

A Powerful Thirst



WATER MARKETING IN TEXAS



ENVIRONMENTAL DEFENSE

finding the ways that work

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EXECUTIVE SUMMARY

Like many other Western states, Texas faces serious challenges in providing water for a growing population while at the same time ensuring sufficient water is available for fish, wildlife and other water resource needs. One increasingly important tool for meeting these water needs is water marketing: that is, transactions between willing buyers and willing sellers for a temporary or permanent transfer of water or water rights at an agreed price. With the proper legal and policy framework in place, water marketing has the potential to help Texas meet reasonable water demand.

Unfortunately, the current framework for water marketing in Texas is woefully inadequate. As this report documents, current law and policy fail to protect aquifers from unsustainable groundwater marketing proposals that could damage rural communities and the environment. In addition, several adjustments must be made in Texas surface water law before water markets can function efficiently while still ensuring that existing water rights holders and the environment are protected. Finally, some changes are needed to ensure that water marketing can be used to help meet environmental water needs.

This report discusses the various forms of water marketing, highlights a few current water marketing proposals and examines the gaps in Texas surface and groundwater law with regard to water marketing. Based on this analysis, we offer several recommendations for appropriate use of water markets to meet consumptive and environmental water needs without damaging rural communities and without undermining incentives for water conservation.

The five major overarching recommendations are as follows:

- The legislature should replace the rule of capture for groundwater with a system based on principles of reasonable use;
- State law should be revised to require that groundwater districts adopt rules setting sustainable pumping caps by 2007, and districts should be authorized to place a moratorium on large export proposals until such rules are in place;
- State law should be changed to provide that market transfers of existing surface water rights be authorized in a manner that protects the environment, downstream water users and other statutorily recognized interests;
- Funding should be provided for sufficient real-time stream gauging and to ensure that water rights are properly enforced and;
- The Texas Water Trust should be reformed to make it a more effective tool for protecting instream flows.

Summary of Recommendations

GROUNDWATER MARKETS

Defining property rights in groundwater

- At a minimum, state law should provide that groundwater pumping be governed by a system based on reasonable use principles, rather than the current rule of capture.
- All wells pumping groundwater should eventually be metered. In order to ensure that pumping limits are enforceable (and that neighboring property rights in the groundwater are meaningful), groundwater districts should initially require all wells pumping over 25,000 gal./day to be metered. The state should provide financial assistance for installation of meters, where required.

A sustainable management framework for aquifers

- As a first step, state law should require that groundwater districts adopt rules setting a sustainable pumping cap for the aquifer or aquifers under their jurisdiction by January 2007. Where an aquifer is covered by two or more districts, the districts should be required jointly to adopt a sustainable pumping cap. That cap could be flexible: (i.e., more pumping allowed in wetter years,) and it could be subject to periodic revision based on new information. But the cap should ensure that all significant springs are protected and that annual pumping not exceed average annual recharge.¹ The districts will require significant technical and financial help from the state to set such limits. State law should also provide that districts are encouraged to put a moratorium on any new permits for major export of water until the pumping caps have been adopted.
- The Texas Water Development Board, in concert with the groundwater districts, should undertake to identify situations that warrant merger of one or more single-county districts. Criteria for such mergers should include: the absence of effective cooperation; relationship of district boundaries to aquifer boundaries and groundwater management areas; and economies of scale in creation of more comprehensive districts. Merger opportunities should be identified for consideration by the 2005 session of the Texas legislature.

¹ We recognize it would take some time to reach this sustainability goal in the Ogallala aquifer without causing severe economic dislocation, which may make that aquifer an exception to this general recommendation.

Relationship of large groundwater export proposals to regional water planning

- State law should provide that all private groundwater marketing proposals over a certain threshold and involving exporting water out of the aquifer boundaries be subject to consistency review by the regional water planning group in which the aquifer is located. The purpose of this review would be to ensure that such proposals are consistent with the regional water planning groups' charge to "provide for the orderly development, management and conservation of water resources" and to provide for the "long-term protection of the state's water resources, agricultural resources and natural resources."

SURFACE WATER MARKETS

Marketing Surface Water Rights

- The law should expressly provide that market transfers of existing surface water rights are generally limited to historical consumptive use. Transfers in an amount greater than historical consumptive use could be authorized to the extent that conditions on such transfers (1) are consistent with regional water plans and (2) ensure no adverse effects on the environment, downstream water rights holders or other interests protected by Chapter 11 of the Texas Water Code. Exceptions could be made for small-scale transfers with an anticipated *de minimus* effect on downstream users or the environment.
- Texas law should be clarified to provide that downstream water right holders and other affected persons have the opportunity for a contested case hearing on water right amendments that propose to change the place or purpose of use of any portion of a water right that has not been used over the last ten years.

Marketing of Conserved Water

- Texas law should be clarified to state clearly what types of conservation measures qualify the conserved water for marketing and to establish clear procedures for the transfer of the conserved water (including consideration of the effects on the environment and downstream water rights holders).
- In fully or over-appropriated basins, Texas law should provide that public investments in water conservation result in a portion of the conserved water being devoted to environmental flow needs.

Re-Use of Permitted Surface Water

- Texas law on direct and indirect re-use of surface water should be clarified. The following principles should guide changes in the law:
 - Indirect re-use should not be allowed where discharged water makes up a significant portion of the instream flow under low flow conditions, unless the reduction in flow caused by re-use is fully mitigated.
 - Parties that could be adversely affected by re-use proposals over a certain threshold (for example, a reduction of a certain percentage of stream flow under low flow conditions) should have an opportunity for a contested case hearing.
 - TCEQ should have a clear mandate and authority to condition approvals of re-use applications in order to protect the environment and downstream water right holders.

Effect of Water Marketing on the Environment and Communities

- Until instream flow needs are quantified and protected, the only way to ensure that transfers do not have an adverse effect on the environment is to continue to provide for an opportunity for a contested case hearing on transfers above a *de minimus* level.
- In fully or over-appropriated basins, state law should authorize TCEQ to require that a portion of the surface water right be devoted to in-basin environmental flow needs when the permit holder seeks to transfer the right through the permit amendment process. This would give the TCEQ a flexible tool to help protect river flows in critical areas.
- TCEQ should adopt rules to more clearly define the factors that will be considered in evaluating the effects of major proposed transfers of surface water rights through the permit amendment process. TCEQ should look to other Western states and legal literature in preparing such rules, and should include a diverse group of stakeholders as part of the rulemaking process. Defining the factors to be considered in evaluating the public interest/public welfare would add clarity to the amendment procedures for market transfers.

Monitoring and enforcement

- Water masters should be established for over- or fully appropriated basins in Texas in order to ensure comprehensive, orderly and fair enforcement of water rights and permit conditions. Resources for the water masters should be sufficient to provide for an adequate network of real-time, internet-available stream gauging.
- In lieu of water masters, TCEQ must be provided with substantial additional resources to carry out these same functions. In basins where one entity, such as a river authority, already holds a substantial amount of surface water rights, TCEQ could be authorized to enter into cooperative agreements with that entity for stream gauging.

WATER MARKETING TO MEET ENVIRONMENTAL NEEDS

- The inactive Texas Water Trust should be reformed to be more effective. Options include:
 - Transfer the Trust to the Texas Parks and Wildlife Department, the agency with primary statutory responsibility for protecting fish and wildlife, and provide state funding for acquisition (purchase, lease, dry-year option or other method) of water rights from willing sellers for instream flow; or
 - Convert the Trust to a non-profit entity, under the auspices of the Texas Parks and Wildlife Department, allowing it to accept grants and donations from foundations, businesses, individuals and government agencies to support an acquisition program and to better ensure that donated water rights can qualify for a tax deduction.
- Statutory and administrative procedures for amending water rights should be reviewed to identify opportunities for making it less burdensome to use leases and dry-year options of consumptive rights for maintaining instream flows.
- In priority areas (where the need for water for instream flow is most pressing), the state should provide additional tax or other incentives for investments in conservation that result in all or a substantial portion of the conserved water being dedicated to instream flows.

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Like many other Western states, Texas faces serious challenges in providing water for a growing population, while at the same time ensuring sufficient water is available for agriculture, fish, wildlife and other water resource needs. One increasingly important tool for meeting these water needs is water marketing: that is, transactions between willing buyers and willing sellers for a temporary or permanent transfer of water or water rights at an agreed price. With the proper legal and policy framework in place, water marketing has the potential to help Texas meet reasonable water demand, while avoiding construction of damaging new reservoirs.

For those who have followed water policy in Texas over the last few decades, an analysis of the potential for and barriers to water marketing in the state is nothing new. Most of these analyses, however, were prepared before the 2002 State Water Plan *quantified* projected unmet water needs by region and, within each region, by water user group. In addition, most of the prior reports were prepared before many of the current large-scale water marketing proposals made their public debut. These specific proposals, some of which are highlighted in Chapter III of this report, provide a new, and less hypothetical, context in which to examine both the potential benefits—and the potential risks—of large-scale water marketing.

At least three factors have combined to bring water marketing to the forefront of Texas water policy:

- Formation of private companies such as Río Nuevo, Mesa Water, Inc. and Water Texas that have as their primary business the buying and selling of Texas surface water and groundwater for future municipal use;
- Large municipalities motivated by rapid population growth and recent droughts to examine the potential for meeting future water demand by importing groundwater from rural areas and/or obtaining large amounts of surface water from other basins; and
- The rapidly increasing value of secure water rights.

In response to these developments, rural communities have become increasingly worried about what water marketing means for their livelihoods, economies and future generations. State policymakers are grappling with whether and how water under state lands might be marketed. And environmental organizations—while recognizing the potential for water marketing in some cases to supplant the need for destructive new reservoirs—are looking for assurances that marketing will not cause further over-exploitation of streams, rivers and groundwater aquifers. They are also interested in how water marketing might be used as one tool to help meet the freshwater needs of fish and wildlife.

Recognizing the central importance of these issues to Texas water policy, Lt. Governor David Dewhurst has charged the Senate Select Committee on Water Policy with studying water marketing and providing recommendations for the 2005 legislative session. Given this context, our report examines the potential for water marketing to meet reasonable consumptive and environmental water needs without damaging rural communities and without undermining incentives for water conservation.

Based on this analysis, we offer several recommendations that we believe are necessary for efficient and environmentally and socially responsible water marketing in Texas.

A SAMPLING OF PRIOR TEXAS WATER MARKETING STUDIES

Texas Water Development Board. August 2003. A Texan's Guide to Water and Water Rights Marketing.

Texas Water Development Board (Research Division). May 2001. White Paper on Improving the Viability of Water Marketing as a Water Management Strategy in Texas (Review Draft).

Texas Water Commission. October 1992. Reallocating Surface Waters in Texas: Facilitating the Development of Water Markets While Protecting the Public Interest. (TWC Report No. LP 92-23).

Griffin, R.C. and G. W. Characklis. 2002. *Issues and Trends in Texas Water Marketing*. Water Resources Update. (University Council of Water Resources). No. 121, January: 29-33.

Kaiser, Ron. 1996. *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*. Texas Tech Law Review, Vol. 27, No. 1.

For two of the many Continuing Legal Education articles on water marketing, see:

Melvin, Robin. 2003. *Buying and Selling Surface Water Rights*. Presented at Texas Water Law, CLE International, October 2003.

Johnson, Russell. 2001. *Transfers and Sales of Groundwater*. Presented at TRWA/TWCA Water Law Seminar, January 25-26, 2001.

WHAT IS WATER MARKETING?

In general, water marketing involves transactions between willing buyers and willing sellers: a temporary or permanent transfer of water or water rights at an agreed price. However, from both the regulatory oversight and public interest perspectives, it is important to distinguish among the various possible types of water "marketing" transactions. It is also critical to distinguish between surface water and groundwater marketing.

Groundwater Marketing

In Texas, no state permit is required for pumping or use of groundwater; thus, there is no state level review of groundwater sales or leases. In areas outside a groundwater district, water pumped from underneath a tract of land can be sold, leased or otherwise transferred for use off the land with virtually no restrictions. Outside groundwater districts, it is almost impossible to define a "right" to a certain amount of groundwater, since any adjacent landowner can pump as much as he or she wants from the same aquifer. Because functioning water markets require certainty of rights,² the "rule of capture" is, to a large extent, a barrier to developing a rational groundwater market in Texas.³

Within groundwater districts, there may be pumping limits, pumping fees, well-spacing requirements and/or fees on groundwater exported outside the boundaries of the district.⁴ Depending on the extent and enforcement of such restrictions, it may be possible to better define a "right" to a certain amount of pumping, thus increasing the potential viability of developing a rational market. This is true, however, only if an aquifer is completely covered by districts and those districts have coordinated efforts to regulate pumping. (These issues are discussed further in Chapter IV.)

In either case, an overlying landowner has two practical options: (1) pump and sell the groundwater himself or (2) lease (or sell) the land for purposes of groundwater pumping, with the pumper either using the water itself or selling it to a third party.

² Kaiser, Ron. 1996. *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*. Texas Tech Law Review, Vol. 27, No. 1, at 244-45.

³ *Id.* at 258-59.

⁴ See, generally, Chapter 36, Texas Water Code, for an enumeration of Groundwater district powers. For one evaluation of how Groundwater districts in Texas are working, see Brock, L. 2002. [Spotlight on Groundwater Conservation Districts](#) (Environmental Defense, Austin, Texas), available at www.texaswatermatters.org.

Surface Water Marketing⁵

Wholesale contract for water. This is the most common type of water marketing transaction in Texas.⁶ A typical example is the wholesale contract for water—not water rights—between a river authority and a municipality within its basin. The river authority holds the underlying surface water right, and typically provides the water to the buyer from a storage reservoir. Most wholesale contracts between river authorities and municipalities or other water supply entities have terms of at least 50 years, with a renewal option. Contracts for water for other uses may have shorter time frames, but also provide an option for renewal. The state exercises very little control over these types of contracts.⁷

Dry Year Option Contract. This type of transaction allows a buyer to have guaranteed access to the seller's water during specified dry periods, with payment for such an option whether it is exercised or not (as well as payment for the water when it is used). A typical example of this type of transaction would be a dry year option contract between an irrigator and a nearby municipality. If the dry year option involves a change in place or purpose of use of the water, which it generally does, the Texas Commission on Environmental Quality (TCEQ) must approve the change through an amendment to the underlying surface water right.

Lease of a Surface Water Right. This is a temporary (short- or long-term) transfer of a water right (or portion of a water right) from one entity to another. At the end of the term, the right reverts to the original holder. In general, if the lease involves a change in use, location, or amount of water it would require a permit amendment authorized by TCEQ. This type of transaction is probably most appropriate for securing water for a temporary need.

Sale of a Surface Water Right. This involves a permanent transfer of the underlying water right. If there is a change in diversion point, place, purpose or amount of use,

⁵ In general, see Texas Water Code Secs. 11.122, 11.132 to 11.134 and the rules of the Texas Commission for Environmental Quality at 30 Tex. Admin. Code Sec. 295.158 and 297.41 for requirements regarding TCEQ approval of amendments to surface water rights. For a thorough review of regulatory, title and contract issues regarding marketing of surface water rights, see Melvin, Robin, 2003. *Buying and Selling Surface Water Rights*. Presented at Texas Water Law, CLE International.

⁶ As discussed in Chapter IV, river authorities control the vast majority of the permitted surface water rights in many Texas river basins.

⁷ Minimum requirements are found at Texas Water Code Secs. 11.036, 11.041, 12.013 and 13.041 and in 30 Tex. Admin. Code Secs. 295 and 297. The provisions relate primarily to "just and reasonable" rates for the water under contract. A bill that would have prevented the Texas Commission on Environmental Quality from taking any action to amend or impair such contracts was introduced in the last regular session of the legislature; it failed to pass in the last-minute crush of business. HB 2184, 78th Regular Session of the Texas legislature.

such a transfer will require the approval of TCEQ. Even if there would be no changes in any of these factors, a change of ownership still must be filed with TCEQ.

Donation of a Surface Water Right. While not a standard transaction between willing buyer and willing seller, a surface water right is a valuable real property interest that can be donated to a non-profit organization or to the state-run Texas Water Trust.⁸ TCEQ must review and approve any donations to the state Trust. As with other transactions, a donation that involves a change in place, purpose, or amount of use of an existing water right to a private trust will require TCEQ review and approval.

⁸ Texas Water Code § 15.7031 established the Texas Water Trust.

RECENT LARGE-SCALE TRANSFER PROPOSALS

Several large-scale public and private water transfer proposals have cropped up in the last few years, and some of them have been quite controversial. These proposals, summarized in the following table, have given added impetus to the debate over water marketing in Texas.

<u>ENTITY</u>	Source	Destination	Project Outline/Status
<u>PUBLIC EFFORTS</u>			
CRMWA	Ogallala Aquifer, Roberts County	Lake Meredith, then on to 11 cities, including Amarillo and Lubbock	Groundwater pumping rights on 43,000 acres. Field of 27 wells currently pipes water to Lake Meredith and onward. Project costs estimated at \$83 million. Seeking an additional 100,000 more acres. Began production in 2001. www.crmwa.com . (Lubbock owns 42% of CRMWA)
City of Amarillo	Ogallala Aquifer, Roberts County	Amarillo	Bought rights to pump from 72,000 acres. The city paid \$22 million and will spend \$70 million in today's dollars to build a pipeline to bring the water to Amarillo in 2025.
LCRA and San Antonio Water System	Lower Colorado River and Gulf Coast Aquifer	San Antonio and in-basin users	Project involves proposed development of additional surface water supplies via off-channel reservoirs along the Lower Colorado River, a portion of which could be provided to San Antonio, and additional groundwater pumping from the Gulf Coast aquifer for in-basin agricultural use during drought. Project is in the study phase.
GBRA, San Antonio Water System (SAWS) and San Antonio River Authority (SARA)	Gulf Coast Aquifer, in Goliad, Victoria, and Refugio counties	San Antonio	This and following two projects involves pumping groundwater in amounts totaling possibly up to 41,400 AF/year, with an average of approximately 14,200 AF/year. May be used to supplement project water during times when surface water flows are inadequate to meet project needs. Research phase. Possible by 2010.
GBRA, SAWS and SARA	Carrizo-Wilcox, in Wilson County	San Antonio	Possible withdrawal of 10,000 to 15,000 AF/year feasible. Research phase.
GBRA, SAWS and SARA	Queen City Aquifer, in Wilson County	San Antonio	A few thousand AF/year of potential. Research phase.

<u>ENTITY</u>	Source	Destination	Project Outline/Status
City of El Paso	Capitan Reef Aquifer, east of Dell City	El Paso	In the summer 2003, the city purchased the 9,300-acre El Diablo Farms for \$14 million. It is located on the Hudspeth-Culberson county line, just outside Dell City. Projected withdrawal of minimum of 15,000 acre-feet. Final negotiations pending for about 20,000 more acres. Future supply. http://www.epwu.org/water_resources.html
City of El Paso	Antelope Valley Ranch (Valentine)	El Paso	Potential to withdraw minimum of 15,000 AF/year; City owns approx. 25,000 acres. Future supply. http://www.epwu.org/water_resources.html
City of El Paso	Wild Horse Ranch (Van Horn)	El Paso	Potential withdraw of minimum of 15,000 AF/year, city owns approx. 22,000 acres. Future supply. http://www.epwu.org/water_resources.html
City of El Paso	Bone Springs-Victorio Peak	El Paso	In March 2004, the City opened a 90-day negotiation period with a group of private landowners for groundwater pumping rights on 25,000 acres. Future supply.
City of San Antonio	Simsboro Aquifer, Milam, Bastrop and Lee Counties	San Antonio	The City's water authority has a contract with Alcoa for groundwater from Milam and Lee Counties, and has purchased water rights owned by City Public Service in Bastrop for a total of 55,000 acre-feet/year. Online 2010 +.
City of San Antonio	Carrizo Aquifer, Gonzales County	San Antonio	San Antonio is working to secure rights to pump approximately 30,000 AF/year. Feasibility study.
<u>PRIVATE INTERESTS</u>			
Native Valley Alliance	Edwards-Trinity Plateau Aquifer, NW Kinney County	No agreements announced.	Looking to export 31,000 to 45,000 AF/year. Managed by WaterTexas. Possible customers mentioned include San Antonio, Laredo and Eagle Pass.

<u>ENTITY</u>	Source	Destination	Project Outline/Status
Mesa Water	Ogallala Aquifer	No final end user agreements announced.	Amassed 150,000 acres of land for groundwater pumping. Signed a nonbonding, Memorandum of Understanding with Brazos River Authority. Under one scenario, water would be delivered to the basin via a 170 mile pipeline as early as 2009. The Brazos basin includes all or part of 70 counties and extends down to Freeport. Negotiations on-going.
Rio Nuevo Ltd.	West Texas Bolsons, West Texas	No end users identified.	Rio Nuevo seeks to lease groundwater pumping rights on about 350,000 acres of far west Texas lands owned by the Texas General Land office. In negotiations.
American PureTex Water Corporation	Brazos River Alluvium, Austin and Colorado Counties	Harris County metro area; but no formal end user agreements announced yet.	PureTex claims water right leases and options on 85,531 acres along both sides of the San Bernard River. They propose to guarantee delivery of 500,000 AF/year of water for the Houston area for 63 years (through 2065) Project is planned to be operational by 2007. On-going studies. www.puretexwater.com
Brazos Valley Water Alliance, L.P.	Simsboro member of the Carrizo-Wilcox aquifer	None so far	Alliance focusing on Brazos, Robertson, Burleson, and Milam Counties. Alliance has 700 members so far. www.brazoswater.com
Carrizo-Wilcox Water Alliance, LLP	Simsboro member of the Carrizo-Wilcox aquifer, in Burleson, Lee, and Milam Counties	Eastern Williamson County	Alliance holds rights to pump from about 25,000 acres, which could add up to about 50,000 AF/year. The rights were acquired from Metropolitan Water Corp. LLP. Focused on landowners in northern Burleson County, southeast Milam County and part of Lee County. Lawsuit over proposed pipeline.
WaterTexas	Carrizo-Wilcox in Lee and Milam County	Agreement with Southwest Water Utilities Corp. as retail intermediary.	WaterTexas is working with landowners in Lee and Milam Counties to obtain groundwater pumping rights. Currently has options on about 10,000 acres. Objective is to supply eastern Travis and Williamson counties, particularly in Texas SH 130 corridor. Exploring partnership with General Land Office for building distribution system. In negotiations. Target date of 2007.

WATER MARKETING TO MEET CONSUMPTIVE DEMAND

Overview of Current Water Use and Demand Projections

Water use in Texas averages almost 17 million acre-feet annually, with some variation depending upon drought conditions.⁹ Groundwater accounts for approximately 60% of the total use and surface water for the remaining 40%. Most of the surface water used is for municipal and industrial purposes (65%) with irrigation accounting for 35%. Conversely, about 80% of the groundwater pumped is used for irrigation; the remainder is used for municipal and industrial water demand.¹⁰

Irrigated agriculture is the largest user of water in the state of Texas. In 2000, farmers used approximately 9.7 million acre-feet of water to grow a variety of crops. There are currently about 6.3 million acres of irrigated land, concentrated in the Panhandle, Far West Texas, Central Texas on the Edwards Plateau, the Lower Rio Grande Valley, and the mid-Gulf Coast region (Fig. 1).

The 2002 State Water Plan estimates that statewide irrigation water demand will decline by approximately 12% over the next 50 years.¹¹ Some of the factors accounting for this projected decline include: shifts in market demand for agricultural commodities; improved irrigation efficiencies; declining groundwater availability; and voluntary transfers of water rights from irrigation to municipal use.

According to the 2002 plan, the fastest growing demand for water will be for cities and industry, with municipal demand projected to increase 67%, to 7.06 million acre-feet over the next 50 years.¹² Over a 20-year horizon,¹³ municipal needs are projected to increase to about 5.4 million acre-feet, or about 28% over current demand. The cities with the greatest projected demand for water include El Paso, Dallas, Houston, San Antonio, Austin and municipalities along the Lower Rio

⁹ Texas Water Development Board. 2002. Water for Texas—2002. Volumes I-III. (hereinafter 2002 State Water Plan), at p. 27.

¹⁰ Lesikar, B, Kaiser, R. and V. Silvy. 2002. Questions about Groundwater Conservation Districts in Texas. (Texas Water Resources Institute, Texas A&M University, College Station, Texas).

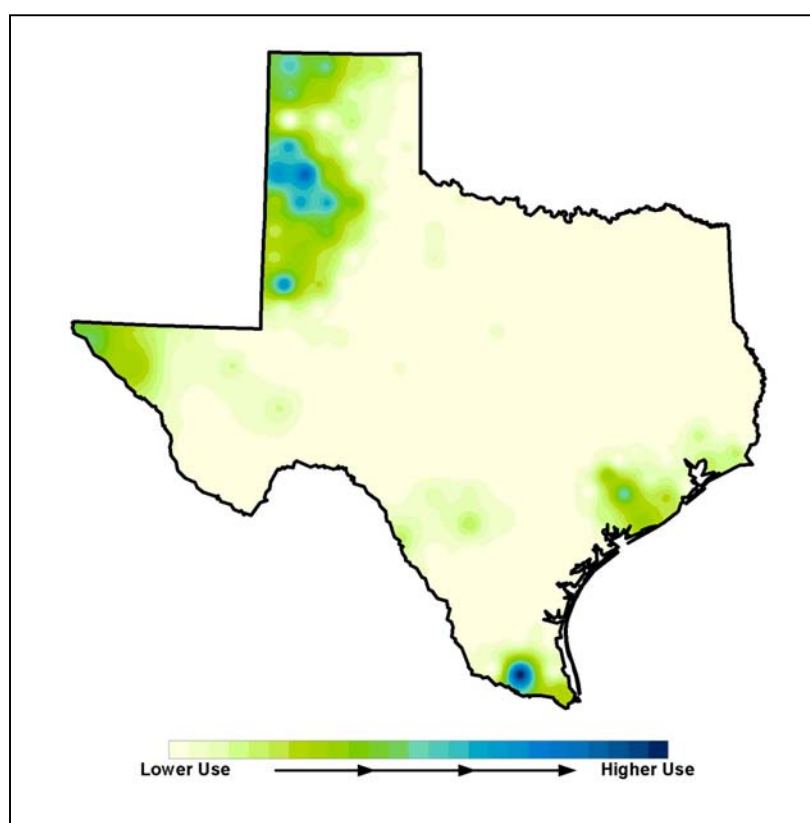
¹¹ In a separate report, we have analyzed the regional irrigation projections. This analysis concluded that some regions appear to have over-estimated future irrigation demand, so the decline in irrigation demand by 2050 may be considerably more than 12%. In addition, as technology improves, it is likely that conservation in the irrigation sector will reduce demand even further. Ball, Laura. 2003. Irrigation Demand in Texas: An Analysis of Methodologies to Predict Irrigation Trends (Environmental Defense, Austin, Texas), available at www.texaswatermatters.org.

¹² The State Plan predicts that increased conservation will result in municipal water demand increasing less than the 90% population increase projected over the same 50-year period. 2002 State Plan, *supra*, at 34.

¹³ Assumptions about conditions affecting water demand are inherently speculative. Using 2020 instead of 2050 reduces the probability that intervening economic, technological or regulatory developments will drastically change water demand scenarios.

Grande Valley (Fig. 2). Some of the 2002 municipal demand projections were unrealistically high, however. Some were based on 1991 data for average per capita water use, before many cities began water conservation programs. Others failed to reflect sufficient application of water conservation as a management strategy.¹⁴ In fact, the Texas Water Development Board has revised the projected municipal demand estimates for the current round of planning to reflect more realistic numbers.¹⁵

Figure 1: 2000 Irrigation Use (relative intensity, based on TWDB data for 2006 water plan)



¹⁴ Johns, Norman. 2002. [Saving Waters, Rivers and Money: An Analysis of the Potential for Municipal Water Conservation in Texas](#). (National Wildlife Federation, Austin, Texas). Available at www.texaswatermatters.org/pdfs/conservation_report.pdf.

¹⁵ For example, in the current round of planning Dallas now has a projected municipal demand of 185 gallons per capita per day for 2050 compared to the 264 gallons per capita per day used in the 2002 State Water Plan (a 43% difference). The new baseline demand projections only have the basic conservation measures (i.e., automatic plumbing fixture savings). Final projected demand will be further reduced by the inclusion of advanced conservation as a water management strategy.

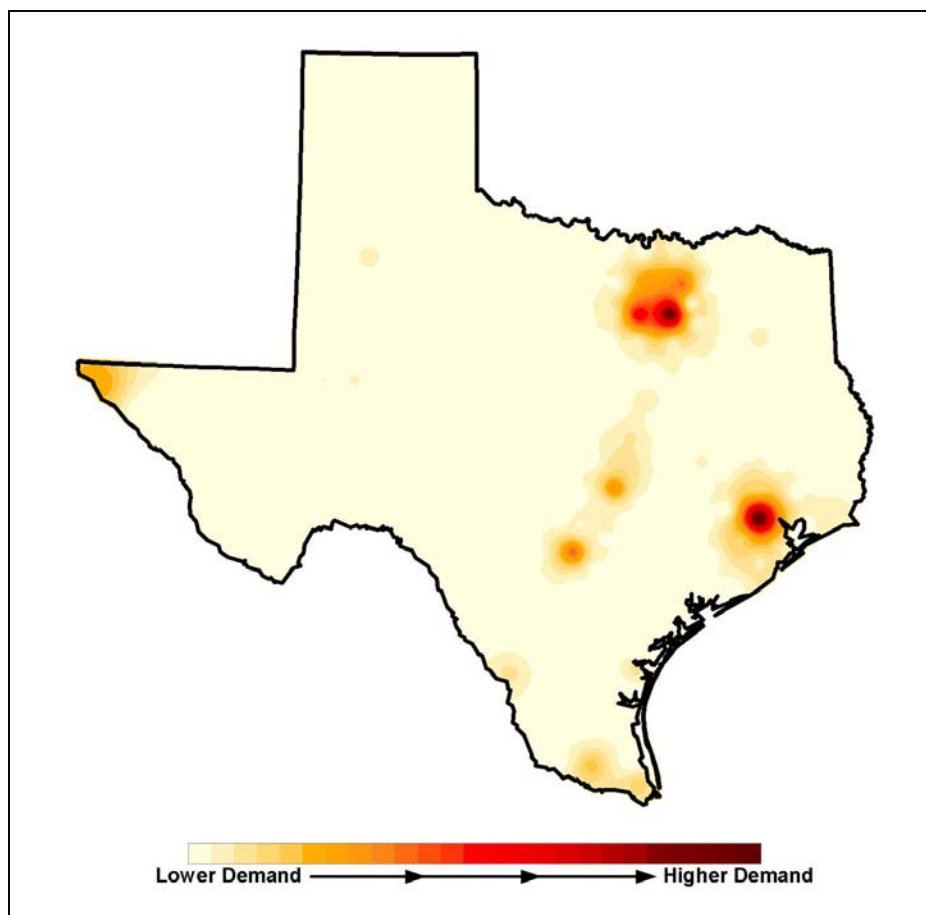


Figure 2. 2020 Municipal Demand Relative Intensity
(based on TWDB for 2007 water plan)

While the statewide totals provide some insight into water use trends, the potential for developing markets to supply municipal or other needs is better examined on a regional basis. Such markets might develop based on a decline in irrigation demand or because it becomes more economically attractive to lease or sell the water than to use it for irrigation.

It is beyond the scope of this report to quantify how much of the projected municipal demand might be supplied by marketing. The regional water planning groups are better situated to carry out such an analysis. Indeed, in the first round of regional planning several groups included voluntary water marketing among their strategies to meet future needs. The new round of regional planning—with its revised demand estimates and better estimates of water availability—provides an opportunity to refine this analysis.

The extent to which these projected water markets actually develop will, of course, depend on whether voluntary water transactions can compete on a price basis with other water management strategies. Most regional plans indicate that conservation (i.e., demand reduction) is still, by far, the least expensive strategy. For any remaining unmet demand, water markets will have to compete with re-use, brackish water desalination, and new storage strategies. A look at the relative prices of these strategies for Region M (Lower Rio Grande Valley), which has an active surface water market, is illustrative:¹⁶

REGION-AVERAGE COST OF 2030 ALTERNATIVE SUPPLY STRATEGIES FOR REGION M¹⁷ (\$/ACRE-FOOT/YEAR)

ADVANCED MUNICIPAL CONSERVATION: \$ 232
 NON-POTABLE RE-USE: \$ 360
 CONVERSION OF CONSERVED AGRICULTURAL WATER TO MUNICIPAL USE: \$ 325
 PURCHASE OF AGRICULTURAL WATER RIGHTS FOR MUNICIPAL USE: \$ 430 (wide range)
 PROPOSED BROWNSVILLE WEIR: \$ 438
 BRACKISH GROUNDWATER DEVELOPMENT: \$ 580 (wide range)

In addition to price signals, there are other factors that will affect the development of water markets in Texas, including: the legal framework for water rights administration and enforcement; the potential effects of marketing on other water rights holders, the environment and the public interest; and the relationship of large-scale water marketing proposals to the regional water planning process. These factors are discussed separately for groundwater and surface water in the following sections.

Groundwater Markets

Groundwater supplies much of West Texas' demand, as shown in Figure 3, but it is also used heavily in other parts of the state. The City of San Antonio still depends primarily on the Edwards Aquifer for municipal supply, even as it looks to develop new surface water sources. In the Panhandle of Texas, the Ogallala Aquifer is used

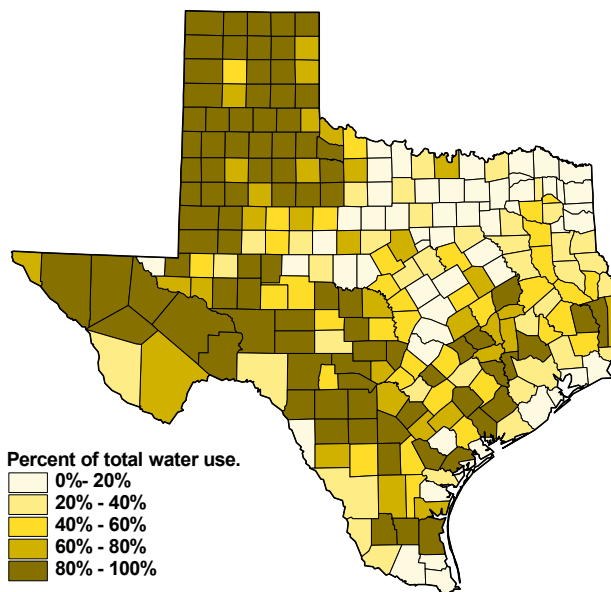
¹⁶ The Valley's market is particularly active because the surface water rights in the Falcon/Amistad reservoir system are essentially correlative (i.e. no senior/junior priority.) The correlative nature of the rights allows transactions to be made without TCEQ review and approval.

¹⁷ Costs can vary, sometimes significantly, across the region. For example, groundwater development from the shallow, but brackish, Gulf Coast aquifer in the lower Valley was estimated to cost about \$ 320/acre-ft/year, while groundwater development from deeper aquifers in the Laredo area was estimated to range from \$ 580 to \$ 1000/acre-ft/acre. Region M (Lower Rio Grande Valley) 2001 Water Plan, pp. 5-56 to 5-59. Prices for purchase (permanent or contract) of agricultural water are also highly variable.

for both municipal supply and irrigation. This aquifer is being drawn down much faster than it can be replenished.

Figure 3. Groundwater as a Percent of Total 2000 Water Use

(Source: TWDB data)



According to the State Water Plan, development of additional groundwater sources by 2050, through new well fields or increased pumping of existing wells, is proposed to provide about 735,000 acre-feet/year for meeting new demand.¹⁸ While this is less than 1% of existing groundwater use, the figure does not include many of the new private groundwater pumping/marketing proposals that have appeared on the horizon in the last couple of years. Very few of those proposals are included in an approved regional plan.

Despite Texas' substantial reliance on groundwater, the state still adheres to the common law rule of capture. Under this doctrine, a landowner may pump an unlimited amount of water from under his or her land, even if such pumping drains water from neighboring land owners. While this approach was largely workable in the Texas of earlier centuries, it has become increasingly problematic with the development of municipal well fields and other high capacity pumping operations.

¹⁸ State Water Plan, *supra*, at p. 72.

The rule of capture was challenged in the courts in the late 1990s. In *Sipriano v. Great Spring Waters of America*,¹⁹ a landowner claimed that a pumping operation by the bottled water provider, Ozarka, had dried up his well. The plaintiff asked the court to protect his private property right in the water by limiting Ozarka's pumping to a "reasonable" level. The Texas Supreme Court rejected the claim, and upheld the rule of capture. The court recognized that the legislature had selected locally controlled groundwater districts as the preferred method of groundwater regulation in Texas. However, the court did not totally close the door to a future judicial action on the rule of capture:

Given the Legislature's recent actions to improve Texas's groundwater management [SB 1], we are reluctant to make so drastic a change as abandoning our rule of capture and moving into the arena of water-use regulation by judicial fiat. It is more prudent to wait and see if Senate Bill 1 will have its desired effect, and to save for another day the determination of whether further revising the common law is an appropriate prerequisite to preserve Texas's natural resources and protect property owners' interests... Given the Legislature's recent efforts to regulate groundwater, we are not persuaded that it is appropriate *today* for this Court to insert itself into the regulatory mix by substituting the rule of reasonable use for the current rule of capture [emphasis added].

Texas has relied on groundwater districts since 1949. Usually created along county boundaries, today there are 80 groundwater districts covering a large portion, but not all, of the state's major and minor aquifers. State law requires the districts to develop management plans. In theory, these plans are required to include information about the total usable quantity of groundwater, total existing use and the annual amount of groundwater recharge.²⁰ In what is viewed by most observers as a constraint on the rule of capture, state law gives groundwater conservation districts authority to limit pumping and to regulate well-spacing in order to prevent interference with other wells on adjacent lands.²¹

While state law allows a district to adopt a management goal as part of its plan, not all districts have done so. This is particularly true of many new (and underfunded) districts that are still trying to define water availability, recharge rates and the hydrological parameters of the aquifer area they are beginning to manage.²²

¹⁹ 1 S.W. 3d 75 (Tex. 1999).

²⁰ Texas Water Code, Sec. 36.1071. As we have documented in a separate report, many newer districts have not had time or resources to adequately define the hydrological characteristics of the aquifer under their jurisdiction nor to develop an effective management plan. See Laura Brock, et al, *Spotlight on Groundwater Conservation Districts in Texas*. (Environmental Defense, Austin 2003), available at www.texaswatermatters.org.

²¹ Texas Water Code, Sec. 36.116.

²² *Spotlight on Groundwater Districts, supra* at 12-13.

The authority of groundwater districts to control out-of-district exports of water has been controversial. In 1997, Senate Bill 1 added provisions to the Texas Water Code that allowed districts to consider several factors regarding permits to transfer groundwater out of the district. These factors included: the availability of water in the district and in the proposed receiving area; how the water was to be used in the receiving area and alternatives to the import proposal; and the projected effect of the transfer on aquifer conditions and existing groundwater users within the source district.

In 2001, the districts' power over exports was narrowed by the legislature in SB 2. Among other changes, districts are now prohibited from imposing more restrictive permit conditions on exports than on in-district use. This is troublesome in some situations, since in-district use may result in local recharge that would not occur under the export scenario. SB 2 also capped the export fee a district can charge at either 2.5 cents/1000 gallons or a 50% surcharge on the in-district production fee. The authority of districts to consider the availability and feasibility of alternative supplies available to the export applicant and the amount and purpose of use in the proposed receiving area was eliminated.²³ The legislation also added several constraints on the ability of a district to put term limits on export permits.

With the exception of the Edwards Aquifer, which is governed by a statutorily created authority and a statutory cap on pumping (and which has a lively water market), the legal regime for groundwater management in Texas does not facilitate functioning, environmentally sound water markets. As discussed below, this is largely due to the uncertainty surrounding groundwater rights (whether inside or outside a district) and the lack of sustainable pumping caps for most aquifers.

LACK OF WELL-DEFINED PROPERTY RIGHTS IN GROUNDWATER

As noted at the outset, one of the central prerequisites for a functioning water market is the existence of well-defined property rights in the water.²⁴ In areas of Texas that are not covered by a groundwater district, there is no defined property right, since any landowner can pump as much as he or she desires. Essentially, the biggest pump wins.

Even within groundwater districts, rights are not always well defined. Some districts have clear pumping limits for individual wells. For example, 2 acre-feet per year per acre of land. But, if land is located near the boundary of the district, this right could

²³ In contrast, both of these factors must be considered by TCEQ in evaluating requests for inter-basin transfers of surface water.

²⁴ See, generally, Anderson, Terry L and Donald R Leal. 1988. "Going with the Flow: Expanding Water Markets." (Cato Institute, Washington, D.C.), available at www.cato.org/pubs/pas/pa104.html.

be undermined by much higher allowed pumping from the same aquifer (since districts frequently don't cover the entire aquifer, or the adjoining area might not be covered by a district). Groundwater rights are even less well defined in districts that rely on historical use to set pumping limits, since it can often be difficult to quantify historical use, especially where previous pumping was not metered.

Texas law authorizes groundwater districts to "minimize as far as possible" the drawdown of an aquifer through the use of production limits.²⁵ However, very few districts have so far used this authority to set an overall pumping cap. Some districts have indicated a desire to set a cap but have insufficient data on the aquifer to go forward.

THE EDWARDS AQUIFER

In the early 1990s, the Lone Star Chapter of the Sierra Club (joined by the Guadalupe Blanco River Authority, the City of San Marcos and others) brought litigation under the federal Endangered Species Act to limit pumping from the Edwards Aquifer. Extensive pumping from the aquifer had begun to severely reduce flow in San Marcos and Comal Springs, both of which are home to endangered species. While the litigation was winding its way through the courts, the Texas legislature responded to the problem in 1993 by creating the Edwards Aquifer Authority. This legislation also set a 450,000 annual acre-foot cap on pumping to protect the aquifer, which is used by both farms and cities, and required that the Authority issue marketable pumping rights to users. Not surprisingly, given its complete departure from the rule of capture, litigation against the new EAA prevented it from fully operating until 1996.

Even as it set the 450,000 acre-foot cap, however, the EAA legislation also guaranteed pumpers in the region their "historic minimum use." Unfortunately, the historic minimums added up to more than 540,000 acre-feet. In 2003, the EAA adopted rules to give itself until December 31, 2007 to reach the cap, and it also established a new category of "interruptible" permits tied to aquifer conditions.

The permits that have been issued, however, have served to clearly define groundwater rights and, as a result, an active water market has been created, with both sales and leases of water. The city of San Antonio is the primary buyer. Since creation of the EAA, about 150,000 annual acre-feet of water formerly used for irrigation have been transferred permanently or leased to municipal use.²⁶ Of the 250,000 acre-feet/year in permits that have been issued to irrigators within the EAA, 125,000 acre-feet are "unrestricted" (based on 1 acre-ft/acre). Of these 125,000 acre-feet, about 50,000 have been permanently transferred to municipal use.

The EAA legislation allows irrigators to lease no more than 50% of the originally permitted irrigation right to municipal use, unless the additional water comes from conservation. This restriction, which was sponsored by legislators from rural counties in the Edwards Aquifer region, was intended to preserve the character and agricultural economy of the western portion of the Edwards. Leaders of the EAA recently called for lifting this restriction, arguing that there is a mature water market and many farmers don't like the restrictions. While lifting the 50% restriction may eventually be necessary, at this point it does not seem urgent since considerable water is available under the current system for transfers.

²⁵ Texas Water Code, Sec. 36.116(a)(2).

²⁶ Edwards Aquifer Authority, testimony at February 18 hearing of Senate Select Committee on Water Policy.

"HISTORICAL USE" PUMPING LIMITS: THE DELL CITY CASE

The "historical use" approach to quantifying groundwater pumping rights has been the center of controversy in a small district in northern Hudspeth County, in Far West Texas. Under the May 2002 rules of the Hudspeth County Underground Water Control District, pumping from non-exempt (>25,000 gal./day) wells for purposes other than irrigation is limited to the maximum annual volume produced *and beneficially used* between 1992 and 2002. For irrigation wells, the permitted amount is based on a variable rate that is governed by the current groundwater level conditions and the acreage of land currently irrigated or historically irrigated during the 1992 to 2002 period. Special provisions were included to cover land where water was not being used because the land was enrolled in the federal government's Conservation Reserve Program (CRP). For lands that were out of production during the historical-use period, well production limits are based on the acreage of land that was in agricultural production for at least two of the five years immediately prior to the land entering the CRP.

In the 2003 session of the legislature, the boundaries of the district were expanded through a last-minute amendment to a largely unrelated bill, pulling new landowners into the district. Some of the landowners who fell within the new boundaries - and who have not been pumping water during the historical period - were angered by the district's expansion. With the application of the district's historical use rules, these landowners stood to lose tentative agreements with the City of El Paso. The City has been bought several "water ranches" in Far West Texas and is apparently still interested in more such arrangements.

These landowners brought their concerns to a recent hearing of the Senate Select Committee on Water Policy. At that same hearing, however, many farmers within the district testified that they believed the rules were reasonable and that they would help conserve the aquifer, even though it meant that some current irrigators had to cut back by 20-25%. The rules were recently upheld by a Texas district court.

RECOMMENDATIONS

- At a minimum, state law should provide that groundwater pumping is governed by a system based on principles of reasonable use, instead of the current rule of capture.
- All wells pumping groundwater should eventually be metered. In order to ensure that pumping limits are enforceable (and that neighboring property rights in the groundwater are meaningful), groundwater districts should initially require all wells pumping over 25,000 gal/day to be metered. The state should provide financial assistance for installation of meters, where required.

LACK OF A SUSTAINABLE MANAGEMENT FRAMEWORK FOR AQUIFERS

In order for groundwater marketing to be environmentally sound, aquifers must be managed, to the greatest extent possible, in a way that sustains the value of the resource to the local community and the environment over time. For example, in order to preserve the resource for future generations, annual pumping from an aquifer should generally not exceed average annual recharge. Pumping should not significantly reduce the flow of springs, as the springs often provide important aquatic habitat and the base flow of streams and rivers.

RIO NUEVO: LIGHTING THE FIRE IN WEST TEXAS

A private corporation, Rio Nuevo, has proposed to lease groundwater pumping rights from more than 350,000 acres of land in Far West Texas that is owned by the state, through the General Land Office. The Rio Nuevo proposal, and the broad opposition to it, highlights the inability of Texas' current groundwater management framework to ensure sustainable aquifer management. First, almost two-thirds of the land currently being considered for the Rio Nuevo lease lies outside any groundwater management district. GLO and Rio Nuevo have said that the pumping from such lands might be governed by "rules of the closest district." However, there has been no analysis of whether the "closest district's" rules even apply to the same aquifer or aquifer conditions expected under the lands outside the district.

Second, the remaining one-third of the lands currently being considered are in very new districts. There is little available science on the sustainable pumping limits for the aquifers covered by these districts, and the districts themselves have very small budgets to develop such science. Thus, their pumping rules, while based on the best information available at the present time, are not necessarily guaranteed to ensure sustainable management of the aquifers.

Finally, there is little opportunity—either within or outside of the districts—to examine the effect of the proposed pumping on the environment, including springs that support native fish and wildlife and provide important habitat on public lands and private ranches.

There may be a silver lining: the ill-conceived Rio Nuevo proposal has greatly increased awareness of the deficiencies in the current system and may help galvanize reform efforts. The issue of leasing groundwater pumping rights under state land, and the rule of capture itself, are now under scrutiny by the Texas Senate's Select Committee on Water Policy.

Though progress has been made over the last several years, Texas has yet to develop a complete framework for sustainable management of groundwater. Three interrelated factors are at the root of this problem:

- With a few exceptions, groundwater districts have been set up based on county boundaries, not on aquifer boundaries, often leading to several different approaches to managing the same aquifer;

- While there are heartening signs of increasing cooperation among groundwater districts managing different portions of the same aquifer, there has been insufficient movement to define and enforce sustainable pumping caps for entire aquifers or aquifer sub-basins; and
- Many districts still lack the resources necessary to thoroughly characterize their aquifer or to define appropriate pumping limits.

While the establishment of groundwater management areas by the Texas Water Development Board, is a positive step, it is limited. In 2001, SB 2 required TWDB to designate groundwater management areas covering all major and minor aquifers in the state.²⁷ The areas were to be delineated with "the objective of providing the most suitable area for the management of the groundwater resources." To the extent feasible, the groundwater management areas are to coincide with the boundaries of "a groundwater reservoir or a subdivision of a groundwater reservoir."

The legislation also required that groundwater districts within the same management area share management plans and cooperate.²⁸ Districts within the same area are authorized to share resources in contracting for studies of groundwater availability, aquifer modeling and recharge enhancement, among other things. However, districts managing the same aquifer are not required to develop joint management goals.

Many districts are beginning to engage in more cooperative efforts, including those located in the Hill Country, Far West Texas, the Lower Guadalupe region and other areas. Some of this cooperation has been inspired by the threat of large groundwater export proposals.

From our perspective, these are some of the most pressing issues in Texas water law. As Chapter III shows, there are an increasing number of large groundwater pumping/export proposals on the table right now, yet many districts are just beginning to get a handle on their own areas, let alone cooperate with other districts in managing an entire aquifer or sub-basin of an aquifer.

²⁷ Texas Water Code § 35.004.

²⁸ Texas Water Code § 36.108. The statute provides that one district may initiate a petition process with the commission if a neighboring district has failed to engage in requested joint planning or is failing to substantially enforce its rules. The petition can result in a "review panel" and a report by that panel to the commission.

LEARNING FROM ARIZONA

Texas is not the only state that has had to grapple with pressing groundwater management problems. In 1980, Arizona was faced with the need to stem over-drafting of its groundwater resources. The state's response was a landmark law, considered by many to be a model for groundwater management in the West. The Arizona Groundwater Management Act of 1980 created a framework for managing the state's groundwater supplies based on a system of different levels of water management, depending on the condition of the resource.

The act created Active Management Areas (AMAs) for areas where excessive groundwater withdrawals presented the most severe problems. It also created Irrigation Non-Expansion Areas (INAs) for parts of the state where an expansion of pumping would result in over-exploitation problems. The boundaries of the AMAs and INAs were defined by groundwater basins and sub-basins rather than by political boundaries. The primary management goal of the AMAs is to achieve "safe yield" by 2025. Safe yield is defined as balancing groundwater withdrawals with natural and artificial recharge rates on an annual basis. In addition, the act required that each AMA establish a program of groundwater rights and permits and required annual monitoring and reporting of groundwater use. The safe-yield policy is the driving force behind other measures that prohibit irrigation of new agricultural lands within AMAs and require that developers demonstrate a 100-year assured supply of water for new growth.

Implementation of the following recommendations would bring Texas much closer to a framework for sustainable groundwater management, which could in turn facilitate sustainable market transactions.

RECOMMENDATIONS

- As a first step, state law should require that groundwater districts adopt rules setting a sustainable pumping cap for the aquifer or aquifers under their jurisdiction by January 2007. Where an aquifer is covered by two or more districts, the districts should be required to adopt a jointly sustainable pumping cap. That cap could be flexible: (i.e., more pumping allowed in wetter years) and it could be subject to periodic revision based on new information. But the cap should ensure that all significant springs are protected and that annual pumping not exceed average annual recharge.²⁹ The districts will require significant technical and financial help from the state to set such limits. State law should also provide that districts are encouraged to put a moratorium on any new permits for major export of water until the pumping caps have been adopted.
- The Texas Water Development Board, in concert with the groundwater districts, should undertake to identify situations that warrant merger of one

²⁹ We recognize it would take some time to reach this sustainability goal in the Ogallala aquifer without causing severe economic dislocation, which may make that aquifer an exception to this general recommendation.

or more single-county districts. Criteria for such mergers should include: the absence of effective cooperation; relationship of district boundaries to aquifer boundaries and groundwater management areas; and economies of scale in creation of more comprehensive districts. Merger opportunities should be identified for consideration by the 2005 session of the Texas Legislature.

RELATIONSHIP OF LARGE GROUNDWATER EXPORT PROPOSALS TO REGIONAL WATER PLANNING

In enacting the regional water planning process, the Legislature clearly provided that TCEQ consider whether permit applications for new surface water rights are consistent with approved regional plans.³⁰ Surface water projects proposed by political subdivisions must also be consistent with regional water plans to be eligible for state financing.³¹

Because there are no state permitting requirements, there is no state review to see if a proposed groundwater development project is consistent with the regional plan. Nor are there requirements (or authority) for a groundwater district to determine if a large groundwater pumping project is consistent with the regional plan. And, of course, RWPGs themselves do not have authority to review or issue permits.

This leaves a significant gap in the viability of the regional planning process, as regions might find the aquifer capacity they depended on to supply future needs being drained by private water export projects.

RECOMMENDATION

- State law should provide that all private groundwater marketing proposals over a certain threshold and involving exporting water out of the aquifer boundaries be subject to consistency review by the regional water planning group in which the aquifer is located. The purpose of this review would be to ensure that such proposals are consistent with the regional water planning groups' charge to "provide for the orderly development, management and conservation of water resources" and to provide for the "long-term protection of the state's water resources, agricultural resources and natural resources."³²

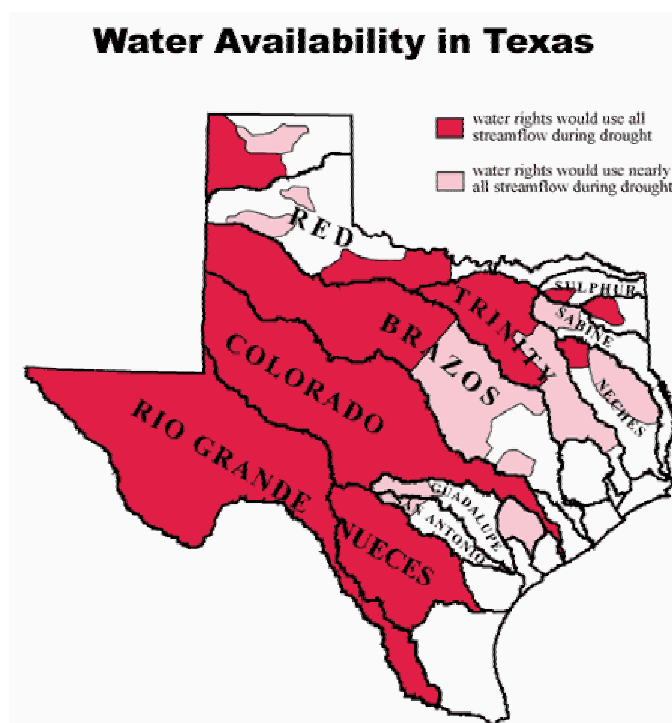
³⁰ Texas Water Code, § 11.1501.

³¹ Texas Water Code, § 16.053 (j).

³² Section 16.053, Texas Water Code.

Surface Water Markets

Much of the available surface water in Texas has already been allocated through permits from the state.³³ In fact, the state has granted some 22 million acre-feet in surface water rights for consumptive use, while estimates show that total surface water availability in drought years is on the order of 14.9 million acre feet.³⁴ Over 90% of these rights were granted before 1985, when Texas first required that environmental flow concerns be incorporated into surface water permit decisions. Thus, in some basins, the amount of the water appropriated in permits equals or exceeds the water available, especially during dry years, though many of the permits are not currently fully exercised (See Figures 4 and 5).

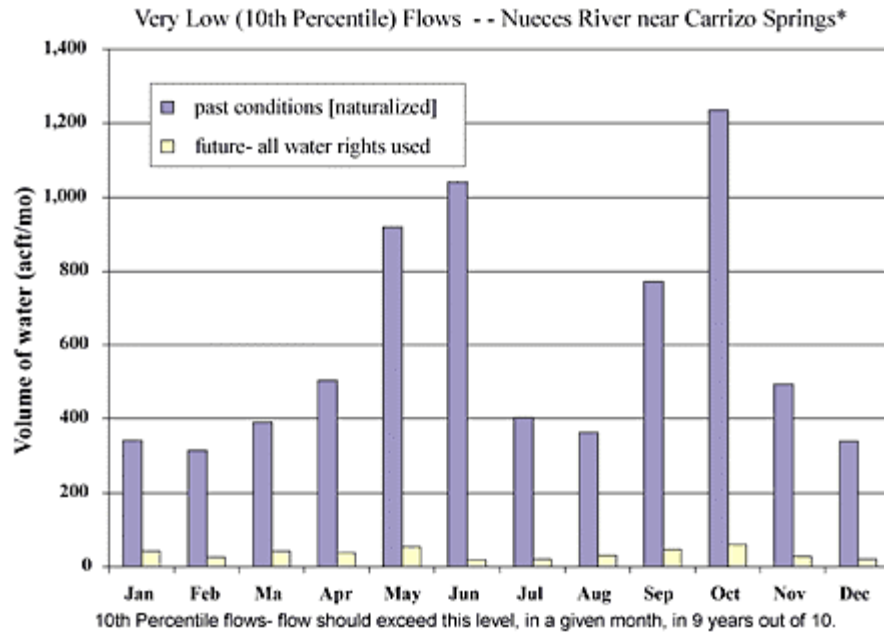


Source: National Wildlife Federation based on TCEQ data.

Figure 4. Effects of Full Exercise of Permitted Rights During Drought

³³ See the TCEQ web site for general information on surface water permitting: <http://www.tnrc.state.tx.us/permitting/waterperm/wrpa/permits.html>.

³⁴ State Water Plan, *supra*, Vol. I at Figure 5-17.

Potential Effects of Existing Permits on Environmental Flows

Source: National Wildlife Federation, based on TCEQ model data.

Figure 5. Effects of Full Exercise of Rights on Segment of Nueces River

River authorities and other large public entities (municipalities, water districts, etc.) hold the vast majority of surface water rights. In fact, in many basins, the top 10 water right holders control over 90% of the surface water rights (Figure 6 and Table 1).

While this ownership pattern means that wholesale contracts between river authorities and their customers will be the most prevalent form of surface water marketing in many basins, there may still be some market potential for smaller holdings of surface water.

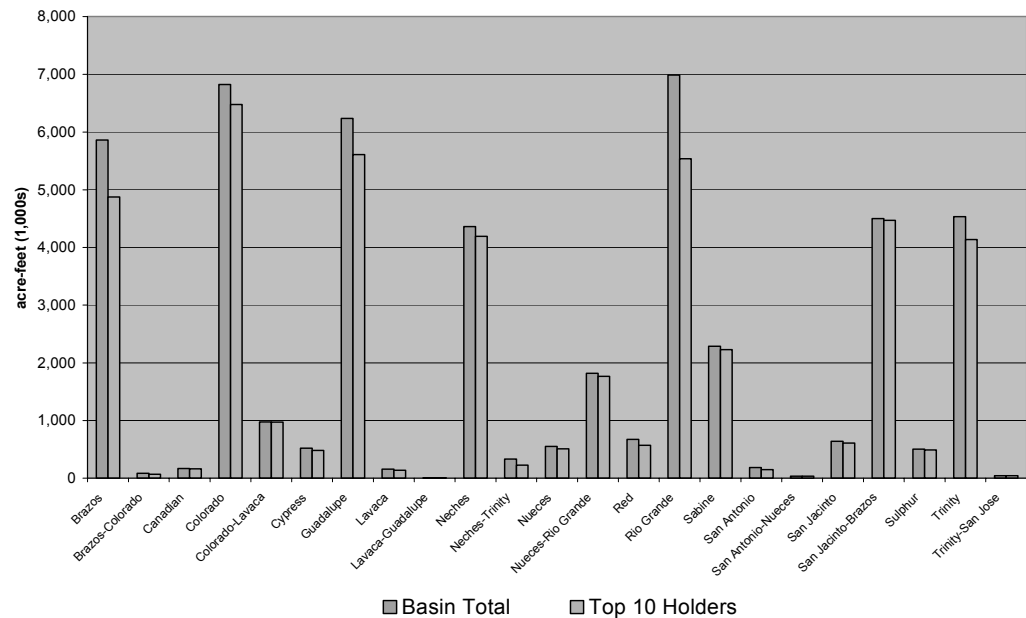


Fig. 6 Ownership of Water Rights Permits

Several of the regional water plans include a strategy of reallocation of surface water use to meet future water demand. The plans project that by 2050 a total of 2.456 million acre-feet of surface water demand, across 12 regions, will be supplied by "voluntary redistribution of existing water resources, including water marketing, sales, leases and options."³⁵ This is about 36 % of current total surface water use, and roughly equivalent to the total amount of surface water used in 1999 for irrigation. However, the 2.456 million acre-feet figure appears to include some amount of new purchases of municipal surface water from large wholesale water providers that already hold the rights, so not all of the projected "reallocation" would be from irrigation to municipal use.

In any case, outside of the Lower Rio Grande Valley, the legal and policy issues surrounding surface water marketing are complex. These issues are explored in the following sections.

³⁵ State Water Plan, *supra*, at 73.

Table 1. Ownership of Surface Water by Top 10 Water Rights Holders

Basin	Basin Total	Top 10 Holders	% Ownership of Top 10
Brazos	5,860,799	4,873,042	83.15%
Brazos-Colorado	85,738	68,686	80.11%
Canadian	164,791	163,814	99.41%
Colorado	6,820,678	6,475,660	94.94%
Colorado-Lavaca	975,444	971,147	99.56%
Cypress	517,049	479,803	92.80%
Guadalupe	6,233,506	5,610,007	90.00%
Lavaca	156,207	138,582	88.72%
Lavaca-Guadalupe	4,550	4,550	100.00%
Neches	4,362,276	4,192,099	96.10%
Neches-Trinity	330,366	226,105	68.44%
Nueces	550,909	508,227	92.25%
Nueces-Rio Grande	1,815,353	1,766,790	97.32%
Red	670,494	568,166	84.74%
Rio Grande	6,985,804	5,537,237	79.26%
Sabine	2,287,732	2,229,248	97.44%
San Antonio	185,957	148,662	79.94%
San Antonio-Nueces	33,271	33,264	99.98%
San Jacinto	637,487	609,019	95.53%
San Jacinto-Brazos	4,498,872	4,468,917	99.33%
Sulphur	501,813	490,860	97.82%
Trinity	4,531,882	4,136,101	91.27%
Trinity-San Jose	44,524	44,474	99.89%
Total	48,255,502	43,744,460	90.65%

Source: Kaiser, R. 2002. *Ownership of Water in Texas*. Presented at: Water Puzzle—Putting the Pieces Together, Texas Agricultural Extension Service Workshop, San Marcos, Texas, April 19, 2000. Updated October 2002.

[MARKETING UNUSED WATER RIGHTS](#)

Surface water right holders have been granted permits or certificates of adjudication to a specified quantity of water for a specified use or uses. However, under Texas law these surface water right holders have a vested right only to the amount of water put to beneficial use.³⁶ In other words, if an appropriator has a permit for 100 acre-feet of water per year but has only used 50 acre-feet per year beneficially, then the unused portion is considered unperfected (Texas Water Code § 11.025 & 11.026). If the water has not been used for 10 consecutive years, it is theoretically subject to cancellation by the state.³⁷ However, the cancellation statute has rarely been

³⁶ Texas Water Code § 11.026

³⁷ Texas Water Code § 11.173(a).

enforced in Texas, and this has created confusion among water right holders about the status of their rights.³⁸

Of the 22 million acre-feet of surface water permitted in Texas, current surface water use is estimated to be less than 7 million acre-feet. A substantial portion of those unused rights may be held by large supply entities, such as river authorities or cities, in reserve for future growth. Nevertheless, it also appears that many permits are not being fully used. As water becomes more valuable in response to increasing municipal demand, some water right holders may seek to market either their entire permitted amount or the unused portion of the paper right.

As far as we can determine, TCEQ has not produced a comprehensive, statewide analysis of how surface water right holders are—or are not—using their permitted rights.³⁹ Without this information, it is difficult to assess where water rights could or should be cancelled, under existing law, in order to make the unused water more readily available for human or environmental needs. It is important to note that holders of unused rights concerned about cancellation have the option of placing the unused rights in the Texas Water Bank, where they are protected from cancellation for 10 years.⁴⁰ Municipal rights also generally have protection from cancellation if they are held for a demonstrated long-term need or are consistent with water management strategies identified in an approved regional plan.⁴¹

In 1997, the legislature enacted a provision that, by most observers' accounts, was designed to promote marketing of unused rights. Senate Bill 1 added new language clarifying the requirements for amending water rights:

" (b) Subject to meeting all other applicable requirements of this chapter for the approval of an application, an amendment, except an amendment to a water right that increases the amount of water authorized to be diverted or the authorized rate of diversion, shall be authorized if the requested change will not cause adverse impact on other water right holders or the environment on the stream of greater magnitude than under circumstances in which the permit, certified filing, or certificate of adjudication that is sought to be amended was fully exercised according to its terms and conditions as they existed before the requested amendment..." Texas Water Code, §11.122(b).

³⁸ See, for example, Melvin, *supra*, ("A water right in Texas may be lost by cancellation... Therefore, it should be determined if a water right is subject to cancellation... at the time of purchase or sale.")

³⁹ In 2002 and 2003, TCEQ did undertake a comprehensive assessment of use and implement appropriate cancellation proceedings in the Lower Rio Grande Valley.

⁴⁰ Texas Water Code, ch. 15, subchapter K.

⁴¹ Texas Water Code, § 11.173(b)(3), (4).

This full transferability of "paper rights," often referred to as the "four corners doctrine," can pose a problem for junior water right holders and the environment, especially in situations where both have come to depend on the unused portion of the right staying in stream and on return flows from upstream users.

Recent litigation has addressed the question of whether TCEQ is required to provide for notice and public hearing when a water right holder seeks to transfer its water right pursuant to the four-corners doctrine.⁴² The case involves the City of Marshall's desire to amend its 16,000 acre-foot municipal water right to include industrial uses. At the time the amendment was filed, Marshall had been in discussions about selling raw water to a proposed power plant, which would be classified as an industrial use. Up until that point, however, Marshall had used less than half of its 16,000 acre-foot paper permit.⁴³

The Texas Parks and Wildlife Department, downstream water rights holders, the City of Uncertain and local citizen groups requested that TCEQ hold a contested case hearing on Marshall's amendment application. These groups requested a hearing based on the argument that the proposed amendment could adversely affect downstream junior water right holders and the level of water in Caddo Lake. TCEQ took the position that, under the language of Sec. 11.122(b), no notice or hearing was required and that TCEQ had no discretion to deny the amendment requested by Marshall.

The City of Uncertain and the citizen groups appealed TCEQ's decision. Both the district court and the court of appeals ruled against TCEQ's interpretation and held that the agency was required to issue notice and consider hearing requests. TCEQ and the City of Marshall have appealed the case to the Texas Supreme Court.

Two changes in Texas law would provide more certainty for surface water rights marketing, while ensuring protection of the interests of downstream water users and the environment: (1) establishing a clear statutory "no injury" standard, providing junior water rights holders and other stakeholders an opportunity for meaningful participation in permit amendment requests that involve transfer of water rights and (2) presumptively limiting transfers to "historical consumptive use" unless accompanied by conditions that protect the environment and downstream water rights holders.⁴⁴ This approach is common in other Western states.

⁴² *City of Marshall, et al v. City of Uncertain, et al*, No. 03-03-00154-CV, Third Cir. Court of Appeals, Austin, Texas, October 16, 2003.

⁴³ The city's 50-year projection of municipal use under this right also never exceeded 8,000 acre-feet, or half the permitted amount.

⁴⁴ For example, this is essentially the approach taken in Colorado. See Sec. 37-92-305(3), 15 Colo. Rev. Stat. (2001) and *City of Thornton v. Bijou Irrigation Co.*, 926 P2d 1, 80 (Colo. 1996) and *Green v. Chaffee Ditch Co.*, 371 P. 2d 775, 783-84 (Colo. 1962).

RECOMMENDATIONS

- The law should be changed to expressly provide that market transfers of existing surface water rights are generally limited to historical consumptive use. Transfers in an amount greater than historical consumptive use could be authorized to the extent that conditions on such transfers (1) are consistent with regional water plans and (2) ensure no adverse effect on the environment, downstream water right holders or other interests protected by Chapter 11 of the Texas Water Code. Exceptions could be made for small-scale transfers with an anticipated *de minimus* effect on downstream users or the environment.
- Texas law should be clarified to provide that downstream water right holders and other affected persons have the opportunity for a contested case hearing on water right amendments that propose to change the place or purpose of use of any portion of a water right that has not been used over the last 10 years.

MARKETING "CONSERVED" WATER

Given the increasing value of surface water rights, it may become more attractive for water users to invest in conservation measures *if* they can market all or a portion of the conserved water. A variation on this approach could involve municipalities or others paying for on-farm conservation in return for the right to the conserved water. However, with the exception of the Lower Rio Grande Valley, uncertainty about the legal status of conserved water may constrain its marketing.

WATER MARKETING IN THE LOWER RIO GRANDE

As many studies have documented, a well-established water market exists in the Lower Rio Grande Valley below Amistad Reservoir.⁴⁵ A separate set of rules governs Rio Grande surface water rights. Here water rights can be bought, sold or leased, but there is no seniority. The rules governing the Rio Grande water market were conceived after a prolonged drought in the 1950s, which resulted in a legal battle over water rights. By 1971, a state court had adjudicated water rights in the region, settling the protracted dispute.

Water rights in the lower Rio Grande are based on the combined storage of Amistad and Falcon reservoirs. Agriculture accounts for 85% of the water rights, but municipal, industrial and domestic use have a higher priority during dry periods. New inflows to the reservoir system are first apportioned to municipalities based on an accounting system, otherwise known as the "municipal reserve." At present, the municipal reserve is set at 225,000 acre-feet, and it is replenished before any remaining inflows are allocated to agriculture.⁴⁶ Thus, allocations to irrigators and irrigation districts can vary significantly according to climatic conditions. Between 1997 and 2002, when inflows into the Amistad/Falcon system from Mexico were greatly reduced, agricultural users were allocated, on average, 38% of their paper water rights.⁴⁷

Transferring water rights in the Rio Grande is a fairly simple procedure. Because there is no seniority of rights (rights are essentially correlative) and because most return flows are discharged not to the main stem of the Rio Grande but to the out-of-basin Arroyo Colorado drainage system,⁴⁸ it is believed that transfers will not adversely impact other water right holders. Therefore, the state does not require public notice or opportunity for a hearing if a water right holder in this section of the Rio Grande applies for an amendment to change the point of diversion or the place or purpose of use.

A rapidly growing population, water scarcity, simple administrative procedures based on correlative rights and the ability to transport water using the river itself, as well as the area's extensive system of canals, have all contributed to making the Lower Rio Grande one of the most active water markets in the state. Most of the transfers have been from agricultural to urban use. According to one study, municipalities are acquiring permanent water rights at a rate of about 10,000 acre-feet/year, with prices averaging \$1200 to \$1400 per acre-foot.⁴⁹ There is also an active market in temporary transfers or "contract water." In 2001 and 2002, nearly 80,000 acre-feet was transferred through temporary contracts, with most of the transfers among agricultural uses.

⁴⁵ The water market takes place in that portion of the river from Amistad Reservoir to the Gulf of Mexico.

⁴⁶ Griffin, R.C. and G.W. Characklis. 2002. *Issues and Trends in Texas Water Marketing*. Water Resources Update. (University Council on Water Resources). No. 121, January: 29-33. Transfers have increased domestic, municipal and industrial (DMI) rights in the Falcon/Amistad system from an initial level of 155,000 acre-feet (1971) to over 300,000 today. Region M Regional Water Plan at 5-36.

⁴⁷ Personal communication between Kathy Viatella, Environmental Defense and Carlos Rubenstein, Rio Grande Watermaster, December 11, 2002.

⁴⁸ Texas Water Development Board. 2003. [A Texan's Guide to Water and Water Rights Marketing](#), at p. 18-19. Also, unlike other basins, there is less monopoly control of water rights. The Rio Grande does not have a river authority.

⁴⁹ Griffin, *supra*. The Region M plan uses lower cost estimate for municipal acquisition of irrigation water rights. Region M Regional Water Plan, *supra*, at 5-38.

Current TCEQ practice generally allows water that meets the statutory definition of "conserved" to be marketed under the applicable statutory notice and hearing procedures for amendments of water rights.⁵⁰ It can be argued that only "new" water created by conservation can be marketed under Texas statutes; that is, water "conserved" by fallowing land on a temporary or permanent basis does not meet the statutory definition of "conserved water," and thus cannot be marketed. In contrast, water saved by, for example, lining an irrigation canal, would more clearly meet the definition of "conserved" water and be marketable under current TCEQ practice. Lingering uncertainties about title to "conserved" water, however, may be a disincentive to making conservation investments solely for purposes of marketing the saved water. Under Texas law, surface water must be put to "beneficial" use; otherwise it is subject to cancellation. If there is no immediate market—and relatively straightforward water right amendment procedures—to transfer the conserved water to another use, it might be considered subject to cancellation unless placed in the Texas Water Bank.

RECOMMENDATIONS

- Texas law should be clarified to state clearly what types of conservation measures qualify the conserved water for marketing and to establish clear procedures for the transfer of the conserved water (including consideration of the effects on the environment and downstream water rights holders).
- In fully or over-appropriated basins, Texas law should provide that public investments in water conservation result in a portion of the conserved water being devoted to environmental flow needs.

INTER-BASIN TRANSFERS

Moving surface water from one basin to another in Texas is nothing new. In fact, the State Water Plan lists almost 100 existing inter-basin transfers, most of which were issued as new permits.⁵¹ These transfers are concentrated in the following areas:

- (1) movement of water from Lake Meredith on the Canadian River south to Amarillo, Lubbock and other Panhandle cities;
- (2) movement of water from reservoirs in northeast Texas to Dallas and other inter-basin transfers for municipal uses in northeast Texas; and

⁵⁰ "Conserved water" is defined in Sec. 11.002(9) of the Texas Water Code as "that amount of water saved by a holder of an existing permit, certified filing, or certificate of adjudication through practices, techniques, and technologies that would otherwise be irretrievably lost to all consumptive beneficial use arising from storage, transportation, distribution or application."

⁵¹ 2002 State Water Plan, *supra*, Vol. I at 53-55.

- (3) various inter-basin transfers among the lower reaches of the basins along the Gulf of Mexico, with most water being moved to Houston and Corpus Christi.

Nevertheless, special considerations apply when considering marketing of water between river basins. These considerations include: the effects of the transfer on flows and downstream water rights in the basin of origin; the effect on future economic development in the basin of origin when water is transferred out; and issues of inter-basin equity (i.e., whether users in the basin of destination should have to conserve to the extent practicable before receiving water from another basin.) All these considerations help make inter-basin transfers one of the most controversial Texas water law issues.

Prior to 1997, an inter-basin transfer could be authorized if it was determined that there would be "no injury" to other water right holders in the basin of origin and if the benefits of the transfer to the receiving basin outweighed the detriments to the basin of origin.⁵² The Water Code was amended in 1997, by Senate Bill 1, to add several very specific factors that must be considered before an inter-basin transfer can be authorized.⁵³ These conditions include need in the receiving basin; availability of alternatives in the receiving basin; conservation and drought management in the receiving basin; economic effects of the transfer on the basin of origin and the receiving basin; impacts on instream uses, existing water rights, water quality, bays and estuaries; and mitigation proposed for the basin of origin.

In addition, the effects of the proposed transfer must be analyzed in relation to the portion of the existing water right that been historically used. That is, in analyzing the impacts of the proposed transfer of an entire water right, the effects must be measured against a baseline condition reflecting only the historical use (not full permitted use) of the water right to be transferred.⁵⁴

Finally, the 1997 amendments added the "junior water rights provision" to the inter-basin transfer section. Under this provision, any water right transferred out of a basin loses its seniority and becomes "junior" to other rights in the basin.⁵⁵

Some claim that the junior water provision effectively deters inter-basin transfers of existing water rights, since during a drought all other basin of origin rights would

⁵² Texas Water Code, Sec. 11.085 prior to amendment in 1997 by Senate Bill 1. *City of San Antonio v. Texas Water Commission*, 407 S.W. 2d 752 (Tex. 1966).

⁵³ Texas Water Code, Sec. 11.085, as amended. A transfer can only be authorized only to the extent that "the detriments to the basin of origin during the proposed transfer period are less than the benefits to the receiving basin during the proposed transfer period" and the applicant for the transfer has "implemented a water conservation plan that will result in the highest practicable levels of water conservation and efficiency achievable within the jurisdiction of the applicant." 11.085(l). The 1997 amendment also added extensive procedures for notice and hearing on proposed inter-basin transfers.

⁵⁴ Texas Water Code, Sec. 11.085(k)(2)(F).

⁵⁵ Texas Water Code, Sec. 11.085(s).

have to be satisfied before the "junior" water could be transferred out of the basin.⁵⁶ The extension of this argument is that the junior water rights provision is a disincentive to inter-basin marketing of existing water rights.

Others maintain that the provision does not represent a major change from Texas law prior to 1997. Under previous law (including a Texas Supreme Court decision⁵⁷ and agency practice), a transfer would not have been authorized if it would injure downstream water rights holders, even under drought conditions. Thus, the argument goes, inter-basin transfers of existing rights under previous law would have been allowed *only* if the basin had a "surplus" of water.⁵⁸ That is effectively no different than making a transferred water right "junior" to existing rights in the basin of origin. In essence, supporters of the junior water rights provision believe it is a clear and administratively efficient way to implement what has always been Texas law regarding protection of basin of origin water right holders.

In addition, it is important to point out that some inter-basin transfers of existing water rights are exempt from many of the requirements of Sec. 11.085, including the "junior water rights" provision. These include transfers of less than 3,000 acre-feet/year under the same permit; emergency transfers; transfers to adjoining coastal basins; and certain inter-basin transfers related to municipal retail service areas.⁵⁹

From an environmental perspective, provisions protecting downstream water right holders generally also protect the environment in the basin of origin from adverse effects of inter-basin transfers. The more difficult question arises if there is a choice between an inter-basin sale of an existing water right versus new storage or over-exploitation of an aquifer in the receiving basin. At this time, however, such a choice appears to be largely hypothetical. Moreover, removing the junior water rights provision in Sec. 11.085 could lead to litigation of specific inter-basin sales of existing rights on the grounds of impairment of constitutionally protected property rights. The prospect of such uncertainty and litigation could also be a significant disincentive to major interbasin transfers.

[RE-USE OF PERMITTED SURFACE WATER](#)

One of the more complex unresolved issues in Texas water law—and one with important implications for water marketing—is how to regulate "re-use" of surface water. As pressure on supply grows, many water providers are trying to get the most out of their existing rights by using the water as many times as possible. For example,

⁵⁶ See, e.g., Timothy Brown, *Interbasin Transfers of Water and Senate Bill 1*. Presented at Texas Water Law Conference/CLE International, November 12-14, 1997, Austin, Texas.

⁵⁷ *City of San Antonio*, *supra*.

⁵⁸ See, e.g., Michael Booth, *Interbasin Transfers in Texas*, Presented at the TRWA/TWC Water Law Seminar, Austin, Texas January 25-26, 2001.

⁵⁹ Texas Water Code, Sec. 11.085(v).

in a city that diverts water for municipal needs not all the water will be consumed; some will end up at the sewage treatment plant. The usual practice is to discharge the treated sewage back to the river. In some Texas rivers, treated effluent constitutes a majority of the flow during dry periods—providing water for the river and water for downstream uses. Increasingly, however, cities are looking to re-use—or even sell—the treated effluent for green space irrigation, use in cooling towers or other non-drinking water consumptive needs.

In fact, re-use was recommended as a water management strategy by 10 of the 16 regional water planning groups. These groups estimate that, in total, re-use could supply 423,000 acre-feet/year of otherwise unmet demand by 2050 (compared with about 180,000 acre-feet of municipal re-use in 1999).⁶⁰

There are uncertainties under Texas law about who can directly re-use water when the water rights holder is different from the discharge permit holder. There are also questions about when and how indirect re-use applications can be approved.⁶¹

There are several large indirect re-use applications pending at TCEQ, including proposals by the Lower Colorado River Authority, the San Jacinto River Authority, the North Texas Municipal Water District and the Upper Trinity Regional Water District.⁶²

While re-use offers benefits (reduced need for developing new surface water or groundwater supplies), it also raises concerns of reduced instream flows and less water for downstream water right holders. Because each potential re-use situation can be quite unique, it is difficult to find solutions that have broad applicability. Nevertheless, resolving re-use questions in Texas law will be one key to establishing environmentally sound water markets.

RECOMMENDATIONS

- Texas law on direct and indirect re-use of surface water should be clarified. The following principles should guide changes in the law:
 - Indirect re-use should not be allowed where discharged water makes up a significant portion of the instream flow under low flow

⁶⁰ This accounts for about 6% by volume of water management strategies in the State Water Plan. 2002 State Water Plan, *supra*, at 71, 73. In contrast to the 180,000 acre-feet of "municipal re-use" for 1999, the State Water Plan also cites a figure of 341,386 acre-feet/year for total re-use statewide in 2000. *Id.* at 58.

⁶¹ Section 11.046 of the Texas Water Code allows re-use of water before discharge to the stream ("direct re-use"), but once it is in the stream, the water cannot be re-used without a "bed and banks" permit under Section 11.042 ("indirect re-use.")

⁶² www.tceq.state.tx.us/permitting/waterper/wrpa/wr_pending.xls.

- conditions, unless the reduction in flow caused by re-use is fully mitigated.
- Parties that could be adversely affected by re-use proposals over a certain threshold (for example, a reduction of a certain percentage of stream flow under low flow conditions) should have an opportunity for a contested case hearing.
 - TCEQ should be given a clear mandate and authority to condition approvals of re-use applications in order to protect the environment and downstream water right holders.

EFFECT OF MARKETING ON THE ENVIRONMENT AND COMMUNITIES

As discussed in previous sections, many of the current issues related to surface water marketing in Texas have implications for the environment, especially in terms of instream flows, water quality and freshwater flows to bays and estuaries. At the very least, it is clear that decisions about surface water marketing are complicated by the fact that Texas has yet to define instream flow needs for major rivers and tributaries. Although some studies are underway, they are not expected to be complete until 2010.⁶³ Without that science, the effects of a proposed surface water market transfers must be analyzed on a case-by-case basis.

The question then becomes how to ensure that the environment – and the larger public interest associated with healthy rivers and streams – are considered and protected in the case-by-case decisions on proposed surface water marketing transactions. Under the present system, the only way to guarantee that environmental concerns are fully considered is to ensure notice and opportunity for a contested case hearing on the amendment application that must be approved by TCEQ before a transaction can take place. In that process, affected parties can contribute the scientific and other evidence needed for TCEQ to make a fully informed decision.

Thus, even though these types of hearings can increase costs for market transactions, at the present time they are necessary to avoid adverse environmental effects of transfers that shift water from one use to another or increase use over historic use. It is likely that most of these hearings will result in permit conditions or other agreements that, while allowing the transaction to go forward, ensure water is available for fish and wildlife and other environmental values. In addition, the

⁶³ See www.twdb.state.tx.us/instreamflow/index.html for information on statutory requirements and on-going instream flow studies, including a review of the study methodology by a committee of the National Academy of Science.

hearings can help develop information that will inform ongoing instream flow studies.

HOW TO PROTECT THE "PUBLIC INTEREST?"

There is a developing body of legal and policy literature regarding how to protect the public interest or the public welfare in water market transactions. Part of this debate centers around whether or how to protect specific third-party interests. For example, local farm suppliers might be considered "third parties" that could be adversely affected by the transfer of water from agricultural to municipal use. Broader environmental or community impacts also fall within the public interest/public welfare sphere.

Like most Western states, Texas law requires that proposed surface water permits or amendments be rejected if they will be contrary to public welfare.⁶⁴

The problem, of course, comes in defining third-party interests, public interest or public welfare, and in deciding how to weigh competing interests. These decisions can be fact-intensive and value-laden, and under current practice there is virtually no statutory or regulatory guidance for making such determinations.

However, without an opportunity for formal consideration of at least the public interest and public welfare, proposed transfers can become highly controversial and polarizing. The challenge then is for the state to define a clearer set of standards for evaluating and balancing the public interest/public welfare aspects of major transfers of surface water rights.

For more discussion of these issues, see: Kaiser, Ron. 1996. *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*. Texas Tech Law Review, Vol. 27, No. 1 and National Research Council. 1992. *Water Transfers in the West: Efficiency, Equity and the Environment*. (National Academies Press, Washington, D.C.).

RECOMMENDATIONS

- Until instream flow needs are quantified and protected, the only way to ensure that transfers do not have an adverse effect on the environment is to continue to provide an opportunity for a contested case hearing on transfers above a *de minimus* level.
- In fully or over-appropriated basins, state law should authorize TCEQ to require that a portion of the surface water right be devoted to in-basin environmental flow needs when the permit holder seeks to transfer the right through the permit amendment process. This would give the TCEQ a flexible tool to help protect river flows in critical areas.

⁶⁴ Texas Water Code, § 11.134(b)(3)(C).

- TCEQ should adopt rules to more clearly define the factors that will be considered in evaluating the effects of major proposed transfers of surface water rights through the permit amendment process. TCEQ should look to other Western states and legal literature in preparing such rules, and should include a diverse group of stakeholders as part of the rulemaking process. Defining the factors to be considered in evaluating the public interest/public welfare would add clarity to the amendment procedures for market transfers.

MONITORING AND ENFORCEMENT ISSUES

Texas has a history of lax surface water rights enforcement. For the most part, enforcement is based on the honor system. During times of plenty, this approach worked reasonably well. With increased demand on our rivers, however, conflicts have begun to arise during droughts, when surface water right holders are unaware that they might not be entitled to use water that has been released from storage to satisfy downstream senior water right holders. For example, during dry spells, water right holders on the Brazos, Colorado and Conchos rivers have complained that water released from storage upstream was not reaching them because junior water right holders were diverting it.

In order for water markets to operate efficiently, water rights need to be secure and enforceable. Expanded monitoring and better enforcement could benefit all water users by providing accurate information on water availability and helping protect water rights.

RECOMMENDATIONS

- Water masters should be established for major water basins in Texas that are over- or fully appropriated in order to ensure comprehensive, orderly and fair enforcement of water rights and permit conditions.⁶⁵ Resources for the water masters should be sufficient to provide for an adequate network of real-time, internet-available stream gauging.
- In lieu of water masters, TCEQ must be provided with substantial additional resources to carry out these same functions. In basins where one entity, such as a river authority, already holds a substantial amount of surface water rights, TCEQ could be authorized to enter into cooperative agreements with that entity for stream gauging.

⁶⁵ Water masters are already in place for the Lower Rio Grande and various South Texas rivers.

WATER MARKETING TO MEET ENVIRONMENTAL NEEDS

Texans increasingly recognize the need to ensure that water is available to keep rivers flowing, keep bays and estuaries healthy and provide for the water needs of fish and wildlife.⁶⁶ Many of Texas' rivers are fully or even over-appropriated, at least on paper.⁶⁷ In these rivers, finding water to meet instream flow needs will be difficult.⁶⁸ An environmental water market—that is, lease or purchase (or even donation) of water or water rights from willing sellers for environmental flow needs—provides one viable mechanism. The Legislature clearly recognized this option in the 2003 session when it expressly protected the ability to convert existing water rights to instream flow purposes.⁶⁹

TEXANS RECOGNIZE NEED FOR ENVIRONMENTAL FLOWS

In a 2003 poll conducted for the National Wildlife Federation by the Tarrance Group, 74% of Texans agree that we need to find ways for people to use less water instead of drying up rivers and streams to meet human needs. Over 88% of those surveyed supported the issuance of permits for water to protect river flows for fish, wildlife and recreation. [Poll of 800 Texans conducted in Spring 2003 for the National Wildlife Federation by the Tarrance Group. Full results available at www.texaswatermatters.org.]

Water markets for environmental needs have begun to be used in other Western states, though—to date—most of the purchases have been made with federal money in order to provide water for threatened or endangered aquatic species.⁷⁰ Clay Landry, an analyst with West Water Research has been tracking environmental water market transactions in the western U.S. for several years. His most recent analysis concludes:

⁶⁶ This discussion is focused on surface water. Protecting aquifers from over-exploitation is the best way to protect the environment in and around springs. Protecting spring flow, of course, has the added benefit of protecting the base flow of many of our most important streams and rivers.

⁶⁷ Moreover, it was not until 1985 that the law required environmental flow conditions to be included in surface water right permits. The vast majority of surface water rights in the state were granted before 1985, however.

⁶⁸ For rivers that still have reasonable volumes of unappropriated water, there are more options to protect environmental flows, including new permits for instream flow, a state "reservation" of water for environmental needs or other measures. For more information on the environmental community's perspective on environmental water needs, see www.texaswatermatters.org.

⁶⁹ Senate Bill 1691, 78th Regular Session of the Texas Legislature, Sec. Section 2, adding Sec. 11.0237 to the Texas Water Code: "This section does not prohibit the commission from issuing an amendment to an existing permit or certificate of adjudication to change the use to or add a use for instream flows dedicated to environmental needs or bay and estuary inflows."

⁷⁰ Landry, Clay. 1998. *Instream Flow Marketing in the Pacific Northwest*. (Political Economy Research Center; Bozeman, Montana).

Throughout the western United States, water acquisitions for non-consumptive uses such as environmental mitigation and flow augmentation are increasing. Commonly used acquisition methods include permanent purchases, leases, and donation. With the exception of Wyoming, environmental water sales have occurred in every western state. This market sector has increased steadily since 1990 when less than \$500,000 was spent on water purchases. In comparison, more than \$11 million dollars were expended from 1990 to 1997 on purchases of water to improve habitat conditions for fish and wildlife. Expenditures for environmental water acquisitions throughout the western United States are currently estimated at \$20 million per year.

The Pacific Northwest has one of the most active markets within the western United States. This is largely due to federal efforts to increase stream flows for federally protected species. From 1990 to 1997, approximately 94 percent of all environmental water acquisitions occurred in the Pacific Northwest. Market activity within the region is continuing to increase. In addition, from 1998 to 2001, a total of \$11.9 million was spent to acquire approximately 1.09 million acre-feet of water for flow enhancement.

Within the Pacific Northwest, active water leasing programs have been developing in the Yakima and Salmon Creek basins of Washington, the Walla Walla, Klamath, and Deschutes basins in Oregon, the Snake and Lemhi basins in Idaho, the Bay-Delta region of California, and throughout various basins in Montana.⁷¹

In Texas, it is most likely that markets would be used for meeting flow needs in streams and rivers, as opposed to providing the much larger quantities of fresh water required for bays and estuaries. Thus, the remainder of the discussion focuses on these "instream" flow needs.

Two issues frequently arise regarding the potential for using markets to protect instream flows:

- Where does the money come from to lease or purchase rights from willing sellers?
- Who can or should hold the instream right?

FUNDING LEASES OR PURCHASES

As noted above, to date most of the money to purchase or lease water rights for the environment has come from the federal government, motivated by legal requirements to protect endangered or threatened aquatic species. Outside of the Edwards

⁷¹ Landry, Clay. 2003. *Review of Western U.S. Water Leasing Programs* (West Water Research, LLC; Laramie, Wyoming). (Citations omitted).

Aquifer controversy, this scenario has not yet occurred in Texas. This does mean, however, that funds for acquisition of rights from willing sellers will more likely have to come from state and private sources.

The economic (as well as aesthetic and environmental) values of environmental water uses, however, should help motivate both public and private financing. These values include:

- enhancing property values for lands bordering flowing streams and rivers;
- stabilizing or even enhancing water supplies for farmers located near the end of a river (such as the Río Grande or the Colorado);
- maintaining the very considerable local economic benefits of fishing, rafting, camping and other river-related recreation in many parts of the state;
- avoiding the types of threatened and endangered species crises that have plagued some rivers in the western U.S.; and
- enhancing water quality, thus helping to hold down wastewater treatment costs.

Of course, not all these benefits will be present in every situation, but standing alone or combined they could motivate public and private spending, especially once environmental flow needs are better defined. Moreover, tax incentives could be used to encourage donations of existing rights to non-profit water trusts for instream flow purposes.

[WHO CAN OR SHOULD HOLD INSTREAM FLOW WATER RIGHTS?](#)

In 1997, the state established the Texas Water Trust, which is currently administered by the Texas Water Development Board.⁷² The Trust was initially conceived to receive donations of water rights for instream flows. To date, however, it has received only one such donation: West Texas rancher Kit Bramblett donated 1,236 acre-feet of existing water rights on the Río Grande, in Hudspeth County.⁷³

⁷² Texas Water Code, § 15.7031. For information on the Trust, see www.twdb.state.tx.us/assistance/waterbank/wtrust.html.

⁷³ The San Marcos River Foundation, which filed for a new instream flow permit for the Guadalupe River, had proposed to donate the right to the Trust if it was awarded. However, the permit application was dismissed by TCEQ in the spring of 2003.

Mr. Bramblett's donation was arranged through the Texas Parks and Wildlife Department.

There are several problems with the current form of the Texas Water Trust, including a lack of regulatory or other incentives for donation of rights; lack of funding for purchases or lease of water rights; very little public education about or promotion of the Trust; and very few efforts by TWDB to "recruit" water rights donations.

Other Western states have private, statewide water trusts. [See Table 2 for examples.] In Colorado and Washington, the rights converted to instream use are actually held by the state, not the trust itself.

Operating as non-profits, these trusts can accept contributions from foundations, government agencies, businesses and individuals to build an acquisition fund for buying or leasing rights from willing sellers. Because they are non-profit organizations, tax deductions for the value of donated water rights are also more easily established and processed. The trusts have staff that are dedicated to appropriate outreach to water right holders and focused on protection of priority streams and rivers. These private trusts have governing boards that represent a variety of interests, including agriculture, ranching, fishing and recreation. Finally, the trusts also help conduct monitoring to ensure that rights converted to instream flow stay in the stream.

Given its broad geographic diversity, another option for Texas might be local or regional non-profit water trusts. With a diverse board of local interests – such as farmers, ranchers, tourism industry representatives, conservationists and local officials – these types of trusts might be more tied in to regional instream flow needs and be more adept at outreach to local water right holders.

DESCHUTES RESOURCE CONSERVANCY

An example of a local water rights trust is the Deschutes Basin Resources in Oregon. Created in 1996, the DRC operates the Deschutes Water Exchange, which is an active market for water rights in the basin designed to facilitate transfers and restore depleted streamflow. To date all transfers have been leases under which irrigators are paid to forego the use of all or a portion of their water right on an annual basis. In 2003, with annual leases on 16,000 acre-feet of irrigation district rights, the DRC was able to double instream flow. See www.deschutesrc.org for more information.

Having instream rights held by a trust, whether a local or statewide non-profit or a state-run entity, helps ensure that the right can be enforced (i.e., that it stays in the stream). However, there may be instances in which it is just as appropriate that the instream right be held by an individual or other private or governmental entity.

Table 2. Statewide Water Trusts in Other Western States

State	Trust Status	Funding
<p>Montana</p> <p>Montana Water Trust</p> <p>www.montanawatertrust.org</p> <p>Founded: 2001</p>	<p>Private 501(c)(3) non-profit; acquires rights from willing sellers (permanent, dry-year options, leases, conserved water) and converts to instream flow.</p>	<p>Support from businesses, government (Bonneville Power Administration) and individuals.</p>
<p>Colorado</p> <p>Colorado Water Trust</p> <p>www.coloradowatertrust.org</p> <p>Founded: 2001</p>	<p>Private 501(c)(3) non-profit; acquires rights from willing sellers, on both permanent and dry-year lease basis; instream rights held by Colorado Water Conservation Board; serves as resource for land trusts on water issues.</p>	<p>Primarily foundation grants.</p>
<p>Oregon</p> <p>Oregon Water Trust</p> <p>www.owt.org</p> <p>Founded: 1994</p>	<p>Private 501(c)(3) organization. Uses a variety of methods to acquire water rights for instream flows, including private donations of short-term (i.e. less than two years) and long-term (i.e. greater than two years) leases; purchase of short- and long-term leases; and “in-kind” payments, such as livestock feed. Donations are tax deductible. Once converted to instream flow, rights are held by the state.</p>	<p>Receives funding from foundations, individual donors, government agencies, businesses and mitigation accounts.</p>
<p>Washington</p> <p>Washington Water Trust</p> <p>www.thewatertrust.org</p> <p>Founded: 1998</p>	<p>A private non-profit; acquires rights from willing sellers for instream flow through purchases, leases, donations or via water conservation projects. Donated rights qualify for tax deductions; waiver of administrative review for donations targeted to fill short-term need to meet an established instream flow requirement. Rights are actually held by the State Trust Water Rights program, managed by the Washington Department of Ecology.</p>	<p>Funding primarily from government (Bonneville Power Administration) and foundations.</p>

RECOMMENDATIONS:

- The inactive Texas Water Trust should be reformed to be more effective. Options include:
 - Transfer the Trust to the Texas Parks and Wildlife Department, the agency with primary statutory responsibility for protecting fish and wildlife and provide state funding for acquisition (purchase, lease, dry-year option or other method) of water rights from willing sellers for instream flow; or
 - Convert the Trust into a non-profit entity, allowing it to accept grants and donations from foundations, businesses, individuals and government agencies to support an acquisition program and to better ensure that donated water rights can qualify for a tax deduction.
- Statutory and administrative procedures for amending water rights should be reviewed to identify opportunities for making it less burdensome to use leases and dry-year options of consumptive rights for maintaining instream flows.
- In priority areas (where the need for water for instream flow is most pressing), provide additional tax or other incentives for investments in conservation that result in all or a substantial portion of the conserved water being dedicated to instream flows.

AFTERWORD



Water marketing, in all its various forms, has a potentially important role in meeting future water needs in Texas. In some cases, it may be the environmentally preferable, and more cost-effective, alternative to development of new reservoirs or opening up large new well fields in over-pumped aquifers.

Even though markets have this potential, Texas does not yet have a legal framework that fosters environmentally sustainable water markets or that offers sufficient protection for rural communities, particularly with respect to groundwater.

The recommendations in this report are designed to address those problems and to foster the use of markets to meet environmental water needs.

Where and how voluntary water markets can help meet future water needs should also be analyzed on a regional basis. The current round of regional water planning – with better demand estimates and, hopefully, more science on water availability – will provide a good opportunity to examine the potential for water marketing to meet reasonable human and environmental demand – provided that the statewide framework is improved.