

Veles Water Weekly Report

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WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell standing in for Robin Bieber

CLICK THE LINK BELOW

"A 2 minute technical analysis video of H2O futures"

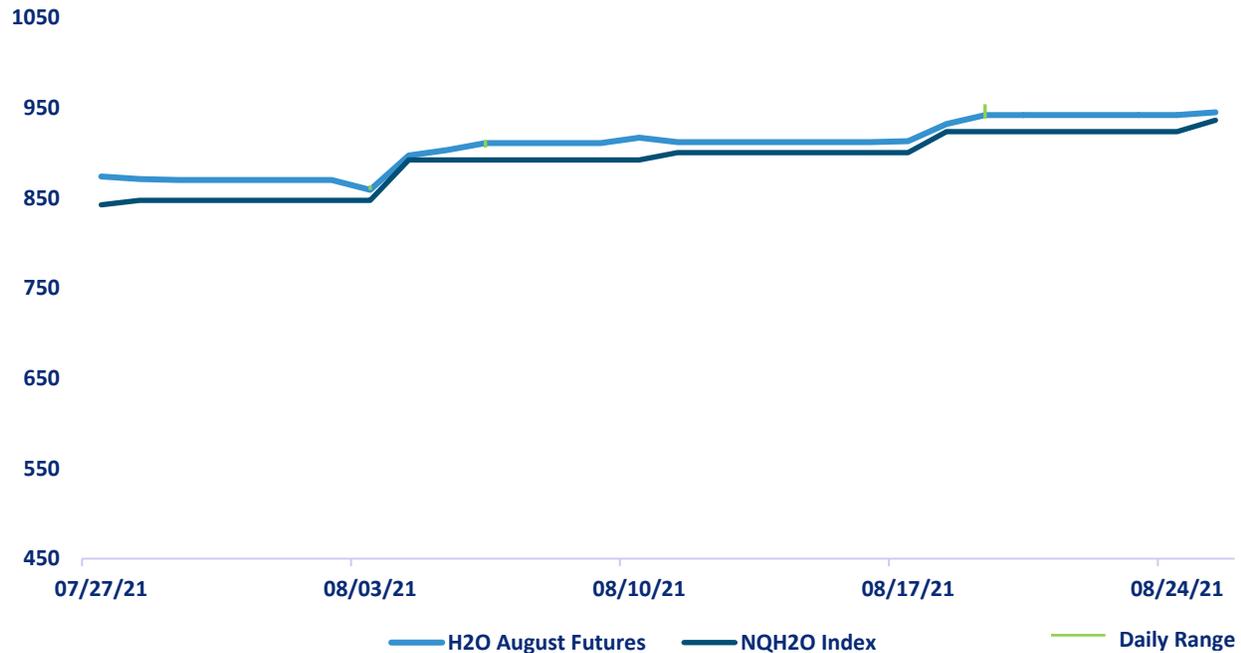
<https://vimeo.com/592644891>



VELES WATER WEEKLY REPORT

NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

Yesterday, 25th August, NQH2O reached a new all-time high of \$936.22, up 1.37% or \$12.68 for the week.

The September H2O futures have been trading at a premium of \$8.46-\$18.46 for the past week with a low of \$938 and a high of \$952.

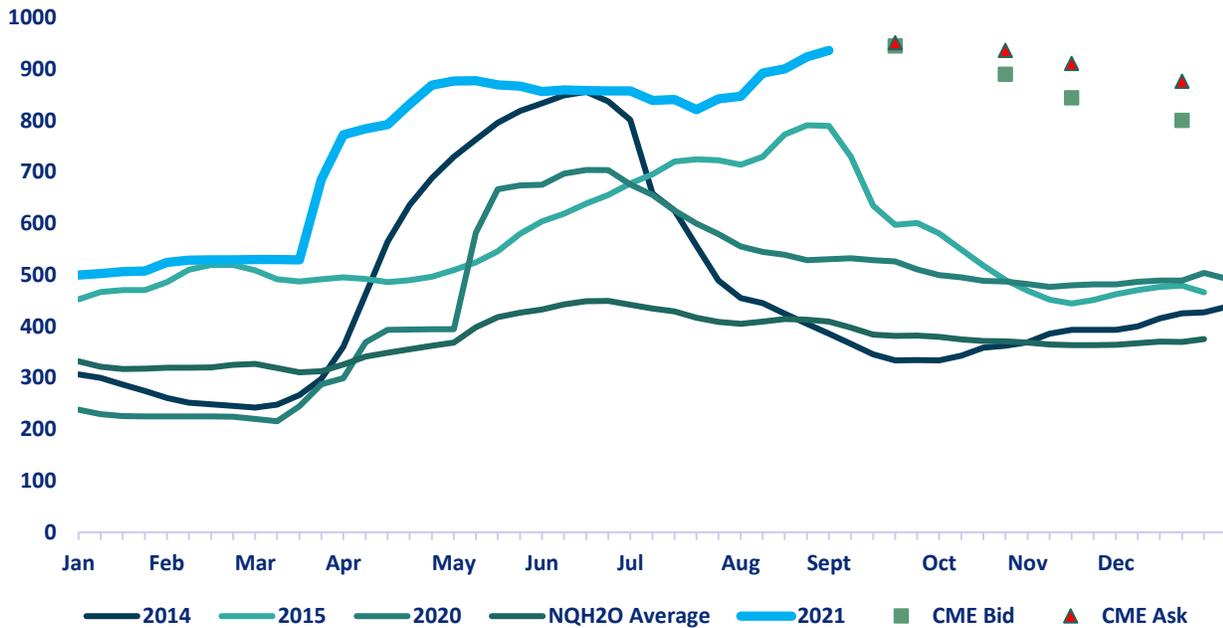
Below are the bid offer prices on different expiries being quoted in the market.

September 945@951
October 890@936
November 844@911
December 800@876
June 22 950@1040

The December offer price is still cheaper than the September bid. The September bid to December offer is minus \$69. This is indicating a significant implied seasonality in the trading of water, with prices peaking in summer and tapering off in winter. NQH2O index is up 87.31% up Year to Date.



NQH2O Seasonal Pricing/ CME H2O Futures Quotes



The graph above lays out the Nasdaq Veles water index by year, showing 2014, 2015, 2020, 2021 plus an average price of the last eight years. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and the possibility of rain/snow.

The restricted ability to “carry” water, much like one can do with financial contracts, gives this index the same type of seasonal pattern that one sees on some other commodities.

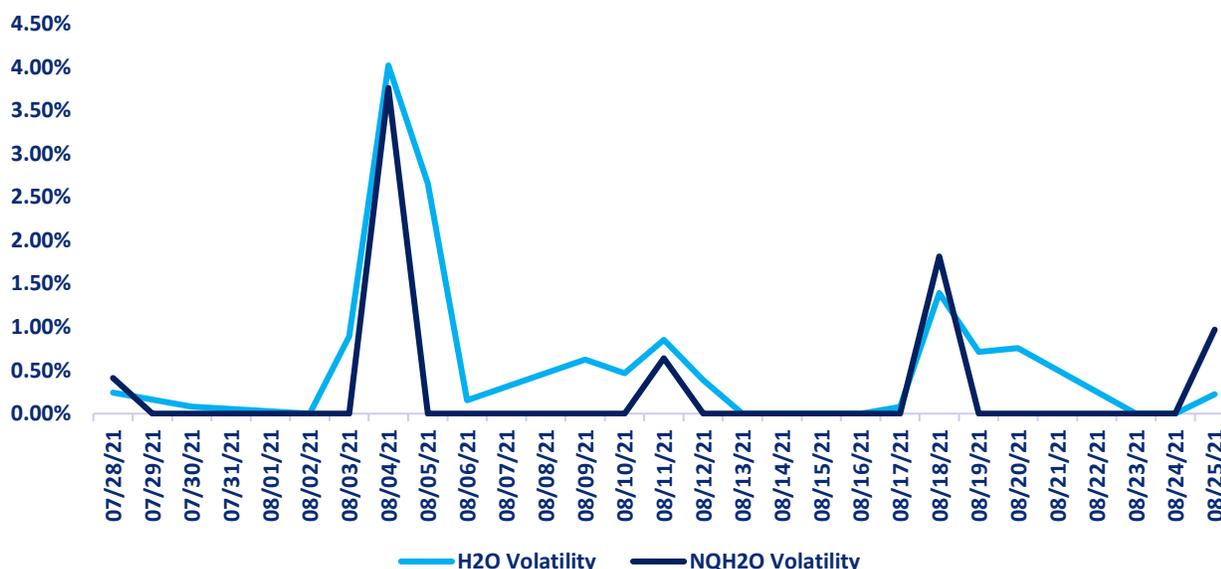
The graph for 2021 is highlighted in light blue. It shows the same seasonal climb, but at record-high values above each of the last eight years since February. Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and prices may not fall seasonally as much as they have in prior dry years.

(Reference: John H Dolan, CME Market Maker)



H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	33.37%	6.50%	3.96%	1.197%
H2O FUTURES	N/A	8.46%	5.16%	1.89%

For the week ending on the 26th August the two-month futures volatility is at a premium of 1.97% to the index up 0.09% from the previous week. The one-month futures volatility is at a premium of 1.20% to the index, up 0.42% for the week. The one-week futures volatility on average remained at a premium of 0.42% to the index, a reversal of 1.53%, possibly indicating that this contract has more upside potential.

DAILY VOLATILITY

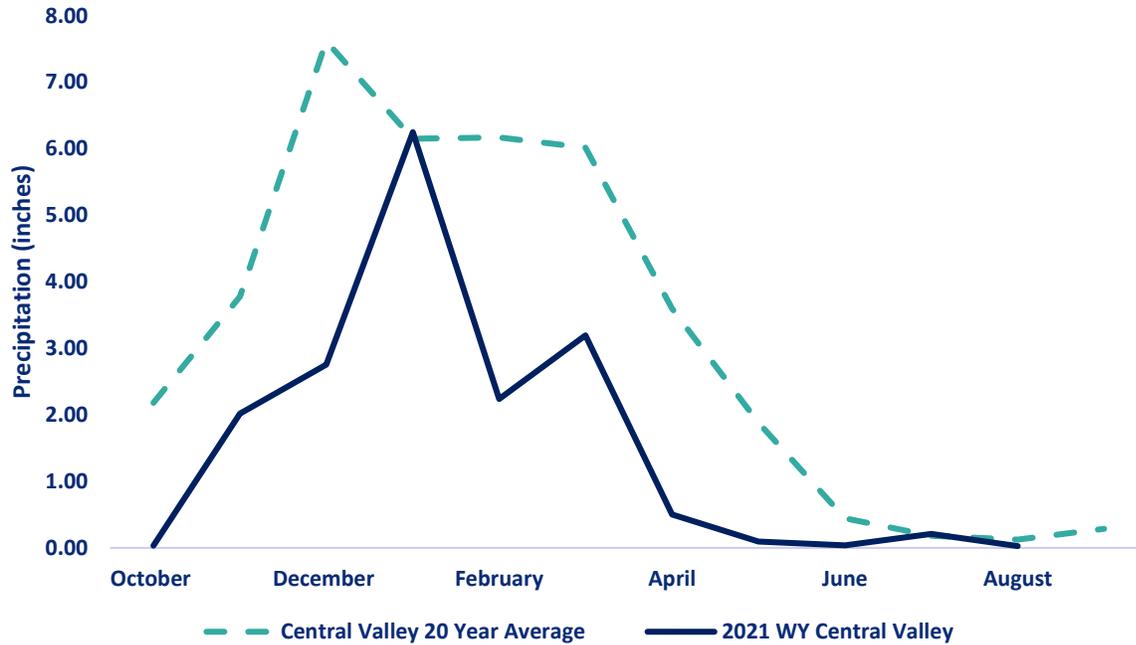
Over the last week the August future volatility high has been 0.71% on August 19th and the low has been 0% on August 23rd.

*Above prices are all **HISTORIC VOLATILITIES** and **IMPLIED VOLATILITIES** will be introduced once an options market has been established.*



CENTRAL VALLEY PRECIPITATION REPORT

Central Valley Precipitation Index



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 26/08/2021

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2021 WYTD VS 2020 WYTD %	2021 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	0.04	0.00	31.37%	62	48
TULARE 6 STATION (6SI)	0.05	0.00	48.08%	66	35
NORTHERN SIERRA 8 STATION (8SI)	0.01	0.00	7.02%	63	46
CENTRAL VALLEY TOTAL	0.10	0.00	28.82%	64	43

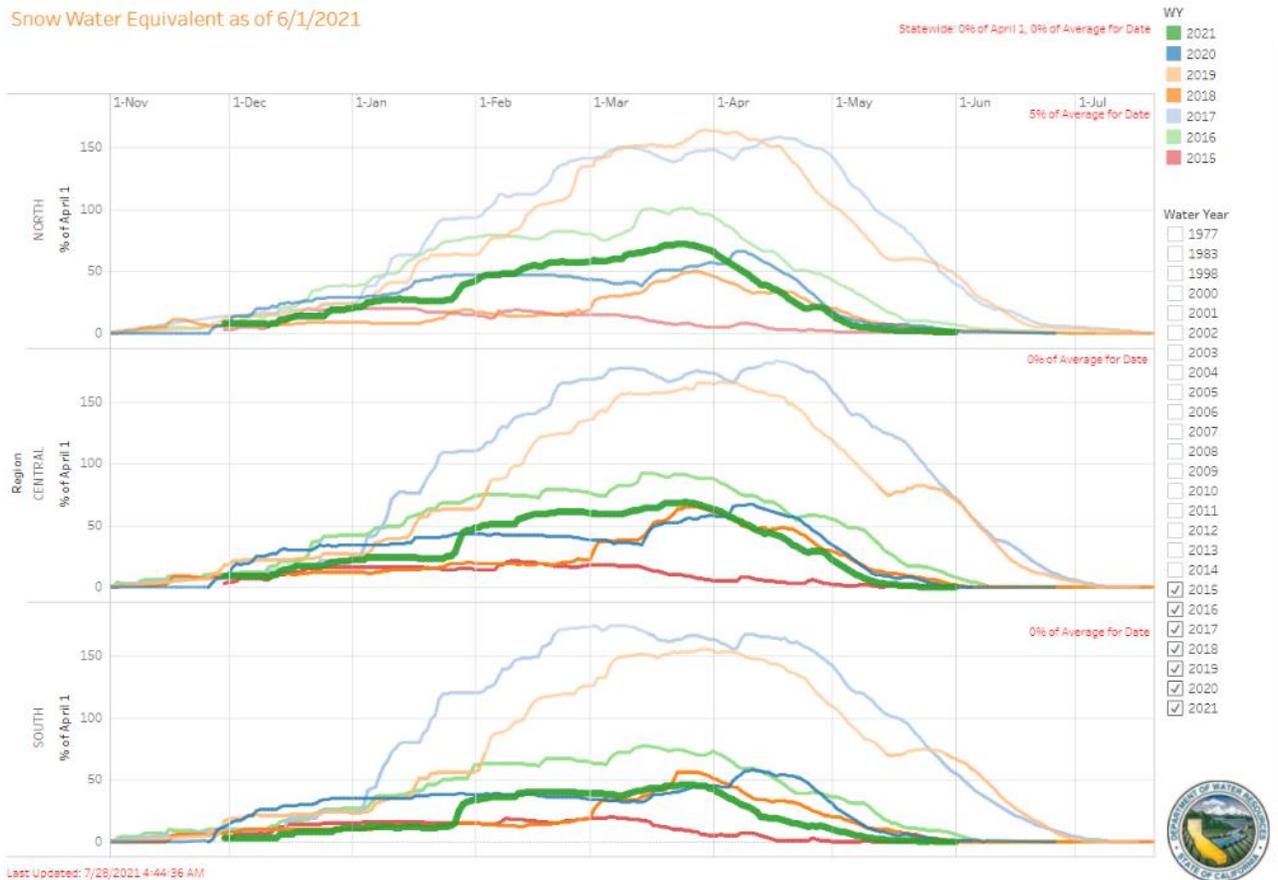
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	882,630	36	63	48
SHASTA LAKE	1,273,216	28	53	43
LAKE OROVILLE	806,025	23	49	34
SAN LUIS RES	302,694	15	46	34



SNOWPACK WATER CONTENT

Snow Water Equivalent as of 6/1/2021



Last Updated: 7/28/2021 4:44:36 AM



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE %	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	0.2	0.00%	9	5	1
CENTRAL SIERRA	0	0.00%	3	0	0
SOUTHERN SIERRA	0	0.00%	3	0	0
STATEWIDE	0.1	0.00%	3	0	0

*Snow Water Equivalent, or SWE, is a commonly used measurement used by hydrologists and water managers to gauge the amount of liquid water contained within the snowpack. In other words, it is the amount of water that will be released from the snowpack when it melts. SWE has regional variance.

** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.

VELES WATER WEEKLY REPORT

DROUGHT MONITOR



U.S. Drought Monitor California

August 17, 2021
(Released Thursday, Aug. 19, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	95.58	88.37	48.97
Last Week 08-10-2021	0.00	100.00	100.00	95.07	88.37	47.10
3 Months Ago 05-16-2021	0.00	100.00	100.00	94.31	73.33	15.91
Start of Calendar Year 12-28-2020	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year 09-29-2020	15.35	84.65	67.65	35.62	12.74	0.00
One Year Ago 08-18-2020	20.55	79.45	54.22	21.72	3.04	0.00

Intensity:
 None (white) D2 Severe Drought (orange)
 D0 Abnormally Dry (yellow) D3 Extreme Drought (red)
 D1 Moderate Drought (light orange) D4 Exceptional Drought (dark red)

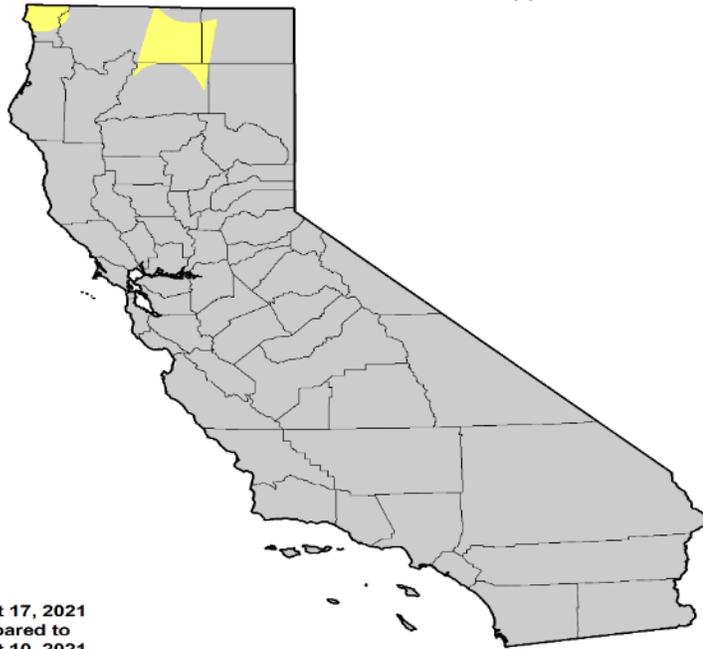
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - California 1 Week



August 17, 2021
compared to
August 10, 2021

droughtmonitor.unl.edu

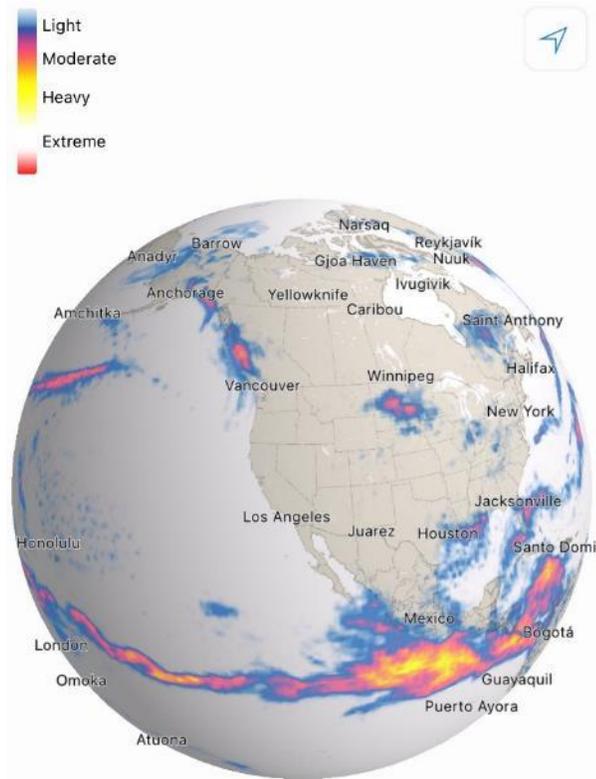


The US Drought Monitor release their statistics with a 1-week lag to this report. There has been a slight class 1 degradation in drought conditions in Northern California.

The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC.



CURRENT SATELLITE IMAGERY



The current satellite picture shows the driest satellite view of the SW seen during this calendar year. There is no frontal activity looming from the Pacific Northwest and the Monsoon activity has shrunk back towards the Tropics.

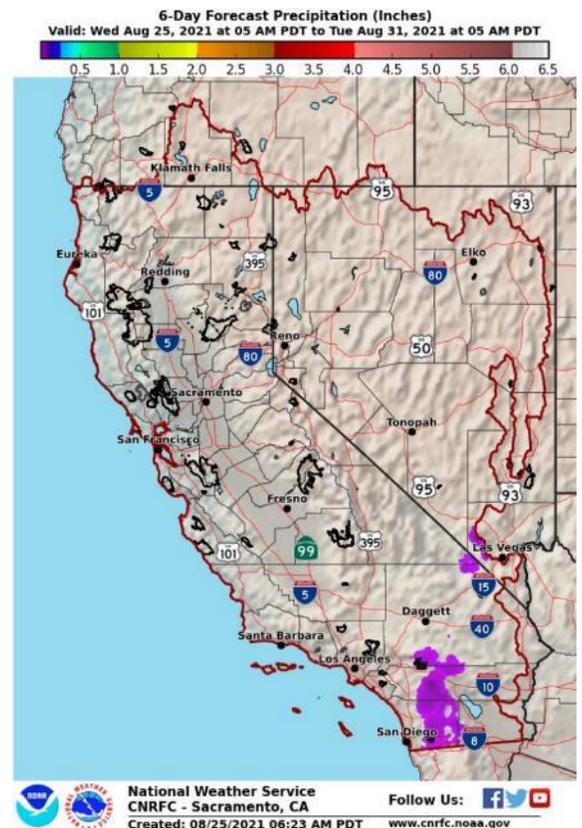
A strong high-pressure system has ridged itself over the SW of the US and in the short term our models show the only relief will be the potential of some Monsoonal moisture coming in from the South in about a weeks' time.

Ref. Dark Sky

10 Day Outlook

A dry airmass in place over the region should continue the lack of precipitation through the end of the week. A trough is forecast to move across the region through Thursday, followed by re-building high pressure aloft into early next week. By early next week, expect SE flow aloft to lead to moisture advection into southern portions of CA/NV and possible shower activity in those regions, especially higher terrain.

National Weather Service / California Nevada RFC / Sacramento CA





WESTERN WEATHER DISCUSSION

Amid water shortages and restrictions in the Colorado River Basin and widespread wildfires and extreme fire behavior in northern California and the Northwest, widespread severe, extreme, and exceptional drought continued across much of the region. Conditions worsened in northern California, western Oregon (and adjacent southwest Washington), southeast Oregon (and adjacent Nevada), and in northern and eastern portions of Montana, where soil moisture continued to degrade as hot and dry weather continued. In stark contrast, widespread improvements in drought conditions occurred in Arizona and New Mexico this week, as heavy monsoonal rains made their return after a one-week hiatus. Two-inch rainfall totals were commonplace, particularly in the southern halves of both states, and localized higher amounts also occurred.

Most of the remaining drought in these states, while still extreme or exceptional in some locales, is confined to long-term impacts, as conditions are wet in many places in the short-term. While heavy monsoonal rain occurred in Arizona and New Mexico, moderate to heavy amounts were mostly confined to these two states. In central and southern Arizona and New Mexico, temperatures were cooler than normal, in some areas by 3 to 9 degrees. Otherwise, the rest of the region was warmer than normal, in particular northern California, Oregon, and Washington, where temperatures from 9 to 12 degrees above normal were widespread.

Reference: Brad Rippey, U.S. Department of Agriculture
Richard Heim, NOAA/NCEI



WATER NEWS

CALIFORNIA WATER NEWS

Thousands of farmers face \$10,000-a-day fines if they pull water from California rivers

Water regulators on Friday formally ordered thousands of farmers across California to cut back their water use this summer or face fines of up to \$10,000 a day.

The State Water Resources Control Board began sending formal “curtailment notices” to the holders of 4,500 water rights permits that allow them to pull water from the Sacramento and San Joaquin rivers and their tributaries.

Between 500 and 600 of the state’s heaviest water users also are being asked to supply information to the state about how much water they’ll be expected to use and their estimated demand.

In a call with reporters Friday, regulators said the actions were necessary since there’s no guarantee enough rain and snow will fall to replenish the state’s shrinking reservoirs. “It’s really critical to prevent additional loss of supplies, and really protecting the resources that we do have going into next year, should next year be dry,” said Erik Ekdahl, deputy director of the water board’s Division of Water Rights. “It’s very important that everyone comply with the curtailment orders.”

Regulators said the cuts need to happen now to protect endangered cold water fish swimming in increasingly languid, warm water and to stave off a potential disaster for California’s human residents next year.

The concern is that without ample water in the reservoirs that ring the Central Valley, the Sacramento-San Joaquin Delta could become too salty next year. The vast estuary on Sacramento’s southern doorstep requires a certain amount of fresh water flowing into it to keep the saltwater in the Pacific Ocean from pushing inland.

If the Delta becomes too salty, it could have dire consequences statewide. Water pumped from the Delta supplies 25 million people in the Bay Area and Southern California.

The Delta also provides water to about 3 million acres of Central Valley farmland, home to the bulk of the state’s \$50 billion-a-year farm economy.

The curtailments have been in the works for weeks. The board formally voted 5-0 Aug. 3 to approve them, but it took more than two weeks for the process to be finalized, Ekdahl said.



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Environmentalists applauded the move, and earlier this summer, Karen Ross, secretary of state Department of Food and Agriculture, said the cutoff was “absolutely necessary” in light of the severity of the drought.

But many farmers were critical, saying the state and federal governments after the last drought should have invested in more dams and other water projects to boost the state’s supplies.

Farms and cities that receive water imported from the network of canals and pumps that make up the State Water Project or the federal Central Valley Project have already had their allocations cut, in some cases down to nothing.

Friday’s orders pertain to farmers and others using water under the state’s byzantine rights system that sets a pecking order giving priority to users with the oldest claims to a river.

Original Article: [The Sacramento Bee by Ryan Sabalow](#)

California has been unable to address water problems in a number of towns. Here’s why

A lot has happened over the past five years, but not much has changed in the tiny farmworker town of Okieville.

Wells went dry en masse in Tulare County, including in Okieville, during the last drought in 2012-2016. Since then, the state has funded a new well for the town.

But the water troubles never ended. The well pump malfunctions frequently and can take days to fix, said Mayra Marquez, an Okieville resident.

“It’s very hectic,” Marquez said. “We’re out of water often.”

With the region again in the grip of drought, she’s worried.

“We can wake up tomorrow and not have water,” Marquez said. “It’s very hard not knowing.”

Residents of small, poor, mostly Latino communities throughout the central San Joaquin Valley are echoing Marquez’s concerns. Despite all the attention during the last drought and even some progress on a few projects, the same communities are again going dry or are on the brink.

The question is why?

Some critics say a large part of the answer is that the state, which oversees small drinking water systems, is slow and overly bureaucratic. Other critics put the blame closer to home.



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“It depends on the agency but a lot of local agencies are also culpable for not prioritizing the basic needs of their residents,” said Amanda Monaco, water policy coordinator for Leadership Counsel for Justice and Accountability.

Long-term fixes for water systems move slowly, acknowledged Andrew Altevogt, assistant deputy director of the Division of Drinking Water, overseen by the state Water Resources Control Board. How slowly depends on a number of factors.

“If you’re talking about a more complicated thing with more planning, more infrastructure, more funding, I mean we’ve seen things take 10 years,” Altevogt said.

In some communities homes are served by private wells. In other areas such as Okieville, the water is managed by a private mutual water company. Still other communities use public service districts. When the state steps in with public tax dollars, there’s a heightened level of scrutiny, especially when those tax dollars are used for privately owned systems.

Beyond the legal complexities, each system has its own problems. Those range from old, broken wells to declining groundwater to contamination, or a combination. Some systems simply need a new well. Others require consolidation with a larger, more capable system.

A lack of good drinking water is the problem. But circumstances and solutions are all unique.

Original Article: [The Fresno Bee by Jesse Vad and Lois Henry](#)

Drought Prompts State to Order Halt to California Delta Water Drawdowns by Rights Holders

Thousands of water rights holders, including farms and cities, were ordered to stop drawing water from the Sacramento-San Joaquin Delta by the State Water Resources Control Board on Friday.

Under the order, 4,500 of the Delta watershed’s 6,600 rights holders were told to halt drawing water in order to protect drinking water supplies, prevent sea water from pushing into the Delta and to minimize the drought’s impacts on fish stocks and the environment, according to Water Board officials.

“Curtailing water rights has an impact on livelihoods and economies but it is painfully necessary as severe drought conditions this year and next could threaten health, safety and the environment,” said Deputy Director of the Division of Water Rights Erik Ekdahl.



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The state is offering reporting and technical assistance to all right holders and will regularly inspect water diversions and investigate complaints to make sure the order is followed.

In early August, state officials said the curtailments are needed to maintain water supplies in three key upstream reservoirs — Shasta, Folsom and Oroville, all of which are well below historical averages for this time of year.

Original Article: [CBS SF Bay Area](#)

California almond farmers let trees die as water grows scarce

As temperatures recently reached triple digits, farmer Joe Del Bosque inspected the almonds in his parched orchard in California's agriculture-rich San Joaquin Valley, where a deepening drought threatens one of the state's most profitable crops.

Del Bosque doesn't have enough water to properly irrigate his almond orchards, so he's practicing "deficit irrigation" -- providing less water than the trees need. He left a third of his farmland unplanted to save water for the nuts. And he may pull out 100 of his 600 acres of almond trees after the late summer harvest -- years earlier than planned.

"We may have to sacrifice one of them at the end of the year if we feel that we don't have enough water next year," said Del Bosque, who also grows melons, cherries and asparagus. "That means that our huge investment that we put in these trees is gone."

A historic drought across the U.S. West is taking a heavy toll on California's \$6 billion almond industry, which produces roughly 80% of the world's almonds. More growers are expected to abandon their orchards as water becomes scarce and expensive.

It's a sharp reversal for the almond's relentless expansion in California's agricultural Central Valley, whose dry Mediterranean-like climate and reliable irrigation system made it the perfect location to grow the increasingly popular nut.

Almond orchards are thirsty permanent crops that need water year-round, clashing with a worsening drought and intensifying heat waves tied to climate change. Scientists say climate change has made the American West much warmer and drier in the past 30 years and will keep making weather more extreme.

California almond production grew from 370 million pounds in 1995 to a record 3.1 billion pounds in 2020, according to the U.S. Department of Agriculture. During that period, land planted with almond trees grew from 756 square miles to 2,500 square miles.



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In May, the USDA projected that California's almond crop would hit a record 3.2 billion pounds this year, but in July, it scaled back that estimate to 2.8 billion pounds, citing low water availability and record heat.

Original Article: [Arkansas Democrat Gazette by Terence Chea \(AP\)](#)

Advanced forecasting strengthens So. Cal.'s water retention

As drought persists in the state of California, the need to increase water supply reliability is an essential issue facing water managers.

A new report evaluating a pilot program to use advanced weather and streamflow forecasts to enhance water storage capabilities at a Riverside County, California, dam found that enough water could be conserved to supply an additional 60,000 people per year.

The pilot program, called Forecast-Informed Reservoir Operations (FIRO), led by research meteorologists from the Center for Western Weather and Water Extremes at UC San Diego's Scripps Institution of Oceanography, found that 7,000 acre-feet per year of stormwater could potentially be added to groundwater recharge in Orange County. One acre-foot is equivalent to about 325,000 gallons. The program was supported by a combination of funds from the U.S. Army Corps of Engineers (USACE), Orange County Water District, and the California Department of Water Resources (DWR).

"We are excited to partner with Scripps and the USACE on this project, which increases water supply and reliability for the region," said Orange County Water District President Steve Sheldon. "Local stormwater capture is important because it lessens demand on imported water supplies, which are more costly and less reliable than groundwater."

The district manages the Orange County Groundwater Basin, which provides 77 percent of the water supply to 2.5 million people in north and central Orange County. It also manages a six-mile stretch of the Santa Ana River between Prado Dam and its recharge basins in Anaheim.

"The Prado Dam FIRO project is an example of the continued partnerships between state, federal and local agencies. The FIRO program has shown that by better utilizing emerging technologies in observations and forecasts to create an adaptive strategy, we can improve water management, not only during the wet years, but during drought conditions as well," said Kris Tjernell, DWR's Deputy Director for Integrated Watershed Management. "This type of project perfectly aligns with the goals described in the Governor's Water Resilience Portfolio and is also the type of multi-benefit project that



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uses common sense approaches, combined with the latest science, to embrace innovation and new technologies, and increase resilience to climate change.”

Prado Dam was constructed in 1941 by USACE for flood risk management, with a secondary benefit of stormwater capture for water supply. Many dams in the west, including Prado Dam, are regulated by USACE-issued water control manuals, which do not take advantage of modern precipitation and streamflow forecasting capabilities.

FIRO is a research and operations partnership that uses data from watershed monitoring, and modern weather and hydrologic forecasting, specifically the study of atmospheric rivers, to help water managers selectively retain or release water from reservoirs in a manner that reflects current and forecasted conditions.

“Atmospheric river storms cause 25 to 50 percent of annual precipitation in key parts of the west, which can replenish water supply, but can also lead to hazardous and costly flooding,” said research meteorologist Marty Ralph, director of the Center for Western Weather and Water Extremes. “When atmospheric rivers make landfall, they can release a staggering amount of rain and snow; however, their absence can lead to drought.”

Original Article: [Water World](#)

San Joaquin Valley Community Provides Water To Well Owners During Drought

Organizations in the San Joaquin Valley, California, are providing drinking water resources to those impacted by the drought.

According to FOX40 News, The California Partnership for the San Joaquin Valley Water Workgroup created a plan and a list of resources for private well owners and small communities struggling with losing access to drinking water as a result of shrinking groundwater levels.

The California Partnership for the San Joaquin Valley Water Workgroup is working with Self-Help Enterprises, which is offering community members bottled water, water tanks, water assessment testing and water quality testing, reported FOX40 News.

“With climate change intensifying the impacts and frequency of droughts in California, collaboration and coordination are vital components to improving the state’s water resiliency,” said Dorene D’Adamo, vice chair of the California State Water Resources Control Board in the FOX40 news release.

As a result of these efforts, residents who have been affected by the impacts of the drought have immediate resources for drinking water.

“Water is an essential resource in the San Joaquin Valley and no resident should be without access to drinking water,” said Merced County District 5 supervisor and chair of



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the water workgroup Scott Silveira in the FOX40 news release. “Self-Help Enterprises is providing vital services and emergency assistance during this drought, and the California Partnership for the San Joaquin Valley and the Valley Counties are committed to ensuring that everybody is aware of these available resources.”

Additionally, The Greater San Joaquin County Regional Water Coordinating Committee (GSJCRWCC) adopted a significant update to the 2014 Integrated Regional Water Management Plan covering most of San Joaquin County (2020 IRWMP Addendum). Over \$6.5 million in state grant funding will be available to the GSJCRWCC region to support water management projects identified in the IRWMP which meet California Department of Water Resources requirements.

Original Article: [WQP Magazine by Cristina Tuser](#)

South Valley communities on verge of running out of water press Newsom to halt 18% rate hike

As if California’s drought situation could get no worse, water agencies and poor communities in the southern San Joaquin Valley are confronting a new reality.

While they receive no water from the State Water Project, they’re being hit with rate hikes of up to 18 percent from last year by California water officials.

In a letter to Gov. Gavin Newsom, state water users in the old Tulare Lake bed – including water agencies that serve some of the state’s poorest communities – called for the Department of Water Resources to halt its planned hike on water rates.

“DWR has informed these Districts and the County, along with three other state water contractors who comprise DWR’s San Joaquin Valley region, that their water charges for 2022 will increase by \$25 million over this year,” the letter reads.

“This is a 13% to 18% increase for these contractors in a single year.”

The letter was signed by Kings County, Tulare Lake Basin Water Storage District, Empire West Side Irrigation District, the City of Corcoran along with representatives from water providers in Kettleman City, Stratford, and Alpaugh.

The signatories argued that, if conditions persist into 2022, they will be paying an estimated \$3,000 per acre foot of water they receive – if they receive any at all.

The state’s current water restrictions have “caused the fallowing of over fifty thousand acres of productive farm land in the Tulare Lake Basin this year,” the south Valley group argues.



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Conditions are particularly dire among the three unincorporated towns in Kings and Tulare counties.

According to the agencies, Kettleman City and its 1,400 residents are set to run out of potable water from the State Water Project by December.

Kettleman, a popular stopover for Californians traversing Interstate 5 between Los Angeles and San Francisco, has a dizzying 10.5 percent unemployment rate with 32.5 percent of its residents living below the Federal poverty line.

Original Article: [SJV Sun by Alex Tavlian](#)

Drought worsens in Southern California, with Ventura County in worst category

As sweltering drought conditions continue to worsen throughout California, Ventura and other Southern California counties have shifted from “extreme” to “exceptional” drought conditions, according to the U.S. Drought Monitor Report.

Along with Ventura County, northwest Los Angeles County, most of Kern County and the eastern portion of San Bernardino County are also in the federal report’s highest range, signifying “exceptional drought.” Almost all of California is facing detrimental drought conditions, with 50 of the state’s 58 counties under a state of emergency amid excessive drought conditions.

In Ventura County, Calleguas Municipal Water District officials have declared a water shortage, continuing their call to residents to conserve water.

“The board’s action urges residents, businesses and agencies in Metropolitan’s 5,200-square-mile service area to lower the region’s water demand to stave off more severe actions in the future, which could include restricting water supplies to Metropolitan’s 26 member agencies,” officials said in a statement Tuesday.

Officials at the Metropolitan Water District of Southern California, which supplies imported water to Calleguas Municipal Water District, said the state’s water supply has been “increasingly stressed by the extreme drought.”

Last week, the MWD issued a supply alert, calling on all of Southern California to conserve water amid the continued drought, a move that brings the state’s largest population center closer to tough water restrictions that have been imposed on communities elsewhere.

The alert came one day after U.S. officials declared the first-ever water shortage on the Colorado River, a key source of water for the region and one that supplies the Calleguas Municipal Water District, which serves approximately 75% of Ventura County.



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In a statement released by MWD, board member Gloria D. Gray said the water management district has needed to begin tapping into its stored reservoirs, and continued to urge residents to conserve water.

Original Article: [The LA Times by Melissa Hernandez](#)

How San Jose could become the first major California city with water allotments and drought penalties

Highlighting the deepening drought, San Jose could soon become the largest city in California where residents are given monthly allotments of water with financial penalties for exceeding them.

San Jose Water Company, a private utility that provides water to 1 million people in and around San Jose, has filed a plan with state regulators that would require each of its residential customers to cut monthly water use by 15% from their 2019 levels and pay \$7.13 in surcharges for every unit of water they use above that amount.

The rules are a possible precursor for similar limits in other communities across the state, experts said.

“If a water system is worried about running out of water, you have to have mandatory rationing with penalties for people who don’t conserve,” said Jay Lund, director of the UC Davis Center for Watershed Sciences. “Otherwise it’s a free-rider problem and some people will say, ‘I don’t need to conserve water because all my neighbors are,’ which undermines the whole effort.”

Sometime soon after Aug. 31, San Jose Water will decide whether to put the new plan in place, said John Tang, the company’s vice president for regulatory affairs, once it reviews water use numbers from July and August to better understand conservation trends. Under state law, the company also is required to hold a public hearing first, which so far has not been scheduled.

“We are putting the pieces in place so that if and when we do need to enact it then we’re ready to go,” Tang said.

One complicating factor: Because of the COVID pandemic, many people are still working from home, using more water than they did in 2019.

The last time San Jose Water put in place such a system was in 2015 and 2016, during California’s last drought, when Gov. Jerry Brown ordered mandatory conservation for urban residents statewide.

One other water utility in Santa Clara County already has put in place monthly water allotments, with a 15% mandatory cut and penalties for overuse. Great Oaks Water



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Company, which provides water to 108,000 people in San Jose's Blossom Valley, Santa Teresa, Edenvale, Almaden Valley and Coyote Valley areas, began the system July 13.

"There was no need to risk water supply issues, so we took immediate action," said Tim Guster, general counsel of Great Oaks Water Company. "This drought is serious. We did not believe delaying the process was good for anybody."

Statewide, California's current drought is the most severe since 1976-77.

This past year, San Jose experienced its driest year in 128 years of record-keeping, receiving only 5.33 inches of rain from July 1 to June 30. That's about the same amount as Las Vegas or Palm Springs gets in a typical year. San Francisco had its third-driest year since the Gold Rush in 1849.

As the drought continues to expand, Santa Clara County is in worse shape than many other counties. Its largest reservoir, Anderson, near Morgan Hill, was ordered drained last year by federal officials to rebuild the dam to improve earthquake safety. On Friday, the 10 reservoirs in the county, collectively, were just 13% full.

The county suffered another hit when federal agencies announced earlier this summer they would be cutting water allocations to cities by half from the Delta due to a meager Sierra Nevada snowpack.

To make up for the shortfall, groundwater pumping in Santa Clara County is increasing. But if the upcoming winter is dry, water tables could drop to emergency levels next year, engineers at the Santa Clara Valley Water District say. That would increase the risk of the ground sinking, a phenomenon known as subsidence which could lead to cracked roads, sidewalks, home foundations and natural gas and water pipes.

"If it doesn't rain this winter, we are going to be in a grim situation next year," said Gary Kremen, a board member of the Santa Clara Valley Water District.

The district, based in San Jose, is a government agency that is the wholesale water provider for Santa Clara County. It sells water to 13 cities and private companies known as retailers who send bills to customers.

The largest retail provider in the county is San Jose Water Company.

Original Article: [Mercury News by Paul Rodgers](#)



US WATER NEWS

Can derivatives trading in water help the western US during ongoing drought?

The Colorado basin states in the western US are going through an unprecedented water crisis—a historic long-term drought. Early this week, the US Bureau of Reclamation officially declared a severe water shortage at Hoover Dam’s Lake Mead, the largest reservoir in the US. At around 1,067 feet above sea level, the lake is barely 35 percent full, the lowest since its construction in the 1930s. The water levels in the second largest reservoir, Lake Powell, also fed by the Colorado River, stands at 32 percent of the full storage capacity. Such low runoff conditions in the Colorado system will result in substantial deductions in downstream releases from Glen Canyon Dam and Hoover Dam in 2022 due to declining reservoir levels.

This will further lead to mandatory reductions in water allocations for all the three lower Colorado states, namely, California, Arizona, and Nevada as also for the downstream nation of Mexico. Based on the federal guidelines worked out for combating drought conditions in 2019, Arizona’s allocation from Lake Mead declines by 18 percent, while those of the state of Nevada and the nation of Mexico declines by 7 and 5 percent respectively. As such, Nevada has already reduced its deliveries to combat the scarcity conditions.

One needs to note here that the long-term trend of the Colorado system reveals a decline in the run-off, which has largely been attributed to the forces of human-induced climate change. A recent paper in Science claims that in the Upper Colorado system, the annual mean discharge is declining by 9.3 percent with every degree celsius of warming due to enhanced evapotranspiration mainly driven by snow loss and a consequent decrease in reflection of solar radiation. But this is not the only reason. Rather, Marc Reisner’s Cadillac Desert and Philip Fradkin’s A River No More bear ample historical accounts of river development and how a structural engineering paradigm for water governance as a response to increasing water demand in the western US had serious long-term negative effects on the environment and water quantity. The decline in long-run run-offs has often been attributed to fragmentation of the flows caused by multiple constructions for storages and diversions. There is no doubt that the long-term trend of declining run-offs in the Colorado system has now further been aggravated and inflicted by an uncertainty posed by global warming and climate change.

Over time, the western US attempted various demand management measures through compacts and statutes, the latest one being the measure adopted in 2019 as mentioned



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above. However, the most interesting intervention emerged by December 2020, with the CME Group and NASDAQ launching the NASDAQ Veles California Water Index futures contract. The derivative contract is designed for California, which is endowed with a highly liquid and a buoyant physical water market worth more than US \$1.1 billion in 2019–20. The futures contract is associated with the spot market price underlier in the form of Nasdaq Veles California Water Index—a price index estimated as the volume-weighted average price of water arrived on the basis of the transaction prices of water rights in California’s five most liquid markets. As against physical delivery, these futures contracts are financially settled, thereby, rendering better leveraging and reducing the transaction costs including those of delivery.

Benefits of a water futures market

There are various expected benefits of the water futures markets (WFM). First, water futures market will help discover price (through the scarcity value of the resource), thereby, leading to an efficient use of the resource. Thus, the market aids efficient allocation, helps proper distribution, and offers means of achieving social optimality in consumption and production. Second, water futures contracts will provide a price indicator for future stored water. This will assist investment decisions as also forward risk management. Third, the price realised at the futures market will be an indicator of the future state of availability of the resource, thereby, indicating the relative scarcity with respect to the demand. In that sense, price discovered in an efficient futures market for water will reflect on what has been delineated as “scarcity value” of water, i.e., the value loss at the margin due to scarcity. Fourth, irrigated as also rain-dependent agriculture, dependent on the availability of water, will be able to use the market (or products derived from the market) to insure themselves against droughts by locking in prices in the water futures market. Such risk transfer in the private sector will significantly reduce the burden of drought relief currently borne by governments. Fifth, water futures provide the financial tools required by investors and banks to confidently invest in the rural sector. This would result in long-term planning and investment that will actually deliver water to areas that need it rather than simply insure against its absence. In fact, banks and financial intermediaries can develop other products suitable for their customers by making use of the water futures market. Sixth, a water futures market will help in promoting the best water-efficient technology. Seventh, the price discovered in the futures market, thus, can offer a mechanism for extending justice and setting conservation priorities within a limited budget. The futures market is expected



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to align the supply side factors and the demand forces, stabilise price risks, and help price discovery.

Original Article: [ORF by Nilanjan Ghosh](#)

Water Agencies Across West Partner to Conserve Colorado River Water, Augment Lake Mead Level Through Agricultural Fallowing

Seizing every opportunity to use Colorado River resources as efficiently and effectively as possible and to help slow Lake Mead's declining levels, water agencies across the Southwest are partnering with the federal government to fund a short-term agricultural land fallowing program in California that will conserve water on a large scale.

The partnership among the U.S. Bureau of Reclamation, the Metropolitan Water District of Southern California, Central Arizona Project, Southern Nevada Water Authority, and Palo Verde Irrigation District is expected to conserve up to 180,000 acre-feet of water over the next three years, amounting to about a 3-foot increase in Lake Mead's water level.

"Reclamation welcomes this collaborative effort to conserve water in Lake Mead," said Bureau of Reclamation Lower Colorado Basin Regional Director Jacklynn Gould. "Working with our partners, we can reduce the risk of the reservoir declining to critical levels."

Under an agreement finalized last week, Reclamation will fund half of the program's total costs of about \$38 million, while Metropolitan, CAP and Southern Nevada will share the remaining costs equally, each providing about \$6.3 million.

With runoff in the Colorado River Basin dismally low this year, Lake Mead's level has dropped significantly. Reclamation declared the first-ever tier one shortage on the river last week, triggering cutbacks to Arizona and Nevada to slow the reservoir's decline.

Through the program, participating farmers in Palo Verde Irrigation District will be paid to fallow a portion of their land over the next three years. The conserved water will be added to Lake Mead, becoming what is known as system water – water that benefits all Colorado River water users.

"Palo Verde Irrigation District agriculture enjoys the highest priority for Colorado River water in California, yet we are devoted to collaborating with our partners along the River. We are all connected by the Colorado River, and making it more sustainable is in the long-term best interest of all of us," said Bart Fisher, PVID board trustee.

The conserved water could help keep Lake Mead levels high enough to stave off a tier two shortage declaration in 2023 and the potential for additional contributions required



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under the Drought Contingency Plan. It will also help preserve green hydroelectric production capacity at Hoover Dam.

“This is just the beginning. We’re working to develop other innovative ideas to keep as much water as possible in Lake Mead. Working as one with our fellow water agencies and with our partners in ag, we can find solutions that benefit us all and that make the river more sustainable,” Metropolitan General Manager Adel Hagekhalil said.

“Building new tools to address the shared risks we all face in the Colorado River requires deepening existing partnerships as well as creating new ones. This unique interstate partnership will generate new resiliency in the Lower Colorado River and is a model for our future endeavors,” CAP General Manager Ted Cooke said.

“To successfully manage these shortage conditions over the next few years, every sector of the Colorado River community within the Basin will need to step up and take strong action to conserve and preserve this resource,” said John Entsminger, General Manager of the Southern Nevada Water Authority. “This is a good example of the kind of action that can be taken in partnership with the agricultural sectors to conserve water and help protect Lake Mead.”

The program is made possible through Metropolitan’s existing land fallowing program with PVID. Typically, the conserved water is made available to Metropolitan and Metropolitan can determine annually how much land it calls for to be fallowed, based on its water supply needs. Because Metropolitan has significant amounts of water stored in Lake Mead – more than 1 million acre-feet – it has flexibility on how it uses the fallowing program for the next few years, opening the door for this system conservation agreement.

Original Article: [Business Wire](#)

In a Land of Scarce Water, Prices Should Be the Guide

This week, the U.S. Bureau of Reclamation, which manages federal water resources throughout the West, announced a water shortage at Lake Mead, the country's largest reservoir, and resulting cuts in allocations to Arizona, Nevada, and Mexico. The announcement came even as parts of the West see massive monsoon rainfall resulting in washed-out roads and loss of life. It's a testament to the extremes of life in the region, where water can be both a scarce resource and sometimes available in dangerous excess. That unpredictability makes a mockery of centralized management schemes for the wet stuff—but flexible rules and water markets offer a way to reduce both risk and waste of the valuable resource.



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"Monsoon 2021 rainfall measured at Tucson International Airport set one of several records set this season with 5.88 inches of rain through July 25," the Arizona Department of Water Resources announced at the end of July. "At Phoenix Sky Harbor International Airport, meanwhile, National Weather Service officials reported 1.67 inches for the month as of July 25, making 2021 the wettest July since 2013 and the 17th wettest on record."

Unfortunately, that's not enough all by itself.

"Fending off drought – especially the kind of long-running drought the Southwest has experienced – takes deep winter snowpack in the region's mountainous watersheds. After more than two decades of dry conditions, it would take several consecutive years of deep snowpack to release from drought's grip," the department added.

The extremes of life in the West were apparent near my home in Arizona's Verde Valley, which early in the summer was hemmed by wildfires that choked the air with smoke during the day and lit the sky with flame at night. The bone-dry conditions of 2020 turned brush into tinder for lightning strikes and stray sparks. But within weeks, torrential rains flooded roads and swept away a local teenager.

As the Arizona Department of Water Resources noted, these conditions have persisted for decades. There comes a time when you have to accept alternating dust and flood as normal and treat old assumptions about water abundance as out of step.

Fortunately, there are established practices for allocating scarce resources in a decentralized way.

"What we have advocated for at PERC is the expanded use of water markets," Reed Watson, then-executive director of the Property and Environment Research Center (PERC) told Reason in 2016. "Can we define water rights in the state, just define them in such a way that they're tradeable so that people can buy and sell water freely?" Watson spoke specifically about California because, well, it's California and the state draws lots of attention. Not all western states treat water the same way, but most recognize "appropriative rights" to water based on historical usage. That's helpful, since those rights can often be transferred independent of the land on which the water is located. So, water markets are developing, but they're compromised by political decision-making and regulatory barriers.

Original Article: [Reason by J.D. Tuccille](#)

What can Arizona learn from California's drought and mandatory water cuts?

Arizona has water issues.



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But they are not nearly as deep or widespread as those pummeling northern California.

Some areas there are facing mandatory 40% cuts in use. In Redwood Valley, residents have been asked to live on 55 gallons a day – barely enough to take a bath and flush the toilet a few times.

Meanwhile, thousands of farmers and others – even those with senior water rights – have been barred from diverting water from the Sacramento-San Joaquin Delta. As have irrigators along the Klamath River near the Oregon border, which also is seeing massive numbers of fish die.

Officials for the first time shut down a major hydroelectric plant on Lake Oroville because of low water levels, a move some feared would add to rolling blackouts.

And the governor is warning that mandatory, statewide cuts could be in the offing, impacting residents in Los Angeles and San Diego, which so far have been insulated from the pain.

That has lessons for Arizona.

Lesson 1: Resiliency matters

Many Californians have been taken aback by the speed and severity of the cuts. Chalk part of that up to a record-breaking drought, which has dried the lakes and streams on which many small farming and tourist communities in the northern part of the state rely. But it's not just the dry weather.

California's rivers also are woefully overallocated and have been for quite some time. Combine that with decades of heavy groundwater pumping, and when the rain and snow stops falling – something scientists expect a lot more of in coming years – many communities simply do not have adequate reserves to fall back on.

Resiliency matters.

Lesson 2: Cuts alone won't solve this

Many in California are now lamenting the lack of investment in more permanent water solutions – particularly, the infrastructure necessary to store more water in the years when it actually falls from the sky.

Sure, the state experienced painful cuts during the last drought, in 2015. Some actions, like ripping out grass and filling in pools, have resulted in lasting water savings. California also passed a groundwater law during that crisis to slow heavy pumping, but so far it hasn't done much to curb use in heavily agrarian areas.

In fact, years later, the state has only approved a handful of communities' long-term plans.



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Lesson 3: Don't just keep talking

We've been talking for a long time. There have been decades of potential solutions that have never gone anywhere, in both states.

Because change is hard, and various interests have dug in over the years to maintain the status quo.

If anything, the pain being inflicted on northern California is a reminder about what happens when fundamental problems just keep simmering, waiting for the next drought to emerge bigger and more painful than before.

If Arizona wants to avoid that fate, we can't just keep talking. We need to shift to doing.

Original Article: [AZ Central by Joanna Allhands](#)

Colorado River cutbacks set stage for decade of drought politics

A prolonged and worsening drought has created an alarming shortage of water across the parched West, setting off what is likely to be a years-long crisis that could threaten the future of some of the fastest-growing cities and economies in the United States.

The Bureau of Reclamation on Monday declared the first-ever water shortage on the Colorado River, forcing cutbacks to water allocations to Western states that will begin in the next several months. Water officials and experts who keep careful tabs on lake and river levels from the Rocky Mountains to Baja California say they expect further cuts unless the heavens open up once again.

In the American West, "whiskey's for drinking and water's for fighting," said Kirk Adams, a former Arizona state legislator who served as chief of staff to Gov. Doug Ducey (R) during negotiations over Colorado River water use.

Water and natural resource issues generally are going to dominate Western politics for the next decade-plus, as a result of climate change," Adams said.

A quarter of the territory in Western states is experiencing exceptional drought, according to the National Drought Mitigation Center, including broad swaths of California's Central Valley, Eastern Washington and Oregon, and large portions of Utah, Nevada, Idaho and Montana. More than 98 percent of Western lands are abnormally dry.

The dry conditions are a major cause of the massive wildfires that have become a common feature of Western summers, when smoke settles over the landscape. But the longer-term problem is now showing up in the reservoirs where those states store their water.



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Across the West, water in those reservoirs, lakes and rivers is near or below record-low levels. Some of the largest reservoirs in the Upper Snake River Basin in Idaho are between 14 percent and 42 percent full. In Southern Oregon, reservoirs near Ashland are less than 5 percent capacity.

Lake Powell, a reservoir that helps generate power for Southwestern states, is only 31 percent full. The amount of water that has flowed into the lake totals just 35 percent of the average it has historically received.

Lake Mead, which serves residents of Arizona, California, Nevada and northern Mexico, stands just 1,067 feet above sea level, its lowest point since the Hoover Dam was constructed in the 1930s. Cuts are triggered when the water level there falls below 1,075 feet.

Original Article: [The Hill by Reid Wilson](#)

How will the Colorado River water shortage impact New Mexico?

For the first time ever, federal officials have declared a water shortage on the Colorado River.

"There's no surprise here," said John Fleck with the UNM Water Resources Program. "We expected this to happen eventually, or we knew there was a possibility that we needed to be ready for. Folks in the Lower Colorado River Basin who depend on this water, especially in Arizona, they're ready for this, they know what to do. They know who's going to take shortages and there will be some communities that are harder hit than others, but this is not the apocalypse at the end of the world for any of those communities."

So what does the water shortage mean for New Mexico and other western states?

"In the short term, by which I mean the next few years, this shortage declaration on the Colorado River doesn't really affect New Mexico," Fleck said. "Our supplies of Colorado River water come from the upper part of the Colorado River Basin, which is managed somewhat differently."

New Mexico sees water shortages all the time, depending on the amount of snowfall in the mountains.

"We had a shortage this year in New Mexico," Fleck said. "As part of the Colorado River, we get water through what's called the San Juan Chama project, which carries water in tunnels beneath the Continental Divide for us here in Albuquerque. We only got about a 60% allocation this year. Nature imposed that shortage, not the government."



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There are backup supplies such as groundwater in areas including Albuquerque. Water researchers said the most important thing for New Mexicans in the long run is to come up with a plan for our portion of the Colorado River Basin. Right now, there isn't one.

"Among the states that we share this part of the basin with — Colorado, Wyoming, Utah and New Mexico — there's a lot of discussion about what that might look like," Fleck said. "And those are hard discussions, right? Because nobody wants to give up water, like we need as much as we can get. So you don't want to sort of volunteer, say, I'll go first. We'll take less right? Nobody wants to go first."

Original Article: [KOB 4 by Joy Wang](#)

As the West bakes, Utah forges ahead with water pipeline

As drought and climate change strangle the Colorado River, a small county in Utah nevertheless continues forging ahead with a billion-dollar pipeline to suck more water from it to sustain its growing population.

The proposed Lake Powell Pipeline, a 140-mile straw from one of the country's largest reservoirs to Washington County in southwestern Utah, has sparked backlash from other states in the Colorado River basin and environmentalists, and now has the Biden administration in a difficult position.

One expert says the project is illegal, a local Native American tribe has sued over the water that could fill it, and critics contend it is reminiscent of the American water mindset of the mid-20th century: Let's build our way out of a shortage.

"It harkens back to the days of the '50s, '60s and '70s when, to meet future demands, you needed a pipeline," said Eric Kuhn, the author and former general manager of the Colorado River District. "Grab that last piece of water — that pipeline — whether the water is there or not."

Utah says it has a right to more water because it doesn't use its full allocation under a 1922 compact that divvied up the river's water. And, it argues, the current drought has underscored the need for the project.

"The drought has really hit us hard," said Zach Renstrom, the general manager of the Washington County Water Conservancy District. "That is one thing that the drought has really taught all water managers, is these large water infrastructure projects have been key to ensuring safe drinking water."

But the proposal is coming under increased scrutiny due to a state of emergency on the Colorado River — and it has put the Biden administration in a bind.



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While the project appeared dead for years, Trump-era regulatory maneuvering gave it new life. The Biden administration says it is continuing to work on it.

For many, the pipeline epitomizes whether regulators are ready to leave behind the cement infrastructure that dominated the 20th century as the West grapples with how to make do with less water.

"We are entering a phase on the Colorado River where we are going to need to have unprecedented levels of cooperation between the states," said Bart Miller of the nonprofit Western Resource Advocates, who has studied the project extensively. "Rather than historic gray infrastructure, we are going to need to build resilience, not this 20th century approach."

Virtually all of the American West is facing drought conditions, and conditions are particularly acute on the Colorado River, which has suffered through a more-than-20-year megadrought. The river feeds 40 million people and millions of acres of cropland. Water levels at the river's main reservoirs — Lake Powell and Lake Mead — have dropped to levels not seen since they were originally filled in the early to mid-1900s. They each hold just a third of their capacity, forcing the Bureau of Reclamation to declare a shortage for the first time ever last week and triggering mandatory cutbacks for Arizona, Nevada and Mexico (Greenwire, Aug. 16).

Utah has been among the hardest hit. Almost all of the state is in extreme or exceptional drought, according to the U.S. Drought Monitor — its most severe ratings. Most of the state's reservoirs are about half full or less, prompting responses like Gov. Spencer Cox (R) calling on residents to pray for rain in June.

Against this backdrop, Utah has billed the up-to-\$2 billion pipeline as a "key to our long-term water future."

Its argument: Utah and the river's other Upper Basin states currently deliver more water than required to the Lower Basin states of California, Nevada and Arizona. Utah, it says, has a right to some of that extra water.

Original Article: [E&E Green Wire by Jeremy p. Jacobs](#)

Arizona Water Rates Rise as Colorado River Water Shortage Declared

According to Fitch Ratings, mandatory water cuts from the Colorado River for the 2022 water year were recently announced by the U.S. Bureau of Reclamation (USBR) in its Colorado Basin August 2021 24-month study (the study). Per the study, Lake Mead will operate under a tier 1 shortage for the 2022 water year as required by the 2019 Drought Contingency Plan (DCP), the Congressionally approved water management plan for Colorado River basin between the Department of Interior, USBR, and all seven



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affected states. The cuts primarily impact Arizona and Nevada, which will experience reduced water allocations from Lake Mead by 18% and 7%, respectively.

For Arizona, cuts will primarily be felt by the Central Arizona Project (CAP), managed by the Central Arizona Water Conservation District (CAWCD, AA/Stable). CAP transports water to three counties in central and southern Arizona under long-term contracts with purchasers having strong credit quality. CAP will see its allocations of Colorado River water cut by 30% of its normal supply, with these cuts borne by the agricultural community. Municipalities and tribes will not experience cuts to their water deliveries under the tier 1 DCP declaration. However, CAWCD will increase delivery rates to municipal and industrial subcontracting parties by 20% for fiscal 2022 to offset lost agricultural sales revenues. CAP's largest municipal purchasers include: Tucson (water revenue bonds AA/Stable), Phoenix, Scottsdale (water and sewer revenue bonds AAA/Stable), Gilbert (water and sewer revenue bonds AAA/Stable), Mesa and Peoria (water and sewer revenue bonds AA/Positive).

Fitch does not expect any immediate credit effects from the tier 1 DCP declaration for either CAWCD or rated CAP purchasers, but the resulting increased water costs could eventually pressure rate affordability for the CAP purchasers. Further, due to the ongoing drought in the Lower Colorado River Basin and CAWCD's participation in the DCP, which could ultimately have a negative impact on CAWCD's financial performance, CAWCD has an elevated Environmental, Social and Governance (ESG) Relevance Score of '4' for Exposure to Environmental Impacts.

For Nevada, the 7% cut is not expected to have a near-term effect as the state had already reduced its deliveries, according to the Southern Nevada Water Authority.

For California, a tier 1 DCP declaration does not immediately impact Colorado River water deliveries. California would not be required to take cuts until Lake Mead levels are less than 1,045 feet (tier 2b). Lake Mead levels are 1,067 feet as of Aug. 16, 2021, equal to about 36% of capacity. Projections from the study point to Lake Mead levels falling below 1,045 by mid-2023, which would reduce the state's 2024 allocation. Despite cuts that would be triggered at the tier 2b, Fitch does not expect the reductions to substantially impact California's supplies due to the diversity of its water sources, manageable demand and considerable water storage levels in Southern California. However, continued drought paired with variable State Water Project supplies could ultimately pressure water rate affordability.

Original Article: [Fitch Ratings](#)



GLOBAL WATER NEWS

A system-based approach to water is a necessary condition to address new climate-water risks

Over the last few weeks heatwaves and droughts have been striking various global regions. The west of the United States, the south of Brazil, and the Middle East are just a few places where infrastructure, social, and natural systems are currently coping with climate extremes. The scientific community believes that In Brazil, the droughts of this year the worst in a century and in the United States the last few years are the worst in 1,200 years.

The initial consequences of these droughts are struggling water systems. In the United States, Lake Mead - the reservoir formed by the Hoover Dam, the largest reservoir in the country – has been declared under historic shortage. This has triggered unprecedented water cuts in most of the Southwest US affecting major economic sectors. In Brazil, the five interconnected reservoirs that form the Cantareira system, which supplies water to cities such as Sao Paulo, is operating at 40% its capacity. Reservoirs in countries such as Iran, Iraq and Lebanon are reporting critically low water levels.

Failing water systems then have ramifications with major economic sectors such as food and energy. Here the immediate impacts may be expressed beyond the local level and could reach national and transboundary scales. In Brazil, failing hydropower production would cause a 15 percent increase in electricity bills. Also, food prices, particularly of sugar and cocoa, have been going up as result of less available water for irrigation. Overall, higher food and energy prices are believed to raise the country's inflation by 8 points. In Iraq, failing crops are lowering farmers' incomes, while augmenting the dependence on food and water imports. Critical power shortages and unreliable regional interconnections in both Iraq and Lebanon are afflicting households and businesses, which cannot afford private generators.

From here, implications of fragile local water systems may scale-up. Extreme local drought conditions in Brazil may also threaten international food security. Particularly for regions such as the Middle East and North Africa that largely depends on food imports.

Moreover, a less responsive hydroelectricity sector, along with a spike in demand for energy, may hinder climate mitigation, decarbonization and energy transition efforts. Energy needs that cannot be met by hydropower would be replaced by other fuels.



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Often the alternatives are less-carbon friendly or more socially controversial sources. For example, California is already delaying the retirement of various gas-fired power plants, while the feasibility of closing its nuclear plants by 2025 has been questioned. Brazil is also responding to its energy needs by using more expensive and more carbon-intensive power plants run by gas, diesel, or coal to make up for lost hydroelectricity. In fact, as a response to the energy shortages, Brazil last June reached its highest ever levels of natural liquified gas imports.

An increasingly interconnected and changing world where local water risks have profound and global impacts, in turn requires a new perspective in the water sector.

Original Article: [World Bank by Nate Engle, Diego Juan Rodriguez and Homero Paltan](#)

Note the attachment is not an inducement to trade and Veles Water does not give advice on investments.