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A Bibliographic Pathfinder on Water Marketing

Western water management is in a state of transition. Robust economic, industrial and tourism development, urban population growth and changing attitudes about environmental water needs have created additional demands for water. There is simply not enough water available to satisfy this new thirst. The normal flows of most western rivers are fully allocated and groundwater resources in many areas are limited and unable supply water for these new needs. Based on increasing demand and limited supply, western water management is evolving from a supply development paradigm to one of demand management. Under a demand management plan water is reallocated from existing to new uses.

Water transfers are a common component of the demand management paradigm. Transfers, defined as a voluntary change in ownership, point of diversion, or place or purpose of use, can serve different purposes in water management, but fundamentally they involve the reallocation of existing supplies to new and often higher valued uses. Water marketing is a variation of a transfer.

The growing acceptance of water transfers and water marketing has been mirrored by a growth in the economic, legal and water planning literature. This bibliographic pathfinder is a research guide to books, journal articles, technical reports and conference proceedings that address issues raised by water transfers. As a considerable number of publications are included in the pathfinder, the bibliography is organized into six major issue areas. Each issue area begins with a short introductory statement followed by the bibliographic entries listed alphabetically by first author's last name.

Many publications deal with two or more issues but in general the source is listed in only one section. Although this bibliographic pathfinder seeks to capture the important and relevant economic, legal and planning literature, it is not exhaustive, nor does it reference political, social, or biological science sources.

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I. REALLOCATIONS AND TRANSFERS

Although long authorized under the prior appropriation doctrine, transfers are one of the most debated topics in western water law today. At least seven benefits have been attributed to water transfers. In addition to providing a new source of water supply to growing cities, transfers are justified as (1) a tool to manage drought, (2) a means to provide water for environmental and recreational needs, (3) a way to promote efficient water use, (4) a way to encourage conservation, (5) an alternative to new reservoir construction and (6) a means to promote political and social harmony. The following literature generally documents transfer benefits and offers specific exemplars of those benefits.

1. Transfer Benefits

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2. Transfer Methods

Ironically, current water transfers change past allocation practices and at the same time continue past practices. Transfers may be permanent or temporary and occur along a continuum from an outright sale of a permanent water right to the lease of water. Transfer transactions are limited only by the imagination and ingenuity of the parties and include; (1) dry-year option [contingent] contracts on right to use water, (2) spot market transfers, (3) sale of reclaimed, conserved or surplus water, (4) subordination agreements, (5) water banks, (6) water ranching, (7) institutional transfers, (8) exchanges, and (9) wheeling of stored water. Most of these are described in the literature that follows.

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Historically, farmers have made extensive use of transfers to obtain water for irrigation. There are numerous examples of water transactions between farmers, mutual irrigation companies and governmental water districts throughout the western states. Mutual irrigation companies are typically nonprofit associations whose customers (ranchers, farmers and irrigators) are also their shareholders, while water districts are governmental entities with elected boards not unlike other local governments. According to Barton Thompson (see *infra* Institutional Considerations) institutions supply, on average, water for about half of the irrigated acreage in the western states.

The new pattern of agricultural transfers involves shifting water from agricultural to urban, industrial and environmental uses. According to Solley *(infra* this section) agriculture utilizes about 80 percent of western water withdrawn for use and is a prime source for reallocation to urban uses. This trend has important implications for agriculture and economic development in many western states.

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The federal government, operating principally through the Bureau of Reclamation (Bureau) and the Army Corps of Engineers (Corps), stores and distributes large quantities of water and has the potential to shape the future of western water transfers. While federal laws recognize the states' primacy in the allocation [reallocation] of water rights the complex relationships between federal water agencies, the state water agencies, state-established water and irrigation districts, mutual irrigation districts and individual water users represents a barrier to water transfers. Basically, if a water user with a contractual right to receive Bureau or Corps water seeks to transfer that water or right to another, the transfer would be subject to federal, state and local review. While the law may tilt in favor of state law governing transfers, federal project managers retain substantial discretion in determining whether to approve transfers under their physical control. The literature speaks to the need for institutional clarification favoring water transfers.

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The legal authority of tribes to lease (transfer) their *Winters* water off the reservation is murky and unclear. While federal legislation confirming tribal rights to sell or lease water would resolve such questions, federal trust obligations suggest that federal approval would still be required on a case-by-case basis.

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II. WATER MARKETING

Water marketing has been a topic since at least 1973 when the National Water Commission recommended the removal of existing legal barriers to water transfers. The literature since then has described the role that market transfers can play in meeting the growing industrial, urban and environmental demands.

Water marketing can be described as a framework and process for transferring water. This process is characterized by voluntary negotiations between the parties over the amount, timing and price of water to be exchanged. Advocates of marketing suggest that the process would allocate water to its highest economic use by allowing those who place the highest economic value on it to buy it. They argue that the specific needs of the purchaser and the seller should dictate the type of transfer sought and the forum through which transfer arrangements are made. In this way property rights are respected and water is reallocated through negotiated purchases rather than through regulatory removal or cancellation. Thus, water marketing is consistent with the current belief that markets are an effective way to allocate scarce resources to meet the tripartite goals of efficiency, equity and conflict minimization.

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3. Water Banks and Transfers

A water bank is basically a brokerage institution created for the purpose of pooling surplus water rights for rental or sales to other users. Typically, a bank buys water for a fixed price from voluntary sellers and sells it to users at a higher fixed price. The revenue from the difference in prices is used to cover the bank's administrative and technical costs. Under most banking arrangements, the original water rights holders retain their permanent water right and only sell to the bank the right to use the water.

The California Drought Emergency Water Banks of 1991 and 1992 are the most celebrated examples of banking. In both years, the state acted as the banker and fixed the terms and prices of transfers. Formal water banks have also developed in Texas and Idaho, and bank-like activities occur in Kansas, Colorado and Wyoming.

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III. ECONOMIC CONSIDERATIONS IN TRANSFERS

Economic value has been the principal means for establishing resource utility in our society. Values established by market price are used to allocate scarce resources. Western water policy is often criticized for allocating water through nonmarket means without regard to its economic value. As such, water is not used efficiently for its highest economic value. The problem of economic misallocation is further complicated by the federal subsidies for water development projects.

Economic theorists have advocated that water be reallocated by market mechanisms to remedy these inefficiencies. They posit that market mechanisms provide allocation flexibility by allowing those who place a higher economic value on the water to purchase it at its market price. In this way, markets generally generate economically efficient outcomes because they facilitate voluntary trading among users thereby delivering water to those users who put the highest economic value on it.

The literature focuses on (1) the technical and legal predicates for market reallocations, (2) efficiency and equity in allocations, (3) investment and risk assessment, (4) benefit/cost valuation and transactional barriers and costs. It includes theoretical and practical articles as well as those that are positive and pessimistic. Positivists suggest that market mechanisms can reallocate water in an economically efficient manner among irrigation, municipal, industrial, environmental and recreational purposes by letting voluntary transfers determine the highest economic use of water. Pessimists point to market failures, third party impacts and water valuation problems.

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A remarkable new demand for water is for instream and estuary flows that support nonconsumptive environmental and recreational uses. This demand is driven by recreation and tourism which has become a major part of the economy of many western states, rivaling or surpassing agriculture in gross state revenues. Water-based recreational and tourism activities require that a certain amount of water remain in streams and these activities are harmed by consumptive diversions. Marketing and transfer advocates argue that recreational and environmental needs can be satisfied through transfers.

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V. INTERBASIN TRANSFERS

One approach to providing water in areas of limited supply is to physically transfer water from one watershed to another. This is cryptically termed the engineering approach because of the extensive infrastructure needed to move the water. Interbasin transfers have been a common means of augmenting supply through the United States. For example, New York City gets part of its municipal water from the Delaware Basin, Denver from the Colorado River Basin and Los Angeles from the Sacramento and San Joaquin River Basins. Since these large-scale interstate transfers evoke substantial political and legal controversy they have limited viability for meeting the new water needs. Smaller intrastate transfers have been more commonplace and may have some potential.

Because of the possible severe effects on the economy, ecology, culture, lifestyle and potential future growth in the originating basin most
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VI. LEGAL AND INSTITUTIONAL CONSIDERATIONS IN WATER TRANSFERS

A water right acquired under the prior appropriation doctrine is a vested property right entitled to protection against interference from other water users. The ability of an appropriator to transfer the legal priority to use a quantity of water is a valuable property right recognized by all appropriation states. This transfer right is not absolute but is qualified. The transfer may not injure other water rights holders. The "no injury rule" is the only universal restriction on transfers.

1. Legal Considerations

Some states have imposed additional restrictions on transfers. One is the area-of-origin restriction that limits the transfer of water between watershed within the state. Unlike the "no injury rule," interbasin transfer restrictions are intended to safeguard the needs of communities and regions and not just those of other water users. State restrictions designed to discriminate against out-of-state transfers are constitutionally suspect as impermissible burdens on interstate commerce.

A more recent restriction on transfers is the public interest review. While the practice varies from state to state, interest reviews require scrutiny of the transfer to protect public values and to internalize the external cost associated with the transfer. This public interest rubric provides the basis for evaluating third-party impacts associated with transfers.

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Public and private water institutions are an integral part of the appropriation doctrine and today control and distribute most of the surface water in the western states. While the prior appropriation doctrine establishes the allocation rules, institutions supply the water. Because of their pivotal development and supply role, institutional arrangements can facilitate or impede transfers. Any analysis of water transfers restrictions must consider these water brokers.

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VII. PUBLIC INTEREST CONSIDERATIONS—THIRD PARTY IMPACTS

Since water supports a wide range of private and public uses, water transfers are not simple transactions between buyers and sellers. Indeed, water transfer can cause a variety of adverse economic, social and environmental impacts on the public and third parties. Existing laws, procedures and institutions may not fully protect the public from these impacts. For example, if agricultural land is taken out of production to transfer water to urban areas negative economic and social impacts can
occur in the rural area. These may include reductions in farm income, dislocation of farm workers, decreases in property tax revenues, a shrinking local tax base and decline in local services. These negative impacts may or may not be offset by similar gains in the urban area.

The literature on third-party impacts is mostly conceptual. Recent studies indicate that most states subject transfers to public interest reviews but the statutes vary considerably regarding specific criteria used and the weight accorded to each criteria. While some protection exists in these reviews serious questions arise as to the scope of protected interests, the extent of protection and how it should be provided.

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