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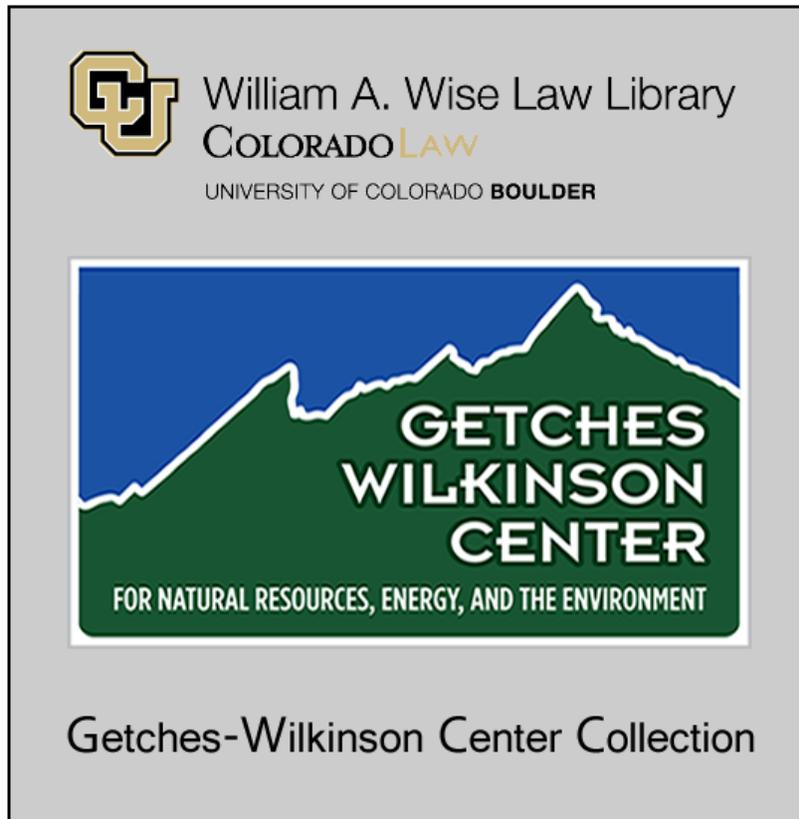


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**STRATEGIES TO FACILITATE CHANGES
IN WATER USE**

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**Two Decades of Water Law and Policy Reform: A Retrospective
and Agenda for the Future**

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I. WHO SEEKS CHANGES IN WATER USE?

Many different types of stakeholders pursue changes in water use. In the early years of water market development in the western United States, transactions were driven by growing urban demand for water. Over the past two decades, water transfers also have become a valuable tool for environmental protection and restoration. Environmental NGOs and public agencies with environmental responsibilities seek to reallocate water from consumptive uses to satisfy endangered species, water quality and other environmental water needs. Some environmental advocates embrace voluntary transfers as a means to encourage water conservation, to stretch scarce regional water resources and to replace the hostility induced by litigation and forced administrative reallocations with more collaborative interactions.

Native American tribal governments also have an interest in water transfers (De Coteau, 2000). In some cases, they lease tribal water to others, and in other instances tribes seek water to fulfill on-reservation water needs as part of a negotiated settlement of tribal water claims. Recreation advocates urge water transfers to provide water for whitewater rafting, sport fisheries and other recreation uses. Municipalities have engineered many different types of water transfers over the past several decades, as they have sought to supply new residential and commercial customers and to drought-proof their supplies. Large-scale industrial users, such as power plants, mines, breweries and microchip plants actively buy, sell and lease water as their water needs change. (See Saliba and Bush, Anderson and Snyder, and the Water Strategist for examples of specific transactions).

The agricultural sector is central to water reallocation discussions for two reasons. Agriculture remains the primary consumptive use of water in most of the West and thus is the sector others look to, in order to acquire water. In addition, there is enormous diversity in western U.S. agriculture. Farmers in many regions grow irrigated pasture using water that costs them only \$5 per acre-foot (af). Southern California avocado growers earn profits even while paying \$600/af for water. Differences in the economic value of water across different types of crops, particularly during dry years, lead to frequent water transfers between irrigated farms throughout the West.

Another force behind changes in water use is the growing recognition that the ability to transfer water generates regional economic benefits by making water available for higher value uses. Water transfers also are more cost effective than developing new water supplies, and generally more environmentally acceptable than new water development.

II. WHO IS CONCERNED ABOUT CHANGES IN WATER USE?

Agriculturally-linked rural communities and local governments (such as irrigation districts and counties) often respond to proposed water transfers out of agriculture with suspicion and alarm. They are concerned that movement of water away from local agricultural uses will undermine the local economy by reducing business activity and property values. The specter of Owen's Valley persists over the decades (Reisner, 1986).

Water transfers out of agriculture have *both* positive and negative impacts. Negative impacts on agriculturally-based communities receive the most attention, but transfers can generate numerous positive third party effects as well.¹ Possible negative third party economic impacts from transfers of water out of agriculture include:

- 1) reduced profits for "backward-linked" businesses, those that sell inputs and services to farmers,
- 2) reduced profits for "forward-linked" businesses, those that purchase crops for their own use or for processing (feedlots, cotton gins) and now must turn to more distant supplies
- 3) reduced profits for general businesses in the area that sell goods and services to households (assuming that water sellers exit the area, reducing the number of households),
- 4) reduced jobs in all of the types of businesses referred to above,
- 5) reduced property values associated with a decline in businesses activity,
- 6) reduced tax revenues collected by state and local governments on business sales and property values.

The negative impacts described above assume that revenues earned from water sales are not reinvested in farm operations or in other businesses in the study region. If farm households that sell water remain in the area and spend most of their revenues from water sales in the area (on farm operations and other types of purchases), then overall business activity and jobs in the region may increase instead of decreasing.²

Positive third party impacts generated by water transfers out of agriculture to urban and environmental uses may include:

- 1) increased economic activity in the sectors acquiring water. In the case of transfers to environmental purposes, there may be increased recreation expenditures in businesses that supply goods and services to hunters, anglers, bird watchers and other visitors drawn to the area by improved environmental conditions,
- 2) increased property values associated with new economic activities,
- 3) increased tax revenues collected by state and local governments on property values and sales,
- 4) increased recreation benefits to local residents associated with improved streams, wetlands and wildlife habitat.

Due to the wide variation in the local economic consequences of water transfers out of agriculture, each case must be examined on its own merits. A number of economic studies have examined actual transfers and have modeled the effects of proposed transactions. Studies of transfers out of agriculture find that local economic impacts are small relative to the amount of irrigated land that is fallowed, even when the water is moved to a new use away from the area of

origin (Nunn and Checchio, 1988, Weber, 1990, Howe, 1990, Coppock et al, 1994). The consistent findings of relatively small impacts are due to several factors. Farmers follow their lowest value crops and their least productive acreage. A portion of water payments received by farmers generally is spent in the county from which the water is exported. Income from crop sales is a small portion of county income in nearly every rural county in the West. Rural county households rely more on income coming from off-farm employment and government payments than on income from crop sales. Water transfers stimulate off-farm jobs and income.

Even though water transfer impacts are small, they may be concentrated in a few types of businesses and in a few specific agriculturally-linked communities (Howe, 1990, 2000). There are several ways to address such concerns.

Market transactions can be structured in ways that help to minimize negative third party effects and maintain agricultural activity in rural areas. Making transfers contingent on drought conditions is one approach to preserving an agricultural base, as farming will occur as usual in normal years and farmers can be adequately compensated in dry years to allow them to remain in farming. Other approaches include paying for farm water conservation practices and transferring only the water conserved, and rotating acreage fallowed (and water lease payments) among landowners to maintain the baseline agricultural economy. Partial buyouts of the water used in farming can leave adequate water rights with the farmland to support gardens, horse pasture and a rural lifestyle, thus preserving property values.

The parties most disconcerted by proposed transfers generally are not those who have water to sell. Farmers and irrigation districts holding transferable water rights will look after their own interests when negotiating a water transfer, but there may be no forum for rural residents, local governments and affected local businesses to have a “voice” in the process. Some states have enacted legislation to give local governments a role in reviewing and approving proposed transfers of water out of their jurisdiction (National Research Council, 1992). In response to area-of-origin concerns, Oregon, Kansas, Nevada and Texas have each enacted additional procedural requirements for transfers and/or appropriations that would move water across basins or over long distances (Getches, 2000). States can protect rural county tax base by requiring in lieu tax payments by public landowners – when agricultural land is acquired by a municipality. States also can legislate the basis on which “water ranches” will be assessed (as a utility, or as agricultural land) for property taxation purposes. Some states attempt to regulate the nuisance effects of retired farmland by requiring control of dust, weeds and insects. Arizona tumbleweed control legislation was passed in 1986, after the media published photos of a rancher unable to use his front door due to tumbleweeds piled up from retired farmland, bought by a city for water supply purposes (Saliba and Bush). Colorado requires revegetation of farmland fallowed as part of a water acquisition (Getches, 2000).

In general, economic impacts of changes in water use on the area of origin can be addressed through specific legislation and through structuring water transfers to minimize impacts. However, underneath concerns over local economic impacts, lie more fundamental (and well-founded) concerns that water transfers signal a change in society’s priorities and values for farms, cities, fish and wetlands. This resistance to social change accounts for a large portion of

rural objections to changes in water use, objections which are not necessarily remedied by compensation schemes and restructuring transfers.

III. So How Many Different Ways Are There To Reallocate Water?

Several decades of experience with water transfers in the western United States demonstrate that the differing types of arrangements under which water is transferred from one use to another are limited only by the creativity of the parties involved.

Possibly the most fundamental distinction is between voluntary and involuntary arrangements. Voluntary reallocations include purchasing and leasing water, incentive pricing, and technical and financial assistance to promote water conservation and free up water for other uses. Compulsory mechanisms follow the three branches of government: court orders, administrative actions and legislative mandates. Examples include litigation and administrative actions to alter water diversions and change upstream dam releases, as well as legislation mandating improved water conservation practices. While there are important distinctions between voluntary and compulsory approaches, the two approaches complement one another in achieving changes in water use.

Voluntary Changes in Use

The western United States provides many examples of voluntary water transactions. The motivating force behind voluntary transfers is the perception that economic gains may be captured by transferring water to a new use in which it generates higher net returns than under existing use patterns. Differing economic benefits per acre foot may be due to differing crops within an agricultural district, differing economic values for water across the agricultural, municipal, industrial and environmental sectors, and differing willingness to bear risk of water supply shortages. Necessity is still the mother of invention and crises (long-term drought, prolonged litigation, contamination of a water source) still are the number one impetus for water transfers. One need only look at changes in California in the 1980s and 1990s to observe the water transfers innovations inspired by a several years of serious drought (National Research Council, 1992, Water Strategist, 1990s).

Three conditions must be satisfied for a buyer and seller to consummate a water transaction:

- 1) The seller must receive a price offer that equals or exceeds the economic benefits sacrificed in transferring water. An irrigator, for instance, must consider the net returns to water in irrigation, any decreases in the value of land due to reduced water availability and expected appreciation in the value of the water right over time.
2. The buyer must expect the benefits (including environmental benefits) from the water right purchase to exceed the costs.
3. The buyer must view market acquisition of water as an economically attractive method of obtaining water, relative to other possibilities—such as litigation to change water allocation or new supply development.

While there are a few well-developed and active markets in the western U.S., water transactions generally are sporadic and complex. Water markets deviate from markets for land and other real property in their “competitiveness.” Water markets in the western U.S. typically are “thin,” meaning there are only one or two major water buyers in a region, or there may be only a few potential sellers. It is not unusual for a water market to involve the one large city in an area as a buyer and a few farmers or a single irrigation district as potential sellers. In some areas, a water right acquisition may only occur every few years, while in active markets there may be a dozen transactions a month. In addition to negotiations between the buyer and seller, affected third parties may be part of the negotiations, and various forms of regulatory approval are required for many types of transfers (MacDonnell, 1990).

Market acquisitions for urban growth began in the 1960s, and water acquisitions for environmental objectives became more common in the 1990s. The private sector, federal, state and local government agencies and non-profit environmental organizations all have acquired water for environmental restoration. For instance, private fishing clubs in Colorado have bought canal company stock from irrigators to maintain lake and stream levels for trout. The Montana Department of Fish, Wildlife and Parks has negotiated water leases in several river basins to maintain stream flows for wildlife and recreation. However, there is much that could be done to further public acquisitions for environmental purposes. For instance, Arizona’s Heritage Fund and Water Protection Fund each have acquired environmentally valuable land, but are specifically prohibited from leasing or purchasing water rights.³

Transfers vary in the duration of the change in use (from a permanent transfer to a seasonal lease to a “dry year only” option). There also are many different structures that can be used to establish price and facilitate negotiations between potential sellers and those seeking to acquire water.

Negotiated Purchases

Transactions negotiated on a case-by case basis are the typical way in which prices are established and water transfers arranged. Prices emerging from bargaining between potential buyers/lessors and sellers/lessees will reflect the value of water to the parties involved and the overall demand and supply conditions in the basin. This is an advantage compared to prices set administratively, such as with standing offers. When multiple transactions involving similar types of water occur, a going price is established and this signals the value of water to water users, encouraging water conservation and transfer of water to higher valued uses. With case-by-case negotiations, the parties can tailor the transfer to meet their specific needs as to timing of payments and schedule for new water use to phase in. A potential disadvantage of negotiated transactions is the transactions costs incurred in negotiating the terms of exchange. There also is a tendency for negotiated prices to cluster around a norm established in past transactions, even when water values have changed (Colby, 1991). When this occurs, prices do not provide the desirable function of signaling changes in value.

Auctions

Auctions have been used to allocate water supplies among potential water buyers, with recent examples in Victoria, Australia and in Texas (See Simon and Anderson, 1990, and the Water Strategist, 1997). Auctions have a number of advantages. They are public and transparent, qualities desirable when allocating water from public projects. If eligibility to participate allows, environmental organizations and agencies seeking water for environmental restoration can acquire water through auctions. Auctions rely on the forces of supply and demand to produce prices that reflect current market conditions and that respond to changing conditions. Auctions do not require an administrator to set a price for water. Instead, the price emerges in the auction process and reflects the participants' knowledge of the basin and of the value they and others place on water in alternative uses. Variations in water right attributes, such as seniority and location, are considered by bidders in the auction setting and reflected in price.

Disadvantages of auctions can include lack of familiarity with auctions by potential water buyers and sellers, and the need to carefully design and describe the auction process so the rules and procedures are clear and so that collusion among participants to influence prices is thwarted. Features which need to be specified in designing an auction process include: minimum and maximum amounts of water that can be offered for exchange, minimum and maximum acceptable prices per unit of water, bidding procedures, necessary documentation to be provided by sellers on the rights offered, qualifications of bidders (such as financial ability and location of intended water uses), and procedures for determining the winning bid and resolving disputes arising in the auction process.

Standing Offers

Standing offers are a widely used mechanism for soliciting water supplies by public entities. For example, the City of Albuquerque maintained a standing offer of about \$1,000 per acre foot for senior irrigation rights and gradually acquired supplies for urban growth in this manner over much of the 1980s. A standing offer involves publicizing a fixed offer price for water rights with specific characteristics that meet the buyers needs. Standing offers have the advantage of simplicity and minimum transaction costs, as there is no negotiating over price and potential sellers merely need to decide whether the posted price is adequate to induce them to sell. The key disadvantage of standing offers lies in correctly setting the offer price and specifying which types of water rights will be accepted for acquisition. If the offer price is set too low, this will become apparent as few takers will come forward and the price will need to be adjusted upward and re-advertised. If the price is set too high, more offers to sell will be received than are needed and the purchaser will have to determine which water rights to acquire and which to reject, and will be paying more than was necessary to acquire the quantity needed. The fixed price will only approach the true economic value of water in a region through a trial and error process of adjusting the price.

The complexities of a standing offer approach are illustrated by the California Drought Emergency Water Bank in 1991-92. In 1991, the Bank offered \$125 per acre-foot to willing agricultural lessors and quickly acquired 820,000 acre-feet. However, end users only wanted 655,00 acre feet at the price they had to pay and so the bank and its buyer of last resort (the State Water Project) were left with a substantial amount of unwanted and relatively expensive water.

On the positive side, the bank rapidly acquired water for drought needs from a pool of previously unidentified sellers and coordinated delivery of water to end users, though it did not accomplish this at least cost due to the high price offered. The following year the bank offered farmers just \$50 per acre foot and acquired 154,000 acre feet, all of which was passed on to end users (Coppock, Gray). A standing offer approach is inflexible over the short run, as it is politically and logistically burdensome to vary the offer price many times over the course of a year. However, the price can be varied from year to year, reflecting new knowledge of water supply and demand.

Water Banks

Water banks can serve many important water management objectives. A water bank is an institutional arrangement for storing water to be used at future periods and to facilitate trade and negotiations among those contributing water to the bank and those seeking to use banked water. When water banks can standardize the units of water to be traded and the trading procedures, they reduce transactions costs because the multiple participants need not independently locate trading partners and develop contracts, pricing and other terms of trade.

Water banks can use reservoir storage capacity, or can store water in aquifers. Reservoir storage entails devising acceptable arrangements with reservoir operators and others who use water stored in the reservoir. Potential conflicts involve determining “whose” water is spilled when flood release spills are necessary and “whose” water remains when stored water is low during drought. Underground storage also can be complex. Will water be recovered at the same site where it was recharged to the aquifer? Are there local impacts on nearby landowners from aquifer storage and recovery? Does the water migrate to another part of the aquifer? What are the risks of contamination?

The opportunity to trade arises when some right holders have reliable senior rights and other water users seek more reliability for their own water supplies. Some parties may wish to make a one-time transaction to sell water, others a long- or short-term lease and still others a dry-year contingency arrangement, and similarly for buyers/lessees. A water bank can help match buyers and sellers based on their preferences. The bank’s supply of water is an aggregation of the various types of water made available by sellers/lessors. This water is then packaged in ways that meet the timing and reliability objectives of buyers.

The Metropolitan Water District of Southern California (MWD) has negotiated underground water banking arrangements with agricultural districts in which some of MWD’s surface water supplies are delivered to and used by agricultural areas during years of plentiful supply. The groundwater not pumped by the irrigators during those years is then considered MWD’s stored water, available to them during years of low surface water supply (Water Strategist). Water banks have operated Idaho’s Snake River Basin for several years (MacDonnell et al, 1994).

The state of Arizona created the Arizona Water Bank in 1996 in order to promote direct use and groundwater storage of Colorado River water, imported into central Arizona via the Central Arizona Project. Surface water is banked in adequate water supply years, so that it can serve as a supply buffer in drought years. The bank seeks to drought proof central Arizona cities and agriculture, and also provides for California and Nevada to store excess water in Arizona

aquifers. Water banked in Arizona by these states can be credited against excess surface water use in other years (Getches, 2000).

Contingent Transfers For Drought Protection

Dry year options and conditional lease-backs, negotiated in anticipation of drought, are two ways to ensure that water quickly can be transferred during drought. The difference between these two approaches is the ownership of water. Under a *dry year option*, ownership of the water right remains with the original water user. The new water user, a municipal water provider or a state agency, enters into an agreement with an irrigator allowing them to use water under specific conditions. For water users who need highly reliable supplies, this type of arrangement provides a back-up source of water for dry years.

Though promising, dry year options can be difficult to negotiate with farmers who desire certainty when planning their farming operations. The following example illustrates this point. In 1987, MWD attempted to negotiate a dry year option with the Palo Verde Irrigation District (PVID). Under the proposed arrangement, MWD offered Palo Verde farmers a payment up front at the time they register acreage in the dry year option from irrigation and additional payments during years the option would be exercised. MWD expected to call that acreage into retirement once about every seven years in order to firm up municipal supplies. Farmers rejected the proposal for a number of reasons, including its effect on their ability to make long-range farming plans. Under such arrangements, farmers face substantial uncertainty in planning their crop rotations, their marketing strategies, equipment leases, and purchases of inputs.

A number of other issues need to be addressed when dry-year options are considered. One of these involves defining the conditions under which the option will be exercised. Reservoir and stream flow levels can be specified as a basis for activating the option. Additionally, it is necessary to ensure that farmers be compensated for lost crop revenues when the option is exercised, for disruption of farm planning and land use patterns and for any production and marketing expenses incurred prior to being notified that land would be dried up for that season. The terms and timing for notification are important issues to irrigators. In the early 1990s, MWD and PVID finally reached an agreement to help firm up MWD supplies during dry years (Water Strategist, 1992).

Under *conditional lease-backs*, land and water are purchased by the entity desiring long-term control of the water, most often a municipality or an industry, and are leased back to the farmer so that farming can continue except when the water is needed to replace drought short falls. The new water right holder could be a state agency, and the lease-back conditioned on the need for water to support instream flows during dry years. Conditional lease-backs are attractive to growing cities because they assure a supply of water that can be reserved either during droughts or for water demand generated by new growth. Land and water acquisitions by the City of Mesa, Arizona provide an example of this type of arrangement (Saliba and Bush).

Other Tools To Encourage Voluntary Transfers

Technical assistance and cost sharing are tools to induce voluntary changes in water use; tools long used by federal agencies to encourage use of improved management practices by

farmers and ranchers. The United States Department of Agriculture and the Bureau of Reclamation have ongoing programs that encourage water conservation and the adoption of management practices to reduce soil and agricultural chemical runoff into waterways. Given the federal government's lengthy experience with providing money to farmers, the time seems ripe to rework federal farm programs in order to specifically encourage beneficial water transfers out of agriculture.

Resource pricing is another tool to motivate change in water use patterns. Some urban water providers reward conservation and penalize excessive use through incentive pricing in their water rate structures (National Research Council, 1992). Western United States agriculture, on the other hand, generally enjoys very low water costs and has little price incentive for water conservation (Anderson and Snyder, 1997).

Compulsory Changes in Water Use

Among compulsory mechanisms, litigation represents a primary tactic for reallocating water. Court-rulings in favor of environmental concerns not only address the litigated dispute, but also set important precedents. Examples include the 1983 decision in *National Audubon Society v. Superior Court* that propelled restoration of Mono Lake in California, the 1989 Ninth Circuit ruling to reallocate Stampede Reservoir on the Truckee River system from urban supply to fish restoration, and the 1993 court ruling that has forced Texas groundwater management to protect endangered species that inhabit springs fed by the Edwards Underground Aquifer in the San Antonio area.⁴ Environmental advocates file suit based on public laws to protect listed species and water quality, against government agencies (to spur them to fulfill their legal mandates) and against irrigation districts, logging corporations, cities, and developers (to enjoin their activities).⁵

Administrative actions also reallocate water. In 1991, the United States Secretary of Interior ordered the operations of Glen Canyon Dam to be modified on an interim basis (while studies of dam impacts were ongoing) to minimize downstream impacts of dam operations on listed species, cultural sites and recreation (National Research Council, 1996). In another example of administrative action, the Environmental Protection Agency vetoed a permit needed to construct Two Forks Dam to supply water for Colorado's rapidly growing Front Range.⁶

Legislatures reallocate water. For instance, the Central Valley Improvement Act, passed by Congress in 1992, substantially alters water allocation in California in one of the largest federal water projects in the United States (Public Law 102-575 1992). In 1997, Congress made the interim changes in the Glen Canyon Dam operation permanent through the Grand Canyon Protection Act.

Both compulsory and voluntary mechanisms are commonly used to reallocate water in the western United States. Compulsory and voluntary mechanisms each have their advantages and weaknesses and can complement one another. One of the key observations among researchers analyzing water conflicts is the interplay between compulsory and voluntary strategies to move water from one use to another (Kenney and Lord, 1999, Colby, 1998).

A market transaction and litigation may appear to be opposite tactics. The market approach accepts existing property rights without argument and fully compensates owners who sell or lease their land and water. Litigation forces changes in land and water management and may constrain property rights, or redefine rights altogether. On closer inspection, however, the distinctions begin to blur. Like court rulings, market transactions can generate heated reactions. This occurs when the transaction negatively affects third parties, even though the buyer and seller have reached a mutually acceptable arrangement (National Research Council, 1992). "Voluntary" agreements often are entered into under the threat of looming financial crisis, litigation or regulatory change, and so may not be purely voluntary (National Research Council, 1992).

In many reallocation efforts, two or more mechanisms are used to effect changes in resource use and management (See, for instance, the Pyramid Lake case as described in National Research Council, 1992, p. 119-136). Current efforts on California's San Joaquin River illustrate the complementarity across approaches. The San Joaquin River flowed unimpeded from the mountains to the Sacramento-San Joaquin Delta until the closing of Friant Dam in the mid-1940s. Since then, irrigation diversions in the San Joaquin Valley have created a dry stretch of nearly twenty miles along the river's course (Water Education Foundation). Fifteen environmental groups, headed by the Natural Resources Defense Council, sued the Bureau of Reclamation and irrigation districts for violations of the state Fish and Game Code and resulting damage to the riparian ecosystem and to fish populations (Natural Resources Defense Council v. Houston, 1998). The 9th U.S. Circuit Court of Appeals found for the plaintiffs on major issues and voided agricultural water district contracts with the U.S. Bureau of Reclamation for Friant Dam water. In response, the parties are engaged in pilot restoration projects, such as operating Friant Dam to mimic the pre-dam hydrograph. The restoration project has changed water release patterns to benefit the riverine habitat but has not decreased the net supply of water for FWUA, due to water exchanges negotiated with water users in other parts of the San Joaquin Valley. Several million dollars have been made available to purchase replacement water for irrigators (Water Education Foundation).

Without the threat of litigation, voluntary agreements in which resource users willingly alter their customary uses of water to accommodate other water needs are difficult to achieve. (See, for instance, the cases documented in d'Estrée and Colby, 2000; Kenney and Lord, 1999; Checchio and Colby, 1992; and, National Research Council, 1992). Compulsory mechanisms provide the impetus for negotiated agreements and voluntary transactions.

Multi-party negotiated agreements have become a preferred tool for resolving conflicts over water. Public officials at the federal and state level actively encourage the use of professional mediators and alternative dispute resolution⁷. Numerous multi-party negotiations involving changes in water use are ongoing around the West⁸.

For negotiated water transfers to become an effective tool to move water to environmental uses, two types of action are needed. First, some organization has to take the lead in designing and implementing innovative water purchases or leases that are tailored to the needs of a specific case. Examples include agreements that tie dam releases to seasonal fish-runs, or dry-year water contracts under which irrigation diversions can be curtailed when stream-flow levels fall below

habitat requirements (Western Water Policy Review Advisory Committee). Second, laws and policies need to be revamped to make it easier to implement voluntary agreements and transactions. For instance, in the 1980s most western states did not have mechanisms to acquire water rights and change their purpose and place of use to maintain instream flows. Environmental advocates persisted in their early efforts to transfer water rights in order to restore streams, and most western states have created procedures to dedicate water to instream needs (Anderson and Snyder). Policies ripe for updating today include those governing the uses of public project water, water pricing, re-licensing of dams and operating criteria for public dams.

IV. Policy Changes: What Remains To Be Done?

There is a long legacy of policymaking regarding water transfers by western states and by the federal government. (See Driver, 1986, Mac Donnell, 1990, National Research Council, 1992, Reisner and Bates, 1990, Wahl, 1989 and Willey and Graff, 1994 for an overview of policies in the 1970s, 1980s and early 1990s). Western state policies are characterized by a vacillation between opening up water markets and encouraging transactions on the one hand, and imposing new restrictions and procedural requirements on changes in water use, on the other hand. This is not surprising as state agencies and elected officials struggle to balance the water desires of the New West (lushly landscaped and rapidly growing cities, abundant water-based recreation and restoration of species and their habitats) with agricultural and rural consternation over the fading of the Old West and its customary water use patterns. Getches observes that most state policy changes of the 1990s served to restrict water transfers and few changes were promulgated to open up and broaden water market activity.

While water has been moved to new municipal, industrial, recreational and environmental uses in a dizzying array of arrangements over the past twenty years, there is still much that could be done. The following is a list of areas for policy reform to facilitate beneficial transfers of water, on a temporary or permanent basis (*to be elaborated in presentation*):

Restructuring municipal water rates and water prices paid by irrigated agriculture

Continuing to refine the conditions under which western states define water as “conserved” and available for transfer to other uses

Revising state and federal policies so that those seeking water for instream flows, wetlands and species recovery can compete on the same basis as those seeking water for urban growth (Neumann, 2000, Getches, 2000)

Integrating water quality into the policies that govern changes in water use – both as a valid reason to transfer water, and as a criteria for evaluating proposed transfers

Modernizing federal and state policies to effectively recognize the interconnections between surface water and groundwater, and to account for these linkages in evaluating proposed water transfers

Establishing basin-wide, interstate water transfer mechanisms as a way to respond to basin-wide challenges such as drought, restoring species and their habitat and improving water quality. (See Weatherford, 2000)

Using common sense economics (Do the benefits justify the costs? Is water priced to reflect its value?) as the litmus test for Corps of Engineers, Department of Agriculture and Bureau of Reclamation water-related activities

Developing inter-jurisdictional arrangements that bring tribal governments more fully into water transfer negotiations and regional water management

Harnessing the formidable resources and experience of the federal farm programs to accomplish on-farm water conservation, water quality improvements, and river and wetland restoration

Designing innovative and cost-effective compensation schemes for area-of-origin interests affected by proposed transfers

V. The Academy Awards for Water Reallocations, 1970-2000

A. Criteria – What Characterizes a “Winning” Reallocation?

In order to identify a few outstanding examples of changes in water use, criteria are needed. The criteria below have been adapted from a larger framework for evaluating different strategies to resolve environmental disputes (D’Estree and Colby). Only a subset of those criteria are discussed here, as adapted to evaluate water transfers.

Positive Net Benefits. This criterion asks whether the water reallocation creates positive net benefits (“net benefits” are benefits minus costs) that would not have been available otherwise⁹. Trades among the negotiating parties are the basis for producing net gains – trades of water for money, or sharing of drought risk in return for expanded water use in wet years. Net benefits also may arise from avoiding the costs of prolonged litigation, from improved water quality, and from better sharing of information and technology. Voluntary, negotiated agreements nearly always provide improvements for those who sign on, compared to their BATNAs. (Best Alternative to a Negotiated Agreement, see Fisher, Ury, and Patton) Otherwise, stakeholders would decline to bind themselves to the water transfer agreement.

Net benefits may be lower (or negative) under court ordered changes in water use because courts need not consider costs as an element in crafting their ruling and are focused, instead, on rights and on consistency with the law. Legislative water reallocations, administrative actions, and negotiated water transfers are more likely to carefully weigh costs because of a political desire to limit financial burdens on taxpayers and property owners, and/or because those parties negotiating the agreement will be bearing some of the costs themselves.

A thorough evaluation of a proposed transfer should consider not only benefits and costs to the direct participants (the litigants and negotiants), but also benefits and costs to public

agencies, taxpayers and more dispersed interests who may not have been direct parties – such as water utility ratepayers, recreationists, and property owners in the affected region.

The next criterion, *fair distribution of costs among parties*, is problematic because perceptions of fairness vary. Nevertheless, fairness appears consistently on lists of desirable characteristics for water transfers. Ideally, those undertaking a water transfer first will identify the most cost-effective plan to accomplish their water reallocation objectives (ie., provide 10,000 af for fish recovery or improve city drought supplies by twenty percent). Then, they can use cost sharing principles and compensation packages to even out discrepancies between parties who gain from the transfer and those who face losses. There are many possible cost-sharing principles. One principle, for instance, is sharing costs in proportion to the benefits received from the change in water use (“beneficiaries pay”). Another possible principle is sharing costs in proportion to past damages to the ecosystem (“biggest water users pay”), or bearing costs proportional to one’s financial assets (“deep pockets pay”). There may be opportunities to assess dispersed interests (who may not be direct parties to a water transfer agreement) for some costs – recreationists, for instance, who will benefit from river restoration and could pay higher access fees.

A “winning” water transfer may represent a *paradigm shift*. From an economic perspective, paradigm shifts are desirable because they break up outdated ways of managing water that fail to reflect modern social values. One of the essential elements in a paradigm-shifting event is that it changes the bargaining power among stakeholders. For instance, a court ruling favoring instream water use puts environmental advocates in a stronger bargaining position for all future negotiations. An administrative decision protecting stream flows gives river advocates a stronger voice in subsequent disputes over water management. Court-rulings in favor of dedicating water to environmental uses not only address the litigated dispute, but also set important precedents. Examples include the 1983 decision in *National Audubon Society v. Superior Court* that propelled restoration of Mono Lake in California, the 1989 Ninth Circuit ruling to reallocate Stampede Reservoir on the Truckee River system from urban supply to fish restoration, and the 1993 court ruling that forced Texas water users to provide water for endangered species that inhabit springs fed by the Edwards Underground Aquifer in the San Antonio area (*Pyramid Lake Tribe of Indians v. U.S. Dept. of Navy, National Audubon Society v. Superior Court, Sierra Club v Lujan*).

Administrative actions stimulate paradigm shifts. The Environmental Protection Agency’s veto of a permit needed to construct Two Forks Dam to supply water for Colorado’s rapidly growing Front Range signaled a paradigm shift in western water management, especially as urban interests had spent over 40 million dollars and eight years preparing to build the dam. Legislation also generates paradigm shifts. The Central Valley Improvement Act, passed by Congress in 1992, substantially alters water allocation in California in one of the largest federal water projects in the United States (Public Law 102-575 1992).

Voluntary water transactions can be paradigm shifters when the transaction is the first of its kind in a region -- the first purchase and transfer of a senior water right to instream flow maintenance, for instance. Innovative transactions can pave the way for more widespread use of the market to accomplish changes in water use by forcing policy makers to clarify how

traditional water right transfer processes will be applied to a new purpose, such as river restoration.

Enhanced Social Capital is another criterion for “winning” water transfers. Social capital encompasses improved problem-solving capacity, mutual obligations and expectations of others behavior. Social capital affects economic and political transactions by altering the terms of agreements reached, and the costs of achieving those agreements and monitoring and enforcing their implementation. Enhancing social capital can reduce transaction costs (such as attorneys’ fees) and improve the productivity of other inputs (such as time spent in negotiations) (North, 1990, Wilson, 2000.)

Trust and reputation (elements of social capital) are important factors in bargaining situations (Casson, Wilson). Enhanced trust can lead to easier, lower cost problem-solving. The stakeholders engaged in managing watersheds often must address multiple resource problems over a period of years. For instance, the dilemma this year may be over providing water instream for endangered fish recovery, but in the next few years the same stakeholders may confront a drought or a water quality problem. Consequently, their ability to build trust and work together effectively can be an important asset. Negotiated water transactions provide clear advantages over litigation because stakeholders become engaged in identifying strategies to accomplish changes in water use and building consensus for a particular approach. The bargaining process gives the stakeholders experience in working together and this can make it easier to solve the next water problem that faces the region. In contrast, litigation encourages an adversarial approach among the parties rather than a problem-solving stance.

B. Best water transfers: 1970-2000 (To be announced)

- accommodating urban growth
- addressing environmental needs
- addressing area-of origin concerns
- attempting to defuse a conflict
- best paradigm shifters
- best for taxpayers
- most innovative
- best transfers that remain to be accomplished

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Endnotes

¹ *Negative economic impacts* from transfers include lost farm profits from reduced irrigated acreage. However, this is not a "third party" impact, since the seller must receive enough revenue from a voluntary transaction in order to willingly give up these farm profits.

² The magnitude of possible negative local economic impacts depends on whether the water reallocation:

- 1) reduces irrigated acreage. (Farmers may be able to continue to irrigate the same acreage by using water more efficiently.)
- 2) reduces farm revenues from crop sales. (Even if irrigated acreage declines, crop revenues may not decline due to increased yields on remaining lands, or a switch to higher value crops.)
- 3) decreases farm household income. (Even if crop revenues decline, voluntary transactions bring water payments to the farm household. Also, many farm households rely more heavily on off-farm income and on government payments than they do on crop sales.)
- 4) decreases spending in the local economy (Farmers selling and leasing water may invest in new irrigation technology and other farm improvements, or in off-farm activities in the local area. Moreover, the water may be used by other sectors in the local area, stimulating off-farm jobs and economic activity.)

³ The Heritage Fund was established by Arizona voters through a 1990 ballot initiative. The fund sets aside \$20 million annually from state lottery funds for wildlife and recreational uses. Funds have been used to acquire land for habitat. The Arizona Water Protection Fund was established by the state legislature in 1994 to provide monies to maintain, enhance and restore rivers and riparian areas. Its funding level varies, and was cut substantially by the legislature in 2001.

⁴ *National Audubon Society v. Superior Court*, 33 Cal.3d 419, 658 P. 2d 709, 731, 189 Cal Rptr. 39,368, cert. denied 464, U.S. 977 (1983); *Pyramid Lake Tribe of Indians v. U.S. Dept. of Navy*, 898 F.2d. 1410, 1420, (9th Cir. 1990), *Carson-Truckee Water Conservancy District v. Clark*, 741 F.2d, 257 (1984), cert. denied 105 S.Ct. 1842 (1985). *Sierra Club v. Lujan* 1993 WL 151353, 3 (W.D. Texas, 1993).

⁵ For examples of this type of litigation, see *National Audubon Society v. Superior Court*, 1983, 33 Cal 3d 419, 658. P. 2d709; *Sierra Club v. Lujan*, 1993 (previously cited).

⁶ U.S. Environmental Protection Agency, final determination vetoing Two Forks Dam, November 23, 1990; High Country News, Paonia, Colorado, Feb. 25, 1991, p. 3. The courts

recently upheld the EPA veto in a recent decision in *Alameda Water and Sanitation District v. Reilly*, 930F. Supp. 486 (D. Colorado, 1996).

⁷ President Clinton issued a memorandum in 1998 ordering formation of an interagency federal taskforce to facilitate agency use of alternative dispute resolution. Clinton, W.J. (May 1, 1998) Designation of Interagency Committees to Facilitate and Encourage Agency Uses of Alternate Means of Dispute Resolution and Negotiated Rule Making, *Memorandum for Heads of Executive Departments and Agencies*, (Washington D.C.: The White House). The Environmental Division of the United States Department of Justice encourages the use of alternative dispute resolution in cases for which this approach is likely to be productive. Also see Schiffer, L.J. and R. Juni, "Alternative Dispute Resolution in the Department of Justice," *Natural Resources and Environment* 11:11-12, 66, American Bar Association, Chicago 1996. The Western Governors adopted principles to encourage alternative dispute resolution. Western Governor's Association Principles for Environmental Management in the West. Resolution 98-001, February 24, 1998, Denver.

⁸ The Natural Resources Law Centers' *The Watershed Source Book*, University of Colorado School of Law, Boulder, 1996 provides dozens of examples of negotiations in the western U.S. (p. 12-50). Also see the report of the Western Water Policy Review Advisory Commission, p. 3-40 to 3-44.

⁹ This concept of weighing benefits and costs is central to the "mutual gains" negotiation framework described in *Getting To Yes* (Fisher, Ury, and Patton, 1991) and applied to environmental disputes in Susskind et al (2001) It is sometimes called "creating value" or converting zero sum negotiations to positive sum negotiations.