

Water Market Insider



Central California | Q1 2011



Spot Market Helps to Meet Demand for Water

Water Shortages Persist in Central Valley

The water market in California's Central Valley provides an integral mechanism for allocating available water supplies to their highest valued uses. Recent drought conditions and environmental regulations have highlighted both the importance and limitations of water markets in the region. The Central Valley's single-year lease market or "spot market" for water is active, and serves as an important water supply source for urban, agricultural, and environmental interests.

Central Valley region and throughout California. Federal, state, and local agencies recognize the benefits of the water market and are working to implement programs and policies that will ease impediments to future water trading activity.

Physical and Regulatory Barriers Restrict North-to-South Water Movement

While southern California accounts for approximately 80% of the state's water use, over 70% of surface water supplies originate in northern California. To address this, many spot market trades move water from relatively lower-valued agricultural applications in the north to urban, agricultural and environmental water uses in southern regions of the state.

In the Sacramento-San Joaquin River Delta (Delta), water transfers are especially restricted by pumping capacity limitations. There, environmental regulations intended to protect threatened fish populations have further reduced through-Delta trading activity by limiting the conditions under which water can be pumped from the Delta into the California Aqueduct. A Delta "fix" remains uncertain at this time which may limit the appetite of buyers located south of the Delta for north of Delta water supplies.

Table 1: Snapshot of Spot Market Trading from 2000-2010

Market Metrics: 2000-2010

Mean Price	\$160/AF/Year
Median Price	\$135/AF/Year
48-Month Range	\$25 – \$500/AF/Year
24-Month Range	\$50 – \$450/AF/Year
Average Annual Volume Traded	403,500 AF
Average Annual Value Traded	\$57,000,000

While the state of California is evaluating the construction of new storage and conveyance infrastructure to expand water supplies, these projects are politically and financially challenging to implement. Even if successful, completion of the projects is many years off. Consequently, spot market water trading will continue to be an important tool for managing water shortages in the

The State Water Project (SWP) and Central Valley Project (CVP) facilitate trading among geographically dispersed buyers and sellers through a vast network of canals and storage facilities. However, canal conveyance and pumping capacity limitations as well as fees and priorities for accessing the capacity constrain the regional movement of water and spot market activity.

WATER MARKET METER

(12-MONTH TREND)

AVERAGE MARKET PRICE



\$181/AF/YEAR
Average annual prices,
2000 – 2010: \$160/AF/Year

NUMBER OF TRADES



36 TRADES
Average annual number
of trades, 2000 – 2010: 25

VOLUME TRADED



344,675 AF
Average annual volume traded,
2000 – 2010: 403,510 AF

Supply and Demand Dynamics Drive Up Prices

Spot Market Prices Show Strong Appreciation

In recent years, spot market prices for water rose rapidly in response to a persistent drought and heightened regulatory restrictions.

Over the period from 2000 to 2010, lease rates averaged \$160/Acre Foot (AF) annually, with the majority of trades ranging between \$95 and \$150/AF annually. Lease prices increased at an average rate of approximately 6% year-over-year during that time.

The origin of the water affects market value. Water originating north of the Delta sells for 30% to 35% less than water supplies originating south of the Delta due to the potential risks and losses associated with transferring water from northern California through the Delta region.

Trading volume remained flat between 2007 and 2010, averaging 323,000 AF/Year with little variation. In 2009, the average spot market price for water rose 34% over the previous year's average to \$252/AF due to limited supply (see Figure 1). Drought conditions have also resulted in increased price volatility in the spot market due, in part, to important regional market differences and physical and regulatory constraints on water mobility (see Figure 2). While improved water supply conditions in 2010 caused prices to soften, it is unlikely that prices will decline to the low levels observed in previous water abundant years. ■

Figure 1: Drought Conditions Drive Up Spot Market Prices

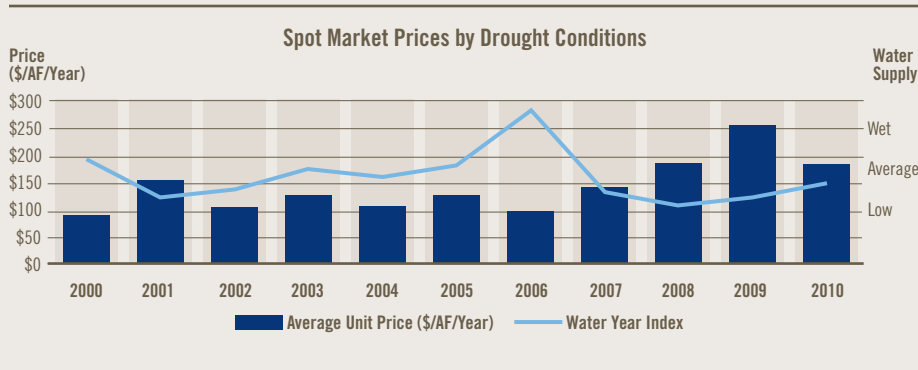
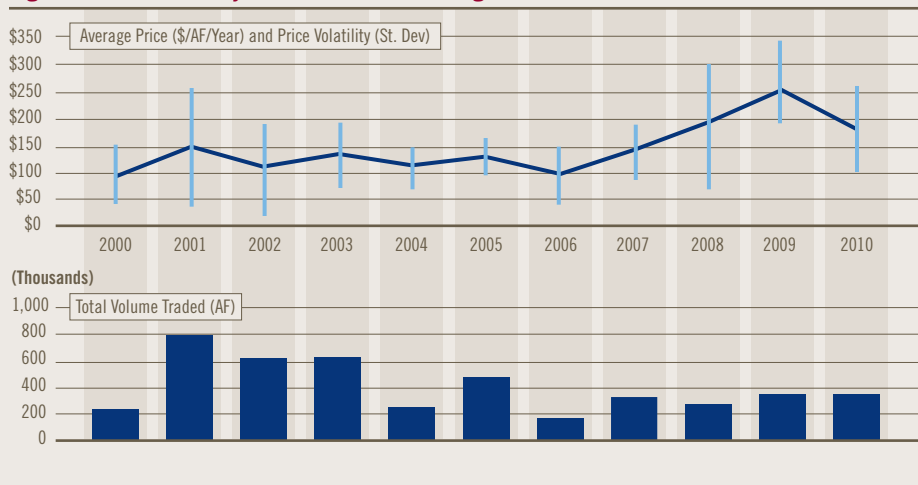


Figure 2: Price Volatility Persists Even as Trading Volume Stabilizes



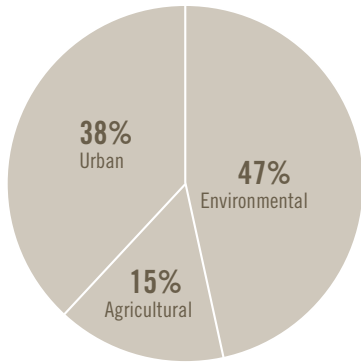
Permanent Water Entitlement Sale Prices Rise to New Highs

Three landmark deals completed in late 2009 and 2010 have raised the bar for permanent water entitlement prices in California. A 2009 transaction moved a 14,000 AF SWP entitlement from Sandridge Partners, a Dudley Ridge Water District landowner, to the Mojave Water Agency for \$5,250/AF. Another permanent SWP sale, negotiated between a land developer and Tejon Ranch Company (NYSE: TRC), traded 1,998 AF for \$5,850/AF. These prices are approximately 200% above the average price in previous SWP entitlement transactions. Most recently, the cities of Davis and Woodland acquired a 10,000 AF Sacramento River water right historically used on the Conaway Ranch. The net present value of the purchase price for this asset amounts to approximately \$3,400/AF. The new owners of Conaway Ranch also recently entered into negotiations with Metropolitan Water District for up to 13,500 AF per year for \$250/AF under a long-term lease agreement.

While permanent surface water right trading activity in California remains limited, these recent transactions are likely to drive asset valuations and purchase prices above prior levels. ■

Trading Volumes Stabilize as Environmental Water Users Buy Less

Figure 3: Total Volume Traded by End Use from 2000–2010



Since 2000, environmental water users have acquired a larger cumulative volume of water on the spot market than urban or agricultural water users. (See Figure 3.)

Recent trading activity has been driven primarily by agricultural and urban demands to firm up supplies during dry years. Agricultural water users have grown more active on the buyer side as increased permanent crop plantings has

hardened water demand and limited the flexibility that previously existed to fallow annual crops to protect investments in vine and tree crops. Environmental spot market activity declined significantly with the exit of the federal and state supported Environmental Water Account as a buyer in the market. (See Figure 4.) ■

Total Water Market Value Spikes in 2009–2010

More than \$625 million has traded in California's spot water market since 2000. Annual water trading activity and total market value are highly responsive to annual water supply conditions within the state. For example, the market reached a high of \$95 million in 2001, one of the driest years on record. Comparatively, the total market value hit a low of \$13 million in 2006, a comparatively wet period.

During 2009, the total market value was \$83 million, up 106 percent from the previous year. Despite improved water availability, \$65 million was traded on the spot market in 2010, higher than average for this market. (See Figure 5.) ■

Figure 4: Trading Volume Stabilizes as Environmental Purchases Decline

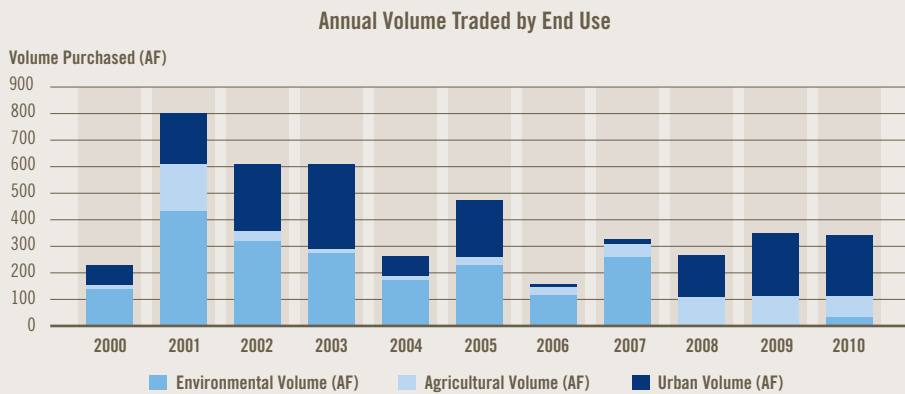
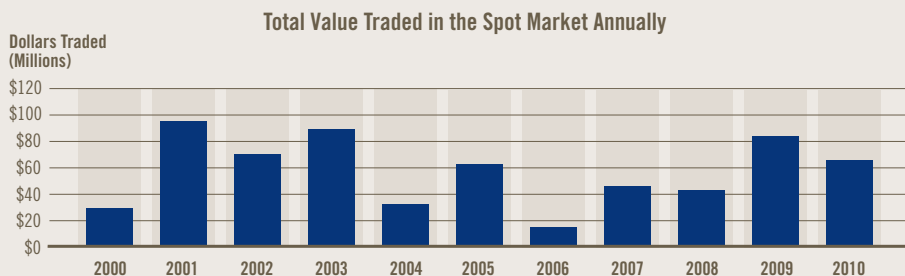


Figure 5: Total Value Traded Annually from 2000–2010



Water Market Outlook

The spot market for water in the Central Valley is influenced by a variety of physical, regulatory and market factors. Some of the key factors affecting trading activity and pricing are discussed below.

SNOW PACK: The quantity of surface water available is closely linked to mountain snowpack. Central Valley water lease rates and trading volumes are higher in drought years with low snowpack levels than in wet years. On December 28th 2010, the Department of Water Resources (DWR) announced the first snow survey results of the 2011 season. According to the survey, statewide snowpack was 198% of normal for the date, indicating that the state may be emerging from drought conditions. In addition, the DWR set the initial State Water Project allocation for 2011 at 50%, and expects allocations to rise over the coming months. Increased water availability in 2011 will cause spot market prices and trading volume to stall or decrease in the short-term.

STORED WATER LEVELS: Three consecutive drought years between 2007 and 2009 depleted surface and ground water storage levels. However, recent higher than normal precipitation has resulted in improvements in reservoir levels and increased ground water recharge activities. During late 2010, surface storage water levels increased to 79% of average statewide. It remains too early to determine how much storage levels will recover during 2011. However, it seems likely that spot market activity will continue at lower prices than observed in 2009 and 2010 as buyers work to rebuild storage accounts.

REGULATORY CONDITIONS AND ENVIRONMENTAL MITIGATION: A 2007 court directive restricted pumping in the Delta to protect threatened fish

species there. These pumping limitations have reduced the volume of water made available to the CVP and SWP by an estimated 60 percent. There are new proposals being considered to implement additional pumping restrictions, further cutting the amount of water delivered through the Delta. We believe continued regulatory uncertainty in the management of the Delta will likely cause further price volatility within the market.

Despite regulatory constraints on Delta pumping, agricultural and urban entities maintain an interest in market transactions involving North of Delta water supplies. In the past, the state has administered programs to support trades between sellers located north of the Delta and buyers to the south. For example, the 2009 DWR Drought Water Bank resulted in water sales from 19 north of Delta irrigators, and the 2010 Water Transfers Program helped to market water from 10 entities. However, these programs have been reactive to drought conditions rather than programs to support long-term through-Delta trading. The San Luis and Delta-Mendota Water Authority and Bureau of Reclamation are in the early stages of preparing environmental documentation to streamline long-term, through-Delta water transfers. These programs represent important efforts to reduce the risk and transaction costs associated with through-Delta trades.

Currently, state water policy focuses on promoting spot market transfers of water.

AGRICULTURAL PRODUCTION: California's permanent crop acreage has been expanding by over 1.5 percent annually. The financial cost of fallowing permanent crops is high. As a result, the water supply flexibility that producers had in

the past to respond to limited water supplies is diminishing. Agricultural producers, particularly on the west side of the Central Valley, have become active buyers in the market, especially during dry years. The increased demand in the agricultural sector for firm water supplies will result in higher spot market activity and prices moving forward.

Crop prices can further impact the spot market for water on the supply side. For farmers, the primary suppliers in California's water market, high crop prices can increase the cost of supplying water to the spot market. Prices for rice, a crop commonly produced north of the Delta and idled in support of spot market transfers, peaked in 2008 and 2009 contributing to high spot market prices. Rice prices are projected to ease slightly in 2011 while remaining well above average.

Upward pressure on prices will persist

Statewide water supply availability appears to be improving for 2011. However, diminished stored water levels from previous dry years and partial CVP and SWP deliveries due to environmental concerns will increase reliance on the spot market as a water supply source for some users. While uncertainty surrounding conveyance capacity in the Delta will continue to limit through-Delta transfers, state and federal efforts to encourage water trading may help to reduce the risk of future through-Delta transfers. Overall, spot market trading volume and prices are expected to be higher than in previous years with comparable water supply conditions. ■



ABOUT WESTWATER RESEARCH

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