

California Water: Uses and Users

What are the major uses of water in California? In other words, who are the “end users?”

Brainstorm about major types of usage

[agriculture]

[wild & scenic rivers/wetlands/delta]

[urban/industry]

estimate % use for each, plus “natural outflow”

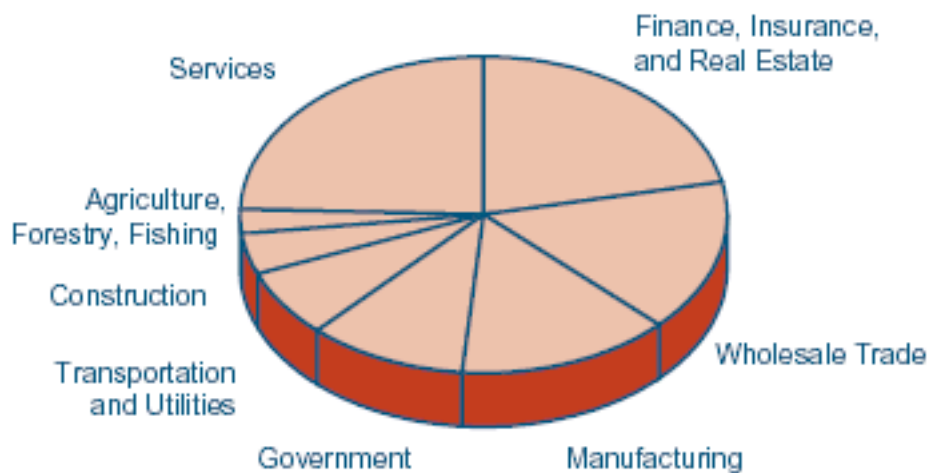
Refer to WEF CA Water Maps (irrigated areas; urbanized areas; wild/scenic rivers)

Discussion

These uses of water are not accidental, natural, or predetermined. Our patterns of usage result from political, economic, and social decisions of the last 150 years. Consult *The Great Thirst*.

Agriculture

Compare % of available water to % state GDP:



“Interesting” agricultural choice in California:

Cotton

Rice

Alfalfa

Excerpts from three Web articles regarding alfalfa and California water

Alfalfa: The Thirstiest Crop
Natural Defenses Resource Council

California's rivers and wetlands, and the critical San Francisco Bay-Delta ecosystem, have suffered serious degradation as a result of excessive water diversions. Much of the water taken out of the ecosystem goes to support California's industrial agriculture. Agriculture now uses approximately 80 percent of California's developed water supply, but produces less than 2.5 percent of California's income.

Alfalfa, the biggest water user of any California crop, soaks up almost a quarter of the state's irrigation water. Yet alfalfa -- harvested mostly for hay to feed dairy livestock -- is a low-value crop that accounts for only 4 percent of state farming revenues. An alfalfa farm using 240 acre-feet of water generates \$60,000 in sales, while a semiconductor plant using the same amount of water generates 5,000 times that amount, or \$300 million. (And while such a farm could function with as few as two workers, the semiconductor plant would employ 2,000.)

In short, California devotes 20 percent of its developed water supply to a crop that generates less than one-tenth of one percent of the state's economy. Given the degraded state of California's rivers and growing demands for water for higher value agricultural crops and urban areas, is this an efficient use of a precious resource?

Alfalfa covers more of California's land than any other kind of produce. About 26% is grown in the state's parched southern deserts, and despite the existence of demonstrated techniques for achieving high crop yields with water-saving methods -- such as drip irrigation and bedded alfalfa -- most California growers use inefficient irrigation techniques such as flooding.

Excessive water use isn't the only cost associated with alfalfa crops. Seventy percent of the state's alfalfa feeds California's largest agricultural industry: its dairy cows. Dairy farms in the Central Valley alone produce as much waste as a city of 21 million; illegal manure waste from dairies is believed to threaten the drinking water of 65 percent of Californians. In total, 7,000 gallons of water go into keeping a single cow alive for a single day, yielding a daily return of about 30 cents. Wasteful subsidies worsen this problem by increasing dairy demand for alfalfa.

Although alfalfa does yield some environmental benefits -- maintaining soil health, providing some wildlife habitat and preventing erosion through its extensive root systems -- current production levels are unsustainable, contributing to the destruction of ecosystems all over the state. Even a modest reduction in production would result in tremendous water savings.

Addressing the alfalfa problem is all about changing how we manage our water supply -- we need to make systemic changes that will encourage markets to work.

Alfalfa water stewardship suggested
Western Farm Press, Jan 24, 2004

Alfalfa uses more water than any other crop in California, almost 20 percent annually of the state's agricultural water use. That is not necessarily news because alfalfa has been a target of people who want to take agriculture's water and claim the forage crop's water use is excessive. This despite the fact that the crop represents \$700 million to \$1 billion in revenue to the state's economy and is the key crop for sustaining the state's \$4.5 billion dairy industry.

While the supply picture has not improved, moving to the forefront of water issues in the state is water quality. There, alfalfa is not a bad actor since it is a relatively low-intensity pesticide user and growers are quickly switching from products implicated in water quality contamination.

Agriculture's (more specifically) the alfalfa industry's response to these issues will be one of the most important determinants of farm viability in the future in California, says Dan Putnam, University of California forage specialist. Putnam told producers and others at the 33rd annual California Alfalfa Symposium in Monterey that alfalfa needs an environmental stewardship program to address water quality issues.

While alfalfa is a relatively low intensity pesticide use crop, there are several used on alfalfa that have been implicated in surface and groundwater contamination.

NRDC: About Federal Water Subsidies

In 1902, the federal government passed the National Reclamation Act, aimed at building water projects that would deliver irrigation water to small farmers in the West. To ensure that only true family farmers would receive this water, the Act limited to 160 acres the amount of land on which growers could receive federally subsidized water. Over time, the original 160-acre limit for water delivered by the federal government became 960, and many much larger corporate farms began using legal dodges to qualify for "small farm" status under the law. These large farms divide ownership on paper, form trusts, and use other subterfuges to drink up significant amounts of taxpayer-subsidized, below-cost federal water.

Many California farmers still pay the government between \$2 and \$20 per acre-foot for irrigation water -- at little as ten percent of the water's full cost. Taxpayers make up the difference; between 1902 and 1986 irrigation subsidies have cost taxpayers around \$70 billion. And as the degraded Bay-Delta watershed demonstrates, massive federal irrigation projects cause irreparable environmental damage, destroying rivers, fish and other wildlife.

Also, artificially cheap water discourages efficient water use. A 1997 study by researchers at Cornell University suggests that more than 50 percent of irrigation water never reaches crops because of losses during pumping and transport. And below-cost water also encourages farmers to grow water-hungry crops such as rice, cotton, and alfalfa.

Subsidized water for alfalfa is linked to U.S. meat-consumption habits. The following table shows annual per-capita consumption of red meat and poultry (beef, pork, lamb, veal, chicken, and turkey) in the U.S. and several other developed countries.

	2002	2001	2000	1999	1998
Canada	26.3	27.0	24.3	23.3	22.7
United States	98.6	91.3	105.8	118.9	110.8
Czechoslovakia (former)	145.9	138.7	130.0	129.6	126.0
Denmark	17.1	17.8	18.2	15.2	15.0
Finland	101.1	102.9	100.4	99.8	102.4
France	13.2	13.6	14.0	14.4	14.9
Germany	9.9	9.1	9.5	9.6	8.8
Greece	113.8	67.1	70.1	72.5	71.0
Italy	56.8	56.2	54.8	59.6	53.5
Netherlands	73.3	80.0	84.7	92.3	100.0
Norway	49.8	40.5	30.8	39.0	39.5

Brainstorm for explanations of the differences among these countries.

Urban/Industry

What parts of California support the largest populations?

Water uses of urban areas include industry, community, and household.

July 1, 2004 County Estimates Ranked by Size, Numeric and Percent Change since July 1, 2003

Rank	County	July 1, 2004 Estimate	Rank	County	Numeric Change	Rank	County	Percent Change
	California	36,590,814		California	599,489		California	1.67
1	Los Angeles	10,179,716	1	Los Angeles	132,309	1	Riverside	4.45
2	Orange	3,044,819	2	Riverside	78,610	2	Placer	4.13
3	San Diego	3,036,373	3	San Bernardinc	60,188	3	Madera	3.55
4	San Bernardinc	1,930,416	4	San Diego	41,919	4	Modoc	3.53
5	Riverside	1,846,095	5	Orange	39,898	5	Lassen	3.22
6	Santa Clara	1,749,365	6	Sacramento	27,441	6	San Bernardinc	3.22
7	Alameda	1,501,952	7	Kern	23,062	7	Kern	3.20
8	Sacramento	1,360,346	8	Fresno	19,464	8	Kings	3.14
9	Contra Costa	1,016,302	9	San Joaquin	18,883	9	Imperial	3.06
10	Fresno	876,842	10	Santa Clara	16,728	10	San Joaquin	3.01
11	Ventura	811,505	11	Contra Costa	13,673	11	Yuba	2.77
12	San Francisco	795,180	12	Placer	12,019	12	Tulare	2.70
13	Kern	744,325	13	Ventura	11,657	13	Del Norte	2.67
14	San Mateo	720,691	14	Tulare	10,667	14	Colusa	2.64
15	San Joaquin	646,007	15	Stanislaus	9,940	15	Merced	2.61
16	Stanislaus	500,172	16	Alameda	8,024	16	Sutter	2.47
17	Sonoma	477,437	17	Merced	6,027	17	Fresno	2.27
18	Monterey	425,521	18	Madera	4,785	18	Sacramento	2.06

Compare these to the precipitation maps...

Discussion

Brainstorm: How can humans minimize their impact on natural water systems and life?

Mulholland et al: Owens Valley

Late night discussion question: Was it right/smart/ethical to develop a megalopolis like L.A./San Diego in a semi-desert?