irrigation District against a neighboring groundwater extractor for using CVP facilities to export large quantities of groundwater for sale outside the region; the case against the CVP as an accessory in this suit was dismissed in November of 1991.[59] The other suit was brought by the Glen-Colusa Irrigation District for the CVP's failure to recognize unexercised storage rights the District claimed it had in one of the Project's tributary reservoirs. As of the end of 1991, this suit was still in the midst of pre-trial motions and discovery had not yet commenced.[60]

Given the millions of acre-feet of water entailed in these Tier 2 allocation cutbacks, the relative lack of formal disputing activity experienced by distributors at this level is noteworthy, especially in contrast to the incidence of complaints either before or against the SWRCB at Tier 1. As the data discussed below will show, this was very much the experience of Tier 3 distributors surveyed in this research as well.

Conservation Cutbacks and Conflict Among Selected Tier 3 Distributors

While the Tier 3 distributors surveyed in this research may not be broadly representative of the twelve thousand appropriative water rights permit holders in California, they do collectively provide the municipal water supply for about three fourths of the population of the state. Also, the similarities in their experience in the formulation and implementation of stringent conservation measures are significant enough to warrant careful attention. They were also among the service areas most directly affected by the recent drought.

Among the most severely affected of the jurisdictions surveyed was the Marin Municipal Water District. In the fifth year of the drought and with reservoirs down to 30 percent of capacity, in March of 1991 the District required its customers to cut water use by 50 percent from existing consumption, to 50 gallons per person per day (compared to the traditional 4-person household/acre foot per year standard, which equals 223 gallons per person per day).[61] Rains later in the season alleviated the situation somewhat; by December of 1991 the District was back to 25 percent conservation, but customers were voluntarily achieving 35 percent on average and 45 percent conservation in certain portions of the District's service area.[62]

58. Telephone interview with M. de Haas, Chief, Repayment and Contracts Division, U.S. Bureau of Reclamation, Pacific Southwest Region, Sacramento, California, Dec. 5, 1991.
59. *Id.*
60. *Id.*
61. Marin Municipal Water District, 2(1) *On the Waterfront* 1 (Winter, 1991).
62. Telephone interview with L. Pischel, Senior Public Information Representative, Marin Municipal Water District, Corte Madera, California, Dec. 6, 1991.

As of December, 1991, no administrative or judicial challenges to the District's severe conservation measures had been mounted. This may be partially due to the active and direct involvement of MMWD customers in water supply policymaking. In November of 1991 they voted on a bond measure proposed to fund an $80 million dollar interconnection project with Sonoma County's Russian River to the north—a plan which had been strongly opposed in the past because of residents' concerns that a greatly expanded water supply capacity would lead to intensive urban development of the county's remaining open space.[63] But by November reservoirs were back up to 70 percent of capacity (the District's capacity is somewhat limited relative to demand), and with voter fears of urban development evidently continuing to outweigh the exigencies imposed on their lifestyles by the drought, they voted by a 54–46 percent margin to reject the bond measure.[64] The only other plan the District is now contemplating for supply augmentation is a desalination plant, which would cost approximately $1,800 per acre-foot of water to build and operate.[65] This is more than 10 times the purchase price of water from the State Water Project, which is unavailable to the Marin District anyway, due to the voters' disinclination to interconnect with other service areas.

The East Bay Municipal Utility District board of directors adopted differential conservation requirements in the spring of 1991, calling for 32 percent conservation among residential customers (the largest user group), nine percent conservation for industrial users and 17 percent for commercial (the East Bay shoreline, including the city of Oakland, its docks, and airport, is heavily industrialized), and 50 percent conservation for irrigators (e.g., golf courses, parks, and cemeteries). As in Marin, residential conservation on average exceeded the standard set.[66] Like Marin, EBMUD also adopted inverted block rate structuring, in which the more water a customer used, the more sharply the rates for that water use went up.

Due to the climatic and geographic peculiarities of the San Francisco Bay region, the EBMUD service area actually encompasses two distinct climate zones: the cool, summer fog-shrouded East Bay shoreline, where Berkeley and Oakland are located, and the much warmer and drier suburban areas east of the East Bay Hills (which are also not nearly as densely populated as the Berkeley-Oakland corridor). In 1989 and again in 1991 an irate citizens' group brought suit against EBMUD, charging that uniform service-area–wide conservation measures and—more signif-

63. Interview with R. Thiesen, Principal Engineer, Marin Municipal Water District, Corte Madera, California, Aug. 7, 1991.

64. Pischel interview, *supra* note 62.

65. Thiesen interview, *supra* note 63.

66. Interview with I. McClendon, Public Information Representative, East Bay Municipal Utility District, Oakland, California, Aug. 2, 1991.

icantly—the inverted block rate structure were imposing an inequitable burden, in that in addition to a warmer climate, many of the large, expensive homes in the area were surrounded by orchards and other extensive, water dependent landscaping.[67] The 1989 suit, brought only by customers, was dismissed for failure to state a cause of action. The 1991 suit was also joined by the wealthy warm-weather suburbs of Orinda, Lafayette, and San Ramon; they charged that the inverted block rate stretched across two climate zones amounted to an indirect surtax, in violation the state's tax limitation initiative.[68] At the end of 1991, the case was still at the pretrial motion stage.

The Monterey Peninsula Water Management District regulates the provision of water to all users in the area; it is also in the planning stages of developing its own storage and delivery facilities. By the end of 1990 the relatively limited existing storage reservoirs owned by public and private water companies in the District were down to 50 percent of capacity; the MPWMD had been mandating twenty percent residential conservation since 1989. Like other municipal service areas surveyed in this research, Monterey Peninsula residents voluntarily exceeded this goal, achieving 31 percent conservation in 1990.[69] An unusually wet March in 1991 restored reservoirs to almost 100 percent of capacity; but since storage is so limited relative to demand, another year of drought could put the District back on mandatory conservation once again.[70]

There have been no legal assaults on the District's water rationing plan since the onset of the drought. The most celebrated legal attack on the Board's authority to restrict water use occurred before the drought, when actor and Carmel tavern owner Clint Eastwood challenged the Board's denial of new water service for the development of his real estate; the Board's action was eventually upheld.[71]

After suspending its moratorium for a period pending more detailed studies of area hydrology and demand, the Board reinstated it in 1990, upon a finding that regional demand was consistently at or in excess of dependable supply;[72] severe new use limitations of some kind will probably continue to be imposed by the Board until additional supplies are developed. MPWMD long-term plans for supply augmentation include a dam and reservoir adjacent to the Ventana Wilderness in the Los Padres National Forest (at the northern end of the Big Sur region), and a 3,000 acre-foot-per-year desalination plant.[73]

67. Telephone interview with R. Maddows, General Counsel, EBMUD, Oakland, California, Aug. 5, 1991.
68. *Id.*
69. 1990 Annual Report, *supra* note 30, at 20.
70. Fuerst interview, *supra* note 31.
71. *Id.*
72. Annual Report, *supra* note 30, at 2.
73. *Id.* at 10.

Although the MPWMD's drought-related actions have not been challenged, water appropriators within the District are in dispute with each other. Since most of the District's water is supplied by the private Cal-American Water Company, when its reservoir on the Carmel River was drawn down during the drought the company sank several large wells in the flood plain below its dam to augment supply. Downstream users complained to the Water Rights Division of the State Water Resources Control Board that the groundwater that Cal-Am was extracting was tributary to their surface water flows. Given the complaint backlog at the SWRCB, however, its investigators have urged the MPWMD to seek a mediated settlement among the disputing parties.[74]

INTERPRETATIONS OF DISPUTING BEHAVIOR

Conflicting Conceptual Perspectives on Tier 1 Disputes

In his landmark essay portraying rational self-maximizers sharing a commonly held resource as collectively creating 'the tragedy of the commons,' Garrett Hardin[75] described a resource management situation in which, to quote Aristotle, "what is common to all has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest."[76] In her 1990 book, *Governing the Commons*, Elinor Ostrom more crisply defined a common pool resource as "a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use."[77] The resource system must be subject to diminution in quantity by individual appropriations, thus making the actions and status of co-appropriators interdependent.[78] Key to the study of these situations, she says, is recognition of "the free rider problem. Whenever one person cannot be excluded from the benefits that others provide, each person is motivated not to contribute to the joint effort, but to free-ride on the efforts of others."[79]

This article is about the role of conflict in the distribution of common pool resources at times when the supply of that resource is in decline. To interpret disputing behavior before the Water Rights Division of the SWRCB from the theoretical perspective of the literature on the governance of common pool resources, the first task is to address the question of whether the surface waters of California subject to SWRCB jurisdiction (or of any state government agency administering the prior appropriation system) do indeed collectively compose a common pool resource. There

74. Fuerst interview, *supra* note 31.
75. G. Hardin, *The Tragedy of the Commons*, 162 Science 1243 (1968).
76. Politics, Book II, chapter 3; quoted in Ostrom, *supra* note 4, at 2.
77. *Id.* at 30.
78. *Id.* at 38.
79. *Id.* at 6.

are sharply conflicting schools of thought on this issue, the debate between which goes to the very heart of the jurisprudence of water rights on the theoretical side; the debate plays just as central a role in understanding the intense legal and political conflict between competing water users in California and elsewhere in the arid West on the policy side.

A useful framework for quickly reviewing the jurisprudential dialogue is provided by the comparativist legal scholar Henry Ehrmann,[80] in his summary and synthesis of the work of theorists such as Max Weber, John Dewey, and Wolfgang Friedmann.[81] In discussing the ends of law, he has pointed out that societies with formal legal systems use them to achieve the ends of *utility* (law as an instrument to achieve a substantive public purpose), *security* (the protection of settled expectations, especially regarding the integrity of persons and property), and *justice* (*inter alia*, the resolution of utility-security conflicts by the use of means and the achievement of outcomes that conform to the prevailing norms and values of the society in question). In describing the dynamic among these ends of the law, Ehrmann concludes:

> If the triad of justice, utility, and security describes adequately the near-universal ends of law, it also must be understood that the relationship among the three values of law is relative and may give rise to considerable tensions. How they will be resolved or mitigated, how far utility should prevail over justice, or security over utility, each political system must decide.[82]

From the standpoint of one school of water rights jurisprudence—one which strongly embraces the security ends of the law—the surface waters of a prior appropriation state are not a commons at all. Based on this line of analysis, water in a prior appropriation state at the time it first adopted the prior appropriation doctrine should be loosely analogized to public land at the time of the state's founding—land which was given away to citizens under policies such as the Homestead Act in order to achieve the public policy objective of maximizing the investment of private wealth and labor in land to produce economic benefit. Just as this once-public land is now held as private property, the argument runs, so should appropriative water rights be considered a like form of property; the many state and federal judicial decisions discovering a compensable property interest in water are cited as support for the "water as private property" position.[83]

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80. Henry Ehrmann, Comparative Legal Cultures (1976).

81. *Id.* at 34–35; sources cited therein.

82. *Id.* at 35.

83. For a dogged defense of this perspective and a lamentation over its twentieth century decline, see C. Schultz and G. Weber, *Changing Judicial Attitudes Towards Property Rights in California Water: From Vested Rights to Utilitarian Reallocations*, 19 Pac. L. J. 1031 (1988).

From this perspective, the appropriated surface waters of a prior appropriation state should be collectively viewed as little more than an assemblage of contiguous private rights; and the disputing behavior before California's SWRCB is properly seen as similar to private land owners engaged in boundary disputes—patrolling their borders to maintain fences and fend off squatters. The commons has been divided by prior appropriation and riparian rights, and no longer exists.[84]

In response, proponents of the opposing instrumentalist or utilitarian school are quick to assert that twentieth century developments in water law and policy have rendered this analogy seriously imperfect in all situations, and wholly inapplicable in many. First, the amended constitutions of most prior appropriation states declare the surface waters of the state to be either the property of the state itself, or of the people of the state collectively, and held in trust for them by the state. What an appropriator therefore obtains from the state is not a fee simple private property right, but rather a use right, or 'usufruct,' which the state defines in terms of both the specific uses to which the water can be devoted and the means of that use.[85] And second (to the relief of environmentally oriented instrumentalists) the courts in California and some other western states have begun to hold that under the public trust doctrine, in granting, conditioning, and construing appropriative rights the state is compelled to take into consideration the preservation of the natural environment for aesthetic and recreational purposes.[86]

In 1928 California voters adopted a constitutional amendment requiring that all appropriative *and* riparian water rights holders make reasonable use of their waters, unreasonable use thereby becoming grounds for revocation of the right.[87] Further, the water must be used beneficially, which the law defines as municipal and domestic, agricultural, and industrial (in that order). Appropriated water used in ways not deemed beneficial under state law will also result in revocation of the right, with no compensation due. Instrumentalists point out that there is no parallel in land use law under which a property owner may lose title to

84. For a multi-faceted explication of this perspective, see T. Anderson, Ed., Water Rights—Scarce Resource Allocation, Bureaucracy, And The Environment (1983), especially Mr. Anderson's introduction and A. Cuzan's chapter, Appropriators versus Expropriators: The Political Economy of Water in the West, *id.* at 13.

85. Usufructory rights in prior appropriation states are discussed generally in W. Hutchins, Water Rights Laws In The Nineteen Western States (1974). More recent discussions of the evolutionary tensions between utility and security-oriented conceptions of western water law may be found in C. Wilkinson, *Western Water Law in Transition*, 56 U. Colo. L. Rev. 317 (1985); S. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 Or. L. Rev. 483 (1982); and A. Dan Tarlock, *Appropriation for Instream Flow Maintenance: A Progess Report on "New" Public Western Water Rights*, 1978 Utah L. Rev. 211 (1978).

86. *See*, for instance, Harrison Dunning, *The Public Trust Doctrine and Western Water Law: Discord or Harmony?* 30 Rocky Mtn. Min. L. Inst. 17 (1985).

87. Cal. Const. art. X, §2.

his or her land simply for not using it efficiently or not devoting it to a state-defined beneficial purpose.

The California courts have interpreted the 1928 amendment as conditioning the rights of riparians,[88] as requiring instream flows to maintain water quality and wildlife habitat in the Sacramento-San Joaquin River Delta,[89] and as compelling the efficient use of water in irrigated agriculture.[90] The legislature has also determined the preservation of fish, wildlife, and recreational opportunity to be beneficial uses of water;[91] and in 1983 the California Supreme Court ordered the SWRCB to exercise its public trust responsibility to preserve the natural environment, in conditioning permits already held by the City of Los Angeles on the creeks flowing into Mono Lake, east of the Sierra Nevadas.[92]

Although the courts in California and elsewhere certainly do continue to recognize some measure of a valuable use interest in water, defensible under the due process and equal protection provisions of federal and state constitutions,[93] that interest appears to have progressively less resemblance to a classic real property right than advocates of the security perspective would like to acknowledge. Under modern usufructory principles, an appropriative water right seems to be less a solid perimeter than it is a semi-permeable membrane.

In addition to the growing influence of the public interest prerogative in the conditioning of water rights, another reason for concluding that California's surface waters resemble a commons more than an assemblage of contiguous private rights concerns the excludability criterion. As discussed earlier, one hallmark characteristic of the commons dilemma is that resource users do not have the ability to exclude newcomers from access to the resource. On first examination, it appears that such access cannot be gained, since most of California's available surface water is fully appropriated; and permit holders diligently guard their rights against any attempted intrusions.

But just as appropriators have been unable to exclude from access to the statewide water commons the emerging requirements of instream flow standards to preserve environmental values, so too have they proved incapable of controlling growing human demands for water. It may be argued (as does the 'security' school of water rights jurisprudence) that since the cities have already acquired water rights, and since the size of the water rights 'pie' is already fixed (unless major new storage facilities are constructed), additional access is not possible, as there is no more water to

88. Joslin v. Marin Municipal Water District, 67 Cal. 2d 132, 60 Cal. Rptr. 377 (1967).
89. U.S. v. SWRCB, 182 Cal. App. 3d 82, 227 Cal. Rptr. 161 (1986).
90. Imperial Irr. Dist. v. SWRCB, 321 Cal. Rptr. 283 (4th Dist. 1986).
91. Cal. Water Code §1257.
92. National Audubon Society v. Superior Court, 33 Cal. 3d 419, 658 P.2d 709, 89 Cal. Rptr. 346 (1983).
93. Schulz and Weber, *supra* note 83.

distribute and what there is has already been allocated. Advocates of the free marketability of water would simply allow agricultural interests to sell their water to expanding municipalities for whatever price the market will bear,[94] just as the finite supply of land in California (and elsewhere in the West) is steadily being converted from agricultural to urban use.

However, the situation is not quite that simple. While municipal consumption still accounts for less than 15 percent of California's developed water supply use (agriculture uses about 85 percent), that demand is growing at an astonishing pace. Between droughts in the 1980s, the state's population expanded at two and a half times the national average; in addition to a higher than average birthrate, in 1990 alone 32,000 people a month moved to California.[95] In 1987 demographers predicted that California's population would reach 36 million by the year 2010; in 1991 they estimated instead a population that size by 2000.[96]

Municipal demand growth that rapid will mean an unrelenting demand for as much—or more—water than the state is now capable of providing. Either more storage and diversion facilities must be built (with their attendant environmental consequences), more water must be diverted from other uses (principally agriculture), or urban Californians will have to learn to get by with far less water than they do today. Whatever path is chosen, there will be net losses to the state: further environmental degradation, a decline in food production capability, or a significant downturn in water-related aspects of the region's traditional quality of life. The uncontrolled addition of more and more people to California's population base is straining every component of the state's social and physical infrastructure,[97] but perhaps most critically its ability to supply water. Given its population growth rate, California would have reached this crossroads anyway; the drought only hastened the inevitable.

It should hardly seem surprising, then, that some of the coastal communities most severely affected by the 1980s–90s drought—those with limited storage capacity and no interconnections with statewide systems, such as Marin and Monterey—have begun refusing to make water available to newcomers. At the statewide Tier 1 level, California is indeed a water commons in crisis.

Interpreting the Tier 2 and 3 Experience

Given the intense levels of conflict at Tier 1, one might expect similar competitive friction at the lower distribution tiers as well. But in fact, just the opposite seems to have occurred. Table 1 is a data table depicting the conservation experience of the Tier 2 and 3 municipal distributors sur-

94. Anderson, *supra* note 84.
95. Vogel, *Is California Bursting at the Seams?* Calif. J., July, 1991, p. 295, 296.
96. *Id.* at 296.
97. Reinhold, *In California, New Discussion on Whether to Bar the Door,* N.Y. Times, Dec. 3, 1991, p. 1, col. 6.

TABLE 1. Surface Water Conservation Experiences of Tier 2 and 3 Municipal Distributors

Jurisdiction	A. Conservation Requested[a]	B. Conservation Achieved[a]	C. Voluntary Additional Conservation[b]
1. East Bay Municipal Utility District	15%	25%	67%
2. Marin Municipal Water District	25%	35%	40%
3. Metropolitan Water District of Southern California	31%	38%	23%
4. Monterey Peninsula Water Management District	20%	31%	55%
5. San Francisco Water Department	25%	33%	32%
6. Santa Clara Valley Water District	25%	32%	28%
Average Voluntary Additional Conservation			41%

a. Reduction in 1991 consumption below base year consumption (1986–87 in most cases).
b. Remainder of B minus A, as a percentage of A.
(Date sources cited in text of report)

veyed in this study, which collectively serve about three fourths of the state's population. Column A lists the levels of water conservation requested of end-users in 1991, relative to their pre-conservation consumption rates in 1987. Column B lists the actual conservation rates achieved by end-users in each jurisdiction, and Column C shows the percentage by which users voluntarily conserved more water than requested by their distributors.

What Table 1 shows is that during the fifth year of drought, coastal Californians voluntarily achieved forty percent higher conservation levels than their providers had requested—a sacrifice that stands in stark contrast to the relentless conflict occurring at Tier 1. To be sure, these numbers mask some risky water management practices: member jurisdictions in the MWD reached their surface water conservation goals largely by pumping finite groundwater supplies instead. The pumpers are gambling that precipitation will soon return to normal and the aquifers can be recharged. If instead the drought continues and groundwater extractions deeply overdraft the aquifers, these cities risk massive saltwater intrusion into and the permanent compaction of their groundwater basins, thus

ruining the subsurface water commons. It took decades of litigation and the forging of complex inter-jurisdictional agreements to preserve southern California's groundwater basins in the latter half of the twentieth century;[98] the temptation to sacrifice these years of cooperative conservation effort for short-term expediency's sake presents a serious dilemma for the MWD and its members.

Nonetheless, these voluntary conservation figures still reflect a capacity for mutual forbearance and collective self-sacrifice that belies the prevailing media image of Californians as self-indulgent exploiters.[99] Moreover, it flies in the face of the grim admonitions of analysts such as Mancur Olson, who warned that

> unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests.[100]

Every Tier 3 provider surveyed had the authority to impose punitive fines, install flow restrictors on the water lines of recalcitrant wastrels, put utility liens on deadbeat property owners, and ultimately to discontinue water service to conservation program violators. Yet in five years of drought, none of them has had to impose physical restrictions on end-user consumption, and the number of lesser enforcement actions has remained low. Some other dynamic must be at work to achieve the remarkable success of Tier 3 conservation programs.

This research has led me to conclude that the publicly owned Tier 2 and 3 water management districts undertaking these conservation measures represent examples of several successful self-organized, self-governing commons, as distinguished from the unstable, destructive, and conflictual commons dilemma occurring at Tier 1. They all reflect the characteristics of successful common pool resource systems identified in Ostrom's extensive comparative study: (1) defined commons boundaries, (2) congruence between distribution rules and supply flow, (3) public participation in rule formulation and implementation, (4) adequate compliance monitoring, (5) graduated sanctions, (6) dispute resolution mechanisms, and (7) the capacity for self-organization.[101] The self-organized Tier 2 and Tier 3 distributors all exhibit these features, they all imposed deep reductions in consumption on their constituent end-users, and they all managed to induce surprisingly high levels of cooperative support for their demand reduction programs. The remainder of this arti-

98. *See* Ostrom, *supra* note 4, Chapter 4.

99. *See*, for example, *Special Issue—California: The Endangered Dream*, Time, November 18, 1991.

100. M. Olson, The Logic Of Collective Action (1965); quoted in Ostrom, *supra* note 4, at 6.

101. Ostrom, *supra* note 4, at 90.

cle explores ways in which some of the keys to the success of Tier 2 and 3 shrinking commons distributions might be applied to the far more troubled situation at Tier 1. Also examined are some Tier 2 and 3 management practices reported to be now engendering some conflict, accompanied by policy recommendations for maintaining end-users' cooperative behavior.

CONCLUSIONS AND RECOMMENDATIONS

Voluntary Conservation and Water Pricing at Tiers 2 and 3

As discussed above, one of the most precious—and largely unrecognized—resources discovered in this research was the cooperative spirit and good will of municipal water users, who on average achieved conservation 40 percent higher than their system managers had requested. But in keeping with the public administration maxim that 'No good deed goes unpunished,' their reward for this collective self-sacrifice in most jurisdictions was a steep increase in retail water rates, because service district revenues are directly tied to consumption levels. A water service district's only marketable product has been its water; when less water was sold, they charge more for it to maintain revenues.

This sent exactly the wrong message to municipal end users. Inverted block rate structuring was the price incentive most districts used for encouraging conservation, so consumers came to associate price with good behavior. When districts raised rates anyway, consumers were left with the sense that there are no rewards to be gained through self-sacrificing behavior.

Among the dozens of municipal consumers with whom I spoke during the conduct of this field work, what repeatedly arose among them was a pervasive sense confusion, frustration, and concern. Most residential water users have realized few discernible benefits from their collective sacrifice, and have been told to expect even less water and higher prices in the future if the drought continues. Many of them are now worried that their voluntary conservation efforts will simply be taken for granted by their water providers, and that current consumption levels will be used as a base figure for computing even deeper cutbacks in the future. Overall, I was left with the impression that municipal water providers are rapidly expending one of their most valuable assets: the good will and collective forbearance of their constituents.

Since it is likely that intermittent water shortages may become a way of life in California (and elsewhere in the developing arid West, if global warming modelers are proven correct), what this situation calls for immediately is a fundamental restructuring of water service rate-making policy. At present, water district revenues and capital improvement bond ratings are directly linked to consumption. There is in this situation an

instructive parallel to electric utility regulation in the 1960s, when the industry's cartoon salesman Reddy Kilowatt was constantly urging us to consume more electricity. The economic viability of electrical utilities was closely tied to high levels of consumption by consumers.

But the electric utilities, their regulators, and their customers were taught a painful and expensive lesson throughout the 1970s and 1980s, as nuclear power plant cost over-runs spiraled skyward and clean air requirements compelled the refitting of fossil fuel burning generators. The lesson was that by far the most cost-effective investment in 'new' energy sources was conservation. Accordingly, by the late 1980s several progressive state public utility commissions were allowing (sometimes urging) electric energy providers to build energy conservation measures into their rate base.[102] Regulated companies were given the incentive to transform themselves from simple energy retailers into energy use managers, and consumers were provided with a variety of economic incentives as well as technical devices for energy conservation.

Most of the Tier 3 distributors surveyed also offer low-cost water saving devices to customers, such as low-flow showerheads; some also offer rebates on low-flush toilets and drought resistant landscaping. But the revenues of all these water distributors are still consumption-based. If instead the Tier 3 distributors operated under an incentive system which rewarded *distributor* conservation instead of the never-ending pursuit of additional supplies, they could go a long way toward meeting future water demand without having to rely so heavily on either new storage construction or agricultural water buy-outs.

What this would require, though, is a radical change in thinking among many municipal water bureaucrats. Los Angeles' aggressive water provider William Mulholland may be gone, but his ghost still has a seat at the boardroom table of every publicly owned water district in the arid West. No water system bureaucrat wants to be in office on the day a voting customer turns on the tap and nothing happens.

In fact, the very success of their water conservation programs may prove to be politically problematic for Tier 2 and 3 distributors. Every year they lobby the legislature to approve either changes in the water law or new water projects or both, citing ever-growing demand for water supplies among their urban populations and commercial enterprises. But suddenly their customers have demonstrated the ability to voluntarily get by on considerably less water than they were before.

102. *See* G. Blackmon, *Conservation Incentives: Evaluating the Washington State Experience*, 127 Pub. Util. Fortnightly 24 (1991); *A New Basis for Conservation Programs for the Poor: Expanding the Concept of "Avoided Cost,"* 21 Clearinghouse Rev. 135 (1989); and R. Colton, *Conservation, Cost-Containment and Full Energy Service Corporations: Iowa's New Definition of "Reasonably Adequate Utility Service,"* 34 Drake L. Rev. (1985).

The municipal water bureaucracy faces a significant leadership challenge. The temptation is probably quite strong at this juncture to scare voters into demanding new water projects, regardless of the financial or environmental costs (especially if the costs are broadly distributed and the environmental destruction is at some remove). And advocating conservation instead of aggressively seeking out new water supplies creates the reverse of the free rider problem: unless all major Tier 3 distributors agree to invest heavily in conservation instead of acquisition, those who do so may lose out on access to new long-term supplies.

In summary, Tier 3 distributors must find new and better ways to reward constituent conservation sacrifices—something they will find difficult to do unless the distribution system itself has effective incentives to conserve instead of consume. If they do not, the precious yet eminently exhaustible sense of collective self-sacrifice among their constituents may well be lost. And like salt water intrusion into an overdrafted coastal aquifer, the political mood that replaces that cooperative spirit will have an unpleasant flavor indeed.

Reforming the Commons at Tier 1

The policy logjam that has beset water management in California since the 1976–77 drought presents a formidable challenge to the political leadership of the state. Since the winter of 1991 a water policy 'summit conference' of municipal water providers, Central Valley agricultural interests, and environmental advocates has been in session, trying to fashion a new consensus-based water policy. If they can come to agreement, Governor Wilson has already announced that he will sponsor the product as his personal proposal to the legislature.[103] As of the end of 1991, the joint statements issued by this activity—informally known as the 'three-way process'—are brief and general, presumably because the negotiators had not yet discovered a great deal of common ground.[104]

If they are to succeed, they might be well-advised to focus on the seven criteria for successful common pool resource management enumerated earlier. The concluding recommendations below are framed within that context.

Regarding the existence of effective dispute resolution mechanisms and adequate compliance monitoring, some attention should be paid to the heavy workload surge that befalls the Water Rights Division of the SWRCB in times of shortage. One means of making the Complaint Section of the Division more efficient might be to partially decentralize it.

103. Interview with R. Potter, deputy director, California Department of Water Resources, Sacramento, CA, July 29, 1991.

104. *E.g.*, letter from Three-Way Water Agreement Process Steering Committee to Governor Pete Wilson, July 23, 1991, and appended documents.

Now, all complaints are received in the Sacramento office; investigators have to travel throughout the state, familiarizing themselves with each new situation. Since the state is already divided up into several hydrologic regions for the purpose of water quality control regulation, an innovation worth trying might be to station a few investigators in each region. They could then become thoroughly acquainted with that region, would not have to travel as extensively as they do now, and could perhaps be trained to engage in more pro-active dispute intervention. Consistency in rule application would not be forsaken if investigator recommendations were subject to the approval of a Sacramento-based supervisor, as they usually are now anyway. The only significant new problem this might create is the possibility of regional investigator 'capture' by powerful local water interests; but other bureaucracies have managed to overcome this difficulty.

Finally, and perhaps most significantly, it is a lack of congruence between distribution rules and supply flow that is creating an increasingly dysfunctional and destructive commons at Tier 1 of the distribution system. Like other western states, California is laboring under water rights and reclamation policy distribution rules adopted at a time when the economic and social organization of the United States—and the resulting needs of its population—were radically different from what they are today. Among the most serious of these distribution rule incongruities are the environmental destruction occasioned by water management during the drought, completely discontinuous water pricing practices between agricultural and municipal water users, and equally striking differences between agricultural and urban consumers regarding the efficiency of water use.

These three issues are hardly newcomers to the western water policy agenda. They have been intensely debated in Congress, state legislatures, and dozens of books and periodicals for at least the last 20 years, when the National Water Commission focused public attention on them in its 1973 report. It is well beyond the scope of this paper to recount the debate over these issues or even summarize all the relevant literature; these topics are in large part what the future of the West is all about. However, the extraordinary circumstances created by prolonged drought in combination with steadily growing water demands in California have cast the debate over environmental degradation, agricultural/urban water pricing, and agricultural/urban use efficiency into fresh and vivid relief. A brief review of California's drought-related confrontation of these issues will demonstrate the challenges facing water policy negotiators in that state, as they attempt to reform the statewide water commons; and it also provides a cogent fast-forward illustration of what the future may hold in store for other allocating institutions in the West, if shortages are not anticipated and pro-actively planned for in the present.

Turning first to the question of environmental deterioration, it was noted earlier in this paper that many observers believed California's aquatic environment to be in steep decline even before the drought. The successful suit against the city of Los Angeles by the Audubon Society, mandating public trust environmental protections in the regulation of tributaries to Mono Lake was decided in 1983, and judicially ordered instream flows through the Delta in 1986 both occurred in the early 1980s, in recognition that even in the best of times these aquatic habitats were not being adequately protected under existing prior appropriation and reclamation policy doctrines; the drought simply made matters much worse. Since California is not among those states which allow instream appropriations for environmental protection,[105] the instream flow standards the SWRCB mandates as a condition for maintaining a water rights permit are proportional rather than absolute, making aquatic habitats more vulnerable to drought-related devastation than states which recognize instream appropriations.

Furthermore, the emergency provisions of the California statute under which short-term water transfers from agricultural to urban use have been accomplished over the last three years allow for exemption from environmental review. This emergency waiver of the environmental assessment of water transfer impacts has been exercised annually for three consecutive years, which in the eyes of some is beginning to amount to a de facto policy of ignoring environmental quality in times of drought. In 1991, groundwater basins were also in overdraft throughout central and southern California, jeopardizing especially the vulnerable coastal aquifers.

In recognition of the principles of successful commons governance, water policy negotiators in California and other states confronting similar problems may wish to devote renewed attention to the concept of regional conjunctive use regulation and management (i.e., region-defined integrated surface and groundwater management). This would amount to doing statewide on a region-by-region basis what the Monterey Peninsula Water Management District has been working on since 1977: the adoption and enforcement of a regional water budget to balance supply and demand, halt environmental degradation, and more thoroughly integrate surface and groundwater use decisions. Popularly elected regional governing boards or board members appointed by local political leaders would also address the criteria of public participation in rule formulation and implementation, and the capacity for self-organization. California's Regional Water Quality Control Boards, established by the 1969 Porter-Cologne Act,[106] could provide a useful starting point in the design of such

105. *See* P. Williams and S. McHugh, *Water Marketing and Instream Flows: The Next Step in Protecting California's Instream Values*, 9 Stanford Environmental L. J. 132 (1990).

106. Cal. Water Code §13000 et seq. (West 1971 & Supp. 1991).

institutions for regional water management governance; these hydrologic region-defined boards would also conform to the criterion of defined common boundaries.

Since this research dealt largely with the drought responses of urban water suppliers and customers, space has not permitted an analysis of another perceived incongruity in distribution rules and supply flow: the water prices paid and water use practices of farms relative to cities. The municipal Tier 2 and 3 distributors in this study are regularly paying as much as ten times more for water than the subsidized Central Valley farmers, yet all of the cities' conservation sacrifices in 1991 amounted to less water than the farmers used to grow hay. Furthermore, much of this alfalfa grown with government-subsidized water was fed to dairy cattle to produce surplus foods such as milk and cheese, which are then sold at government-supported prices.[107]

This aspect of the utility-security debate turns on the question of whether farmers should be allowed to keep using the low-priced irrigation contract water as they please; or if they should be allowed to indefinitely sell subsidized irrigation water to cities at much higher free market prices; or if instead these irrigation contracts should be phased out and the water simply sold to the highest bidder (presumably the cities), thus putting an end to uneconomical or inefficient agricultural water applications. Lacking such incentives, in the current drought there has been precious little evidence of water conservation by Central Valley farmers relative to the substantial sacrifices made by municipal users (that is, until the CVP and SWP cut them off in 1991). Yet curtailing California's agricultural water use by only 10 percent would result in savings equal to all indoor residential water consumption in the state.[108]

In their defense, agricultural interests point out that it is much easier for urban residents to achieve higher conservation levels because so much of their water use is nonessential (e.g., lawn watering, car washing, swimming pool maintenance), and because conservation retrofitting of domestic water use devices (low-flow showerheads, toilets, drip irrigation) is much less costly relative to state-of-the-art agricultural water conservation technology. In addition, farmers feel caught between the Scylla of California's 'reasonable use' constitutional provision (a wastefully used water right is subject to revocation of the wasted portion), and the Charybdis of the prior appropriation doctrine's 'use it or lose it' mandate (any portion of an agricultural water right not devoted to agriculture for a defined statutory period is also subject to revocation). This latter provision of California's water code has been amended to allow for short-term emergency agriculture-to-urban water use sales without jeopardizing

107. P. Passell, *Greening California*, N.Y. Times Feb. 27, 1991, p. D-2.
108. S. Postel, *California's Liquid Deficit*, N.Y. Times, Feb. 27, 1991, p. A-27.

agricultural rights, but long-term transfers are unlikely unless and until California's version of prior appropriation is significantly amended. Under California law as of 1991, not using an agricultural right for agriculture for an indefinite period created grounds for forfeiture.

Of course, if any of these proposed actions were as easily done as said, water policy gridlock would not be the political fact of life that it has been for most of the 1970s and 1980s. For years, one of state assembly speaker Willie Brown's more printable nicknames was 'Farmer Brown'; although agri-business' political influence in Sacramento may be waning, it has still proven sufficient to block major legislative water policy reform throughout the 1980s (the most significant changes have been wrought by the courts during this period). And while regional water governance might sound splendid to regions with plenty of water, the notion understandably has fewer advocates in arid yet politically powerful southern California than it does in the water-rich but more sparsely populated north. Water traverses the length and breadth of the state, and leaders of allocative institutions such as DWR are convinced that more extensive regional interconnection rather than the kind of regional isolationism evidenced by Monterey and Marin are what the state desperately needs.[109]

Unfortunately, while water conveyance facilities are cast in concrete, the rules governing their management are not. Vigorous northern opposition to a peripheral canal to more efficiently transport water through the Delta is premised on the suspicion that its control would be dominated by southern interests, creating even more environmental damage in the north than has already occurred.

Perhaps one principle that negotiators may be able to agree on is that no one region of the state can or should be sacrificed, either environmentally or economically, for the sake of another (implying something of a departure from historical precedent).[110] Utility and security must find their balance in the new water policies being contemplated in California and elsewhere in the West, if the people of the West are to conclude that a 'commons sense' of justice can be achieved.

109. Potter interview, *supra* note 103.
110. *See* Kahrl, *supra* note 26.