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### Policies to Enhance Western Water Use Efficiency: Best of the West

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POLICIES TO ENHANCE WESTERN WATER USE EFFICIENCY:

BEST OF THE WEST

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Western Water:

Expanding Uses/Finite Supplies

Seventh Annual Summer Program  
Natural Resources Law Center  
University of Colorado School of Law  
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1

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3

I. INTRODUCTION: Getting the terms straight.

A. "Efficiency": what does it mean?

1. To many involved in water management issues, "efficiency" means "engineering efficiency", a term describing the ratio of the quantity of water applied to a particular use that is consumed over the total quantity of water applied. A limitation of engineering efficiency as a policy objective in an era of increasing competition for water derives from its failure to address the value of any particular use in relationship to alternative uses.
2. "Economic" or "allocative" efficiency addresses the value of the use of scarce resources, including water, available to society. Concern with the economic efficiency of water use in the West leads to consideration of relative net values of water use. It also involves consideration of whether the policies that provide the context for water use are sufficiently flexible to permit water to be allocated to that pattern of uses at any time that result in

westerners gaining maximum dollar and non-dollar values from the region's water.

3. My study of water use efficiency for the Western Governors' Association was addressed to economic efficiency.

B. Principal means by which water use efficiency may be enhanced.

1. Making initial allocations of water according to value.
2. Transfers: a change in the nature of use, point of diversion, place of use or period of use of water under an existing entitlement.
3. Salvage: making water available for additional beneficial uses from water "wasted" by irretrievable loss or pollution.
4. Conservation: minimizing the need for water to meet the requirements of beneficial uses of water.
5. Alternative supplies: provision of substitute or alternative supplies by junior users for senior users either through voluntary arrangements entered into by users or involuntarily by "physical solution".

6. Protection of public community and environmental values in water.
7. Conjunctive management of physically related or substitutable supplies.
8. Conventional water storage and conveyance facilities.

My study was addressed to means 1-7. Water projects were used as a general, theoretical "benchmark" to measure the cost-effectiveness of the first seven means.

- C. Price: a "super-means" by which to communicate relative cost-effectiveness of the others means under varying conditions.
- D. The models by which the means may be implemented:
  1. Markets: the actions of individuals acting in their own self-interest.
  2. Government administration of water use.

II. Review of the effect of western state programs on implementation of the means to enhance water use efficiency.

A. Initial allocations of water. The pure prior appropriation doctrine does a fair job in making initial allocations of water according to value. However, there are some problems:

1. Political considerations may skew public allocations towards certain kinds of consumptive uses.
2. Many western states still require there to be a diversion before a valid water right may be perfected.
3. Some western states allocate water for certain future uses by plan in quantities that may exceed those which would add the most value to these states' waters.

B. Transfers.

1. Transfers are critical to the mobility of water according to value. Every western state permits the transfer of at least some rights to use water. Some transfer activity occurs in every western state, usually on a localized basis.
2. New Mexico, Colorado and Utah manifest the most transfer activity of the western states.



3. Some other states without the tradition of a relatively high volume of transfers have recently implemented means to permit and facilitate transfers of rights to use water. For example:
  - a. Idaho has a state water bank in place on the Upper Snake River. The efficacy of the bank is sharply limited, however, by restrictions imposed by the Bureau of Reclamation prohibiting "profit" on the water (all Bureau-provided) that is deposited in the bank and by a one-year limitation on the amount of time water may be placed on deposit with the bank.
  - b. California, a state with little water transfer activity so far, except in local pockets, comprehensively re-wrote its statutes governing transfers of water rights, among other things, to authorize special water districts to transfer "surplus" water outside their boundaries; to permit transfers to proceed on a trial basis when evidence whether there

would be injury to vested rights or to fish and wildlife from a transfer is inconclusive; and to authorize those who conserve water to lease such water for a limited amount of time.

4. Some localities permit and encourage the transfer of water within their boundaries. For example:
  - a. The Northern Colorado Water Conservancy District market for Colorado-Big Thompson shares is active and includes auctions.
  - b. Adjudicated groundwater basins in Southern California manifest transfer activity.
  - c. Utah's mutual irrigation districts demonstrate sometimes active water markets facilitated by ready transferability of non-appurtenant shares of rights to use water.
5. However, there exist generic impediments to transfers of water in the West:
  - a. Little water is transferred from within special water districts to users outside of these districts, in part because of barriers in state

law and federal Reclamation law and contracts.

b. Little salvaged or conserved water is transferred in the West, partly because of disincentives in western water law to salvage and conservation.

c. There is little water transferred between states.

C. Conservation and Salvage.

1. How much water could be conserved or salvaged cost-effectively in the West is subject to considerable debate even in local areas. Return flow and measurement problems compound the difficulties of estimating amounts.

2. Western water programs address conservation and salvage through law and other initiatives:

a. In theory, usage of water is limited to what is reasonably needed to meet the requirements of beneficial uses.

b. "Waste" is generally proscribed.

c. Some western states have implemented conservation assistance and information programs for users.

3. However, cost-effective conservation and salvage are hampered by:
  - a. Prices of water that are not efficient, i.e. do not reflect marginal costs of supply.
  - b. Financial problems among many agricultural users.
  - c. Uneven enforcement of abandonment/forfeiture and waste authorities.
  - d. The "use it or lose it" principle which continues to encourage usage beyond needs.
4. Some states have made strides in addressing these problems:
  - a. Arizona's Groundwater Code. The Code represents a relatively tough regulatory approach to the conservation of groundwater in certain areas of the state. The aspects of the Code which may have the most significance for other states contemplating a regulatory approach to conservation and salvage are: (1) The Active Management Area concept; (2) Dependence on users to supply information on their own

consumption, among other reasons, for enforcement purposes; (3) quantification and site-specificity of agricultural water duties and their M&I equivalent, gallons per capita per day standards; (4) the technology-forcing Management Plan concept; (5) the exemption for effluent from water duties and GPCD standards.

- b. Recent amendments to California's water code: (1) overcoming the effect of the "use it or lose" principle on incentives to conserve and salvage by establishing that the senior right to saved water is with the holder of the water right from which the water has been saved; (2) overcoming the pervasive effect of "local custom" on the determination of "waste" by instructing courts to consider "local custom" as only one kind of evidence of "waste".
- c. North Dakota meters all agricultural groundwater withdrawals. It also issues conditional permits in which amounts of water allowed to be

diverted or pumped are adjusted after experience.

- d. Utah has addressed the issue of whether a user may reduce the amount of water he uses by conservation measures in instances in which this may cause an adverse effect on return flow use by permitting the conservation.

D. Alternative supplies

1. The provision by junior users of adequate alternative or substitute supplies of water for senior users is an important means by which western states can enable additional development on waterways that have become near or close to full allocation.
2. One way for a state to encourage the provision of alternative or substitute supplies to senior users is to accept and encourage voluntary arrangements for their provision, such as through conjunctive use of surface and groundwater, exchanges or pooling, entered into by junior and senior water rights holders. In some states, notably

Colorado, these arrangements are relatively common.

3. Another way states may encourage the provision of alternative supplies is to provide that junior users may provide alternative supplies for seniors at the expense of the juniors which the seniors are required to accept, provided they "make the seniors whole". Colorado has implemented this concept, known as the "physical solution", as part of its broad "plan for augmentation" legislation. Elsewhere in the West, the provision of substitute or alternative supplies of water to seniors on an involuntary basis is atypical and has occurred usually as the result of court decision.

E. Protection of public values.

1. There are, of course, important public community and environmental values in water use. They must be addressed in any review of the efficiency of water use.
2. Environmental values may be broken into two categories: those dependent on

maintenance of in-stream flows and those that go beyond in-stream flows, such as impact of water resource development on wilderness or on land-based wildlife.

a. In-stream flows: most western states accord some protection for in stream flow values going beyond hydroelectric values. No two states that accord such protection do so in the same way. Techniques of affirmative protection include: establishment of minimum flows on a basin basis through rulemaking or other similar procedure (Oregon and Washington); establishment of minimum flows through attachment of conditions to individual permits or licenses to use water (California and Washington); reservation (Montana), state appropriation (Colorado and Nebraska); and, legislative enactment confirming administrative action (Idaho). Some "reactive" protection is accorded these values in those states that require an initial allocation or transfer to be consistent with the "public interest".



There is no clear "right" way to protect in-stream flow values. Attributes of a good program include comprehensiveness of approach (Washington's base flow program); consideration of relative values of in-stream flow maintenance versus consumptive uses (Nebraska's program requires balancing of values); and flexibility over time (appropriation, such as in Colorado appears the most flexible). No western in-stream flow programs may adequately protect in-stream flow values on fully allocated streams. Private acquisition of in-stream flow rights could help in these situations. South Dakota, Washington and Arizona permit such acquisition but this authority has rarely been used.

- b. Non-instream flow values: In many situations federal legislation provides protection, but this legislation is not adequate where federal interests are not present. State fish and wildlife agencies

provide some protection, but whether these programs will be effective in protecting these values in an age of more salvage, conservation and transfers of water is unclear.

Oregon's program to protect riparian habitat is an example of what a state may try to do in this area.

3. Community values include cultural or heritage values in water use patterns (such as the Spanish acequia system in New Mexico and agricultural lifestyle values) and diffuse "economic" values (such as control over a community's future and the interest in the maintenance of a strong state economy and decent standard of living). These values are "protected" in western states primarily through "public interest" reviews attending initial allocations and transfers, basin of origin legislation and, where federal actions are involved, the National Environmental Policy Act. Idaho's public interest review provisions are the west's most pervasive. However, these protections are not systematic and do not appear to

have made much of a dent in resistance often encountered when changes in water use patterns are proposed. State appropriation and leasing (or other marketing) of water is one way that states may be able to afford residual protection for community values.

Montana's water leasing program is the most advanced example of this type of initiative. New Mexico is contemplating a similar program. Idaho's Swan Falls legislation is an example of a state acting as public trustee with respect to a portion of in-state water.

F. Conjunctive management.

1. The largest component of this subject is conjunctive management. Two key steps to take to enhance water use efficiency of surface and groundwater sources taken together are (a) conjunctive use regulation when ground and surface water sources are physically related or may readily be substituted for each other and (b) regulating withdrawals from aquifers to maximize the present value of their waters in light of alternative supplies.

2. Colorado and New Mexico are probably the most advanced states in conjunctively regulating the use of surface and groundwater supplies that are physically related. California, locally, manifests considerable activity. Washington encourages groundwater storage by recognizing storage rights in the use of surface waters to recharge groundwater aquifers.
3. Most western states have addressed the problem of groundwater mining, usually through critical area regulation. The typical resolution of groundwater mining issues is establishment of a "safe yield" requirement to bring withdrawals in balance with recharge over time. Arizona's Groundwater code has this objective. However, "safe yield" may not be the efficient solution. Nebraska's program to localize resolution of mining and other aquifer use problems in light of alternative surface supplies, pursuant to general state policy, is an example of innovative policy in this area.