



Public Citizen's Critical Mass Energy and
Environment Program

California Water: A Primer

California is among the fastest growing states in the nation. Its population is projected to grow from 35 million in 2000 to 46 million in 2020.¹ Water consumption is increasing at an even faster rate – from 200 gallons per person per day in 1992 to 229 gallons today.²

Along with the influx of millions of new residents, California continues to experience rapid economic growth. Stress on water resources is augmented by the state's popularity among the computer and biotechnology industries – both of which depend on tremendous amounts of water.

Because of these developments, the state – which is already facing serious water supply challenges – will need even more water in the years to come. The big question is: Where will it come from?

According to the California Department of Water Resources (DWR), urban demand for water will rise more than one-third from the 1995 figure of 8.8 million acre-feet (2.9 trillion gallons) to 12 million acre-feet (3.9 trillion gallons) by 2020.³ In 1998, the DWR forecast that the state would experience increased water shortages by 2020 – 2.4 million acre-feet in an average year and 6.2 million acre-feet in a drought year.⁴ DWR's forecast fails to include cost-effective efficiency measures, but the state has not taken steps to adequately address the coming shortage by implementing conservation.

Many Californians are intimately acquainted with the consequences of shortages and droughts. In 1976-77 the state experienced a severe drought that forced radical changes in the lifestyles of many people, ranging from the inability to water lawns, wash cars and fill up swimming pools, to having to put bricks in toilets to save water. These are common sense measures in dry areas of the world, but Californians have backslid to their water-wasteful ways in many areas of the state and are not prepared for the coming shortage.

In 1987 California entered another dry spell that lasted until 1992. Rationing was imposed in many places, reaching 50 percent of the average usage in some communities. Santa Barbara banned lawn watering for 14 months.⁵

The 1987-1992 drought served yet another reminder of California's dependence on water and the state's limited supplies. To prepare for future shortages, new facilities were built and new water-sharing agreements were negotiated. The

Metropolitan Water District's Diamond Valley Lake Reservoir in Riverside County and Contra Costa Water District's Los Vaqueros Reservoir, for instance, were built to provide emergency water supplies.

A constant problem is that California's water supply fluctuates significantly between wet and dry years, creating nightmares for water planners. Because 75 percent of California's rain and snow falls between November and March, wet winters mean wet years, while dry winters cause droughts that are felt statewide due to reliance on storage in snowpack in its mountain ranges. Storing water in both aboveground and underground reservoirs has become a key strategy to overcome this problem.

Even as demand for water grows and future supplies become more tenuous, existing water resources are being ruined by pollution. The San Joaquin River, for example, has become a dump for sewage, industrial waste and agricultural runoff, placing it on the nation's 10 most endangered rivers' list. During dry years, a 43-mile section of the river becomes toxic.⁶

California's Water Grid

The distribution of California's population does not reflect water availability. Water is plentiful in the North, but not in Central and Southern California, where it is most needed. To remedy this problem, the state, with assistance of federal government, constructed an elaborate network of dams, reservoirs, pipes, pumps and canals.

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary, known as the "Bay-Delta", is the core of California's water supply, providing water to two-thirds of state residents and more than 7 million acres of farmland.⁷ Bay-Delta water supplies 16 million people in Southern California and supports the region's \$450 billion-a-year economy.⁸ It is also crucial to the state's agriculture industry, which grows 45 percent of the country's produce, but is very water-intensive, consuming 80 percent of California's developed water.⁹

The Central Valley Project and State Water Project are the chief instruments of California's grandiose water transfer system. The New Deal-era Central Valley Project (CVP) was constructed to transfer northern water to the Central Valley via a system of canals, dams and reservoirs. Overseen by the U.S. Bureau of Reclamation, the CVP encompasses an area more than 400 miles long and 100 miles wide, delivering irrigation water to large portions of the Central Valley and its vast farmlands.

Unfortunately, building the system destroyed millions of acres of wetlands, threatening half of all Pacific Flyway birds and damaging wildlife refuges.¹⁰ In 1992, legislation designed to ameliorate these problems was introduced by

George Miller, a U.S. representative from the Bay-Delta area. Signed into law by President Bush, the Central Valley Project Improvement Act was a major victory for the environmental community. The legislation ordered 800,000 acre-feet of annual freshwater flow to be restored; established a regulated market in which farmers could sell water to urban users, thus decreasing demand; directed the U.S. Fish and Wildlife Service to double wild salmon populations; and created economic incentives to conserve CVP water.¹¹

Construction of California's second major water storage and delivery system, the State Water Project (SWP), began in the early 1960s. Managed by the DWR, the conglomeration of canals, aqueducts, dams and pumps runs 662 miles from Plumas to Riverside County. It supplies water to 20 million Californians in San Jose, Los Angeles and other cities, and to 660,000 acres of farmland. Seventy percent of its water supply is allocated to urban users, with the remainder going to the agricultural sector.¹²

State Water Project and Paper Water

When the State Water Project was constructed, the DWR promised to deliver 4.2 million acre-feet per year to agricultural and urban users. The department's contracts with buyers specified that in case of water shortages, agricultural users would have to absorb cutbacks before urban users, and in the case of permanent shortage, each contractor's entitlement would be reduced proportionally.¹³ However, the SWP was not completed; in part, because the public voted against one of its projects – the Peripheral Canal – and against additional dam construction. As a result, the DWR has not been able to deliver approximately half of the contracted water. This water is referred to as “paper water.”

In 1995, the DWR adopted changes to the SWP contracts that removed preferential treatment of urban users and eliminated language that required proportional cutbacks in the event of systematic inability to deliver. This could help developers who have to show they have sufficient water for new developments by allowing them to claim “paper water” rather than real supplies. Recent court decisions have limited the use of “paper water”, but the issue remains open.

CALFED

Both the Central Valley Project and the State Water Project draw water from the San Francisco Bay-Delta, placing a significant stress on its water resources. Pollution and inadequate emphasis on conservation in the North stress the

system further.

The early 1980s brought more problems. Fish species were becoming extinct, salinity intrusions were occurring more frequently, and contamination levels were increasing. Wildlife habitat and water quality were compromised in order to feed the agricultural sector, urban sprawl and development in arid parts of the state. However, when environmental groups began a campaign to save the Bay-Delta, they were met by opposition from state officials and agricultural and urban lobbies.

In 1994, talks over water sharing resulted in the Bay-Delta Accord, negotiated by the agricultural, urban and environmental communities. The accord called for the creation of a federal/state task force to address California's water issues. Although the task force is not a branch of government per se, it works with both state and federal agencies to find solutions to water allocation, quality, contamination, supply and reliability problems.

While CALFED has initiated the most comprehensive ecosystem restoration project in the United States, many environmentalists nevertheless feel the effort is skewed in favor of consumption instead of conservation.

Recent proposals to expand the water transfer infrastructure have been criticized by environmental groups. These groups are concerned that pending CALFED reauthorization bills, sponsored by U.S. Sen. Dianne Feinstein and Rep. Ken Calvert, would do little to curb water usage or explore sustainable sources of water, such as desalination or recycling. Instead, the proposals call for enlarging the Shasta Dam and Los Vaqueros Reservoir, and building new storage facilities. Rep. George Miller has criticized this approach and has introduced alternative legislation.

Groundwater

Advocates for further development of groundwater sources argue it would not only reduce the stress on the Bay-Delta, but would also increase water supplies. According to DWR, 30 percent of California's water currently comes from groundwater sources, a level that increases during dry years. The largest of these draws are from the agricultural centers of the Central and Salinas Valleys, and also the Southern California coastal plain.

Groundwater extractions exceed permitted levels by 1.5 million acre-feet annually – nearly a half-trillion gallons. Most of the overdrafts occur in the San Joaquin Valley. In 1995, the DWR estimated that developed groundwater supplies were 12.5 million acre-feet lower than what they should be under average hydrologic conditions.¹⁴

Reliance on groundwater sources increases during droughts, often leading to dire environmental consequences. During the 1987-92 drought, for instance, many private wells and wells supplying small rural systems were bled dry. During the same period, extractions in San Joaquin Valley exceeded recharge levels by 11 million acre-feet – 3.6 trillion gallons. In 1991 the San Antonio and Nacimiento reservoirs, which are used by the Monterey County Water Resources Agency, were at just 6 percent of their capacity.¹⁵

The Colorado River

The Colorado River, which provides water to seven states and Mexico, is a critical source for California. The state has been allowed to draw more than its allotment from the Colorado River because other states were not using their full quotas. However, as the demand from other states increased, California came under pressure to reduce its take.

A recent agreement among Colorado water users requires California to reduce its take from 5.5 million acre-feet per year to 4.4 million, putting the state in another tough position: having to look elsewhere to make up the difference.¹⁶ The “4.4 Plan” will hit Southern California especially hard because it is the region’s primary source.

The Imperial Irrigation District (IID) and the Metropolitan Water District of Southern California (MWD or the “Met”) are the two biggest users of Colorado River water, receiving 70 percent and 12 percent, respectively.¹⁷

As the largest wholesale water supplier in the country with 17 million customers, the Met is in a perpetual search for new sources, especially after agreeing to the 4.4 Plan. Among its initiatives is a controversial deal with Cadiz Inc., a Santa Monica-based agriculture corporation that owns land in the Mojave Desert. Cadiz has proposed storing Colorado River water in an aquifer that underlies both the Cadiz and federal lands during wet years and then extract it, together with native groundwater, for sale to the MWD in the dry years.

While the storage aspect has arguably beneficial features, pumping groundwater at unsustainable levels and profiting from overdrafts is not among them. Numerous environmental and public interest groups have argued that the extraction levels proposed by Cadiz exceed recharge levels, and that the desert ecosystem, which includes the federally protected desert tortoise, would suffer as a result. Even the U.S. Geological Survey says Cadiz’s recharge estimates are 5 to 25 higher than reality.

Sustainable Water Resource Management

Plain and simple, conservation and efficiency are key to ensuring that California does not run out of water. Saving water can often eliminate the need for expensive and environmentally damaging water infrastructure, such as dams, reservoirs and canals, while freeing up additional water to meet the state's needs. Low-flow toilets, for example, reduce the amount of water used per flush by over two-thirds. Some cities have provided incentives to replace the old models with the newer ones, and they have seen reductions in per-capita use. More communities should follow suit. Similarly, technology can significantly reduce industrial water demand. Treatment and reuse of municipal water also carries a great potential to help conserve California's water.

Over the last decade, the idea of agricultural-to-urban water transfers has become increasingly popular – particularly in California, due to the state's large agricultural sector. Transferring water from one public agency to another poses fewer risks than does purchasing water from a private water right holder.

Farmers often purchase water at lower prices than do cities. For instance, Southern California's MWD sells treated water to urban users for \$431 per acre-foot¹⁸, a price representing capital, conveyance, treatment, and conservation costs. The IID, however, charges only \$15 per acre-foot, a figure that does not include many expenses like treatment, but is, nevertheless, much cheaper than untreated water from many other sources.¹⁹

Thus, it makes sense for the IID to sell "surplus" water to cities. In return, the cities pick up the cost of conservation measures that make this additional water available. The idea is attractive to urban users, because buying water allows them to increase or stabilize supplies without substantially increasing rates.

An agreement between the IID and San Diego County Water Authority provides for such water transfers for 45 years. San Diego will give Imperial Valley farmers incentives to conserve while paying for the conservation measures.²⁰ Because San Diego believes the Met's water transportation charges are too high, San Diego may build its own pipeline, however, neither the costs nor the environmental impacts have yet been assessed.

Another solution is fallowing marginal agricultural land. This would make additional water available and help remedy the devastating environmental problems caused by farm runoff. Replacing water-intensive crops with crops that depend on less water would also reduce agricultural demand.

Taking water to market

The practice of selling water for profit is taking root in California. Over the past 25 years, there have been efforts to change California water law to promote the creation of water markets. Three major changes in California water law have been pursued over the past twenty-five years: (1) making it easier for water right holders as well as those who use large quantities of water (e.g., farms or industries) to sell, lease, or transfer their water 'entitlements' to another on a long-term basis; (2) allowing transferors access to the unused capacity of existing conveyance facilities in order to move water around the state, commonly referred to as 'wheeling'; (3) promoting water transfers that would result in 'groundwater mining' by overlying property owners.

Most of the recent legislative activity has focused on 'wheeling', attempting to more precisely define the circumstances under which the owner of a conveyance facility can deny access to a transferor; and to spell out how to calculate 'fair compensation' which is to be paid by the transferor for the use of the conveyance facilities in those cases when access cannot be lawfully denied.

If California water law in all three areas described above is changed to promote water transfers and markets, privateers will be able to make handsome profits by acquiring water entitlements that were established by, and stored within, taxpayer-funded infrastructure. Furthermore, these privateers would also move these water entitlements around the state through taxpayer-funded conveyance facilities.

A farmer who starts selling surface water may turn to groundwater to satisfy his irrigation needs, instead of stepping up conservation or fallowing the land. Because aquifers usually extend beyond a single farmer's property, lower levels could force other farmers to pay more to pump groundwater, or even make water unavailable altogether. Lower levels could also dry out springs that support flora and fauna.

Over the past eight years, California has enjoyed high levels of precipitation. In 2001, however, these levels decreased, leading to concerns about another drought. Another major drought likely would make it even easier to market water, creating a favorable environment for private companies and individuals to profit from selling the resource. In fact, the Water Bank, California's first large-scale system to facilitate water transfers, was created in 1991 in response to the drought.

Going Private

Private companies view California's limited water resources as a profit

opportunity. Several corporations have made overtures to acquire water rights and develop water resources. Azurix wants to mine water from an aquifer underlying its landholdings in Madera County. Feasibility studies are currently underway. Azurix, a former subsidiary of Enron, has been bought by U.S. market leader American Water Works, which itself is being acquired by German energy giant RWE – parent of the British water giant Thames Water.

US Filter, a subsidiary of French Vivendi, a mammoth conglomerate that also owns Vivendi Universal, recently bought 43,000 acres of farmland and owns extensive water rights in the Imperial Valley.²¹

Cadiz, Inc. wants to sell groundwater from an aquifer underlying its Mojave Desert landholdings as well as under federal lands, to the Metropolitan Water District of Southern California. The proposal also calls for storing “surplus” Colorado water in the aquifer. Cadiz, whose debt-to-equity ratio puts into question its financial stability, stands to bring in up to \$1 billion if the deal goes through. (Cadiz’s CEO Keith Brackpool, a British investment banker, is a significant and regular contributor to Governor Gray Davis and advises the governor on water issues, including making water policy speeches as Davis’ substitute.)

The storage component has arguably beneficial features. However, Cadiz’s proposal to sell up to 60,000 acre-feet of native groundwater per year – an amount that scientists and environmentalists believe would devastate groundwater resources – is controversial. Overdrafts of this magnitude may dry out springs and wells fed by the aquifer, jeopardizing animal and plant species already on the brink of extinction. Building a 35-mile pipeline and an elaborate infrastructure to support the system may damage the habitat of these imperiled species, including the desert tortoise. Finally, lowered groundwater levels may result in massive dust storms, potentially turning the region into another Owens Valley.

Under its contract with MWD, Cadiz would also be allowed to sell a significant amount of groundwater directly to willing third-party buyers. Cadiz would reap handsome profits from this provision, under which MWD would permit Cadiz to use its infrastructure, built with taxpayer money, to convey this water.

Conclusion

Although high water demand projections have been challenged and are currently under review, it is clear that California must either develop more water sources or find better ways to manage its existing resources, or do both. California must focus its attention on sustainable solutions. By any standard, building more dams and exhausting aquifers is not sustainable.

Conservation is. It would prevent wasteful spending of taxpayer money and eliminate the need for more dams and diversions, while making more water available for municipal, industrial and agricultural uses and leaving more water for animal and plant life. Conservation should be a joint effort of both Southern and Northern California. It should be a priority not only for dry Los Angeles but for rainy San Francisco as well.

Conservation has many different faces. Older toilets and showerheads can be replaced with low-flow models. Water-efficient irrigation techniques can be introduced. Leaky water infrastructure can be fixed or upgraded. Water can be reused. Ascending block rate structures can be phased in. Water-efficient landscaping can be encouraged. And crops requiring less water can be planted in lieu of water-intensive varieties.

At the same time, California should not allow private water interests to convert a public good into a commodity for sale to the highest bidder. If water trading for profit flourishes, environmental consequences could be dire and groundwater resources would suffer most. Lowered groundwater levels mean higher pumping costs and sometimes new equipment. Many farmers, heavily reliant on groundwater, could not afford these measures.

A community that becomes dependent on water from a private entity may face the same risks that many of California's communities faced as a result of energy deregulation: higher rates and volatile service. As we saw in the electricity sector, privatization or deregulation means there is no incentive to conserve the resource. In order to maximize profit, private companies encourage consumption.

The State Constitution declares that water belongs to all Californians and is, in effect, free, in the sense that people pay only the cost of treatment and delivery. Allowing private companies to profit from this public resource would stand California's Constitution on its head.

Wisdom, patience and frugality should guide water resource management. Anything less will put California's environment at further risk, as well as its economy, its farming sector, and its rural population. Californians must demand that water remains a public trust under democratic control and should oppose turning water into just another commodity.

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Notes

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