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**Federal-State Decision-making on Water:
Applying Lessons Learned**

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Notes for a luncheon address
at the conference on

“Allocating and Managing Water for a Sustainable Future:
Lessons from Around the World”

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1. Summary

Water policy in the United States has been significantly influenced in recent years by a number of high profile conflicts, including conflicts relating to California's Bay Delta, Florida's Everglades, the management of the Colorado River system, the Columbia/Snake system, and the Klamath and Trinity River Basins. For a variety of legal, institutional and financial reasons, the federal government has played a major role in all of these matters, typically in partnership with state and local stakeholders.

This paper provides a "lessons learned" perspective on the federal/state decisionmaking process in these major water policy disputes. The paper briefly summarizes key issues involved in the disputes, identifies important drivers in each conflict and discusses the nature of the decisionmaking process, including the role of federal and state authorities, science, funding, and political support.

The paper then looks across these high-profile disputes and draws a number of conclusions regarding the ingredients for successful resolution of difficult water-related conflicts in which federal and state authorities have a significant role. It concludes that success often depends upon a mix of a strong triggering event (often a galvanizing regulatory or environmental development such as the listing of an endangered species and/or a hard drought); significant public interest in the issue; personal attention by leaders that have the standing and wherewithal to deliver on promises; a close federal/state partnership; a heavy dose of science and money; and an opportunity for meaningful stakeholder involvement in shaping a solution. Typically *all* of these requirements are needed to successfully solve large, difficult water conflicts, although the strong presence of one or two of the elements (e.g., personal leadership by high-ranking officials) can sometimes compensate for the absence of others (e.g., significant public interest in an issue). Failure is almost assured when at least two of these elements are missing from major water conflicts.

2. A Learning Laboratory: High-Profile Water Disputes

A number of high-profile water disputes have erupted over the past 10 years. Although many of the disputes are large and seemingly intractable, federal, state and local players have developed problem solving approaches that are bearing fruit in many of these matters. The outlook is less optimistic in others. In all cases, however, there are lessons to be learned.

The discussion that follows focuses on high-profile water disputes that have developed in five major watersheds, and which have provided a laboratory for all who are interested in solving complex, difficult water conflicts. Cross-cutting conclusions and observations are presented in the final section of the paper.

A. California's Bay Delta

The Bay Delta region, where the Sacramento and San Joaquin Rivers combine and flow into the San Francisco Bay, is historically one of the most environmentally productive and rich ecosystems in the nation. Salmon traveled up Sacramento and San Joaquin tributaries and spawned in large numbers. Freshwater fish also used the Bay Delta as their nursery, and the meandering river systems formed a large wetlands system that provided habitat for migratory and resident birds, and many other forms of wildlife.

Beginning in the 1930s, water engineers took over and constructed the largest federal Reclamation Project in the west (involving the diversion of 7 million acre feet of water), followed by the construction of the companion State Water Project. As a result of this feat of engineering, most of the major tributaries in the Sacramento/San Joaquin river systems were dammed, an extensive canal system was built, and large pumps were constructed on the south side of the delta so that water could be pumped through the delta and sent south to farms in the lower San Joaquin Valley and over the mountains into the Los Angeles Basin. Overall, it is estimated that the federal Central Valley Project and the State Water Project together divert as much as 60 percent of the natural inflow into the San Francisco Bay to the San Joaquin Valley and to southern California. Today, as a result of this infrastructure, 20 million Californians rely on the Delta as their primary water supply, and irrigated farms in the San Joaquin Valley are the most productive in the world.

The engineering achievements in the Central Valley have come at significant environmental cost. Habitat losses in the delta region have been severe as watercourses have been channelized, leading to significant losses of wetlands, and increased use of levees to protect (and isolate) remaining lands. Water quality in the Delta has declined and fishery resources have been stressed as natural migration paths have been cut off, and large numbers of fish have become "lost" in artificial canals or entrained in large pumping stations.

In the early 1990s, resources agencies began to take action to protect several species of fish that had recently been listed under the Endangered Species Act. Delta pumps were closed down, leading to panic among water users. Indeed, it was the triple whammy of new listings under the Endangered Species Act, a major drought, and the looming need to implement a new federal mandate to dedicate 800,000 acre feet of water from the federally-operated Central Valley Project environmental purposes (enacted as part of Central Valley Project Improvement Act of 1992), that forced a new dialogue among contending water interests – environmental, urban and agricultural.

Led by Secretary Babbitt and Governor Wilson, with a major assist from a concerned California business community, the warring factions entered into an interim agreement in 1994 – the so-called "Bay Delta Accord" – that established a short-term

peace, and kicked off a three year, comprehensive study of how to better manage water resources in the Bay Delta for the mutual benefit of water users and the environment.

Federal and state authorization and appropriations followed, and money began to flow. The ad hoc stakeholder group that was central to the success of the Bay Delta Accord was convened into a more formal governing body which had input on all aspects of the study effort. This stakeholder effort was supported by a new federal/state organization, called CAL-FED, with its own staff (consisting primarily of staff on detail from 14 participating state and federal agencies), and its own offices and mission statement.

The three year study period stretched to five as the CAL-FED process evaluated how to improve the environment, while also improving water reliability and water quality. On the environmental restoration side, scores of dams were inventoried and evaluated; new wetlands opportunities were explored; and watershed improvements of all kinds were analyzed. An innovative “environmental water account” was identified as a potential new tool that would enable the resource agencies (U.S. Fish & Wildlife Agency and California’s Department of Fish & Game) to dedicate water supplies to protect fisheries, when needed. During the evaluation phase, funding for some of these activities began as 195 environmental restoration projects were approved, and more that \$200 million dollars were earmarked for these efforts.

On the water user side, the CAL-FED study evaluated the increased use of modern water management tools, including water transfers, the use of groundwater aquifers for additional storage, and increased conservation and water reclamation and recycling. In addition, potential new surface water storage and transmission facilities were evaluated, with the most promising new projects given priority attention.

The study effort culminated in a \$8 billion dollar programmatic plan that was endorsed by federal and state authorities, and all of the major stakeholders, in June, 2000. The final discussions were candid, and difficult. In the end, Senator Diane Feinstein, Secretary Babbitt and Governor Davis sought accommodations that would keep everyone at the table, arms were twisted, and all major parties appeared together on the steps of the State Capitol in June, 2000. A Record of Decision was issued in August, 2000.

Two years later, the CAL-FED program is in trouble. The strong impetus to finalize a long-term plan to accommodate environmental and water user needs has not translated into the legislative arena; a multi-billion dollar authorization bill is stalled in Congress. California is no longer speaking with one voice as some stakeholders are seeking to improve upon the deals that they made through the stakeholder process, putting strains on the delicate balance of interests that stands behind the Record of Decision. And the high price tag for the program is raising eyebrows, particularly outside California, where the Bay Delta (unlike the Everglades) is not a household name.

It remains to be seen whether the mutual dependency that characterizes the many interests involved in the California Bay Delta will hold the deal together. While it seems unlikely that the CAL-FED architecture – developed over nearly a decade – will collapse, the future of the program is very uncertain, the latest reminder of the delicacy of high-wire water deals.

B. The Everglades

The history of the Everglades water conflict bears a striking resemblance to California's Bay Delta. Like the Bay Delta, the feds had a major presence in South Florida, this time through the National Park Service (Everglades National Park; Big Cypress National Preserve), the Fish & Wildlife Service refuge system and, most notably, the complex plumbing system that the Army Corps of Engineers had constructed, and continues to operate, throughout south Florida.

Like the Bay Delta, serious environmental issues triggered the need to take a fresh look at the Everglades. Environmental degradation of the Everglades became obvious by the late 1980s and early 1990s. The cumulative impact of the Corps' management of water away from the Everglades was cause much of the legendary "sea of grass" to dry up. By 1992, 90 percent of the wading birds had departed the Everglades, 68 species were listed as endangered or threatened, Biscayne Bay and Florida Bay fisheries were suffering, the top five feet of organic topsoil in the Everglades Agricultural Area had eroded, the inland and coastal water quality was degraded, invasive exotic plants had invaded 1.5 million acres, and wetlands and tree island habitats had disappeared.

Litigation also drew attention to the Everglades' environmental problems. The federal government sued the state of Florida in 1988, alleging that polluted agricultural runoff, including elevated phosphorus levels, was flowing onto Parks and Wildlife Refuge lands in violation of state water quality laws. An apparent settlement of the federal/state lawsuit in 1991 led to the filing of 36 follow-up lawsuits filed by interested parties.

With the ecosystem on the ropes, and facing a litigation nightmare, the Clinton Administration stepped in, gathering all of the federal agencies together to work with the state, and with the South Florida Water Management District to address the water quality issues, and related restoration needs. In 1993, Secretary Babbitt formed the South Florida Ecosystem Task Force to coordinate the efforts of the federal agencies involved in south Florida. State authorities, led by Governor Chiles, became deeply involved, and helped to pass the state's Everglades Forever Act in 1994, which created a billion dollar fund to help clean up contaminated agricultural runoff. Congress then took up the cause, appropriating funds to develop a restoration plan and, in 1996, by formalizing the South Florida Ecosystem Restoration Task Force – a federal coordinating body that was expanded to include state, local and tribal representatives.

With state and federal funds in hand, the planning effort was underway in earnest while on-the-ground restoration activity began with important land acquisitions and the development of a multi-species conservation plan. Finally, the study period and stakeholder processes matured into a thorough environmental analysis and the Corps' development of a long-term, comprehensive restoration plan. The plan is a bold, science-driven effort that calls for a fundamental modification of the south Florida's water delivery system and the improvement of the quantity, quality, timing and distribution of water to natural systems, so that some of the water can be returned to its historic, southerly flow pattern through the Everglades, rather than bypassing the land and being shunted off directly into the ocean.

Despite a high price tag of approximately \$8 billion dollars, the Everglades restoration plan is moving into the implementation stage. Congress endorsed the plan and enacted it into law as part of the Water Resources Development Act of 2000.

C. Colorado River

The Colorado River is widely recognized as perhaps the west's most important river system. Although it is relatively modest in size (its flow is only one-tenth that of the Columbia River), its basin includes some of America's most treasured landscapes, and it supplies vital water supplies to 30 million Americans. By way of example, the Colorado River is a primary water source for Phoenix, Las Vegas, and the Los Angeles Basin (the Colorado supplies approximately one-third the water supply for 17 million residents in Southern California), and it supports a large irrigated agricultural economy throughout the Colorado River Basin. In addition, Hoover and Glen Canyon dams are two of the largest hydropower facilities in the nation, and a large recreational industry has grown up around Lake Powell and Lake Mead, as well as on the Colorado itself, through the Grand Canyon, and its tributaries (e.g., the Green River).

The Colorado River Basin serves as a laboratory for many important water issues, including some significant conflicts. Three are noteworthy in the context of this paper:

Glen Canyon Dam/Grand Canyon. When the Glen Canyon Dam first began to operate and generate hydropower, the flow regime adopted by the Bureau of Reclamation was developed to maximize electricity generation. Unpredictable, scouring flows roared down the Grand Canyon and damaged the fragile beaches and riparian habitat that river enthusiasts enjoy on their trips down the river.

The environmental damage caused by operation of the Glen Canyon Dam led to the initiation of one of the earliest multi-agency, interdisciplinary restoration study efforts, initiated by the Reagan Administration in 1982. After a slow start, an EIS was

initiated in 1989 and, in 1992, Congress passed the Grand Canyon Protection Act, which required completion of the EIS process and the adoption of an “adaptive management” approach whereby the effects of dam operations on downstream resources would be monitored and assessed.

A comprehensive EIS was subsequently developed with the involvement of water and power users, environmental and conservation groups, federal and state agencies, and Indian tribes. The EIS was released in 1995 and a follow-up Record of Decision, signed in 1996, established the Glen Canyon Adaptive Management Work Group as a Federal Advisory Committee.

The results of the effort have been impressive. A considerable body of science has been developed regarding the impacts of various types of flow regimes on beaches and riparian habitat through the USGS Grand Canyon Monitoring and Research Center, established in 1995. The Adaptive Management Work Group is up and running, providing an opportunity for representatives from power interests, tribes, recreational and fishery interests, and federal and state officials to participate in science reviews, and to review operational plans for the Glen Canyon dam.

Now, the Glen Canyon dam is operated with an eye toward protecting the ecosystem, in addition to producing hydropower. And the process is dynamic, with scientific research continuing. In 1996, for example, a major “spike” flow was released through the Grand Canyon, simulating a flood condition. Downstream impacts were monitored carefully, providing feedback that will assist in making future operational decisions.

Upper Colorado. Listings of native fish under the Endangered Species Act in the upper Colorado River triggered significant controversy in the late 1980s as water project approvals were held up and local and state representatives expressed alarm about the ability of the region to develop its underutilized Colorado River water rights. Political leaders acted quickly and entered into a Cooperative Agreement in 1988 among the federal government and the governors of Wyoming, Colorado, and Utah. The Agreement established a Recovery Implementation Committee that has worked through management and technical committees to develop and implement fish recovery strategies in the Upper Colorado basin. In return, the Fish & Wildlife Service provided blanket approvals for new water projects, within certain parameters.

The Upper Colorado recovery program has now been in place for more than 10 years, and many native species have been rebounding remarkably. In 2000, with the full support of the affected Governors and the Administration, the Congress authorized an additional \$46 million in funds for the program. The environmental restoration success story continues from all angles – science, stakeholder involvement, federal/state cooperation, and accommodation of water holder interests.

Lower Colorado. The Lower Colorado River is more developed than the Upper Colorado. With the completion of the Central Arizona Project in the mid-1990s, and the enormous growth of demand in Arizona, Nevada and California, the Lower Basin States (Arizona, Nevada and California) are now diverting their entire Colorado River water rights, adding stress to fishery and riparian resources along the river, limiting flows to Mexico and its biologically rich Delta region, and requiring the introduction of creative new water management tools to stretch limited water supplies.

California's oversubscription of Colorado River water has threatened to destabilize the water rights allocations that have been in place on the Colorado for 80 years. In this case, the federal government has a clear, obvious role insofar as the Secretary of Interior is the "water master" in the lower basin under the "law of the river." As a practical matter, however, the Secretary must work closely with the seven basin states in managing the river in light of the legal and political interests that all of the states have in management of the issues.

The approach taken by Secretary Babbitt to defuse the growing crisis on the Colorado River was instructive. Rather than force a top-down solution, he used his bully pulpit to deliver a series of annual messages to Colorado River water users to alert them to the seriousness of the issue, and to lobby California to develop a plan to reduce its take of Colorado River water. When California made progress on a plan, but requested time to implement it, the Interior Department worked closely with representatives of the other states to manage Colorado River surpluses in a way that would enable California to phase in its water reduction efforts. At the same time, Interior negotiated a precedent-setting arrangement that allowed the banking and transfer of Colorado River water among lower basin states, thereby providing Nevada with additional assurances that it would have adequate access to Colorado River water supplies in the future.

Although the delicate negotiation of Colorado River management issues has differed from the Bay Delta and Everglades examples in many respects, the political sensitivity and leadership exercised by the federal government in pushing for change, in close consultation with affected parties, finds parallels in many other water conflicts. As the plan moves forward, however, a serious environmental complication has arisen. Specifically, California's Colorado River water reduction plan is based, in large part, on the conservation of a large block of Imperial Irrigation District water, and the transfer of much of that water to the San Diego County Water Authority. As it turns out, water conservation and transfers from the Imperial Valley will negatively impact the Salton Sea, a resource that is being sustained because it receives water that flows off Imperial Valley fields. A collision is brewing between the implementation of modern water management techniques needed for the vitality of the Colorado River Basin (conservation and transfers) and impacts on an important local resource (viz., the Salton Sea).

D. Columbia/Snake River Basin

Salmon and hydropower provide the story line in the Columbia and Snake River basin. They do not mix very well. Many historic salmon runs in the basin have crashed. Hatcheries are churning out fish, but many of the wild populations are in serious trouble.

Because the federal government is the primary operator of the river system (via the Bonneville Power Administration (BPA); the Corps of Engineers; the Bureau of Reclamation), and because the federal government has a trust responsibility to address the tribes' treaty rights to fish, the feds have been a primary focal point of attention regarding salmon recovery efforts. Based on input from the federal "action" agencies (e.g., the Corps; BPA; the Bureau of Reclamation), the federal resource agencies – the National Marine Fisheries Service and the Fish & Wildlife Service – are implementing an interim salmon recovery plan that relies heavily on a \$400 million per year investment by BPA in salmon recovery efforts which includes a large barging program (under which smolts are transported around the dams in trucks and taken to the ocean), extensive scientific studies, and operational changes in flow regimes to assist the passage of fish. New turbine technologies also are being evaluated.

A new, interim biological opinion was released late in 2000 which expanded the on-going study effort, and established benchmarks for recovery that may require, over time, more drastic action (e.g., potential removal of the lower Snake River dams) to protect endangered runs, depending upon the success of recovery efforts.

Despite massive investments of capital, and a major science effort, the salmon recovery effort is only limping along. Virtually no one is satisfied with the process or results of many years of effort and tens of millions of dollars in investments in the basin. Lawsuits have been filed on the latest biological opinion and on the legal status of wild versus hatchery fish under the Endangered Species Act, among other things. Adequate funds to implement measures set forth in the biological opinion may not be forthcoming, leading to additional challenges.

Why have salmon recovery efforts been so disappointing in the Columbia and Snake River Basins? One reason may be the inability to develop a workable stakeholder group to build scientific and political support for a specific path. A related issue may be the overwhelming federal presence in the basin, and the lack of a strong, countervailing set of state and local actors.

That is not to say that stakeholder efforts have not been undertaken to address the salmon/water conflicts in the Columbia/Snake basin. Indeed, the Basin is littered with unsuccessful efforts. The Northwest Power Planning Council, acting under the authority of the Northwest Power Planning and Conservation Act of 1980, has done much good work in the area, but its lack of tribal representation is seen as a major liability. Also, the Council has no formal federal representation (Council members are appointed by

Governors). Because key decisionmaking authority is in the hands of federal resource agencies, the Council's state-oriented tilt puts it at a disadvantage.

The Columbia Basin tribes pushed for a "Three Sovereigns" approach that invested decisionmaking in federal, state and tribal leaders, but non-governmental stakeholders objected, and that proposal died a quiet death. Finally, with decisions needing to be made, the feds retreated into a "federal caucus" where they have spent an enormous amount of time and effort in internal discussions, leaving little opportunity for outreach or the building of consensus.

One bright spot in the region is in the upper Snake, where water interests in Idaho have been drawn into litigation with the Nez Perce tribe, and where concerns of a potential "water grab" for downstream salmon needs run high. In that context of mutual concern, discussions are well along toward a resolution of competing demands for Snake River water in Idaho. In contrast to the rest of the basin, where the sheer number of players, complexity of the issues, and absence of an effective forum has impeded progress, a settlement in Idaho appears possible.

E. The Klamath and Trinity River Basins

The Klamath Basin in southern Oregon and northern California is the home of a large irrigation project developed by the Bureau of Reclamation and one of the first wildlife refuges (established by President Teddy Roosevelt). It also is home to the Klamath Tribe, which has fishing rights in Klamath Lake and, downstream, to the Hoopa Tribe, which has fishing rights on the Klamath River. Added to the mix are endangered species in the Lake and in the River, and a water-short, overappropriated Basin.

Last year, the combustible mix of conflicting interests in the Klamath Basin exploded as the region was hit with drought. There was not enough water to maintain lake levels needed for the resident endangered fish, to maintain stream levels needed for the endangered salmon, and to divert water to the irrigation unit and the wildlife refuge. Secretary Norton responded by cutting off water to the irrigators and the refuge, and all hell broke loose.

The upshot of the Klamath debacle remains to be seen. Interesting and potentially precedent-setting actions taken by the Administration include the referral of the resource agencies' biological opinions to the National Research Council, an arm of the National Academy of Sciences, which concluded that there was not enough science to dictate the lake levels and stream flows identified by FWS and NMFS. (The NRC did not comment on the policy question of what FWS and NMFS should do when the science is unclear and in light of the agencies' statutory responsibility to protect the species in question.) This year, the Administration did a complete about-face and is diverting all of the water this year to the farmers, alleging that the Bureau of Reclamation has a mandatory

obligation to supply water to its customers, and that any ESA-based water needs must be met through water purchases, or via some other means. This action already has triggered additional litigation.

The confluence of the competing upstream and downstream water needs for different species under the ESA, the conflicting needs for water for farmers and for an adjacent National Wildlife Refuge, and tribal treaty rights, presents the same type of seemingly-intractable challenges faced in the Bay Delta and the Everglades. Why, then, has the Klamath Basin problem exploded, while the other matters appear to be on a road toward success?

It is too early to draw many conclusions regarding the Klamath because the situation remains a work in progress. Crisis usually has been a necessary prerequisite to serious engagement in problem-solving in the water world. What comes next will be instructive. Nonetheless, there were warnings that a Klamath melt-down might come; why wasn't more incremental progress made before the severe drought appeared to remove all options?

Oregon State researchers have undertaken a comprehensive review of the Klamath situation that provides important insights into this question. Their report notes that "the essential institutional quality of the Klamath River system is the fragmentation of interests and authorities without compensating relationship for the resolution of conflicts." It continues:

The Klamath is an extreme case in this regard. Although the third largest California river, it displays little of the institutional fabric that has developed for the Sacramento-San Joaquin or Eel-Russian systems. Its major tributary, the Trinity, has been managed primarily as an extension of the Central Valley system, subjected to a wholly different and external set of institutional and political dynamics that effectively isolate these hydrologically connected river systems. Although holding senior water rights, the tribes have been isolated from decision processes about the river. The divisions of jurisdiction among Federal, Oregon, California, and tribal sovereignties are largely unresolved, or are perceived as resolved but in highly ambiguous and thus far unimplementable ways. In particular, the extent of Federal deference to state water law, and the extent to which tribal rights depend on the relative balance of Federal to state power, are historical issues that do not, and perhaps may never, display resolution.

The Oregon State observations are on target. The federal interests in the Basin are fragmented among the Bureau of Reclamation and their constituency (the farmers), the Bureau of Indian Affairs and their constituency (the tribes), and two different resource agencies from different departments, the Fish & Wildlife Service (Interior) and the National Marine Fisheries Service (Commerce). Add to the mix the State of Oregon's strong push for the resolution of Basin water rights in the context of a state

proceeding that has been in progress for many years, and an unimpressive track record in attracting financial or political support for water-related projects in the basin (some local political representatives have strongly resisted the Fish & Wildlife Service's efforts to buy land and water rights on a willing buyer/willing seller basis; the Bureau of Reclamation historically has had limited success in obtaining funding for water supplementation projects). And many of the interested parties also are fragmented – geographically and otherwise. Environmental, fishery, and some Tribal interests (e.g., the Hoopa Nation) are concentrated downstream, out of the central basin area. The local area tribe (the Klamath) is in the upper basin, and largely isolated from the other actors. And neither the agricultural community nor the Refuge representatives have had a history of working with the other interested parties. The state-sponsored water rights adjudication had begun to bring some of the parties together, but that forum was too limited in scope to push the parties toward a comprehensive solution that would address basin-wide issues.

The contrast between the Klamath experience and the management of water conflicts on its California tributary, the Trinity River, is instructive.

The Trinity River once was among California's most prolific salmon streams. In 1955, however, Congress authorized the construction of Lewiston and Trinity Dams and associated structures to export water into the Central Valley of California. From 1965-97, approximately 74 percent of Trinity's water above Lewiston was exported. The remaining river was a shadow of its former self; salmon stocks and other environmental indicators declined precipitously.

In 1981, Secretary Andrus commissioned a study to evaluate how much water would need to be returned to the Trinity River to make the river productive again. In 1984, Congress passed the Trinity Restoration Act, which codified this commitment and budgeted funds for the study effort. The Central Valley Project Improvement Act of 1992 renewed the commitment, and established a stakeholder group to participate in the restoration study effort, including federal, state, and local officials, tribal representatives, water and power users, and commercial and sport fishery representatives.

The USGS and Fish & Wildlife Service completed its study and an accompanying Environmental Impact Statement in 1999 and recommended that some of the diverted flows be returned to the Trinity. The study did not call for a return of all diverted water. Instead, it modeled potential flows needed, working in combination with mechanical restoration efforts, that could help restore natural functions on the river. Secretary Babbitt signed a Record of Decision in 2000, which adopted the new plan.

The Trinity River decision was controversial, but it evolved out of a science-based and stakeholder-heavy process that developed significant support for the decision throughout the Trinity River watershed. Predictably, some water users in the Central Valley were unhappy with the decision, and they sued to overturn the plan. (A District

Court judge has held up full implementation of the restoration plan pending additional study on impacts on power interests.) While the litigation is pending, however, significant flows have been returned to the Trinity.

The contrast could not be sharper between the long-term commitment to science and stakeholder involvement that characterized the Trinity restoration effort, and the absence of a participatory science effort, or a meaningful forum for the airing of conflicting interests, in the adjacent Klamath River. When drought precipitated a crisis on the Klamath, there was no institutional place to turn for help, funding or problem-solving.

3. Distilling Principles for Federal/State Conflict Resolution in Water Disputes

Studying experience gained over the past several years suggests what ingredients may be needed to resolve difficult water conflicts that involve significant federal interests. As noted in the introduction, success often depends upon a mix of a strong triggering event (often a galvanizing regulatory or environmental development such as the listing of an endangered species and/or a hard drought); significant public interest in the issue; personal attention by leaders that have the standing and wherewithal to deliver on promises; a close federal/state partnership; a heavy dose of science and money; and an opportunity for meaningful stakeholder involvement in shaping a solution. In my view, *all* of these requirements typically are needed to successfully solve large, difficult water conflicts, although the strong presence of one or two of the elements (e.g., personal leadership by high-ranking officials) can sometimes compensate for the absence of others (e.g., significant public interest in an issue). Failure is almost assured when at least two of these elements are missing from major water conflicts.

A. Strong Triggering Event

There are literally thousands of significant water disputes brewing in the United States, including a number of large and seemingly intractable conflicts. The large majority of these water conflicts remain in the background; they act like a low grade fever. Occasionally, enough friction develops around the dispute that a trip to the “doctor” is warranted (a water court judge; a federal or state official; or the like), but neither the doctor nor the patient is prepared to risk major surgery. Instead, small solutions are sought, around the edges – enough to keep the fever in check.

Typically, a strong triggering event is needed to convert a simmering water conflict into a major dispute that cannot be solved with over-the-counter medications. Nearly all of the case examples set forth above share this characteristic. Often it is a regulatory action, such as the listing of a species under the Endangered Species Act with its attendant, increased risk that water users will not have access to their customary

supplies, and/or a drought, which creates anxiety in the water user community, while also exacerbating environmental problems in the watershed. Litigation frequently provides the spark that pushes a dispute over the edge.

Interestingly, nearly all of the triggering events in the conflicts reviewed above related directly to environmental issues. In the Bay Delta, long-term environmental degradation issues led to the listing of anadromous and resident fish species. In the Everglades, water quality issues associated with agricultural runoff, and magnified by a major piece of litigation, drew attention to broader environmental problems in the ecosystem. Damage to the beaches in the Grand Canyon forced James Watt, the then-Secretary of the Interior, to establish an early study of Glen Canyon Dam operations. Endangered species listings in the Upper Colorado, and in the Columbia/Snake system triggered conflict resolution efforts in those basins. And, of course, it was the operation of newly-released Biological Opinions in the Klamath Basin, when combined with the worst drought in a century, that led to headline-grabbing conflict in that watershed.

Although there was no specific triggering event that initiated the Trinity River restoration effort it, too, was motivated by environmental concerns, and the broadly-recognized need to address a degraded watershed. The Lower Colorado allocation issues among the basin states stand alone as a major water dispute that had neither a strong triggering event, nor an obvious environmental bent. As discussed further below, it represents an unusual case in which strong federal and state leadership anticipated a serious water conflict and took action to address it before reaching a crisis stage.

B. Significant Public Interest

Big problems typically require big solutions which, in turn, typically require the expenditure of significant political capital and dollars, as discussed below. Interestingly, strong public interest in a water dispute often is a necessary ingredient in forging a “big” solution, precisely because political leaders cannot – or will not – muscle a solution through the thicket of competing interests, and through the legislative and budgetary process, in the absence of demonstrated public interest in the issue.

Historically, water disputes do not captivate the interest of the general public. Water conflicts often appear to affect only narrow interest groups. They also can be highly technical, and can seem somewhat abstract, insofar as the general public’s access to adequate water supplies rarely appears to be at issue.

Nearly all of the conflicts reviewed above, however, share a common characteristic in that they have captured the public interest during important phases of their development and/or resolution. Interestingly, the evolution of water disputes into environmental-oriented conflicts has played a major role in garnering public interest in these matters. The Everglades restoration project, for example, has had broad public

appeal because the Everglades National Park is a nationally-recognized environmental resource. Likewise, salmon-related conflicts on the Columbia and Snake River systems have captured significant public interest, in part because salmon are strongly-valued, publicly-recognized resources in the Pacific Northwest. And both local and national interest has been strong in the well-publicized troubles in the Klamath basin, particularly in light of the economic suffering of the farming community and the conflicting interests of tribes and fishermen.

In other cases reviewed above, public interest has been less sustained. In the Bay Delta, the well-publicized conflicts in the early 1990s provided the public support and pressure needed to help strike the Bay Delta Accord in 1994. Once a long-term stakeholder effort was launched and financial and scientific resources were invested in the effort, however, the Bay Delta conflict no longer became “news” and the general public assumed that the Accord’s temporary peace would continue indefinitely. Also, because the environmental resource of the Bay Delta is not as well understood by the general public (in contrast to the Everglades), on-going interest in the Bay Delta dispute has waned.

The lack of continuing public interest in the Bay Delta matter may explain why California leaders are having difficulty in converting the successful dispute resolution effort into a permanent reality through the passage of an omnibus authorization for the CAL-FED program. Without an expression of significant public interest in the issue in California – and, preferably, throughout the nation (again, as in the case of the Everglades) – leaders face a formidable challenge in sustaining the momentum needed to nail down a solution to this complex, long-standing set of water conflicts.

Focused and episodic public interest in a water conflict sometimes is enough to satisfy this ingredient to water conflict resolutions. In the early 1980s, concern about the impacts of Glen Canyon Dam flows on Grand Canyon beaches galvanized public interest in the issue, and prompted early attention of the issue. Likewise, in the Upper Colorado, species listings in the late 1980s were big news in the region. Because potential negative impacts on water projects are newsworthy developments in Utah, Wyoming and Colorado (in contrast to California and many other jurisdictions), public interest in the issue was high, and the stage was set for addressing the issue proactively. Likewise, local interest always has been strong in restoration of the Trinity River basin in northern California, primarily because Trinity County is one of the poorest in the state, and the public’s livelihood and future is heavily tied to the health and attractiveness of its natural resources.

C. Personal Attention By Key Leaders

A common characteristic that runs through virtually all successfully-addressed water conflicts is personal attention by key leaders. In the case of water conflicts that

have a heavy federal and state component, such as those discussed above, leadership by top agency officials typically is required. A personal commitment is needed by top officials because the difficult problems presented by large disputes, and the strong competing interests presented in such matters (including within governmental subagencies that have different, and sometimes conflicting, missions), typically can only be addressed if the full authority and stature of the government and its leaders are brought to bear on the conflict.

When really tough issues are presented, active involvement by top officials needs to be hands-on; window-dressing will not suffice. The personal leadership of Secretary Babbitt and EPA Administrator Browner in the Everglades and Bay Delta disputes illustrates the point. In both cases, these cabinet-level officials participated actively in stakeholder meetings, strategy sessions, Congressional briefings, and media events. They were joined by top political representatives, on a bipartisan basis including, among many others, Senator Diane Feinstein, Congressman George Miller, Governors Pete Wilson and Gray Davis (in the case of the Bay Delta), and Senators Graham of Florida, Robert Smith of New Hampshire, Governors Lawton Chiles and Jeb Bush (in the case of the Everglades).

Likewise, on the Colorado, the sustained personal interest of the “water master” – the Secretary of the Interior, has been a key ingredient to resolution of the Glen Canyon Dam operations issues, the Upper Colorado species restoration plan and, more recently and most obviously, in the river-wide management issues that have arisen in light of the State of California’s over-reliance on Colorado River water supplies. In the latter matter, Secretary Babbitt had the personal interest and experience in Colorado River matters to enable him to carefully push the right levers in an engaging and sustained diplomatic mission to negotiate a solution with the active involvement of major water interests in the basin and their sometimes-prickly state representatives. He was able to do so even in the absence of several of the other ingredients that usually are required before major water conflicts can be solved (*viz.*, a strong triggering event; significant public interest).

Interestingly, the same type of high-level, sustained personal commitment by governmental officials has not been devoted to the Columbia and Snake River basins. Unlike the Colorado River, where the Secretary of the Interior is the obvious leader, the Columbia/Snake involves a gaggle of federal government agencies, with the lead regulatory role being played by the National Marine Fisheries Service (NMFS), a subagency in the Commerce Department. NMFS officials do not have the stature and clout needed to forge a comprehensive solution to the basin’s problems, particularly when many other agencies have competing players and missions, including the Defense Department (the Army Corps of Engineers), the Energy Department (Bonneville Power Authority), the Interior Department (Fish & Wildlife Service; Bureau of Reclamation; Bureau of Indian Affairs).

In the Klamath, high level attention is now being paid to the conflict after the issuance of new NMFS and FWS biological opinions, combined with a record-setting drought, forced the issue. Although the Klamath Basin's oversubscription problem had been incubating for decades, Klamath was treated, like many other disputes, as a low grade fever until a triggering event demanded attention. As discussed below, Klamath also suffered from the absence of an effective forum to resolve basin-wide disputes due, in part, to the fragmentation of authority in the basin among federal, state and tribal organizations, as highlighted in the Oregon State analysis of the situation. With a strong triggering event, and the subsequent personal engagement of Secretaries Norton and Veneman, the stage is set for addressing the long-standing conflict in Klamath, so long as the other necessary ingredients for success which are identified in this paper come into play.

D. Close Federal/State Partnership

A consistent theme of successful resolution of major water rights conflicts is a close federal/state partnership. Even in matters in which the federal government arguably is the major player due to its legal authority and budgetary commitment, active state support and involvement typically is needed to bring a solution across the finish line.

The Bay Delta and the Everglades again prove the point in dramatic fashion. In both cases, the full authority of state government supported these major new water and environmental initiatives. Both states contributed expert help, significant state funding, and strong political support. Indeed, without strong state support, including the arm-twisting of interested parties, neither initiative would have succeeded.

The same principle applies, in a less dramatic fashion, in the other disputes reviewed above. On the Colorado River, strong state involvement by California and the other basin states was a key ingredient in enabling the Secretary of Interior to develop a plan to address California's over-reliance on Colorado River water. Although the Secretary is the "water master," as a practical matter he or she must work in close cooperation with state officials in order to achieve consensus solutions. That is the history of problem-solving on the Colorado, and it serves as a model for disputes elsewhere.

In the Columbia Basin, a close federal/state partnership has not been evident, and the salmon conflicts arguably remain poorly addressed as a result. In the Columbia, state officials have tended to call for state-led solutions, as exhibited by the passage of the state-oriented Northwest Power Planning and Conservation Act and, more recently, by the efforts of the four governors in the region to meet periodically and develop their own solution. At the same time, the fragmented federal agencies gathered in the federal caucus and attempted to address their own competing interests and regulatory responsibilities. In defense of both the state and federal efforts, the complexity of the issues and the number of actors involved presented a nearly impossible challenge to

overcome, but the fact remains that the failure to forge a strong federal/state partnership has been a continuing barrier to success in the region.

E. Strong Science/Funding

Virtually all of the successful efforts to solve major water disputes have included a heavy dose of science. Indeed, looking across the high-profile disputes that have dominated a number of watersheds in recent years, the role of science has become more and more important in helping to resolve (or, in a few cases, confound) water conflicts.

Tens of millions of dollars have been devoted to long-term science efforts in the Bay Delta, the Everglades, the Columbia, the Colorado (in connection with the Upper Colorado species recovery effort, and the Glen Canyon dam study effort) and the Trinity. In all of these cases, science has helped to frame the issues involved and has provided the foundation for restoration plans. In most of these cases, formal science input has been solicited and received, with extensive use of outside scientific resources and peer review. The science has been woven into stakeholder group reviews (as discussed below), and made available for public review and comment, typically through the operation of the National Environmental Policy Act (via Environmental Impact Statements), and/or in the issuance of targeted reports.

It is difficult to understate the importance of science in helping to resolve the new generation of major water conflicts that are arising out of concerns that traditional management practices are damaging water quality and ecosystem health. Scientific evaluations of how much water needs to be available, and under what conditions, to address ecosystem needs typically are central to resolving the conflict. Creative, practical solutions are needed, and scientists often are in the best position to test the potential viability of alternative approaches.

The contrast between the science effort in the Trinity River basin, and the Klamath, highlights the importance of having strong, open science to support watershed decisionmaking. In the case of the Trinity, a twenty year-long science effort, led by the well-respected United States Geological Survey, the Bureau of Reclamation and Fish & Wildlife Service, established a strong scientific base for long-term river restoration decisionmaking. The science effort on the Trinity was well-funded, open, and participatory.

In contrast, the Klamath Basin historically has not attracted significant scientific funding, and when a triggering crisis hit, the scientific groundwork for solving the water conflict had not been laid. The potential role of groundwater supplies in the basin had not been carefully evaluated, and the science behind the Biological Opinions issues by NMFS and FWS had largely been developed by the agencies themselves, under the constraints of the agencies' tightly-funded, regulatory programs. Now, with the

involvement of the National Research Council, additional scientific resources are being brought to bear, in the hope that the basin can benefit from the same type of scientific analysis that has helped define solutions for the Bay Delta, the Everglades, the Grand Canyon, and the Trinity River, among others.

The role of science in solving disputes is tied directly with the need for adequate funding to address difficult water conflicts. As with the other factors identified in this paper, money is a consistent ingredient for – and often an indicator of – success. Big problems often need big solutions and such solutions typically are expensive. The \$8 billion dollar scope of both the Bay Delta and the Everglades restoration effort is breathtaking. To help put it into context, the entire budget for the original, nationwide Superfund cleanup program was \$8.5 billion dollars.

Just as funding has been a key ingredient in the Bay Delta and Everglades matters, long-term, significant federal investments also have been made in all aspects of the Colorado River disputes, in the Columbia/Snake basin (as illustrated by the \$400 million in annual investments by the Bonneville Power Authority), and in the Trinity River. In each case, funds have been used to support scientific evaluation, to fund specific restoration pilot projects and, later, to implement more broad-based restoration programs, and to support federal, state, tribal, and local participation in the complex, participatory processes needed to generate solution paths in these difficult disputes.

F. Meaningful Stakeholder Involvement

One of the most remarkable, consistent themes of successful conflict resolution efforts in high-profile water disputes is the development and use of meaningful stakeholder forums to scope issues, air complaints, work through problems, identify and test solutions and, ultimately, to develop the range of constituencies needed to support new watershed approaches. The major water disputes discussed in this paper provide excellent examples of “lessons learned” when it comes to stakeholder involvement.¹

In the case of the Bay Delta and the Everglades, for example, ad hoc stakeholder groups later developed into more formal convening bodies that brought together the full range of interested parties, including federal, state and local decisionmakers, water user interests, environmentalists, tribal representatives, and representatives of the business community. Just as importantly, these stakeholders were brought together to solve a specific problem that needed to be addressed due to the presence of the other important ingredients discussed in this paper, including a strong triggering event, significant public interest, etc. As such, the effort was directed, and targeted; meetings were not held for

¹ There are many other good examples as well including, notably, the participatory stakeholder process in the Platte River Basin.

the sake of holding meetings. Decisions needed to be made. Important constituencies needed to be on board.

Less ambitious, but equally important, stakeholder groups have played a key role in addressing Glen Canyon Dam operational issues, the Upper Colorado restoration plan, and the Trinity River restoration effort. In all cases, formal groups have been put in place and are participating, on an on-going basis, in key decisionmaking in the watersheds.

The Columbia/Snake Basin provides an interesting contrast to the successful stakeholder efforts described above. In the Columbia, there has been no shortage of attempts to convene stakeholder groups. Indeed, as explained above, the landscape seems to be littered with stakeholder forums. Interested parties in the Pacific Northwest can spend years – even careers – attending meeting after meeting after meeting.

The missing ingredient in the Columbia watershed has been the close connection between stakeholder groups and actual decisionmaking in the basin. The decisionmaking undertaken by NMFS, Bonneville, the Corps and other key actors has proceeded largely through customary processes at the affected agencies. Input was received from the public, but the type of disciplined vetting of alternatives with closely-involved stakeholders, which characterized the Bay Delta, Everglades, and Colorado River efforts, has been missing. Indeed, the Columbia Basin may be suffering from too many stakeholder efforts, diluting the importance of the input and the linkage with actual decisionmaking.

Part of the Klamath's difficulties also stem from the absence of a meaningful stakeholder forum that brings together the geographically divided communities of interest in the basin. Until the triggering events of 2001 occurred, there was no obvious forum (such as the preparation of a programmatic Environmental Impact Statement or a focused science effort) around which a broad-based stakeholder group might coalesce. Also, the fragmented character of the basin – with an Oregon-led water rights adjudication proceeding alongside regulatory decisionmaking conducted separately by NMFS and FWS, and a largely self-contained Bureau of Reclamation annual decisionmaking process – pulled potential stakeholders into competing orbits of activity, and away from any centralized forum.

4. Conclusion

A new generation of water conflicts has been emerging in the United States and, with it, we are developing a new experience base for addressing and resolving difficult and complex water conflicts. This paper has reviewed major water disputes that have arisen in recent years in five major watersheds, and has analyzed common elements of conflict resolution success – and failure – in this difficult arena.

The results of this analysis are striking. Based on the experience base reviewed in this paper, one can predict the outcome of serious water conflicts that involve significant federal interests by examining the presence of six specific factors – a strong triggering event; significant public interest; personal attention by key leaders; close federal/state partnership; strong science and funding; and meaningful stakeholder involvement. If *any* of these elements are missing, it is rare that difficult water problems will be solved in any meaningful way. The attached chart illustrates the phenomenon.

The challenge for all of us who are interested in these issues is to push out the base of experience further, and share the results of these experiences, so that the observations made and tested in this paper can undergo additional evaluation and refinement – all for the purpose of enhancing our collective ability to find way to develop consensus-based solutions to difficult resource conflict issues.

