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The San Francisco Bay-Delta: A failure of decision-making capacity

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ABSTRACT

The paper reviews the history of Bay-Delta decision-making in California in order to highlight the continuity between what happened with CALFED and what happened in the preceding decades since water project deliveries began in 1949. Throughout this period, there has been intense conflict about whether and how to transfer water from the Bay-Delta to users elsewhere—a conflict marked by a fundamental opposition of interests among stakeholders. We document how the State of California has failed to organize itself effectively to resolve this conflict and make a decision on how to manage the Delta. The strategy consistently adopted by the State was to encourage the main parties – agricultural and urban water diverters, and fisheries and other instream-protection interests – to work out a solution among themselves, rather than imposing one externally. However, economic theory suggests that a bargaining solution is unlikely to exist because of the extreme opposition of interest among the parties. The Bay-Delta history amply confirms this theoretical prediction. Thus, the State's strategy of relying on voluntary agreement to resolve the issue is fundamentally misconceived and is, at some level, an abdication of its responsibility.

1. Introduction

All of the contributors to this symposium agree that CALFED was an iconic innovation in water and ecosystem management. There is somewhat less agreement on whether it has failed and, if so, why. Indeed, as with *Rashomon*, what happened with CALFED is susceptible to multiple interpretations: people observe the same events differently and attach varying significance to them. The fate of CALFED has been seen as a continuing failure to overcome fragmentation among agencies and among narrow scientific disciplines. It has been seen as a failure to adopt new paradigms of governance, to organize adequately to deal with complex systems, to cope with dynamic ecosystems, to embrace science in decision-making, and to adapt to new knowledge and new ways of knowing. While not rejecting these perspectives, our own is slightly different. We focus on the broad sweep of Bay-Delta decision-making in California, starting long before CALFED, and we emphasize the continuity between what happened with CALFED and what happened in the preceding decades. Although the current scientific understanding of the estuary is different than in the past, we suggest that the root cause of the problem is not the complexity of the ecosystem, nor our imperfect understanding of it. From the beginning, there has been intense conflict in California about whether and how to transfer water from the Bay-Delta to users elsewhere—a conflict marked by a fundamental opposition of interests among stakeholders, and by disagreements about

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facts as well as values. For at least 60 years, the State of California has failed to organize itself effectively to resolve this conflict and make a decision on how to manage the Delta.

It is, and always has been, a difficult decision. There are longstanding differences – even antipathies – between northern and southern California, between agricultural and urban water users, between extractive interests and environmental interests. As explained below, it is precisely the raw opposition of interests that makes it harder to craft a decision-making institution. Nevertheless, it is a serious indictment of the political leadership in California to have failed so consistently and for so long to create a viable mechanism for making this decision. We emphasize the state's failure because, in our view, the issue is fundamentally a state matter. There are, to be sure, important federal interests involving compliance with the Endangered Species Act (ESA), the Clean Water Act (CWA), and the Reclamation Act. But, at bottom, this is a question of determining the allocation of water resources that are being sought by competing in-state interests. The failure embraces not just CALFED but also, as we explain, the State Water Resources Control Board (SWRCB), California's water rights and water quality control agency.[1]

The paper is organized as follows. The next section lays out a conceptual framework, explaining why a raw opposition of interests makes voluntary agreement unlikely. Section 3 sketches the history of past Bay-Delta decision-making, focusing mainly on the period 1949–1994. Section 4 assesses CALFED and the SWRCB in the context of this history and identifies the broader governance failures.

2. Conceptual framework: the Delta as a zero-sum game

As elaborated below, the Delta has long been a source of conflict between those in California who support and those who oppose water diversions, those who wish to preserve the natural flow of water into the Delta and those who wish to modify it. However, when the CALFED agreement was unveiled in December 1994, many thought it was the dawn of a new era in which the contending parties would cooperate to find a win-win solution to longstanding Delta problems. Thus, there are two very different framings of the Delta. One is as an adversarial situation in which the interests of the parties are mutually opposed. In economic terms, this can be viewed as an instance of a negative externality: water diversions, whether for agricultural or urban uses, create a negative externality for the Delta ecosystem, while protecting the Delta ecosystem creates a negative externality for would-be water diverters. This can also be seen as a zero-sum game where increasing the benefit to one party necessarily causes a reduction in the benefit to the other party.[2]

The second framing emphasizes collaboration through a process of negotiation and collective decision-making by stakeholders. A collaborative process can change the payoff outcomes as perceived by the parties through two mechanisms. First, it may uncover new opportunities for action that are mutually beneficial and lead to improved payoffs for one or more parties.[3] Second, the interaction among the parties fosters an exchange of information and perhaps a degree of social learning, which may lead them to see things in a different light. The greater mutual understanding can shift each party's perception of its individual payoff. If these tendencies progress sufficiently, the result may be a situation in which some courses of action are seen as increasing the payoffs to all parties, thereby eliminating the zero-sum nature of the game.

There is evidence that both mechanisms were at work in CALFED, and this is clearly laudable. The question is whether they had advanced – or would have advanced had CALFED been allowed to continue – to the point where the zero-sum aspect of the game was eliminated. In our view, the answer is no. First, while some CALFED program activities like water conservation can be win-win for all parties, there is still only a finite amount of water in the system. Diverting water for use *off-stream* and preserving natural flows *in-stream,* or allocating diversions to agricultural versus urban users, are still inherently rivalrous uses of the same resource. Second, some of the remedial actions contemplated by CALFED entail substantial *joint costs*, which must be allocated among the parties. The joint cost allocation is a zero-sum game. Hence, there has been, and still remains, an ineluctable element of conflict in the Delta.

This element of conflict has crucial implications for the formulation of a water resource management strategy for the Delta. For the past 60 years, the strategy adopted by SWRCB and its predecessors has been to encourage the main parties – agricultural and urban water diverters, and fisheries and other instream-protection interests – to work out a solution among themselves, rather than imposing one externally. Because of the inherent opposition of interests, economic theory suggests that this strategy is not likely to succeed.

As noted, from one perspective the Delta involves the existence of a negative externality among the parties. One might therefore ask why this externality has not so far been resolved by Coasean bargaining among the parties. High

[1] The interpretation offered here is based partly on our study of the history of the events described below and partly on our own personal involvement in some of them, stemming from Hanemann's service as the SWRCB economic staff from 1986 to 1989 and as its economic consultant in 1992–1993 for the Mono Lake Decision, as well as his participation in the negotiation of the Memorandum of Understanding on Urban Water Conservation (1990–1991) and his service on the CALFED Finance Independent Review Panel (2003–2004).

[2] Technically, this is a constant-sum game, where the sum of the payoff functions across all the parties is a constant; thus, a higher payoff value to one party implies a lower payoff value to one or more other parties. The actual value of the constant is immaterial. A zero-sum game, where the payoff functions sum to zero, is functionally equivalent to any other constant-sum game. The term zero-sum is the more common usage.

[3] The improved payoffs can come about in various ways, including if an outside party offers to reward the parties if they reach an agreement. This was a factor in the resolution of the conflict over water diversions from Mono Lake by the Los Angeles Department of Water & Power (LADWP) in 1994. To facilitate a settlement, the state legislature offered up to $39 million to LADWP. There was something similar in the first phase of CALFED.

transaction costs are a possible economic explanation, but this is hardly plausible. Since the parties *were* in negotiation throughout the CALFED process, and for decades prior to it, it is unlikely that transaction costs per se were the obstacle to an agreement.

One might also ask why water marketing has not been a solution to the dispute about Delta inflows. After all, if water for environmental and instream flows or diverted for urban use, is sufficiently valuable compared to water diverted for agricultural use, why did not transactions occur in which water was purchased from agriculture and transferred to those other uses? Purely voluntary water market transactions in California have not so far been able to bring about a reallocation of water from agricultural to environmental or urban uses on the scale that is needed to resolve the Delta conflict—nor, for reasons elaborated at greater length elsewhere, do we believe that they will be able to do so in the future.[4] Rather, three structural factors limit the scope of water market activity, and these same factors also work to frustrate the emergence of a bargaining solution. First, the fact is that some agricultural users have a distinct preference to maintain the status quo and keep on farming; their water is simply not for sale. In the context of bargaining, they are therefore likely to prefer their default outcome[5] – the status quo in which they maintain their present level of water diversions – to any other possible bargaining outcome.

A second factor is the tenuous and vague state of appropriative water rights for many non-project users in California. The total ''face value'' of post-1914 appropriative water rights permits and licenses within the Delta is 3.4 times the observed maximum annual flow in the watershed.[6] Surface water rights holders are required to report their diversions to SWRCB every 3 years, but there is no sanction for failing to do so or for reporting incorrectly. Many rights holders do not report their diversions, and the SWRCB does not verify the data from those who do report their diversions.[7] Consequently, surface water diversions are essentially unmonitored in California, as are groundwater extractions. The inadequate supervision of actual water diversions means there is no effective baseline. This is an impediment to long-run water market transfers, and it also complicates bargaining solutions.

A third factor is disagreement over property rights. In Coase's theory, actors bargain within the framework set by their legal property right. However, an alternative possibility is that actors prefer to spend their energy fighting to change their property rights rather than accommodating to them. Much of the conflict in the Delta is really an argument over what the property rights should be: to what extent do the public trust doctrine or the ESA impose a limitation on water rights duly obtained in an earlier era?[8] Because of the mutual opposition of interests, there is disagreement about what the property rights should be. And because of disagreement over what the property rights should be, a bargaining solution is elusive.

A well-known theorem from game theory has application to the bargaining regarding the Delta. The theorem applies to multi-person, cooperative (bargaining) games. A solution concept for such a game is what is known as *the core*: the core is the set of outcomes with the property that no coalition of players, acting as an independent group, can achieve more for itself than what it would obtain from outcomes in the core. The core is thus the set of bargaining outcomes that cannot be improved on by any coalition acting alone. The theorem states that no core exists when the game is zero-sum. In such a game, any equilibrium leaves at least one group in the position that it can do better for itself by dropping out and going it alone. Hence, any bargaining equilibrium is not stable and cannot be sustained.[9]

Aivazian and Callen (1981) make the link with Coasean bargaining explicit and emphasize that the Coase theorem does not hold when there is no core. They point out that, while there are some other game-theoretic solution concepts besides the core, these do not offer a convincing prospect of a Coasean bargaining outcome: ''If the core does not exist, the participants may accept an alternative solution concept; then again they may simply stop negotiating. It is an empirical question as to what happens when the core is empty. We do not know.'' (p. 180).

To summarize, our thesis in this paper is that the issue of water diversions and Delta inflows has been unresolved in California for six decades because (1) it involves a fundamental opposition of interests, (2) this opposition of interests makes a voluntary solution unlikely because of the game-theoretic considerations described above, and (3) the SWRCB's strategy of relying on voluntary agreement to resolve the issue is fundamentally misconceived and is, at some level, an abdication of its responsibility.

3. The historical context

When does this story begin? Some accounts of CALFED begin with the crisis in 1993–1994 that led to the signing of the Bay-Delta Accord. Others start with 1982, when the proposed Peripheral Canal was rejected by the voters of California. In fact, the harmful impacts of upstream water diversions on water quality in the Delta have been an object of concern in California for over 100 years. The specific aspects of water quality which were of concern have changed over time,

[4] Bickett and Hanemann (forthcoming).

[5] The default outcome is the outcome that accrues if no agreement is reached.

[6] Governor's Delta Vision Blue Ribbon Task Force (2008, p. 8). This total does not account for pre-1914 appropriative rights or riparian rights.

[7] ''[I]t is clear that the State Water Board has permitted less than a third of the diversions occurring in the legal Delta. ... The State Water Board estimates that 68% of permit and license holders and 65% of diverters who should file a Statement fail to report.'' (State Water Resources Control Board, 2008, pp. 1–2).

[8] Furthermore, as Nawi and Brandt (2008, p. 141) caution, ''From a political and legal point of view, providing greater definition to water rights [as recommended by economists] would not be an easy task. ... Water rights, by their nature, are 'limited and uncertain' (*People v.Murrison* 2002, 359).''

[9] In addition to zero-sum games, Shapely and Shubik (1969) note that no core exists in some games with negative externalities. The instability in bargaining outcomes is illustrated in the CALFED context by Layzer's (2008) observation that ''stakeholders and agencies defected when shifts in the political context seemed to create better options for them'' (164–165).

reflecting the transition from a narrowly utilitarian view of the Delta to a broader environmental perspective.[10] The changes in the framing of the water quality issue over time provide a way to segment this brief historical overview into six distinct epochs.[11]

3.1. Freshwater inflows

Hydraulic mining began in the Sacramento Valley in 1853 and grew rapidly after about 1860. It involved large-scale diversions of water from the rivers in the foothills and generated a massive volume of debris that was released into the downstream river system. The debris caused flooding of riparian lands and sometimes left them covered with muck, making them unusable for farming. In the 1870s some Sacramento Valley farmers started suing mine owners for damages; the litigation culminated in two court rulings in 1884 that essentially ended hydraulic mining in California. Drainage and reclamation of Delta lands began almost simultaneously with the California gold rush. By 1870, 15,000 acres in the Delta had been reclaimed; by 1900, the total reached 235,000 acres.[12] Delta farmland, too, was affected by the mining debris that reduced the inflow of freshwater from upstream. The inflow is naturally low during the late summer—there is relatively little precipitation after March, and the streamflow in the spring and summer is fed by Sierra snowmelt, which dwindles by the late summer. The reduced freshwater inflow allows seawater to penetrate upstream, harming crop irrigation in the Delta and threatening urban water diversions there. The problem was exacerbated by diversions of freshwater in the Sacramento Valley for crop irrigation, which started in the 1860s and grew rapidly, replacing hydraulic mining as the major influence on Delta hydrology. By the first decade of the 20th century, salinity intrusion had become a major concern for Delta interests. In 1920, the city of Antioch filed the first salinity lawsuit charging that upstream diversions left an insufficient freshwater flow at Antioch to keep salinity at bay.[13] The suit was ultimately rejected because of evidence that, on occasion, there had been natural salinity incursions before these water diversions began.

The planning for a major Central Valley water project, which commenced around this time, only highlighted the problem. The solution that emerged in the 1920s was a proposal to construct a physical barrier that would seal off San Francisco Bay and keep saltwater out of the Delta. In the 1930s, as the planning for what now became the Central Valley Project (CVP) progressed, a different solution was identified: instead of a physical barrier, the plan was to create a virtual, or hydraulic, barrier by releasing a sufficient volume of freshwater into the Delta to hold the salt water back. This required a degree of juggling: while some freshwater was being diverted out of the southern part of the Delta for use in the San Joaquin Valley, there had to be a sufficient flow freshwater to repel salinity in the western edge of the Delta. This was the plan when the Bureau of Reclamation (BoR) started delivering CVP water in 1949.[14]

3.2. Flows for dilution of industrial pollution

During World War II, California's population mushroomed from 6.9 to 9.9 million between 1940 and 1949. The San Francisco Bay area, along with Southern California, was transformed into a major hub for the war effort. Military facilities and manufacturing establishments designed to support them sprung up all around the Bay and in portions of the Delta. In 1949, there was virtually no wastewater treatment in the San Francisco Bay area, and the wastes of over 1 million people plus numerous industrial facilities were discharged untreated into the Bay.[15] At the same time, the supply of freshwater into the Bay was being reduced by upstream diversions for irrigation in the Sacramento Valley, and would be further reduced by the CVP as it started delivering water from the Delta to the San Joaquin Valley.

This was the backdrop to the passage of the Dickey Water Pollution Act of 1949 (Dickey Act), commonly regarded as the first comprehensive water pollution control legislation in the United States. The Dickey Act created a State Water Pollution Control Board (SWPCB) and nine regional Water Pollution Control Boards located in each of the state's major watersheds. The boards were given broad power to control pollution and prevent the impairment of the quality of "the waters of the state," defined, significantly, to include ground waters as well as surface waters.

At first, these pollution control efforts were focused on people, not fish. Their purpose was to ensure the supply of water safe for drinking water and satisfactory for irrigation use, and to eliminate the health risks and public nuisance from raw sewage discharges. The question of the impact on fish had arisen during the course of planning for the CVP, but it had been brushed aside by both federal and state agencies. The situation is described by McEvoy (1986, p. 197)[16]:

> "[BoR] had consulted with US Fish & Wildlife Service and with [the California Department of Fish & Game (DFG)] over the [Friant Dam] project but had rejected their request for remedial measures, claiming that maintaining enough flow

[10] In economic terms, the transition was from use value to total value, including various forms of non-use value.

[11] A more extensive treatment of this history is contained in Dyckman and Hanemann (forthcoming).

[12] The total peaked at around 441,000 acres by about 1930.

[13] Jackson and Paterson (1977) and Steinberg and Schoenleber (1987).

[14] However, as deliveries grew, BoR became increasingly reluctant to release water for salinity repulsion in the Delta.

[15] Until 1950, the only treatment plants in San Francisco Bay were primary treatment plants at Palo Alto and Central Contra Costa Sanitary District (SFEI, 2007); the figure of untreated wastes from one million people around the Bay comes from (Legislative Report 1949). According to SFEI (2007), a 1941 report referred to a "Big Stench" on the east side of the Bay.

[16] The federal Fish and Wildlife Coordination Act of 1934 required BoR, the Army Corps of Engineers and other agencies involved in water development to consult with the US Bureau of Fisheries and to give "due and adequate consideration" to protecting fisheries. The California State Water Resources Act of 1945 required state agencies to consider all beneficial uses of watersheds and to cooperate with state and federal wildlife agencies in the planning of development (McEvoy, 1986). But, neither law had any bite in 1949.

in the river below the dam to sustain salmon in the river and waterfowl in the adjoining grasslands would have required more than 25 percent of the dam's capacity. Duck hunters, commercial fishers, and landowners below the dam began suing [BoR] to ensure continuing flows below Friant Dam in 1947 but lost their fight in the 1950 case of Rank v. Krug. The court recognized that the landowners had suffered an injury from the loss of water, but refused to enjoin the diversion in part because the power of Congress, and thus of [BoR], over navigable waterways was supreme. Salmon fishers and other private parties had no legal right to sue a government agency on behalf of wildlife, and the State of California refused to intervene in the case. Moreover, in 1951 the California Attorney General ruled that fishery interests had no legal claim to water designated for 'higher use' by the California Water Code.''[17]

However, the issue refused to go away. Two factors kept it alive. First, in the 1930s and 1940s when Friant Dam was planned and constructed, BoR had not acquired water rights related to the project. By the time the State Engineer initiated a process to issue water rights in 1955, DFG and angler associations were eager to re-open the legal question of water for salmon. Second, the issue of fisheries impacts was raised afresh in connection with the State Water Project (SWP). In 1951, the plan for the SWP was released and the legislature appropriated funds for the necessary engineering studies. In 1956, to clear the way for the project, there was a major re-organization of the state's water agencies. The office of State Engineer was abolished and its functions were divided into two separate agencies: the Department of Water Resources (DWR) was charged with the task of building and operating the SWP, while the State Water Rights Board (SWRB) assumed responsibility for administering the state's water rights permitting and licensing program.

In 1958, the SWRB made its first major Delta water rights decision, D-893, which granted applications by BoR and two local agencies for diversions from the American River system.[18] The permits were conditioned on compliance with the terms of recent DFG agreements regarding flow maintenance for fish conservation, and were subject to a future agreement between interested parties to control the salinity in the Delta.

Events came to a head in 1959. That year, the state legislature expanded the SWRB's power with the authority to reserve jurisdiction and amend/coordinate/condition permits (Water Code §1394). The Board then issued D-935 on the appropriation of water from Friant Dam. The Board rejected DFG's request of water for fish on the grounds that the obligation to provide for the protection of migratory fish applies ''when it [could] be accomplished without impairment of the primary objective of the Central Valley Project, which ... is irrigation.''[19] The Board inferred the CVP purpose from the fact that it is a reclamation project and ''subordinates contracts for [fish] requirements to irrigation'' through federal legislation. The Board also observed that the salmon fishery below Friant Dam ''is now virtually extinct.''[20] The Board concluded, therefore, that releasing water for the re-establishment and maintenance of the salmon fishery ''is not in the public interest.''[21] DFG's attempts to appeal were vetoed by Governor Pat Brown, who was campaigning vigorously for the Burns-Porter Act that would pave the way for the SWP.

The SWP was planned in tandem with an expansion of the CVP on the west side of the San Joaquin Valley, known as the San Luis Unit. The two projects were to share a new aqueduct conveying water south from the Delta, known variously as the San Luis Canal (CVP) and the California Aqueduct (SWP), a new pumping plant, and a new storage reservoir, the San Luis Reservoir. A key piece of legislation also passed in 1959, the Delta Protection Act guaranteed that Delta water would be kept fresh enough for agricultural and other uses, and required that CVP and SWP operations be coordinated to ensure this goal. In June 1960, Congress authorized funding for the San Luis Unit. In November of that year, after a hard fought election campaign, California voters narrowly approved the issuance of bonds to finance the SWP.[22] California's modern water system, with the Delta as its hub, was about to be put into place.

3.3. *The rise of the environmental movement*

A distinctive feature of the SWP planning was the attention to the potential for enhancing fishing and other wildlife-related recreation. A fish hatchery was built downstream of Oroville Dam to compensate for spawning grounds lost to returning salmon and steelhead, with a portion of the cost charged to water users. In 1961, the Davis-Dolwig Act declared recreation and fish and wildlife enhancement to be among the official purposes of the SWP.[23]

[17] Similarly, Warner (1991, p. 62) writes: ''In 1948 disaster struck. Friant Dam ... had been completed and [BoR] assumed control of the [San Joaquin] river. Ignoring pleas from Fish and Game and local sportsmen groups, bureau officials diverted water desperately needed by salmon down the Friant-Kern Canal ... the bureau argued that the enabling legislation for Friant Dam said nothing about protecting fish and wildlife. ... Attorney General Pat Brown and Governor Earl Warren, pushing for development of the CVP, supported the bureau. The state's position was that water for agriculture was next in priority to domestic use, and salmon had no legal claim to San Joaquin water.'' McEvoy notes that, prior to the CVP, the California Fish & Game Commission ''appealed time and again to the Water Rights Division of the state Public Works Department to guarantee minimal flows of water through central valley dams, but in vain'' (p. 177).

[18] For the purposes of this research, the authors examined the following major Delta water rights decisions: State Water Rights Board decisions D-893 (1958), D-935 (1959), D-990 (1961), D-1020 (1961), D-1250 (1966), D-1275 (1967), D-1291 (1967), and State Water Resources Control Board decisions D-1308 (1968), D-1356 (1970), D-1379 (1971), D-1422 (1973), D-1485 (1978), D-1594 (1983), D-1630 (1992), D-1631 (1994), D-1641 (1999), Water Rights Order 2000–02 (2000), and D-1641 (revised) (2000).

[19] SWRB D-935 (1959, p. 34).

[20] SWRB D-935 (1959, p. 35).

[21] SWRB D-935 (1959, p. 41).

[22] The victory margin was 0.3% of the votes cast. At the time, this was the largest bond issue in the history of any state.

[23] This was a two-edged sword. It empowered the California Resources Agency to coordinate fisheries protection between DWR and California Fish and Game (DFG). But it also allowed a portion of the cost of SWP operations associated with fish and wildlife to be allocated to the general taxpayer, as opposed to water users.

In the same year, the SWRB issued D-990. The context for this decision was BoR's attempt to firm up its water rights for the CVP. This was opposed by Delta interests and DWR primarily because of a concern that water diversions could raise salinity levels in the Delta, adversely affecting irrigation and urban/industrial users there. The Delta interests wanted larger releases of fresh water for salinity repulsion than BoR was willing to allow. The Board had initiated its hearings in 1959 but then stayed them pending negotiations among the three parties. When negotiations broke down, the Board resumed its decision process. Rather than making a substantive decision on salinity in D-990, the Board decided to reserve its jurisdiction for 3 years, during which the parties were admonished to resolve their differences.[24] If they could not reach a mutual agreement, the Board would then issue its own order on salinity control in the Delta. However, the Board dealt more substantively with the fishery issue. Here, BoR had been able to reach an agreement with DFG regarding minimum releases to protect fisheries. The Board accepted this agreement, and declared that the "use of water for the preservation and enhancement of fish and wildlife resources is a beneficial use of water."[25] D-990 set a pattern for much of the Board's future deliberations. On the one hand, its finding that enhancement of fish and wildlife resources constitutes a legally protected beneficial use of water in California created an important precedent; on the other hand, its preference for the parties to reach a mutual agreement and it reluctance to make its own decision signified a degree of passivity that persisted in subsequent Delta decisions.

The tenor of California water politics was changing with the rise of environmental activism in the Bay Area and elsewhere. This was recognized by Governor Brown in his second inaugural speech in January 1963, when he called for "new steps to broaden the guarantee of pure water in California." Later that year, as a signal of the shift in focus from a narrow interest in pollution to a wider interest in water quality, the Legislature granted broad water quality control authority to the State Water Pollution Control Board and changed its name to the State Water Quality Control Board (SWQCB).[26] This was the beginning of a cycle of environmental activism in the Legislature, from which there emerged a major institutional re-organization and environmental law reform.

Assemblyman Carley V. Porter was the driving force, paving the way with a report issued in July 1966 from a committee that he chaired. The report set out a powerful vision of what was needed for the Delta and the institutional reforms required to accomplish these goals. It argued for the combination of water rights and water quality regulation in a single decision-making entity, noting that "[i]t is becoming increasingly apparent that water quantity and water quality have a close relationship."[27] Further, "[w]hen the State Water Rights Board approves an application to appropriate water, it is not necessarily concerned with the downstream effect on water quality. . . . A prime example of this deficiency occurred in the application of [BoR] to appropriate waters in the Delta. . . . The problem of resolving the protection which the Delta water users should receive, based on their vested rights, is beyond the ability of the presently organized State Water Rights Board to solve."[28] The report also noted that:

> "Increasingly, the State Water Rights Board has also been requested and has given attention in its hearings and issuance of permits to the need to maintain a flow of water for recreation and fish and wildlife. If this water is to be used for these purposes, it will need to be protected from discharge of harmful wastes. At the present time there is no clear provision in state government to assure that waters which are reserved by the State Water Rights Board are in fact protected from undesirable waste discharges."[29]

The report concluded that "an effective, coordinated approach to water quantity and water quality matters can best be accomplished"[30] through the formation of a new State Water Resources Control Board, combining the powers and functions of the 3-member, full-time State Water Rights Board and the 14-member, part-time State Water Pollution Control Board.[31] Following this recommendation, a 5-member, full-time State Water Resources Control Board (SWRCB) was created in 1967.

Shortly after the SWRCB began operations, Assemblyman Porter asked it to reconsider the Dickey Act to reflect changing environmental values in California. The result was the 1969 Porter-Cologne Act, called "the toughest water quality act in the nation."[32] This set forth "a complete regulatory framework for the regulation of waste discharges to both surface and ground waters of the state."[33] Under the Dickey Act, waste disposal had been a beneficial use of water. The Porter-Cologne Act ended this, bringing a much greater emphasis on the environmental aspects of water quality. Waste discharge requirements became directly enforceable, and the Regional Water Quality Boards, under SWRCB guidance, were given authority to prohibit discharges entirely in a given area, whether water or land. Through the Act, the SWRCB and its

[24] There was a vigorous dissent to this part of D-990 by Board member Rowe who asserted that: "the Bureau has some unfulfilled obligations, one of which is a clear-cut commitment on salinity control as it was originally conceived and understood by all parties" (p. 3). He also observed that "The Bureau and water users in the Sacramento valley have been negotiating for over 15 years without a contract. The fixing of responsibility for salinity control [by SWRB] should speed up the time for solving this problem" (p. 8).

[25] SWRB D-990 (1961, p. 42).

[26] A similar broadening in the power of the regional boards occurred in 1965.

[27] Assembly Interim Committee on Water (1966a, p. 24).

[28] Assembly Interim Committee on Water (1966a, p. 25, p. 28).

[29] Assembly Interim Committee on Water (1966a, p. 29).

[30] Assembly Interim Committee on Water (1966a, p. 24).

[31] As a subsequent report noted: "Essentially, both water quality and water pollution control are based on a common determination of the beneficial uses to be protected. The determination of beneficial uses also establishes a common basis with water rights and water quality functions of the State Water Rights Board" Assembly Interim Committee on Water (1966b, p. 56).

[32] Robie (2008, p. 3). The 1965 federal Water Quality Act had required states to "review, establish and revise water quality standards." However, there was no major federal action to regulate water quality until the 1972 Clean water Act.

[33] Attwater and Markle (1988, p. 994).

nine Regional Boards were empowered as the state's primary water quality agencies and were free to adopt policies regarding water recycling, pollution control, and water management more generally.

The SWRB's last two Delta decisions dealt with DWR's application for water rights for the SWP. D-1275 and D-1291 granted most of DWR's applications but, in a manner similar to D-990, the Board continued to reserve jurisdiction for salinity control and the coordination of SWP and CVP operations pending the development of more detailed information. With fish and wildlife, DFG and DWR had recently reached an agreement on fishery flows to be maintained in the Feather River and these were written into D-1291, but the Board reserved jurisdiction with respect to fish and wildlife flows in the Delta. In a new twist – a likely product of the imminent institutional restructuring – the Board imposed the first "interim water quality requirements" pending a final determination; the interim requirements limited water withdrawals if certain specific salinity limits were exceeded.[34]

3.4. *The SWRCB takes charge*

In July 1969, 20 years after CVP deliveries began, the newly formed SWRCB (aka the Board) commenced hearings on permits issued to BoR and DWR, focusing on what further terms and conditions should be imposed in the exercise of its reserved jurisdiction. In the Board's view, despite efforts to re-open them, certain issues had now been settled including the availability of unappropriated water to supply the projects, that the uses of water proposed by the projects are beneficial, and that these uses are in the public interest when subjected to the limitations and conditions expressed in the Board's previous decisions.[35] However, at the time the Bureau's applications were approved, "information was insufficient" for the Board to establish permanent conditions for the protection of fish and wildlife, for salinity control in the Delta, and for the coordination of CVP and SWP operations. Those three items were still subject to reconsideration and revision by SWRCB. Today, 40 years later, the Board still has not resolved them.

In Decision D-1379, issued in July 1971, observing that "the Delta has become a *man-made* ecosystem which must be protected and managed intelligently to achieve a level of environmental quality that will meet all present and future needs,"[36] SWRCB strengthened and broadened the previous water quality constraints imposed on CVP and SWP diversions.[37] Based on information from recent engineering studies, new quality standards were introduced for the protection of industrial and municipal water uses in Contra Costa county, the protection of agriculture and fish and wildlife in the eastern Delta, and the protection of striped bass spawning habitat. These requirements not only obliged the CVP and SWP "to refrain from interference with the natural flows required for property salinity control and for fish and wildlife in the Delta" but also mandated that they utilize for fish and wildlife protection some of the water which they had stored for the benefit of water contractors.[38] The Board stated that it will require "qualitative and quantitative monitoring of fish, benthos, phytoplankton and zooplankton" and it called on DWR and BoR to study a variety of additional water quality criteria including temperature, velocity, algal growth, and dissolved oxygen, for possible future implementation.[39] It also stipulated that it would re-open hearings on these issues no later than 7 years hence, depending on the availability of additional information.

However, before the decision could be implemented, it was stayed by a law suit from irrigation users challenging the SWRCB's authority to impose conditions on permits held by BoR as a federal agency. At about this time, the regional water quality control boards proceeded to develop water quality plans for their various basins. In 1975, SWRCB approved the basin plans for the Sacramento-San Joaquin Delta Basin and San Francisco Bay Basin. Soon thereafter, SWRCB began a hearing regarding the terms and conditions for water permits held by DWR and BoR. In July 1978, the US Supreme Court issued its decision in California v. United States that a state may impose any condition on the appropriation, use or distribution of water in a federal reclamation project if it is not contrary to a clear congressional directive, thereby affirming SWRCB's authority over BoR. In August 1978, pursuant to its combined authority, SWRCB simultaneously issued D-1485 and adopted a Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh ("the Delta Plan"), setting water quality standards for beneficial use protection.

In D-1485, the Board continued to reserve its jurisdiction regarding salinity control, fish and wildlife protection, and the coordination of the CVP and SWP permits, based on the principle that "water quality in the Delta should be at least as good as those levels which would have been available had the state and federal projects not been constructed."[40] The Board revised and extended the operating conditions and water quality standards prescribed in D-1379. Its fish and wildlife

[34] The limits imposed by the Board in D-1275 were those that had been accepted by DWR, BoR and other major Delta water users in a voluntary agreement in 1965, known as the "Tracy standards" (Brandt, 1987, p. 722).

[35] SWRCB D-1379 (1971, p. 6).

[36] SWRCB D-1379 (1971, p. 5).

[37] In so doing, the Board modified previous Delta decisions, saying that "coordination requires that terms for protection of fish and wildlife be included in all of these permits" because inclusion of this protection in only some "would create confusion and would be unworkable" (D-1379, 1971, p. 20).

[38] Littleworth and Garner (2007, p. 207) who note that this "placed all the burden for the protection of these uses on [SWP and CVP], even though other water rights holders contributed to the depletion of Delta supplies," a point subsequently taken up by Justice Racanelli.

[39] SWRCB D-1379 (1971, p. 49). The Board justified these actions through an expanded set of legislative authorities, compared to its reliance on the Reclamation Act in D-935. It cited to §§11900, 12581, 12201-04, and CEQA, saying that "the effect of these sections, particularly the underlined portions, is to give first priority to satisfying all needs for water in the Delta" (p. 13), tempered by constitutional policy. WC §1257 states that the Board must "consider the relative benefit to be derived from all beneficial uses of the water concerned (not limited to beneficial uses proposed by the applicant)" (D-1379, 1971, p. 11).

[40] SWRCB D-1485 (1978, p. 10).

standards were those recommended by DFG and were taken from a draft agreement that had been negotiated by BoR, DWR, DFG and US Fish & Wildlife Service, but not yet executed. Because of "the uncertainty associated with possible future project facilities and the need for additional information on the complex effects of project operations and varying water quality conditions," the standards set in D-1485 were "based on circumstances expected to prevail over the next 10 years."[41] The Board emphasized: "The effect of the Delta Plan and this decision is that water quality standards in the Delta must be satisfied prior to any export from the Delta to other areas for any purpose. These standards must be maintained as first priority operating criteria for any and all projects or parts thereof ... under the permits considered in this decision."[42] Also, the Board established its first monitoring plan for water quality compliance and mandated associated data-gathering studies. Finally, the Board said it would re-open hearings on these issues within 8 years.

D-1485 was greeted with a barrage of lawsuits from BoR and other water users. The cases were consolidated and were finally disposed of in a 1986 ruling by the California Court of Appeal.[43] In this ruling, Justice Racanelli (and two concurring justices) upheld SWRCB's authority to modify CVP and SWP permits and to set water quality standards through its reservation of its jurisdiction in D-990 and subsequent decisions, as well as through the public trust doctrine and the constitutional prohibition against waste and unreasonable use. However, he found that the Board should have been *more* far-reaching in its actions. The Board was performing a dual function. In its water rights role, it performed an adjudicatory function; in its water quality role, it performed a planning function. It had broader powers in the latter role than the former, yet it had unduly allowed the former to constrain the latter in two particular ways. First, in setting conditions for water diversions by CVP and SWP the Board had framed its approach in terms of protecting the pre-existing water *rights* in the Delta against impairment. Justice Racanelli ruled that, in its water quality role, the Board was obligated to protect *beneficial uses*, not water rights. As Brandt (1987) explains:

> "By seeking to protect water rights, the Board had introduced the priorities scheme of water rights law into water quality planning. The result of this approach was that the holder of superior water rights would receive water quality protection without having to bear any of the costs of maintaining water quality. The court found that this approach did not protect all [beneficial] water uses, but instead protected water uses based on the priority of the user's right. Following this approach, the Plan imposed all the costs of water quality protection on the [CVP and SWP] projects since they had the most junior water rights.
>
> The court suggested that the Board's focus on water rights was a result of the Board's concern that protecting *all* beneficial uses would require the projects to maintain a constant flow of fresh water, even during droughts when they lacked sufficient stored water.[44] The court reassured the Board that its water quality plan need provide only "reasonable protection of beneficial uses." Once all beneficial uses are considered, the Board enjoys broad discretion in deciding how much water quality protection is required."[45]

Second, Justice Racanelli ruled that the Board was obligated to consider the water quality that could be achieved by regulating *all* users in the watershed, not just the projects. The Board had erred in acting "to protect the quality of Delta waters only from degradation by the projects; the Board made no effort to protect against water quality degradation by other users—namely, upstream diverters or polluters."[46] The court directed the Board adopt a "global perspective" and consider "*all* competing demands for water in determining what is a reasonable level of water quality protection."[47]

In summary, the procedure adopted by the Board of combining its water quality and water rights in a single proceeding "was unwise." But, since the Board had already declared its intention to revisit its water quality standards in 1986, the court upheld both the 1978 plan and the decision, and admonished the Board to proceed differently in the new hearings.

Two other environmentally significant events should be noted briefly: the rejection of the Peripheral Canal in 1982 and the 1983 California Supreme Court ruling in the National Audubon case. The vote against the Peripheral Canal is widely seen as an iconic victory for the state's environmentalists and a defeat of the state's water establishment. In reality, it was also a victory for some water interests over others, and a defeat for some degree of environmental protection in the Delta. The SWP issued contracts in 1960 to deliver 4.2 million acre-feet (MAF), but this exceeded water users' initial demand, and the actual facilities had a delivery capacity estimated at around 2.4 MAF. In 1965, DWR released a plan to construct a canal circumventing the Delta on the east, increasing SWP delivery capacity and reducing the stress on Delta fisheries caused by the operation of the pumps at Clifton Court Forebay. The proposal was immediately embroiled in controversy; it came to be seen as an attempt by Southern California interests to take water from still undeveloped rivers on the North Coast. After many twists and turns, in 1980 the Legislature passed both SB 200 authorizing construction of the Peripheral Canal and, separately, a measure placing a constitutional amendment (Proposition 8) on the ballot. Among other protections, SB 200 specified that fish and wildlife populations in the Delta would be restored to the levels that existed, on average, between 1922 and 1967 (i.e. prior to SWP operation). Proposition 8, which would come into force only if SB 200 took effect, protected the North Coast rivers by prohibiting dam construction unless approved by a majority of the electorate or a two-thirds vote of the Legislature, and also

[41] SWRCB D-1485 (1978, p. 8).

[42] SWRCB D-1485 (1978, p. 18).

[43] United States v. State Water Resources Control Board (1986) (hereinafter "Racanelli").

[44] This outcome, which successive Boards were unwilling to bring about, is now occurring under Judge Wanger's 2007 Delta ruling in Natural Resources Defense Council v. Kempthorne (2007).

[45] Brandt (1987, p. 746).

[46] 182 Cal. App. 3d 82 (1986), p. 179.

[47] Brandt (1987, p. 179).

prohibited the Legislature from reducing Delta water quality standards or the fish and wildlife protections in SB 200 without the same approval margin. Proposition 8 passed in November 1980 but never took effect.

By the time voters approved Proposition 8, a petition circulated by opponents of SB 200 to put it to a popular vote had qualified—the first measure to qualify for the ballot by signature petition in California since 1952. Without voter approval, SB 200 would not take effect. The vote on Proposition 9, which asked voters to approve SB 200, was held in June 1982 following a fierce public debate. The opposition to Proposition 9 was an odd alliance. The funding came from farming interests in the Delta and, especially, from the Boswell Company, a SWP water user reputed to be the world's largest farming company, with 150,000 acres in the San Joaquin Valley. Their motives included opposition to the environmental restrictions imposed by Proposition 8, a concern that reduced freshwater inflows to the Delta would harm farming there, and a fear that SB 200 would enable Southern California to grab Northern California's water. The public voice of the opposition was primarily environmental groups who considered the environmental restrictions in Proposition 8 to be too *weak*, and who feared Southern California's grab for Northern California's water, as well as opposing the water demands of big agriculture in the San Joaquin Valley. The measure was rejected by a statewide margin of more than three to two—with a 90% no vote from voters living north of Santa Barbara.

The following year, Southern California water appropriation efforts in the Sierra Nevada were also thwarted, generating another environmental precedent for consideration in the SWRCB's rights determinations. The events started in 1940, when the city of Los Angeles, through the LADWP, was granted permits to appropriate the entire flow of four creeks tributary to Mono Lake on the east side of the Sierra. LADWP had little need for the water at the time and had limited conveyance capacity, and hence appropriated only a portion of the permitted amount. In 1963, under pressure from the Board to use its permit or abandon it, LADWP authorized the construction of a second aqueduct to convey water. The aqueduct was completed in 1970 and diversions duly increased. In 1974, the Board issued licenses confirming LADWP's right to appropriate the Mono Lake tributaries. The lake level, which had declined since the mid-1940s, declined more rapidly in the late 1970s, exposing a land bridge to Negit Island that gave coyotes access to formerly isolated breeding grounds for migrating birds.[48] Using a novel legal argument, environmental groups sued LADWP in 1979 claiming that its diversions violated the doctrine of the "public trust." In a landmark decision, the state Supreme Court upheld this claim in 1983.[49] The court ruled that the water law of California integrates both the public trust doctrine and the appropriative rights system, and the former obligates the state to protect public trust resources, including environments such as Mono Lake, "wherever feasible." The court found that LADWP's water rights were granted without any consideration for the impact on Mono Lake, an ecological and scenic resource of national significance. It directed SWRCB to undertake a reconsideration of LADWP's water right in the light of public trust considerations.[50] This ruling was cited in the Racanelli decision in support of the court's finding there that SWRCB is authorized to re-open permits to impose "conditions which give a higher priority to a more preferred beneficial use even though later in time."[51]

3.5. *The SWRCB falters*

The Board initiated a new round of hearings in July 1987. The hearings were to consist of three phases. Phase I would culminate with the preparation of drafts by SWRCB staff of (i) a water quality control plan for salinity control in the San Francisco Bay-Delta estuary and (ii) a pollutant policy for the estuary. In phase II, the Board would hear comments on these draft plans and adopt final versions of them. Phase III would be a water rights hearing to issue a water rights decision for implementing the plans adopted in Phase II. The Phase I hearings cast a wide net, covering hydrologic conditions, fish and wildlife conditions, and water uses upstream of the Delta, in the Delta itself, and downstream, including in the export areas, with more than 50 days of hearings attended by a multitude of parties. The hearings ended in late December 1987. In November 1988, drafts of the two reports were released. The reports were different in tone and substance from previous Delta reports. Previous decisions relied on conditions that had already been agreed to by the parties involved. This time, the Board staff pursued a more independent approach, following directions from the SWRCB Chair, W. Don Maughan. Maughan had been SWRCB Vice-Chair when D-1485 was issued, but he left the Board in 1979 and served as Chief Deputy Director of the Arizona Department of Water Resources (ADWR). He was in Arizona in 1980 when its Groundwater Management Act was passed, committing the state to eliminating groundwater overdraft. The approach adopted by ADWR was to impose strict limits on water use in overdraft areas, including requiring stringent water conservation measures from new urban development in Phoenix and Tucson. After retiring from ADWR, Maughan was appointed Chair of SWRCB in 1986, and the Arizona experience influenced his approach to the Delta. The draft salinity control plan proposed to cap water diversions from the Delta at their level in 1985, and it imposed minimum springtime releases for both salinity control and to help declining estuarine fish populations.[52] The plan recognized that there would be

[48] Mono Lake lies on the Pacific Flyway for birds migrating between Canada and Central America; the island is the second nation's largest breeding country for California gulls. It was acknowledged when the permit was granted in 1940 that this would be harmful to fish and wildlife, but the State Engineer believed at the time that nothing could be done about this (Hundley, 2001, p. 340).

[49] Nat'l Audubon Soc'y v. Superior Court (1983).

[50] The Board subsequently did this through hearings in 1993, leading to D-1631 (1994) which reduced the allowed diversions by LADWP.

[51] 182 Cal. App. 3d 82 (1986), p. 189.

[52] Although the fish and wildlife standards in D-1485 were what DFG had requested to protect striped bass, the striped bass population had nevertheless plummeted. It is believed that this was caused, at least in part, by the introduction of an invasive clam that became established in the Bay during the 1976–1977 drought and was attacking the pelagic food web.

significant supply impacts but considered these justified because of the decline in aquatic species. It called for a "California Water Ethic" and concluded that, with more vigorous conservation by agricultural and urban water users throughout the state, the cap on diversions and the flow requirements could be reasonably sustained.

Environmental interests complained there was not enough protection in the staff plans for fish and wildlife, while water users generated a firestorm of opposition to the plans' restrictions. There was outrage at the cap on exports from the Delta and the flow requirements. There was outrage that the Board had not deferred to the ongoing (but inconclusive) negotiations between water users and fishery agencies. There was outrage that the staff had conducted an independent analysis reaching conclusions that contradicted testimony presented by water users. There was outrage that the Board was more concerned with protecting fish than with assuring a reliable water supply for 20 million southern Californians.

In the face of this opposition, the Board withdrew the draft reports. One factor was political pressure from the Governor. Also, two legal issues were raised by the critics. First, it was said that the cap on exports was really a water right issue belonging in Phase III, and its inclusion in Phase I violated Justice Racanelli's admonition to the Board not to combine its water quality and water rights functions in a single proceeding. This may have been influential with Chair Maughan. Second, it was said that a flow requirement per se was not a water quality parameter.

In our view Justice Racanelli erred if he required a *sequential* application of the Board's water quality and water rights function. If there is to be balancing in the establishment of water quality standards, the impact on the quantity of water available for diversion has to be considered at the same time because the two are closely related, as the Porter Committee had noted back in 1966. The fundamental tradeoff is between fish and people; trying to deal with the two separately is unwise.[53] With regard to flow requirements, since this can affect the wellbeing of a fish population, it is hardly out of place in a water quality plan. Moreover, while there seems to be some consensus that it is outside the province of the EPA to set a flow requirement since that would give a federal agency the power to allocate water, generally considered a state prerogative,[54] there seems to be a strong argument that it is well within the Board's authority.[55,56]

In January 1989, the Board announced a delay in the hearing process to provide time for further hydrological investigations by DWR, and it removed the export limit and increased spring flows from consideration in the Phase II hearings. The SWRCB staff was directed to take a low profile and let the parties work things out among themselves. With the Board out of the picture, negotiations did begin between urban, agricultural and environmental interests. In May 1991, the Board adopted its water quality control plan for salinity in the estuary. This set more stringent water quality standards compared to D-1485, but contained no requirement for flow levels. In September 1991, having previously deferred to the Board's decision-making process, the EPA now put its foot down. It rejected the water quality plan as inadequate to stem the decline in fish populations, and directed the Board to develop a plan that would accomplish this; the Board did not respond. Meanwhile, negotiations among the parties had produced an agreement between urban water agencies and environmental groups regarding urban water conservation signed in December 1991.[57] The Board moved on to Phase III and, in December 1992, it released a draft water rights decision D-1630. The decision limited pumping in the late winter, spring and summer and required certain pulse releases of water to help the migration of young salmon and striped bass; it also imposed varying reductions on Delta exports ranging from 800,000 AF in average years to 1.9 MAF in dry years. The decision was supported by urban and environmental interests,[58] but was opposed by agricultural interests. On April Fool's Day, 1993, Governor Wilson ordered that D-1630 be withdrawn. This action, widely believed to be politically motivated,[59] set the state and federal governments on a collision course. Following a suit by an environmental group for failing to promulgate water quality standards for fishery needs, the EPA was under a court order to issue standards by December 15, 1994. In addition, both the Delta smelt and the winter run of the Chinook salmon had been listed as threatened species, and further ESA actions were forthcoming, including the imposition of restrictions on CVP and SWP exports.

With some heroic efforts the collision was averted. Starting in 1993 under Interior Secretary Babbitt, the key federal agencies – BoR, EPA and the two ESA Agencies, US Fish & Wildlife and National Marine Fisheries Service – were induced to collaborate and coordinate their regulatory activities, culminating in December in the publication of an integrated federal proposal to protect the Delta.[60] This was followed in June 1994 by an agreement between the federal and state administrations to coordinate the development of Delta water quality standards. Meanwhile the three-way negotiations between agricultural and urban water users and

[53] It is also unrealistic. The potential impact on the quantity of water available for diversion was on everyone's mind throughout the Phase I hearings.

[54] Littleworth and Garner (2007, p. 212) and Rieke (1996, p. 355).

[55] Dunning (1989, p. 202).

[56] In a 2006 California Court of Appeal decision, Justice Robie stated that "[n]othing in [Racanelli] *prohibits* the Board from conducting a regulatory proceeding to amend a water quality control plan in the midst of an adjudicative proceeding to assign responsibility for meeting the water quality objectives in that plan," provided that the duties of each function are not compromised (State Water Resources Control Board Cases, 2006).

[57] This committed the signatory urban water agencies to engage in certain conservation practices, but with no commitment as to a resulting level of per capita demand. It was a voluntary version of the Board's California water ethic applied to urban water use, based on self-regulation. With agricultural use, there was no consensus. It was not until December 1996 that an agreement on conservation was signed by agricultural and environmental interests, but that agreement was even weaker than the urban one.

[58] Boronkay and Abbott (1997, p. 146).

[59] Wilson was contemplating running for the Republican presidential nomination and needed support from Central Valley agriculture (Rieke, 1996, p. 346).

[60] The alliance of federal agencies became known as "ClubFed."

environmental NGOs had intensified. However, the negotiations were deadlocked 3 days before the deadline. With a final compromise by the environmental groups, an agreement was reached in the nick of time. On December 15, 1994, ''in a triumphant press conference, Governor Wilson, flanked by secretary of the Interior Bruce Babbitt and EPA administrator Carol Browner, declared 'peace has broken out' ... and announced joint state-federal Principles for Agreement to protect the Bay-Delta's natural resources and to provide reliable water supplies to farms and cities dependent on Delta diversions.''[61] The Agreement involved a federal commitment to limit regulatory reallocation of water for ESA purposes during the 3-year period of the Agreement, and a commitment by agricultural and urban water users and DWR to fund and implement *non-flow* fish protective measures, with any additional water needed for fish to be obtained through water market purchases, not expropriation.

3.6. CALFED

The 1994 agreement created a planning entity, the CalFED Bay-Delta Program, charged with conducting a comprehensive planning process for the Delta, to be overseen by state and federal agencies and key stakeholders.[62] However, as soon as the Agreement was signed, ''many [of the parties] had second thoughts.''[63] In any event, it took five rather than 3 years to complete the development of a comprehensive management plan for the Delta. The plan was embodied in a Record of Decision (ROD) endorsed by all 23 state and federal agencies in August 2000. The ROD incorporated a wide range of activities aimed at four objectives, deemed co-equal in importance: ecosystem restoration; water supply reliability; drinking water quality; and levee system integrity. Supply reliability itself involved four distinct components: storage infrastructure, conveyance infrastructure, the environmental water account (EWA) for water transfers, and water use efficiency. Drinking water covered both treatment technology and source control (improved freshwater inflows, which would also benefit agricultural users). The broad focus reflected compromises among competing interests: water users wanted additional reservoir storage and a new conveyance facility (a replacement for the Peripheral Canal); environmental groups wanted urban and agricultural water use efficiency (WUE); cities wanted better drinking water from the Delta; and environmentalists wanted healthier fish populations. Water users also worried about the fragility of Delta levees, weakened by decades of subsidence and subject to seismic risks. The ROD identified various options under each rubric for further evaluation. In addition, the ROD called for the establishment of a Science Program under the direction of an Independent Science Board (ISB).

Several of these items, including the EWA, WUE and ISB, were notable innovations, and led to some significant improvement in the management of the Delta. However, the situation at CALFED began a slow decline. Until 2001, CALFED enjoyed strong support from the political leadership in Washington and Sacramento, including the Governor's office, the leadership of the state Senate and Assembly, and Senator Diane Feinstein in Washington.[64] Those leaders worked in tandem to enforce collaboration among the stakeholders, using both rewards and threats of punishment. Support was lost first when the President Bush was elected. Then there was turnover in the state Assembly and Senate, and the new leadership was less supportive of CALFED. It thus became safe for stakeholders to attempt to defect. The situation was exacerbated when a new governing body, the California Bay-Delta Authority (CBDA), was created in September 2002. This was intended to strengthen CALFED and formalize its position relative to other state agencies. However, while CBDA was given the power to review the Delta-related work of other state agencies, it had no authority to regulate or co-ordinate them. Rather than helping, this ultimately poisoned CBDA's relationship with DWR and other agencies that had previously co-operated with it. Also, the generous external funding secured earlier from Congress and the state taxpayers was depleting.[65]

Within months of the ROD, some water users challenged it through lawsuit.[66] In addition, the Westlands Water District, the largest CVP contractor, filed a series of suits in 2002 attacking the CALFED agreement. Layzer (2008) continues the story:

> ''Dissension among stakeholders was severe enough to threaten the program's funding: Congress balked at reauthorizing it, citing disputes within California over the program's direction. At water users' urging, in 2001 Senator Dianne Feinstein introduced a bill that would provide money to enlarge two reservoirs and create two new ones, and in the House, Rep. Ken Calvert (R. Riverside) introduced an even more aggressive bill that would have bypassed CALFED altogether by preapproving a handful of water projects. Over the next 2 years, as Feinstein struggled to work out a package that the state's own congressional delegation could agree on, CALFED's federal authorization languished.''[67]

As for CBDA:

> ''[it] had no means of enforcing its will, and agencies continued to pursue their own interests when cooperation

[61] Rieke (1996, p. 348). Rieke describes the peace negotiations from the federal perspective, and was the architect of the unified federal approach.

[62] Freeman and Farber (2005, p. 843).

[63] Rieke (1996, p. 366).

[64] Wright (2001).

[65] ''In the first 5 years after the 2000 ROD, CALFED enjoyed substantial state bond funds, leading to an imbalance between federal and state appropriations. As those state bond funds dwindled, there was increasing pressure to shift at least some of the financial burden to local [water] agencies that benefited from CALFED projects, applying the ''beneficiary pays'' principle. Defining those benefits and the necessary payments, however, proved problematic for stakeholders, agencies and legislators'' (Nawi and Brandt, 2008, p. 133).

[66] These suits were eventually dismissed by the California Supreme Court. See In re Bay-Delta Programmatic Environmental Impact Report (2008).

[67] Layzer (2008, p. 165).

with CALFED would have impeded their ability to fulfill their traditional missions. Under the Bush administration, for example, [BoR] began operating CVP without consulting other agencies, unilaterally sending more water to farms and less to the environment. ... Even as evidence of the Delta's collapse accrued, state and federal water managers continued to seek ways to increase exports. In July 2003 [BoR] and [DWR] met secretly with the MWD, Westlands Water District and the Kern County Water Agency to forge the so-called Napa Agreement – a deal to raise the amount of water sent south from the Delta by the SWP pumps by 27 per cent ... Beyond additional pumping, the agencies proposed an Operations Criteria and Plan (OCAP) that would weaken temperature standards for salmon on the Sacramento River. ... Disregarding its own biologists' judgment, in late 2004 NOAA Fisheries issued a biological opinion on salmon and steelhead that allowed OCAP to take effect ...''[68]

Throughout the CALFED process, the Board maintained a low profile. In 1995, it issued a revised Water Quality Control Plan for the Bay/Delta that hewed to the conditions specified in the 1994 CALFED agreement. In 1999, it issued D-1641 (revised in 2000), which focused primarily on CVP and SWP diversions, permitting some requested changes in use and removing some salinity limits imposed in D-1485. The decision generally avoided mandating salinity control actions, deferring instead to future agreement among the parties.[69] And like D-1485, it generated significant litigation.

Meanwhile, the smelt, striped bass and Chinook salmon populations continued to decline. The causes are unclear and in dispute. ''The South Delta export facilities entrain so many fish that it is often assumed that export pumping has massive effects on fish populations within the Delta. ... However, no quantitative estimates have been made of the losses of fish caused by export pumping. It is difficult to know the impact of these losses in the context of so much larger variability in survival and reproduction of these species. Export pumping also alters flows in delta channels, which may have indirect effects on fish, and removes phytoplankton and zooplankton from the Delta. These losses can be substantial, but their effects on the ecosystem are unknown.''[70]

When Governor Schwarzenegger took office in 2004, his advisers shared the water users' disenchantment with CALFED, and he soon moved to reign it in. External reviews of CALFED's performance were commissioned in 2005, which turned out to be mostly negative. A review by the Little Hoover Commission found CALFED to be ''costly, underperforming, unfocused and unaccountable''[71] and noted that ''CALFED enjoyed a lot of support when it provided money that stakeholders believed otherwise would not have been available, but once the program faced difficult policy choices and its funding dwindled, stakeholders began to doubt its value. 'Process and structure,' the commissioners commented dryly, 'cannot substitute for leadership and authority.'''[72] In 2006, following these reviews, the state legislature moved all Delta funding from the California Bay-Delta Authority to the Office of the Secretary of Resources.[73]

The aggressive actions by water users in 2004 triggered a counter-reaction from environmental groups, who filed a legal challenge against the biological opinions that formed the basis for OCAP. In May 2007, federal district Judge Wanger invalidated the opinions and prescribed highly restrictive conditions for the operation of CVP and SWP pumps, which remain in effect today.[74] In March 2009, CVP and SWP contractors filed three new lawsuits challenging the restrictions on the operation of project pumps. Thus, the saga continues.

3.7. *Summary*

In the 1940s when the CVP was being constructed and in the 1950s when it first came into operation, fish protection had no effective legal standing, as demonstrated by D-935 in 1959. By 1961, the situation had changed; in D-990, the Board held that enhancement of fish and wildlife resources constitutes a legally protected beneficial use of water in California. However, starting with D-990, the Board has shown considerable passivity in protecting that beneficial use, repeatedly postponing action in the hope that the parties could reach an agreement among themselves.[75] Only in 1988 did it pursue an independent approach and issued a draft decision – which it then withdrew under pressure. In 1988, and perhaps in 1992 with draft D-1630, the Board followed Racanelli's admonition to conduct a broad-based balancing of competing uses of water in the larger system. But legal and political opposition each time it sought to protect the Delta ecosystem took their toll. Since the withdrawal of D-1630 in 1993, the

[68] Layzer (2008, p. 165–166).

[69] The Board stated that it ''encourages parties with diverse interests to reach agreements as to their responsibilities to meet the Bay-Delta objectives, and to submit the agreements to the SWRCB for consideration. The SWRCB has the responsibility to decide, however, what parts of an agreement will be incorporated into a water right decision or order'' (Water Right Order 2000–2002, 2000, p. 29).

[70] Healey et al. (2008, p. 87–88). Other possible factors include invasive species, including the introduction of the voracious Asian and overbite clams, and toxic effects of contaminants in the watershed and in Delta sediments that can accumulate in food webs.

[71] Little Hoover Commission, letter to Governor Schwarzenegger, November 17, 2005.

[72] Layzer (2008, p. 167).

[73] California's Secretary of Resources has authority over DWR and DFG but not over SWRCB, which falls under the Secretary of the Environment.

[74] Natural Res. Def. Council v. Kempthorne (2007); Natural Res. Def. Council v. Kempthorne (2008).

[75] Others have interpreted the same facts slightly differently. Nawi and MacMillan (2008) argue that the only effective SWRCB Delta action is the product of external, voluntary agreements. While we concede that the SWRCB has made definitive allocation decisions based on outside agreements (see e.g. D-990 for fish and wildlife protection or D-1275 for the ''Tracy standards''), the majority of their Delta decisions indefinitely reserve jurisdiction in deference to ultimately unsuccessful outside agreements, resulting in inaction (Dyckman and Hanemann, forthcoming).

Board has retreated to a narrow consideration of diversions, leaving the larger issues in the Delta to be addressed by someone else.

4. Assessment

4.1. *CALFED: vision without authority*

Before the CALFED process, Freeman and Farber (2005, p. 940) write, ''there was no governmental mechanism for coordinating activities across [the various state and federal] agencies, or for including stakeholders in Delta-related decision-making in an ongoing way.'' This does not adequately distinguish federal from state agencies. It is true that, before 1993, the federal agencies did not speak with one voice. But, following the formation of ClubFed, they *did* speak with one voice for the remainder of the Clinton administration.[76] On the state side, it is certainly correct that DWR and DFG have not – ever – spoken with one voice. But, unlike on the federal side, this is not primarily bureaucratic in-fighting. The fact is that, with regard to water diversions, DWR has been the servant of the SWP contractors, not their master. Hence, the agency differences on the state side are a reflection of the underlying disagreement among the stakeholders.

As Section 3 shows, this disagreement has lasted for a century, although some details have changed. In 1920, it was a conflict between upstream agricultural diverters versus agricultural and urban water users in the Delta. Today, the additional parties include environmental interests and both agricultural and urban users of exported water south of the Delta. While some items that were disputed in 1949, 1969, or 1989 were subsequently resolved through the CALFED process, there remain core areas of disagreement. In the face of this disagreement among in-state stakeholders, CALFED was ultimately unable to move forward.

CALFED was condemned for its failures to reverse the decline of the Delta ecosystem and to improve the reliability of water supply for users. And yet, the causes of ecosystem decline and the potential for its reversal remain unclear. That aside, CALFED had no power—whether to restrict diversions, set water quality standards, levy charges, or make infrastructure investments. The Little Hoover Commission's reference to CALFED's lack of ''leadership and authority'' is apposite.

The federal agencies had reconciled their differences and worked in harmony when the political leadership – Secretary Babbitt, with the backing of President Clinton – pressured them to do so. There has not been similar leadership on the state side. Since the defeat of the Peripheral Canal, except for a brief interval in the late 1990s, the political leadership of California has viewed the Delta as a quagmire to be avoided. Governors have intervened to block SWRCB action and to maintain the status quo in the Delta when this was preferred by powerful water users. But, so far, they have not expended political capital to bring about a solution in the Delta, nor have they been willing to take responsibility for the continuing decline in the ecosystem in the face of inaction.[77]

CALFED has advanced scientific understanding of the Delta. Yet the Delta ecosystem has continued to decline. At each point in time, events in the ecosystem have outpaced both the scientific understanding and regulatory actions. This obviously implies a need for adaptive management. But, even in the face of massive uncertainty, decisions *do* need to be made. As the events of 2007 have shown, if the state of California is unable to make those decisions, a federal court will fill that vacuum.

4.2. *SWRCB: the hollow center*

Freeman and Farber refer to the need ''for including stakeholders in Delta-related decision-making in an ongoing way.'' But, in 50 years of rulings on the Delta, while appearing to meet the requirements of their quasi-judicial duties, the SWRCB and its predecessors displayed a chronic passivity by constantly seeking to defer to agreements reached by the stakeholders. Because of the zero-sum nature of the Delta, the stakeholders were consistently unable to agree. And, because they were consistently unable to agree, the Board consistently failed to take decisive action.[78] And where they finally agreed, the Board was bound by the burdens the projects assumed, unable to include users who weren't party to the agreement.[79]

There are several reasons for the Board's passivity. One is that it lacks adequate staff and resources to conduct an independent analysis. It has meager staff in hydrology, engineering, biology or economics. It relies on agencies such as DWR because it does not have a hydrologic or fisheries modeling capacity of its own.[80] In this regard, there is a striking contrast between how the Board has handled the Delta and how it handled Mono Lake, where it acted with considerable effectiveness. In that case, it hired an environmental consulting company to conduct an extensive

[76] That this did not continue in the Bush administration reflects that administration's policy.

[77] Governor Schwarzenegger may prove an exception; he became engaged with the Delta through the issue of levee fragility. It should be noted that Arizona only took decisive action to resolve its groundwater overdraft crisis in 1980 when Governor Babbitt intervened and forced the parties to reach an agreement.

[78] The Board had itself recognized in D-990 the danger of excessive deference to stakeholders, when it stated: ''[i]ndefinite postponement of the determination of mutual responsibility and the clarification of the relationship between local interest and the two great Federal and State projects which are, or will be, dependent upon a Delta water supply, is adverse to the interest of the entire State'' (61).

[79] The Board has been stymied by the projects' settlement in Phase 8, which prevents the Board from assigning responsibility to other Delta users. See El Dorado Irrigation District v. State Water Resources Control Board (2006).

[80] In the 1988 Delta report, it was possible to conduct an independent and substantive economic analysis only because, by chance and through a back-door connection, we obtained access to the detailed economic model being used by the Metropolitan Water District of Southern California (MWD). At the 1987 hearings, MWD presented the conclusions of their modeling analysis, but did not make the model available and revealed few details of the assumptions underlying those conclusions.

investigation of the hydrological, biological, ecological and economic aspects,[81] including conducting original data collection and modeling.[82] The independent information gave it the ability to cut through competing stakeholder claims.

Another cause of the Board's passivity is the fact that, for a long time, it has been under the governor's thumb—whether through the governor's direct intervention, as in 1993, or by less direct means. On several occasions over the past two decades, governors have chosen not to appoint (or reappoint) members of the Board whom the water users considered too independent.[83]

Apart from the external constraints, the Board seems hampered by a lack of imagination and a narrow vision. If it had thought to do so, the Board surely could have formed a Science Advisory Panel, as CALFED did. If it had though to do so, it could have adopted a pro-active approach to water marketing.[84] If it had thought to do so, it could have adopted a risk-sharing approach to the allocation of water in the Delta. If it had thought to do so, it could have approached water use efficiency by putting some substance into the constitutional requirement for the ''reasonable and beneficial use'' of water in California.

To be sure, by reserving its jurisdiction in D-990 and successive decisions, the Board created an opening for an adaptive approach to managing the Delta. But, adaptive management is impossible without the capacity to collect and analyze data, and without the will to make a decision. The Board's failure thus leaves California without an effective capacity for adaptive management.

5. Conclusions

The State Water Resources Control Board is the absent authority and silent stakeholder in the Delta saga. Its abdication of its authority is a fundamental vulnerability for California as it faces population growth, species decline, and climate change. The Porter Committee's conception in 1966 was that California needed an entity that would serve as a decision-making mechanism outside of the traditional court system, with more capacity to account for the breadth and intricacy of water rights and quality disputes. The Board was established to serve this purpose, but has signally failed to do so. Whether it should now be reformed or entirely replaced, we do not know. But, we do know that California needs a decision-making entity capable of filling the role that the Porter Committee conceived.

[81] Economic analysis played a major role in the Mono Lake decision but has been minimally present in the Delta decisions. Unlike Mono Lake (Jones and Stokes, 1993), there has been no economic valuation of the use and non-use values associated with ecosystem protection and restoration – either by SWRCB or by CALFED. The stakeholders in the Delta have all been fearful of what an economic analysis might reveal – the water users because they fear it might show too large an economic value for the ecosystem, and the environmental groups because they fear it might show too small a value. Consequently, they have both felt more comfortable keeping non-market economic analysis out of the picture. However, the failure to measure non-market values explicitly makes balancing more tenuous.

[82] The Board asked LADWP to pay for the work performed by the consulting company and LADWP consented for strategic reasons (it preferred to have SWRCB make a determination rather than the El Dorado Superior Court).

[83] In this regard, Mono Lake was not different than the Delta: it is believed that the Board obtained Governor Wilson's consent before releasing its decision.

[84] For example, as recommended by LAO (1999, p. 18).

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