

SECTOR IN-DEPTH

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 Rate this Research

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Environmental Utilities – California

Water utilities prepared for current drought; climate risks will intensify threat over time

California water utilities are generally well prepared to meet operational and financial challenges as the state enters a second consecutive drought year. Robust contingency planning, satisfactory storage, strong rate-setting practices and financial positions, and entrenched conservation practices will help maintain credit quality. A signal of municipal utilities' ability to withstand the stress: no Moody's-rated public finance issuer in the US has defaulted because of a drought or any other natural disaster since at least 1970. Some water utilities, however, will be more exposed to the drought's effects, largely providers in the state's agricultural regions. More broadly, climate trends resulting in below-average precipitation and above-average heat point to long-term challenges. Continued capital investment to address potential water shortages will remain key to sustaining credit quality.

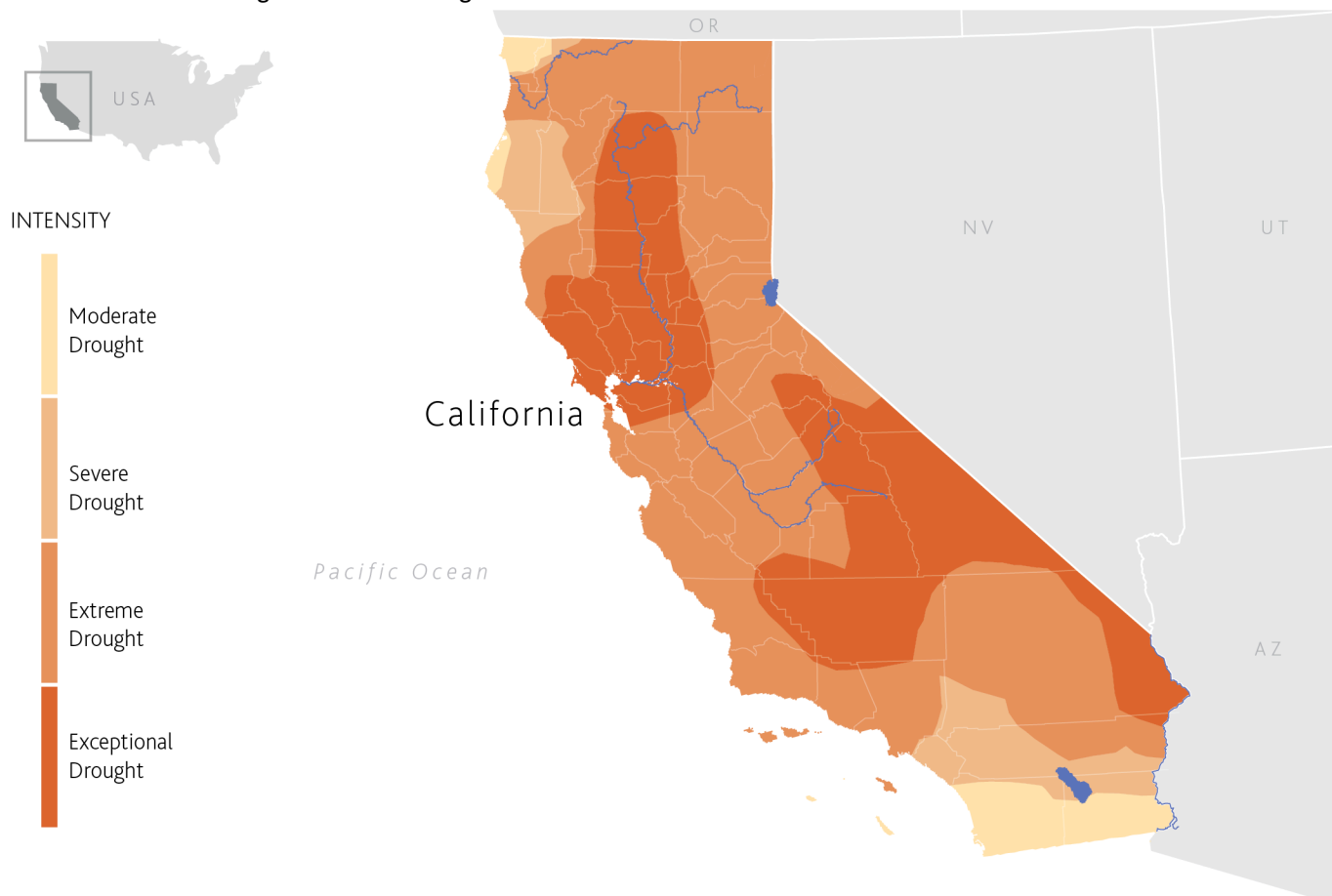
- » **Most of California has returned to drought conditions, posing a challenge for water utilities.** The current 2021 water year, the 12-month period that started October 1, 2020, is shaping up as the third driest on record with diminished winter precipitation straining the main sources of water supply, including federal and state delivery systems. A drought state of emergency is currently in place for 41 of California's 58 counties.
- » **Water utilities are generally well prepared for the current drought and likely to maintain credit quality.** Drawing lessons from the 2012-16 drought, the majority of utilities entered the current dry period better prepared than a decade ago, partly because of improved planning and stronger finances, including liquidity and debt service coverage. Management practices will remain key in leveraging these strengths. Also, the state has more potential resources to provide assistance than in 2012 following the recession.
- » **Some utilities face heightened exposure to a supply shortage and increased costs.** Utilities serving Northern California and the agricultural Central Valley currently face the greatest stress. Water providers reliant on groundwater for a disproportionate share of supply also face significant hurdles, including stress on aquifers and increased pumping and quality-control costs.
- » **Drought threats will escalate, requiring investment.** Drought conditions exacerbated by climate change will require ongoing investment from utilities and governments to provide sufficient water supply and increase conservation. California's water and combined water and sewer utilities will face growing strain in the coming decade: Forty of the 46 utilities Moody's rates are in counties with "red flag" or "high" physical risk for increased "water stress," according to Moody's affiliate Four Twenty Seven.

Most of California has returned to drought conditions, posing a challenge for water utilities

Only a few years since the 2012-16 drought, water year 2021, the 12-month period that started October 1, 2020, is shaping up as California's third driest year on record. Amid a severe reduction in precipitation, most of the state is enduring an acute drought (see Exhibit 1) and the governor expanded a state of emergency to 41 of the state's 58 counties in May. Most California utilities are well prepared to manage the drought's effects, though constrained supplies pose a challenge. Water provision through state- and federal-run systems serves to stabilize local water supplies, but these major sources are under strain.

Exhibit 1

Most of California is suffering from an acute drought



Source: US Drought Monitor as of June 17

Below-average snowfall and rain in the state's key northern water supply regions pose a supply challenge as three-fourths of California's water supply is generated from precipitation north of Sacramento. Eighty percent of demand, however, is in the southern two-thirds of the state. As of April 1, a key marker for what is typically the end of the winter season, snowpack in the northern Sierra mountains, which accounts for 30% of the state's fresh water supply, equaled only 59% of average snow water equivalent (SWE). Rainfall levels are also down across the state with most areas below 50% of normal.

Storage levels in many of the state's major reservoirs are at less than half capacity and below historical averages (see Exhibit 2). However, they are not yet at the 2014 low point that most reached during the 2012-16 drought, prompting mandatory statewide conservation measures that while helping to manage supplies, reduced utilities' water sale revenue and strained their financial performance.

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Exhibit 2

California's major reservoirs are below historical averages

Reservoir	Current level vs. total capacity (as of June 16, 2021)	Current level vs. historical average	2014 level vs. total capacity
Folsom Lake	34%	40%	48%
Lake Oroville	35%	43%	41%
Pine Flat	38%	54%	28%
San Luis	39%	54%	45%
Exchequer	41%	59%	13%
Lake Shasta	41%	50%	49%
Trinity Lake	50%	58%	39%
Millerton Lake	51%	65%	32%
New Melones	54%	85%	17%
Castaic Lake	60%	68%	33%
Don Pedro	64%	82%	38%
Lake Perris	89%	108%	38%

Source: [California Data Exchange Center](#)**State and federal water delivery systems provide critical supplies but are under strain**

Large federal and state delivery systems play a critical role in supplying water from outside utilities' immediate service areas, stabilizing what would otherwise be acute supply challenges. The State Water Project (SWP) and federal Central Valley Project (CVP) are the principal systems in California. However, warmer temperatures are straining these systems with declines in snowmelt and water storage levels.

Managed by the [California Department of Water Resources](#) (Aa1 stable), the SWP plans to deliver only 5% of total supply allocations in 2021. While actual deliveries may exceed this amount because of carryover supplies, this figure is down from 20% in 2020 and off sharply from the past decade's annual deliveries averaging 48% of first-priority, contracted amounts. The SWP delivers water supplies to wholesale and retail water systems that serve approximately 69% of the state's population.

Shortages in allocations by the CVP, which are used to irrigate about one-third of the state's farmland, hurt water providers serving agricultural customers in the Central Valley. The CVP, which delivers water from northern California and the confluence of the Sacramento and San Joaquin rivers (the Delta), has eliminated all allocations to agricultural water service contractors south of the Delta.

California, favorably, will not be affected by the potential supply reductions from the Colorado River until at least 2023 because it has the most senior water right among far Western states that source water from the river. Drought conditions will likely result in a shortage declaration by August 2021, resulting in reduced allocations for Arizona and Nevada in 2022.

Water utilities are generally well prepared for the current drought and likely to maintain credit quality

California water providers are generally better positioned to manage the drought's effects than at the start of the 2012-16 severe dry period. While the length of the current drought will be a factor, most utilities are likely to maintain credit quality, with stable operations helped by additional fixed charges, available drought surcharges, and generally strong debt service coverage and liquidity levels. Those factors will help offset lower per capita consumption and the potential for mandatory use restrictions.

Drought contingency planning remains key and most credit weakness will be driven either by contingency plans that fall short of actual drought conditions or by management weakness in executing these strategies. Additionally, the [State of California](#) (Aa2 stable) has stronger financial reserves and is better positioned to help than in 2012 when still emerging from the recession. State revenue exceeded projections in the fiscal year that ended June 30, and the state expects to add to reserves while spending to address critical near-term purposes such as the drought.

Given the significant operational and financial improvements, we expect less credit strain on utilities than during the last drought when weakened debt service coverage levels eroded credit quality for some utilities. In 2015, for example, following mandatory conservation measures and weakened financial performance, we downgraded four utilities and assigned negative outlooks to two others. The

negative outlooks were subsequently revised to stable as the utilities undertook concerted efforts to improve operating performance and prepare for subsequent volatility.

Utilities benefit from available storage, strong water management and drought contingency plans

While the state's largest regional systems derive their water from varied sources (see Exhibit 3), all use stored surface and/or groundwater to meet demands during periods of drought. Many of the state's largest providers entered the current drought with stronger storage levels relative to annual water production than they had in 2011 heading into the last acute dry period (see Exhibit 3). For example, the [San Francisco Public Utilities Commission water enterprise](#) (Aa2 stable) has 570% stored water as a share of annual supply compared with 410% in 2011. Some Southern California suppliers appear to have less in local water storage than a decade ago, but the regional storage they depend on outside of their service areas is generally in a better position than the 2012-16 drought. The storage levels for [Orange County Water District](#) (Aa1 stable), which relies on groundwater basin storage, have also improved, with an accumulated overdraft of 200,000 acre-feet (AF) down from around 218,000 AF at the beginning of fiscal 2012, resulting in 300,000 AF of useable storage.¹

Exhibit 3

States' largest utilities draw on multiple water sources

	Metropolitan Water District of Southern California	San Francisco Public Utilities Commission Water Enterprise	Los Angeles Department of Water and Power	San Diego County Water Authority	East Bay Municipal Utility District Water Enterprise	Orange County Water District
Rating	Aa1 stable	Aa2 stable	Aa2 stable	Aa2 stable	Aa1 stable	Aa1 stable
Customer base	19 million	2.7 million	4.0 million	3.3 million	1.5 million	2.4 million
Annual water delivery (acre-feet)	1.4 million AF	220,000 AF	488,000 AF	354,000 AF	187,966 AF	287,000 AF
Primary water source(s)	State Water Project, Colorado River	Hetch Hetchy Regional Water System	State Water Project and Colorado River (via MWD), Los Angeles Aqueduct system, local groundwater	State Water Project and Colorado River (via MWD), Colorado River via transfers and desalination	Mokelumne River watershed	Orange County Basin (Santa Ana River), MWD
Stored water as % of annual supply (current)	250%	570%	70%	60%	330%	120%
Stored water as % of annual supply (2011)	150%	410%	70%	30%	280%	110%
Fiscal 2020 operating revenue	\$1.3 billion	\$581 million	\$1.3 billion	\$569.1 million	\$573.7 million	\$146.7 million
Revenue-backed debt outstanding	\$3.8 billion	\$4.5 billion	\$5.9 billion	\$1.7 billion	\$2.7 billion	\$544 million
Fiscal 2020 debt service coverage	2.1x	1.6x	1.9x	1.2x	2.0x	2.6x
Fiscal 2020 days cash on hand	170	618	323	151	818	878
Fiscal 2020 debt to operating revenue	2.9x	7.7x	4.5x	3.0x	4.8x	3.7x

Source: Audited financial statements, continuing disclosure, offering documents and Moody's Investors Service

These large systems have developed strong water management and drought contingency plans, though they vary in reliance on independent supplies and storage. Many have already activated certain initiatives identified through these planning efforts.

The drought contingency plan for [Metropolitan Water District of Southern California](#) (MWD, senior revenue bonds Aa1 stable), a wholesaler to utilities serving 19 million residents, includes draws on stored water supplies, reliance on transfer agreements, demand reduction, and operational flexibility through actions such as deferred capital spending. MWD's long-term planning involves reserve and other financial policies and drives decisions on providing assistance to member agencies to bolster local development of alternative water supplies and encouraging customer conservation practices.

Changed rate-setting practices benefit utilities

Many water utilities improved their rate-setting practices following the 2012-16 drought, often engaging outside consultants to help with planned increases under California's Proposition 218, which requires charges be directly tied to costs. Utilities have also increased the share of revenue derived from fixed, rather than volumetric charges, and implemented charges specifically tied to the procurement of water supplies. These changes will provide greater financial stability during the current drought, helping utilities withstand declines in debt service coverage or liquidity.

In 2016, following the last drought, the [Los Angeles Department of Water and Power](#) (LADWP, Aa2 stable) decoupled fixed-cost recovery from water usage, implementing a cost-based rate program with four rate tiers based on water usage. Water rates progressively increase with higher consumption, helping LADWP recoup the incremental costs of meeting greater water demands, especially at peak capacity. The rate program permits LADWP to hedge against both variable water sales and purchased water costs,

while also covering fixed costs and remaining compliant with the state's rate-setting requirements under Proposition 218. The rate structure includes a base rate target that generates sufficient revenue and increases annually without requiring city council approval. Several other pass-through rates are calculated annually or semiannually to automatically capture variable costs, including the cost of purchased water.

Utilities of all sizes also have provisions for drought surcharges to offset lower water sales. The [City of Clovis Water Enterprise](#) (Aa3) and [East Bay Municipal Utility District](#) (EBMUD, Aa1 stable) are examples. Beginning in fiscal 2017 (ended June 30, 2017), Clovis' water utility introduced two water rate schedules, one for normal water conditions and one for drought or water shortage conditions. In 2015, EBMUD implemented a four-stage drought rate structure with increasing surcharges as drought conditions worsen. In April 2021, EBMUD entered stage 1 drought demand reduction rates, asking customers to voluntarily reduce consumption by 10%.

During a major drought, utilities' operating costs often increase even as their revenue declines with consumers reducing water use either voluntarily or because of mandatory conservation measures. Utilities' higher water purchase prices and increased pumping costs are examples of marginal cost increases. Additionally, utilities with electric generation capabilities face the prospect of increased power purchase costs or reduced power sales as hydropower generation declines.

While we expect some declines in debt service coverage levels, especially should mandatory conservation measures be required, California water utilities are generally at their strongest financial point in years, helping mitigate financial effects from the current drought. And it's worth noting that most have not endured any reductions in favorable debt service coverage or collections in fiscal 2021 as a result of the coronavirus pandemic.

Liquidity provides a buffer

Stronger liquidity provides utilities with a cushion to withstand potential financial difficulties resulting from a drought. Median days cash on hand for all California water utilities rose to 462 in 2020 from 417 the prior year and is well above the level in 2012 when the last drought took hold (see Exhibit 4). The median debt ratio is also significantly lower than 2012. (For details on the financial positions of the state's largest utilities, see Exhibit 3.) Stronger balance sheets are important in weathering a drought should mandatory conservation measures be put in place, thereby reducing water sale revenue. This is especially true if rate adjustments or drought surcharges fail to take into account water use restrictions. That occurred in 2015, when the state's mandatory conservation directive to reduce water consumption by 25% came in the middle of the fiscal year, catching utilities off guard and resulting in almost universal declines in debt service coverage levels in fiscal 2016.

Exhibit 4

Liquidity and debt metrics have improved for California water utilities since the start of the last drought

	Median								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Debt ratio	31.6%	33.7%	36.4%	34.9%	33.5%	32.8%	32.0%	29.5%	28.6%
Total annual debt service coverage	2.1x	2.7x	2.3x	1.9x	1.9x	2.1x	2.4x	2.5x	2.5x
Days cash on hand	268.8	440.9	468.3	470.5	424.1	423.7	405.3	417.2	462.4

Source: Moody's Investors Service

Utilities with rate-stabilization accounts such as [San Diego County Water Authority](#) (SDCWA, Aa2 stable) are particularly well prepared to manage the current drought. SDCWA's rate-stabilization account had a balance of \$120.7 million at the end of fiscal 2020 (ended June 30, 2020), equal to 21% of operating revenue. While rate-stabilization accounts have traditionally been used to moderate required rate increases over time, in the event of a protracted drought they can also be used to ensure stable debt service coverage levels despite negative variations in net operating revenue. SDCWA also targets cash reserves based on specific reductions in revenue driven by drought conditions, an additional credit strength.

Many utilities have stepped up efforts to expand storage capabilities, transfer programs and alternative water sources including water reuse and desalination. For example, SDCWA officials expect that the Carlsbad desalination plant will eventually provide 10% of its water supply, and the [City of San Diego Water Enterprise's](#) (Aa2 stable) Pure Water program, which focuses on reuse of local water to reduce reliance on imported water, is expected to meet 42% of the enterprise's demand by 2035.

Additions to stored water during wetter periods will remain important. The Intentionally Created Surplus program (ICS), which incentivizes additional water banking by contractors in California, Nevada and Arizona in Lake Mead through 2026, provides a key example. As part of this effort, MWD has entered into agreements with other agencies that also have rights to Colorado River water to augment supplies. Agreements with the Central Arizona Water Conservation District and Southern Nevada Water Authority, have given MWD an additional 100,000 acre-feet of storage in Lake Mead. As of January 1, 2021, MWD had taken delivery of 35,000 acre-feet of the additional stored water.

Water conservation lowers risk

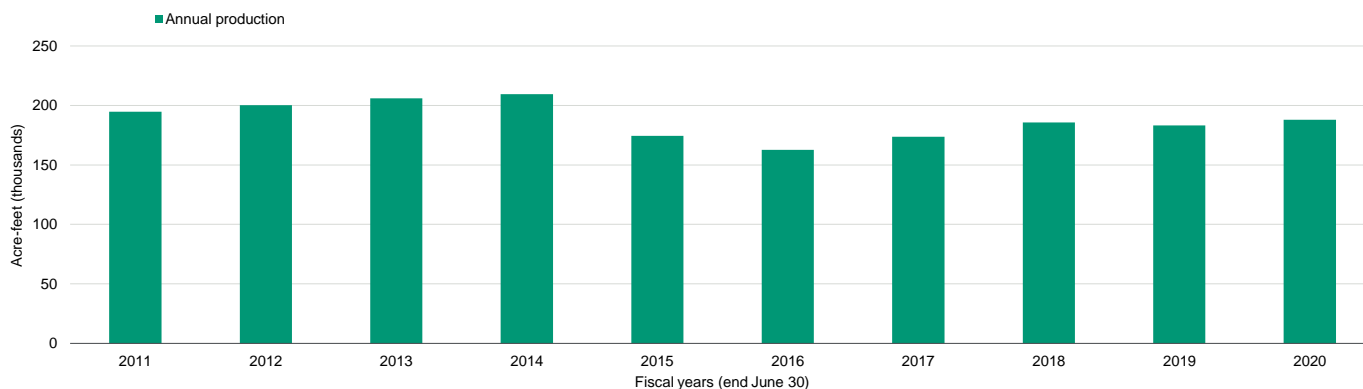
Consumers' entrenched water conservation habits reduce risks for water utilities, although further reductions in use will become more difficult. California's Water Conservation Act of 2009 sought to achieve a 20% reduction in urban per capita water use statewide by the end of 2020, and most utilities have met and even exceeded this target. MWD estimates that residential water use in its contractors' service areas has fallen by 34% since before the 2012-16 drought. Many demand reductions will be permanent given more efficient household appliances and replacement of grass with artificial turf or more drought-tolerant landscaping.

Statewide water restrictions remain a possibility in the current drought, and some utilities are not waiting for state action. With one reservoir emptied for seismic upgrades, [Santa Clara Valley Water District Water Enterprise's](#) (Aa1 stable) board of directors has declared a water shortage emergency in Santa Clara County (the county followed with a similar proclamation) and called for water retailers to achieve a 15% reduction in water use versus 2019.

With conservation, both statewide urban and per capita water consumption remain below levels before the 2012-16 drought. East Bay Municipal Water District, which provides water to over half the population of Alameda and Contra Costa counties, is typical of many utilities, with water use remaining below pre-drought levels because of increased water efficiency despite population growth in the service area (see Exhibit 5).

Exhibit 5

With conservation measures, East Bay Municipal Water District's water production remains below pre-drought levels



Source: East Bay Municipal Utility District

State set to take a more active role in managing drought

The state is better prepared than in 2012 to make critical investments and assist communities disproportionately impacted by the drought. For example, the Budget Act of 2021 includes \$5.1 billion over three years to advance the state's water resilience and support drought preparedness and response. The funds would go toward both immediate response to the drought and longer-term investments to enhance water and groundwater preservation. Some of the investment aligns with the 2018 update to the California Water Plan. That plan calls for additional infrastructure investment to improve the reliability of water supplies and a reduction in depletion of groundwater sources. It also incorporates additional assistance in meeting regulatory requirements and better coordination in regional and statewide data tracking and water management.

Some utilities face heightened exposure to a supply shortage and increased costs

Unlike California's 2012-16 drought, which had a larger impact on Southern California, current drought conditions are centered in Northern California. Water agencies serving California's Central Valley region, which accounts for 75% of the state's irrigated land, face

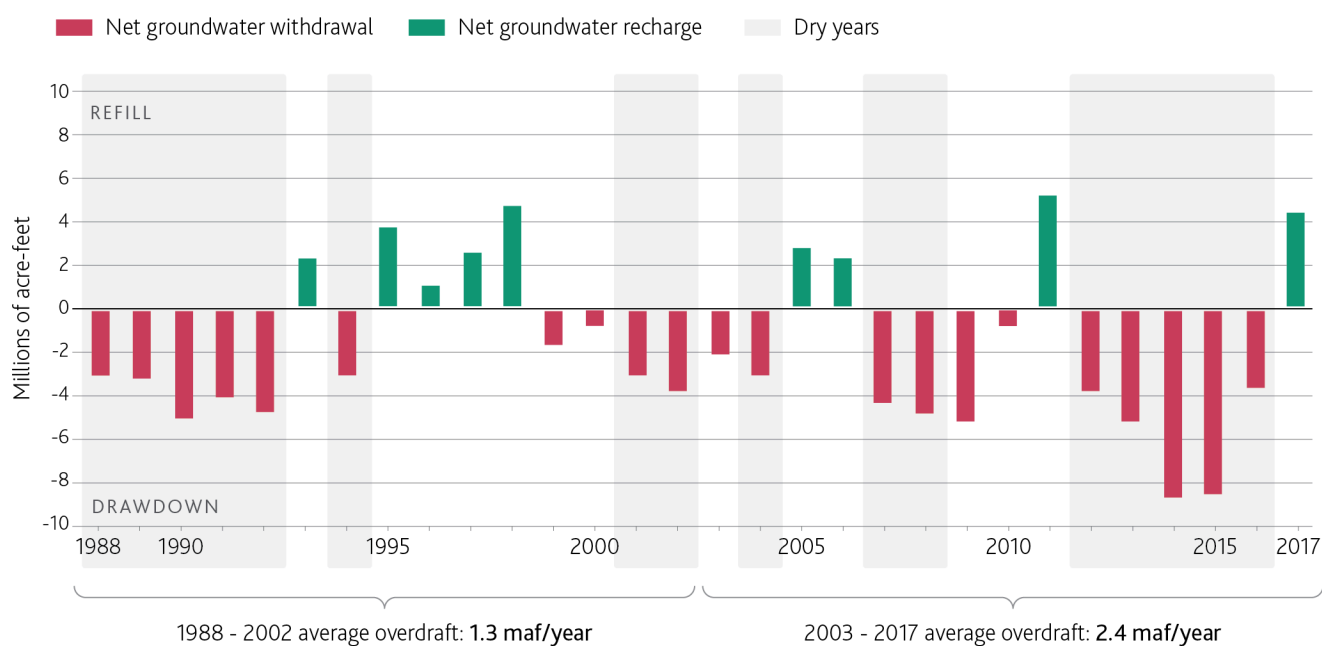
the most immediate stress as do those across the state that rely on groundwater for a disproportionate share of supply. Groundwater aquifers provide critical supply in drought periods when surface water is not as readily available, but additional pumping or well drilling can drive up costs. Shifting from surface to groundwater supplies can also place additional demands on already stressed aquifers.

Agricultural use accounts for 80% of the state's water consumption and provides less flexibility in terms of demand and conservation, straining Central Valley water providers. Years of unsustainable pumping has lowered groundwater levels, particularly in the San Joaquin Valley's agricultural region within the Central Valley. On average, water users in the San Joaquin Valley pump 1.8 million acre-feet more than is replenished annually in the region (see Exhibit 6), resulting in basin overdraft conditions in which the long-term annual amount of groundwater extraction exceeds the long-term annual additions to aquifer water supplies. During the last drought, the San Joaquin Valley pumped up to 9 million acre-feet more groundwater than was replenished.

Groundwater overdrafts, however, are not limited to the San Joaquin Valley. As a result, local water utilities statewide have been required to adopt plans under the Sustainable Groundwater Management Act of 2014 (SGMA) to curtail excess groundwater use and reach sustainability by 2040.

Exhibit 6

Groundwater overdrafts in San Joaquin Valley during drought periods have exceeded replenishments



Source: Public Policy Institute of California (PPIC)

Groundwater aquifer overdraft is not only a supply challenge but creates a myriad of other issues for utilities in the Central Valley, including increased costs. Lowering groundwater tables requires drilling deeper wells and more electricity to power pumps, and results in land subsidence, reductions in water quality, and seawater intrusion for coastal groundwater basins. The current drought threatens to place further stress on the 21 groundwater basins classified as critically overdrafted by the SGMA.

Given current cuts in SWP allocations, many water purveyors will increase their reliance on groundwater sources. For example, [Antelope Valley-East Kern Water Agency \(A1\)](#), a wholesale water supplier to a diverse set of 58 municipal, industrial and agricultural purveyors, typically obtains around 12% of its water supply from groundwater sources, a figure that is likely to increase during the current drought.

Some utilities are moving forward with plans to safeguard groundwater deliveries. For example, the Orange County Water District (OCWD) received \$23 million from MWD for a project that includes construction of new wells and seawater barrier improvements. OCWD is also facing supply challenges related to per- and polyfluoroalkyl (PFAS) contamination. Should the state proceed with a

proposed new limit on PFAS, OCWD estimates it could impact up to 71 out of its 405 groundwater production facilities, reducing annual production by as much as 90,000 acre-feet. The district estimates, in turn, that revenue could decline by as much as \$43.8 million, or 28%. OCWD further estimates that facilities to treat groundwater from the contaminated wells could cost up to \$275 million.

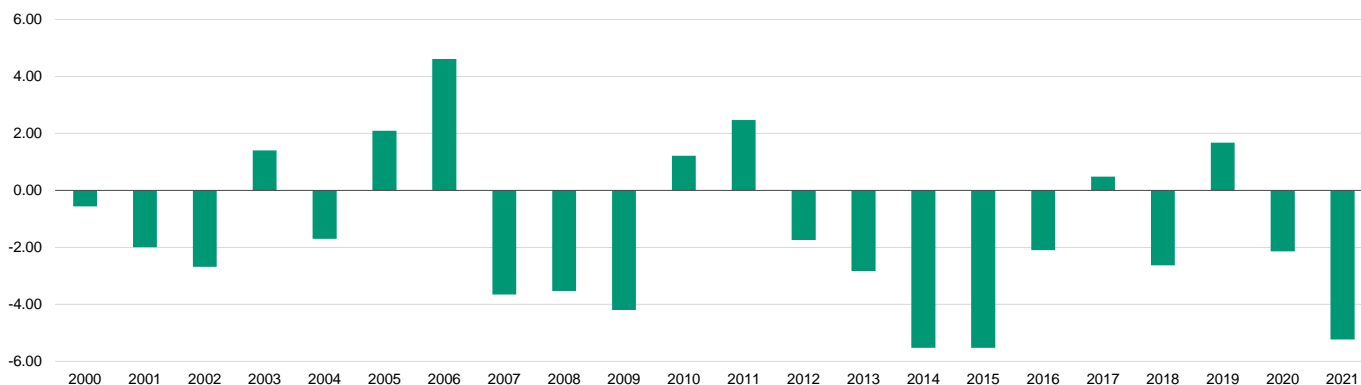
Drought threats will escalate, requiring investment

Amid intensifying climate change, California's current drought conditions continue a trend that will require ongoing investment by utilities and local, state and federal governments in conservation measures and water resources (see Exhibit 7). Sufficient supply will remain an increasing challenge given multiyear drought periods and significant year-to-year swings in precipitation. The risks will likely occur more frequently and with more intensity as a result of the warming climate. Water scarcity and rising temperatures will continue to influence the credit quality of water utilities throughout the state.

Exhibit 7

California Palmer Drought Severity Index shows several extreme dry periods over last two decades

Below 0.0 indicates dry conditions at varying levels; 2021 level close to low points of 2012-16 drought



Source: National Centers for Environmental Information, part of the National Oceanic and Atmospheric Administration

California's water utilities face increased stress in the coming decades. Forty of the 46 water or combined water and sewer utilities we rate are located in counties at "red flag" or "high" physical risk for increased "water stress," according to Moody's affiliate Four Twenty Seven.

California's 2021 Drinking Water Needs Assessment identifies 617 (25%) of 2,779 evaluated public water systems as "at risk" based upon water quality, accessibility, affordability, or technical, managerial and financial capacity, with the majority of them located in Fresno, Tulare, Monterey and Kern counties. Small water systems that rely on groundwater are especially at risk. The report pegs the total statewide cost for implementing interim and long-term solutions for water systems and domestic wells at close to \$10.3 billion.

Central to utilities' credit quality will be whether investments in water supply and storage are made while maintaining affordable water rates. Critical projects include long-term improvements in water conveyance, levees, pumping and habitat restoration across Northern California's Bay-Delta just east of San Francisco. This project will harden the 30% of Southern California's water supply that is transported across the Sacramento and San Joaquin River Delta, supporting critical wholesale suppliers including MWD. The urgency is highlighted by efforts to construct a \$10 million rock barrier to prevent saltwater intrusion from the Pacific Ocean from flowing into the Bay-Delta's river water.

Interstate cooperation and shared investments will remain beneficial. MWD's evaluation of a regional water recycling program provides an example of a project that may attract investment from other states such as Nevada.

Funds to increase water storage are critical as are investments in the use and availability of recycled water. Ensuring the sustainable use of groundwater aquifers remains central to ensuring long-term supplies sufficient to sustain California's growth. Additionally, addressing water quality through environmental regulations remains a challenge and is likely to increase costs. At the utility level, capital investments to maintain distribution systems and implement "intelligent metering systems" remain important.

Continued federal support of state revolving funds and WIFIA financings is also strategically important, especially for larger projects. California and its local governments may also choose to use some of their funds from the American Rescue Plan, a coronavirus relief package, for water projects. The infrastructure plan the Biden administration and Congress are negotiating could also lead to substantial funding. A bipartisan proposal calls for \$55 billion for water infrastructure and \$5 billion for Western water storage.

Ongoing investments, however, will require popular support. Already, some fault lines are emerging between agricultural and urban water users, with agricultural users balking at supporting higher water costs, especially those driven by environmental requirements.

Appendix

Exhibit 8

The majority of Moody's-rated California water utilities are in areas at risk for water stress Red flag is the most extreme risk

Utility	Rating	County	Water stress risk
Otay Water District Imp. Dist. 27, CA	Aa3	San Diego	Red flag
San Diego (City of) CA Water Enterprise	Aa2 stable	San Diego	Red flag
San Diego County Water Authority, CA	Aa2 stable	San Diego	Red flag
Clovis (City of) CA Water Enterprise	Aa3	Fresno	Red flag
Eastern Municipal Water District, CA	Aa2 stable	Riverside	Red flag
Elsinore Valley Municipal Water District, CA	Aa2	Riverside	Red flag
Riverside (City of) CA Water Enterprise	Aa2	Riverside	Red flag
Antelope Valley-East Kern Water Agency, CA	A1	Kern, Los Angeles	Red flag
Beverly Hills (City of) CA Water Enterprise	Aa1	Los Angeles	Red flag
California Dept. of Wtr. Res. (Water Ent.)	Aa1 stable	Los Angeles	Red flag
Central Basin Municipal Water District, CA	Baa3 negative	Los Angeles	Red flag
Glendale (City of) CA Water Enterprise	A1 stable	Los Angeles	Red flag
Long Beach (City of) CA Water Enterprise	Aa2 stable	Los Angeles	Red flag
Los Angeles Department of Water & Power, CA Water System	Aa2 stable	Los Angeles	Red flag
Metropolitan Water District of So. California	Aa1 stable	Los Angeles	Red flag
West Basin Municipal Water District, CA	Aa2 stable	Los Angeles	Red flag
Calleguas Municipal Water District, CA	Aa2	Ventura	Red flag
Bay Area Water Supp. & Conservation Agcy. CA	Aa3	San Mateo, Santa Clara, Alameda	High
Redwood City (City of) CA Water Enterprise	Aa3 positive	San Mateo	High
Modesto (City of) CA Water Enterprise	Aa3	Stanislaus	High
Manteca (City of) CA Water Enterprise	A2 negative	San Joaquin	High
Irvine Ranch Water District, CA	Aa1	Orange	High
La Habra (City of) CA Water Enterprise	Aa3 stable	Orange	High
Orange County Water District, CA	Aa1 stable	Orange	High
San Luis & Delta-Mendota Water Authority, CA	A2	San Benito, Santa Clara and multiple in San Joaquin Valley	High
Palo Alto (City of) CA Water Enterprise	Aa1	Santa Clara	High
Santa Clara Valley Water Dist., CA Water Ent.	Aa1 stable	Santa Clara	High
Sunnyvale (City of) CA Water Enterprise	Aa1	Santa Clara	High
Central Coast Water Authority, CA	A1	Santa Barbara, San Luis Obispo	High
San Francisco Public Utilities Commission, CA Water Enterprise	Aa2 stable	San Francisco, San Mateo, Santa Clara, Alameda	High
El Dorado Irrigation District, CA	Aa3 stable	El Dorado	High
Kern County Water Agency Imp. Dist. 4, CA	Aa3 stable	Kern	High
Chino Basin Desalter Authority, CA	Aa3	San Bernardino	High
Cucomonga Valley Water District, CA	Aa2	San Bernardino	High
Inland Empire Utilities Agency, CA	Aa2 stable	San Bernardino	High
Alameda County Water District, CA	Aa1	Alameda	High
East Bay Municipal Util. Dist., CA Wtr. Ent.	Aa1 stable	Alameda, Contra Costa	High
Contra Costa Water District, CA	Aa2 stable	Contra Costa	High
Martinez (City of) CA Water Enterprise	Aa3	Contra Costa	High
Pittsburg (City of) CA Water Enterprise	Aa3	Contra Costa	High
Placer County Water Agency, CA	Aa2	Placer	Medium
Roseville (City of) CA Water Enterprise	Aa2	Placer	Medium
Folsom (City of) CA Water Enterprise	Aa3	Sacramento	Medium
Sacramento County Water Agency, CA	Aa3 stable	Sacramento	Medium
Sacramento Suburban Water District, CA	Aa2	Sacramento	Medium
Santa Rosa (City of) CA Water Enterprise	Aa2	Sonoma	Medium

Water stress levels primarily reflect projected imbalances between local water supply and demand in 2030 and beyond in the counties served by these utilities. They do not incorporate mitigating factors such as current or future imported water supplies, development of alternate supplies, or reservoir storage levels.

Source: *Four Twenty Seven*

Moody's related publications

Sector In-Depth

- » [Municipal Water and Sewer Utilities: Climate threats and aging infrastructure portend rising credit risks for many utilities](#), May 7, 2021
- » [Local Government - US: Farm-based local governments will maintain credit quality, though climate risks loom](#), May 16, 2019

Sector Comment

- » [Local Government - California: Wildfires amid pandemic compound social and economic risks, but unlikely to hurt credit quality](#), August 26, 2020

Endnotes

- 1 Acre-feet is the volume of water covering one acre to a depth of one foot.

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