

# Veles Water Weekly Report

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November 3<sup>rd</sup> 2022

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**VelesWater**



## WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell

**CLICK THE LINK BELOW**

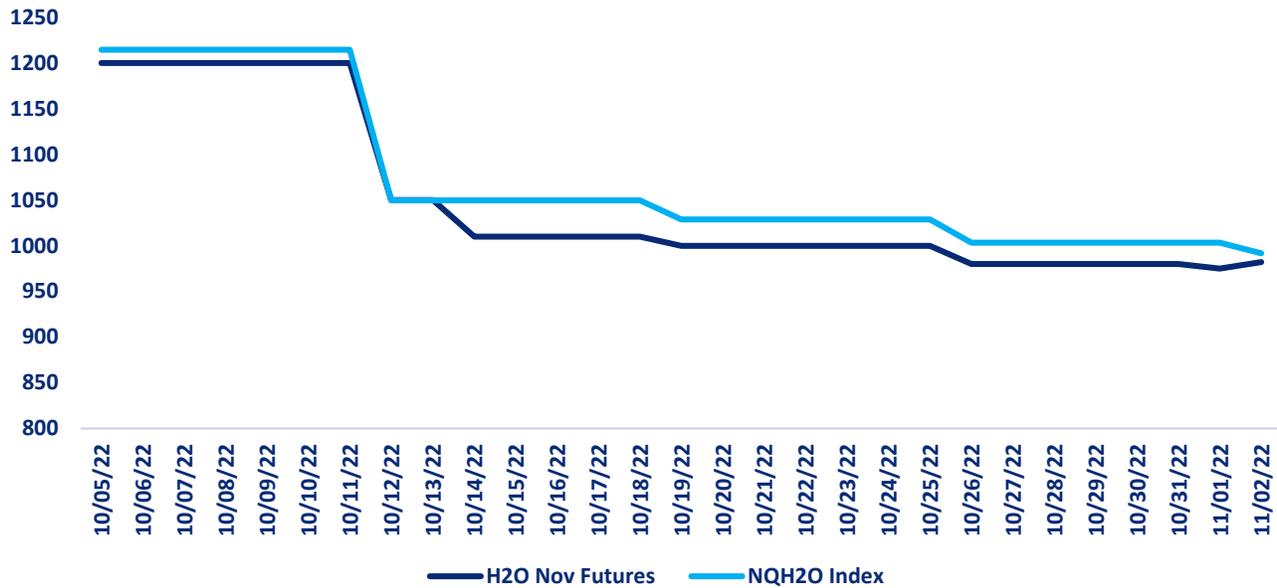
*"A 2 minute technical analysis video of H2O futures"*

<https://vimeo.com/766647387>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

The new NQH2O index level of \$991.73 was published on the 2<sup>nd</sup> November, down \$11.49 or 1.15%. The November contract is now considered the front month contract. The futures have been closing at a discount of \$9.73 to \$28.22 to the index.

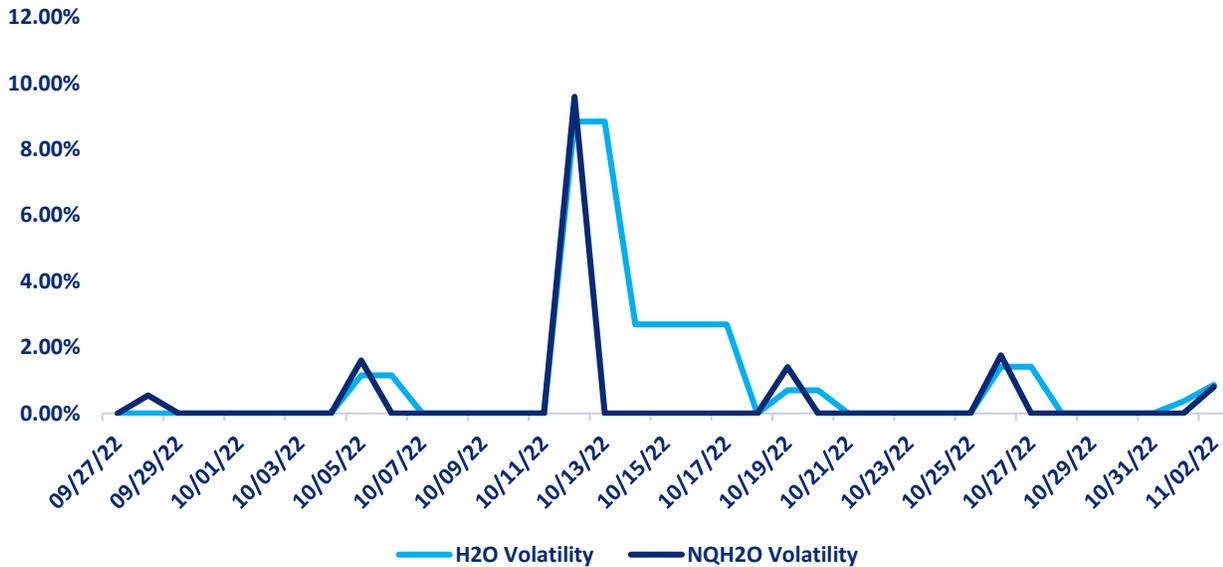
NQH2O is up 35.13% Year to Date.

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

Nov 22	975@983
Dec 22	950@961
Mar 23	920@975
Jun 23	1225@1265
Jun 24	1275@1515



### Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



#### DAILY VOLATILITY

Over the last week the November contract daily future volatility high was on the October 26<sup>th</sup> 1.41% and a low of 0% for the rest of the week.

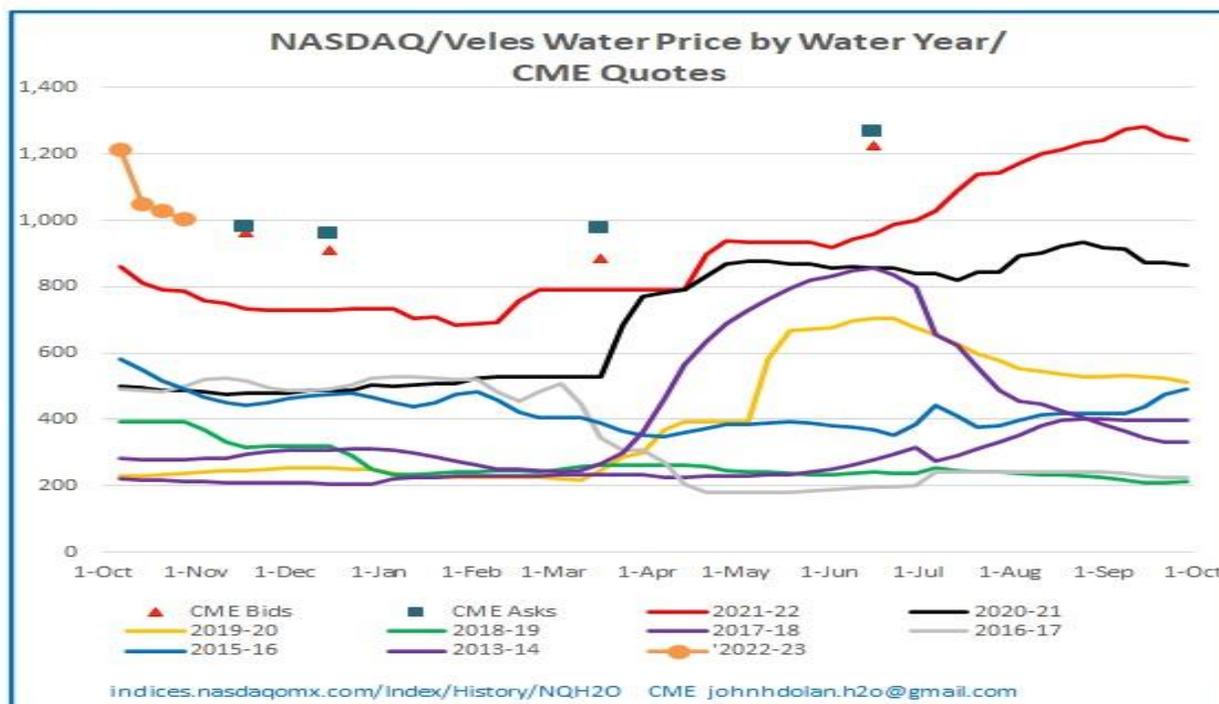
ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	25.60%	12.34%	1.36%	1.35%
H2O FUTURES	N/A	15.12%	12.91%	0.98%

For the week ending on November 2, the two-month futures volatility is at a premium of 2.78% to the index, down 0.44% from the previous week. The one-month futures volatility is at a premium of 11.55% to the index, a reversal of 11.88% from last week. The one-week futures volatility is at a discount of 0.37% to the index, a reversal of 1.87% from the previous week.

*Above prices are all **HISTORIC VOLATILITIES** and **IMPLIED VOLATILITIES** will be introduced once an options market has been established. All readings refer to closing prices as quoted by CME.*

# VELES WATER WEEKLY REPORT

## NQH2O INDEX HISTORY



The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. 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.

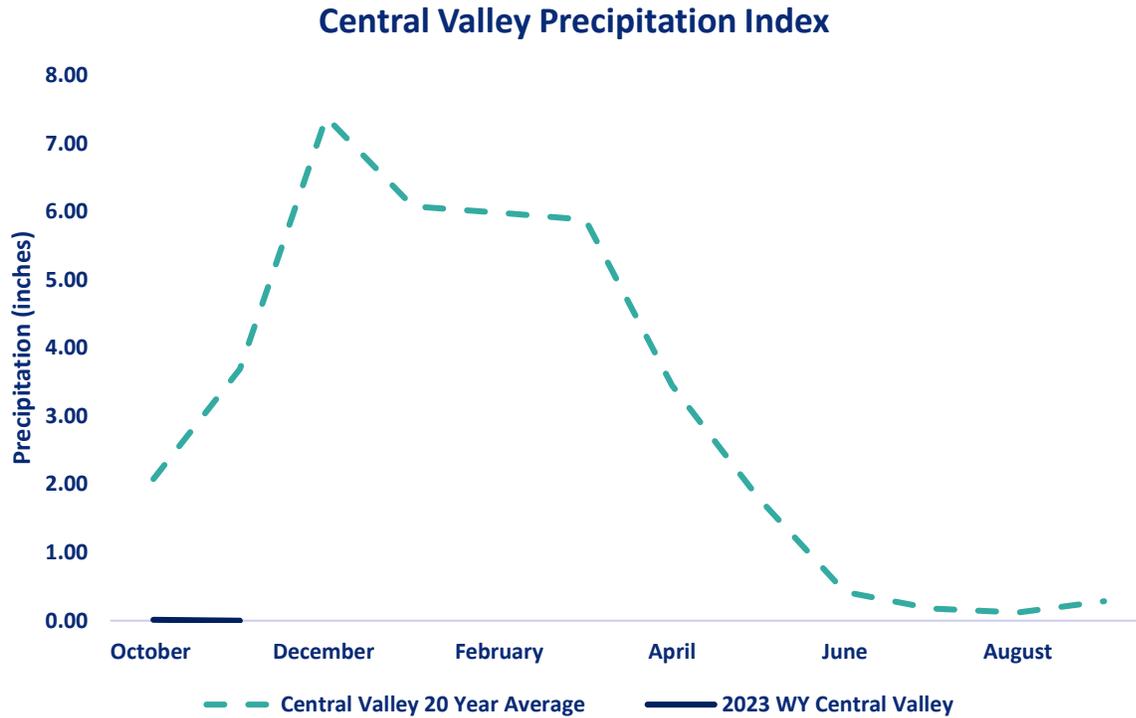
The graph for 2021-2022 is highlighted in red. It shows the same seasonal climb, but at record-high values above each of the last eight years since February. Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and prices may not fall seasonally as much as they have in prior dry years.

**(John H Dolan, CME Market Maker)**



# VELES WATER WEEKLY REPORT

## CENTRAL VALLEY PRECIPITATION REPORT



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.  
Data as of 03/11/2022

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2023 WYTD VS 2022 WYTD %	2023 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	0.00	0.00	0.00	0	2
TULARE 6 STATION (6SI)	0.00	0.00	0.00	0	0
NORTHERN SIERRA 8 STATION (8SI)	0.00	0.00	0.00	0	1
CENTRAL VALLEY AVERAGE	0.00	0.00	0.00	0	1

## RESERVOIR STORAGE

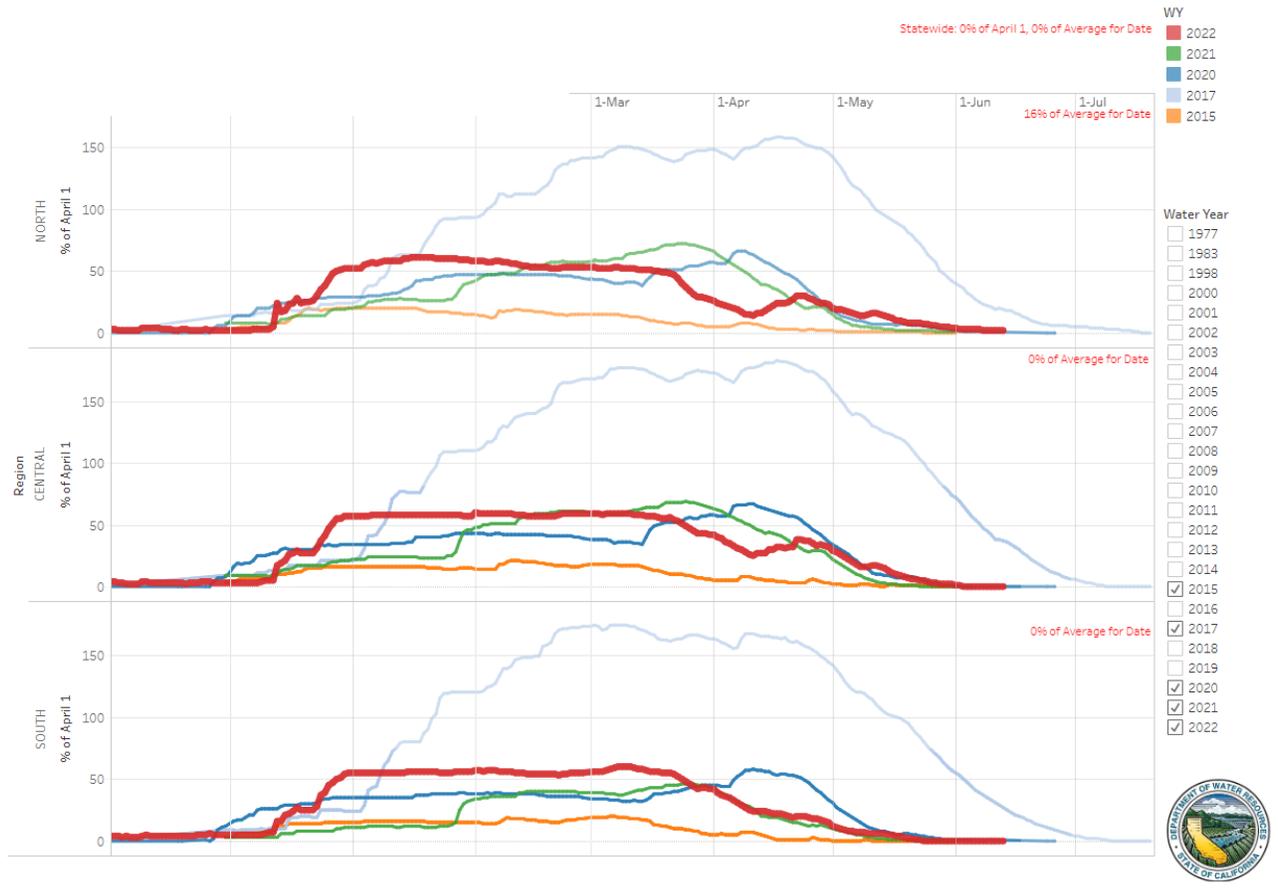
RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	534,659	22	27	38
SHASTA LAKE	1,414,226	31	22	58
LAKE OROVILLE	1,102,824	31	28	61
SAN LUIS RES	501,134	25	14	55

Reference: [California Water Data Exchange](https://www.waterdataexchange.com/)



# SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL ** APRIL 1ST BENCHMARK
NORTHERN SIERRA	0.4	0.00	0	16	2
CENTRAL SIERRA	0	0.00	0	0	0
SOUTHERN SIERRA	0	0.00	0	0	0
STATEWIDE	0.1	0.00	0	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.

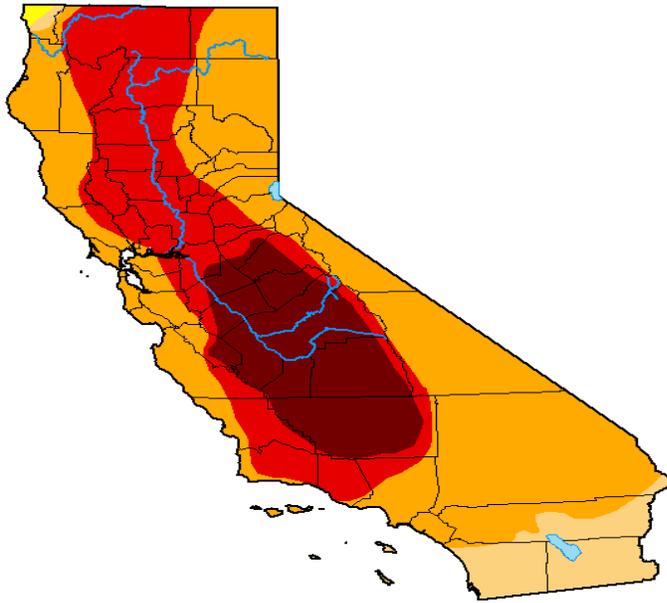
\*\* April 1<sup>st</sup> is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.



DROUGHT MONITOR

U.S. Drought Monitor  
California

October 25, 2022  
(Released Thursday, Oct. 27, 2022)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.77	91.83	43.06	16.57
Last Week 10-18-2022	0.00	100.00	99.77	91.83	40.91	16.57
3 Months Ago 07-26-2022	0.00	100.00	99.78	97.47	59.81	12.74
Start of Calendar Year 01-04-2022	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year 09-27-2022	0.00	100.00	99.76	94.01	40.91	16.57
One Year Ago 10-26-2021	0.00	100.00	100.00	93.81	83.33	38.74

Intensity:

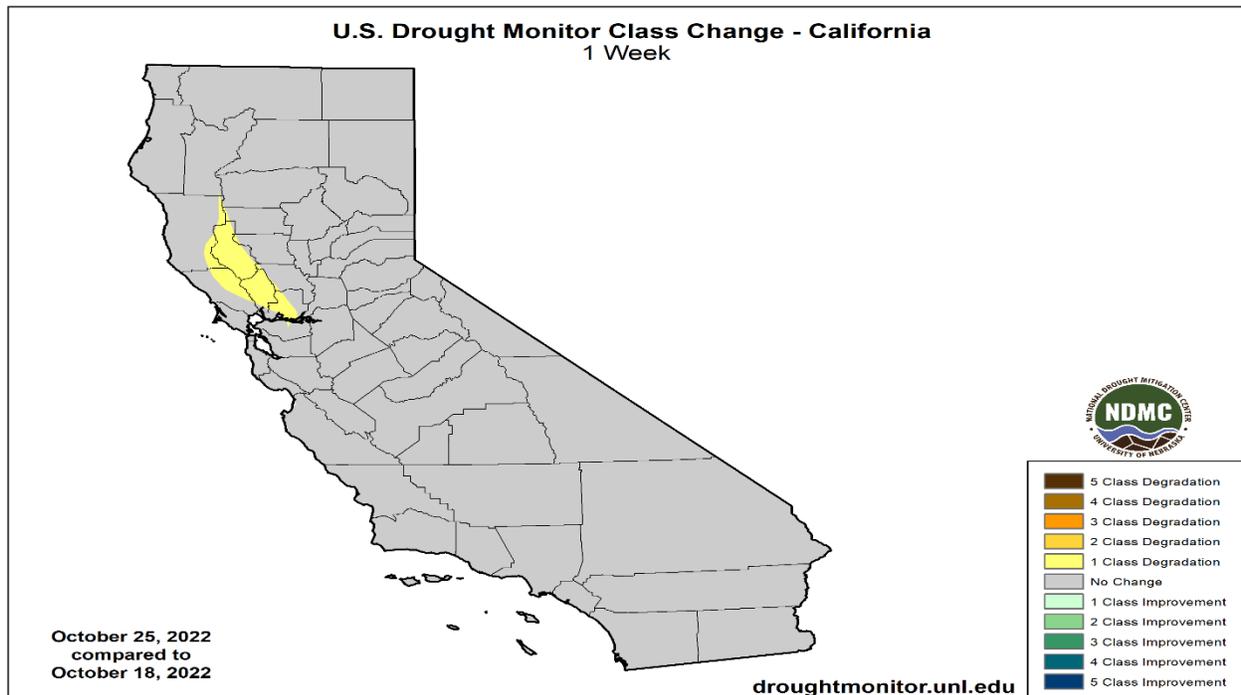
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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:  
Adam Hartman  
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

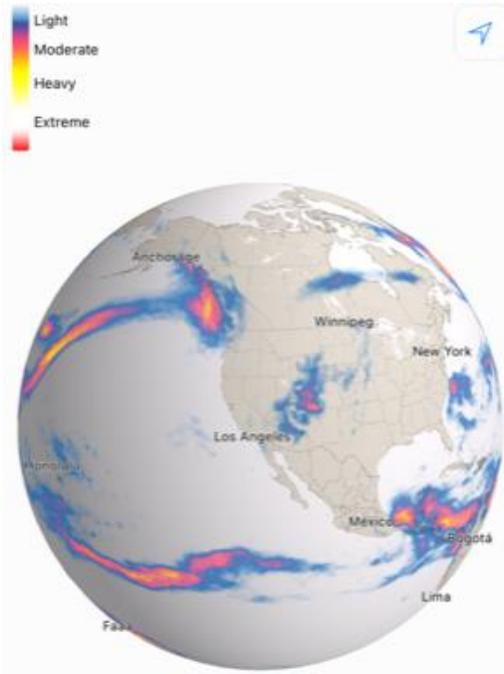


The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week the has been 2.15% class 1 degradation D3 drought conditions.

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 2 weather systems affecting the US.

Firstly a weather system that is already over the Rockies and heading eastward bringing much cooler weather and precipitation to these regions.

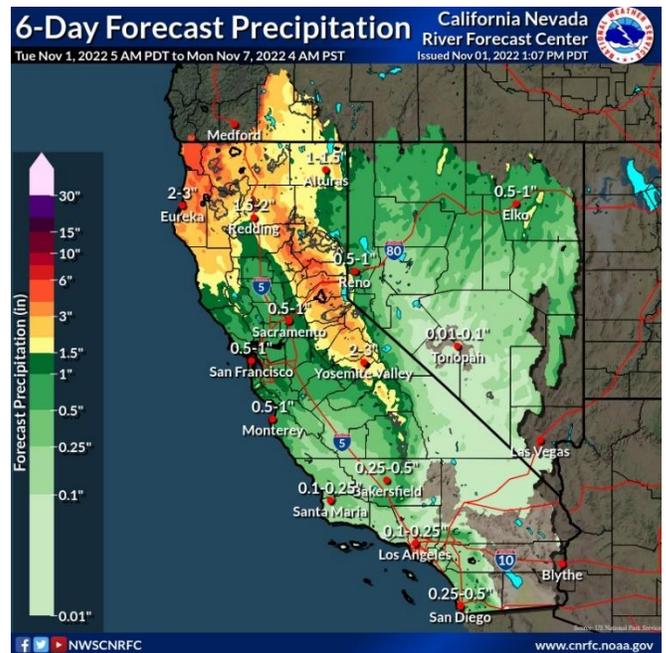
This is being followed by a frontal system coming off the North-western Pacific. This will bring precipitation to the Western US and is a start to the winter storms. Precipitation is expected as far south as the Central Valley Region on Monday and Tuesday of next week.

There are no Monsoonal effects at present and these may only appear again at beginning of

Map: Dark Sky summer next year.

### 10 Day Outlook

Cold front is progressing across the region and is currently just N of Monterey Bay and stretching northeast into Lassen and Modoc. It will continue to progress to the south and east tonight into Srn Ca and NV. Precipitation amounts generally around 0.5 -1 inch for NW CA coast and Northern Sierra 0.25-0.75 for the Shasta Basin so far today. Showers will continue behind the front and with trough over the region tomorrow. No major changes but little changes especially with a strong line of storms near eastern Tehama and Plumas/Butte county border so increased precipitation there a little this afternoon and increased amounts a little for the Central coast and Nrn SJ Valley. Cold front is progressing across the region and is currently just N of Monterey Bay and stretching northeast into Lassen and Modoc. It will continue to progress to the south and east tonight into Srn Ca and NV. Precipitation amounts generally around 0.5 -1 inch for NW





## **VELES WATER WEEKLY REPORT**

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Reference: National Weather Service / California Nevada RFC / Sacramento CA

## **WESTERN WEATHER DISCUSSION**

A strong storm system moved into the western U.S. heading into the weekend and moved across the Intermountain West leading up to Tuesday, October 25. Many locations across the Pacific Northwest, Great Basin, and the Rockies received in excess of 0.5 inches of rainfall, with the heaviest amounts (greater than 1 inch, with locally higher totals) concentrated across the Pacific Northwest, Idaho, and Montana. Precipitation was not enough to improve drought conditions in the Pacific Northwest, but was enough to halt another week of degradation along the windward slopes of the Cascades and Coastal Ranges. Only areas east of these ranges, in the rain shadows, experienced some targeted degradations. Farther south, D2 (severe) drought degraded to D3 (extreme drought) north of San Francisco, where USGS 28-day average stream flows have fallen below the 2nd percentile of the historical distribution, CPC soil moisture indicates D4-equivalent (exceptional drought) conditions, and the long-term objective drought blend depicts D3 conditions. Elsewhere, localized and targeted improvements were made across the Intermountain West, based on 7-day precipitation totals and improvements short-term precipitation deficits.

Reference:

Adam Hartman, NOAA/NWS/NCEP/CPC

Ahira Sanchez-Lugo, NOAA/NCEI

## **WATER NEWS**

### **CALIFORNIA WATER NEWS**



### **Major flood would hit Los Angeles Black communities disproportionately hard, study finds**

Flooding from a storm event so severe that it occurs only once every 100 years would cause far greater damage to life and property in the Los Angeles Basin than federal emergency officials have forecast, according to UC Irvine researchers who warn also that Black and low-income communities would be hardest hit by the disaster.

“We found that nearly 1 million people are living within areas that could be threatened by a 100-year flood,” said Brett Sanders, a professor of civil and environmental engineering. “That’s roughly 30 times more people at risk than what the Federal Emergency Management Agency suggests.”

The study, which was published Monday in the journal *Nature Sustainability*, does not predict when the next 100-year flood will occur. However, the paper is among the first to examine how whiplashing weather extremes due to climate change may impact the Los Angeles Basin — a region whose development was guided by deep social and racial divisions that favored white residents.

In the Los Angeles Basin, researchers found that Black, Latino, and Asian residents were — respectively— 79%, 17%, and 11% more likely than white residents to be exposed to waist-high flooding.

That’s because a 100-year flood could rapidly overwhelm the area’s principal waterways — the Los Angeles River, the Dominguez Channel, Compton Creek and the San Gabriel River — as well as storm drainage systems that were originally built seven decades ago to make the region habitable, researchers say.

Since that time, the study says, massive urban sprawl has sharply reduced the amount of unpaved ground available to absorb runoff from powerful atmospheric rivers propelled by climate change.

“Our goal is to highlight communities where flood risks are disproportionately high,” Sanders said, “and to provide critical data for protecting lives and livelihoods and for planning and designing cost-effective and equitable flood adaptation measures.”

Federal disaster authorities decades ago designated a low-lying zone, stretching 75 miles from Pico Rivera to Long Beach, as a “special flood hazard area” at risk of being swamped during El Nino storm conditions unless the aging system was improved.

Homeowners with federally backed loans within such areas are required to purchase flood insurance. But the study says that property owners outside of it may consider flood insurance unnecessary.

Original Article: [The LA Times by Louis Sahagun and Sean Greene](#)

### **Hoopa Valley Tribe sues US over California water contracts**

The Hoopa Valley Tribe alleged in a lawsuit Monday that the federal government is violating its sovereignty and failing to collect money from California farms that rely on federally supplied water to pay for damages to tribal fisheries. The tribe, which has a



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reservation in northwest California, says in its lawsuit against the Biden administration that the Trinity River that it relies on for food and cultural purposes has been decimated by decades of the federal government diverting water. The suit alleges the U.S. Department of the Interior has failed to follow laws that require the contractors who use that water to pay money for habitat restoration projects. It says those contractors owe \$340 million for environmental restoration work along the Trinity River and other places damaged by water diversions.

“The river has become a place that is no longer a healing place, but a place that is a sick place,” said Jill Sherman-Warne, a member of the Hoopa tribal council. The suit also alleges that the federal government has failed to appropriately consult with the tribe on matters related to the river. The Interior Department declined to comment through spokesman Tyler Cherry. Since the 1950s, the Trinity River has been a major source of water for the Central Valley Project, a system of dams, reservoirs and canals that sends water south to farmers who harvest fruits, nuts and other crops.

Fish that swim through the river include the coho salmon, which is listed as an endangered species. Twelve miles of the river flow through the tribe’s reservation. Congress updated laws governing the water project's operation in 1992. It gave the tribe some power to concur over changes to river flows, added requirements for protecting fish in the Trinity River, and stated any renewals of long-term water contracts had to follow existing laws. At the end of the Obama administration, Congress passed a law saying that any temporary federal contracts for water could be turned into permanent ones if they pay back the federal government for certain costs.

Previously, the contracts had to be reapproved on a regular basis. Westlands Water District, the nation's largest agricultural water district, was one of the contractors that converted its water contract to a permanent one. The new agreement doesn't grant Westlands any additional water or promise that it will get everything in dry years, but it effectively gives the district a contract for water in perpetuity. The deal was controversial because David Bernhardt, a former Westlands lobbyist, was interior secretary when the contract was approved and a judge later declined to validate it. But Westlands and the federal government are still moving forward with it, Westlands spokeswoman Shelley Cartwright said. The district has rejected claims it received special treatment. The suit alleges the contract fails to include requirements for habitat restoration payments. As Bernhardt left office, he wrote a memo agreeing with staff recommendations that most environmental mitigation work related to the Central Valley Project was complete. Daniel Cordalis, deputy solicitor for water resources in Biden's Interior Department, later rescinded that decision. But the tribes allege the money has still not been paid. Cherry, the interior spokesman, didn't respond to an email



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asking for the department's current position on whether the work is done. Tribal leaders, though, say restoration work is far from complete and that the river is in dire need of help. "An integral part of the life here is the Trinity River.

That changed dramatically in the 1950s when Congress chose to dam up the river," said Mike Orcutt, fisheries director for the Hoopa Valley Tribe. "We've been fighting for decades to right that wrong." Cartwright, the Westlands' spokeswoman, said the district pays a set fee to a restoration fund based on how much water it receives. She said in an email that the contract "provides for the payment of money, consistent with federal law." The tribe initially sued during the Trump administration but later put the lawsuit on hold and hoped to settle with the Biden administration. The current interior secretary is Deb Haaland, a member of the Pueblo of Laguna Tribe and the first Native American to hold a cabinet position. Tribal officials chose to renew the lawsuit because the Biden administration has not changed course, leaders said.

Original Article: [The Sacramento Bee/ Associated Press by Kathleen Ronayne](#)

### **Rain and snow will hit California in November. Will stormy weather be enough to squash drought?**

The Bay Area and most of California has seen a roller coaster of active weather patterns over the course of the past few months, ranging from extreme heat waves to unusual storms and season swaps.

These fluctuations have been largely attributed to the shifts in two global weather patterns: the Pacific North American Oscillation (PNA) and La Niña. And it looks like November will be ruled by the PNA. This means the chances for low-pressure systems from the Pacific Ocean bringing wet weather to California will increase over the next thirty days. This would help put a dent on the state's ongoing drought conditions — but not everywhere.

An upcoming burst of beneficial rains and snow

A deep plume of moisture is set to slam the Pacific Northwest beginning the first day of November, and a storm off the coast is likely to tap into some of this moisture. Weather models expect a good soaking in both the Pacific Northwest and Northern California. Scattered rain showers will sweep onto the coast while rounds of wintry weather fall over the Southern Cascades and Sierra Nevada. This means most of Northern California can look forward to a healthy start to November's rains.

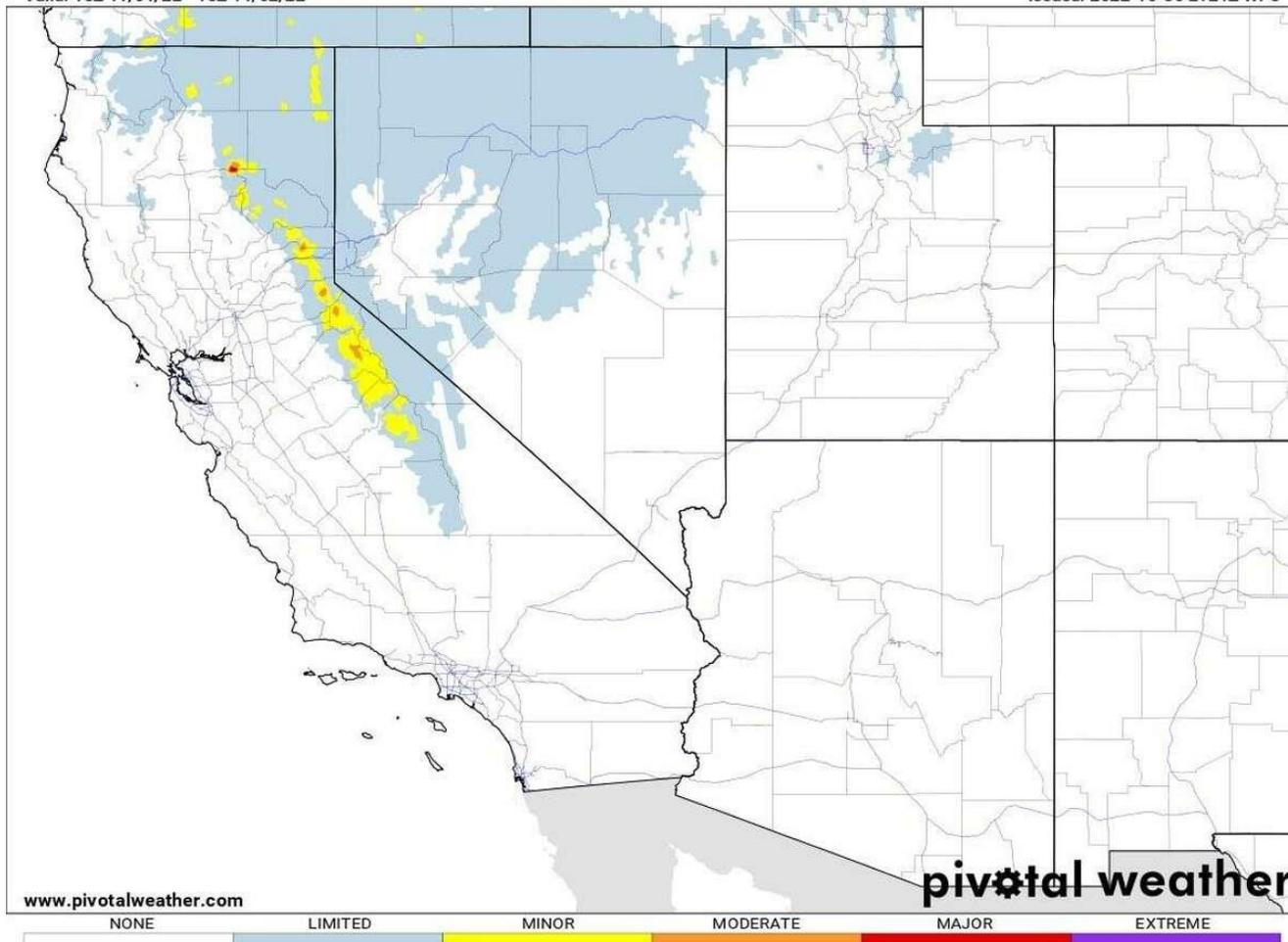
This week's highest precipitation totals - two inches of rain or more - will likely fall along the Sierra Nevada and Cape Mendocino coastline between Tuesday and Wednesday. But the Bay Area will also see its fair share of rain out of this upcoming moisture exchange, with models leaning toward the San Francisco Peninsula tallying up anywhere from three tenths of an inch along the coast to upwards of an inch and a half heading south on Highway 1.



## WSSI Day 3 Overall Winter Storm Impacts

Valid: 18Z 11/01/22 - 18Z 11/02/22

Issued: 2022-10-30 2124Z WPC



The Weather Prediction Center's overall winter storm impacts outlook for Wednesday. Most of the Sierra Nevada can look for minor risks out of this storm thanks to slippery roads and steady snowfall rates around three tenths to half an inch an hour. A more moderate winter storm risk will be possible higher up in the summits above 4,000 feet where high winds, heavy snow bands and low visibility will be more widespread. Gerry Díaz / Pivotal Weather

Snow showers are also forecast to roll into some of the higher peaks along the Sierra Nevada by Wednesday and Thursday of this week. Final snowfall totals will be tallying up to 6 inches near Tahoe, Donner Peak and many of the summits around 4,000 feet by the time this storm moves out of the region.

Even higher totals - around 8 to 12 inches - may settle over some of the highest peaks of the range by Thursday. Fresh coatings of snow ranging from trace amounts to an inch will be possible as far south as the Kern County mountains, San Bernardino ranges and the San Jacinto range that extends into Baja California.

This storm system could increase the risk for landslides and debris flows on some of the burn scars in the Sierra, including the Mosquito scar. For now, the risk remains low, but it is something that will keep in the back of our minds as the month goes on. The chances for rain and snow during the first week of November will extend south into the Central Coast, the San Joaquin Valley, the LA Metro and San Diego County areas. This includes a



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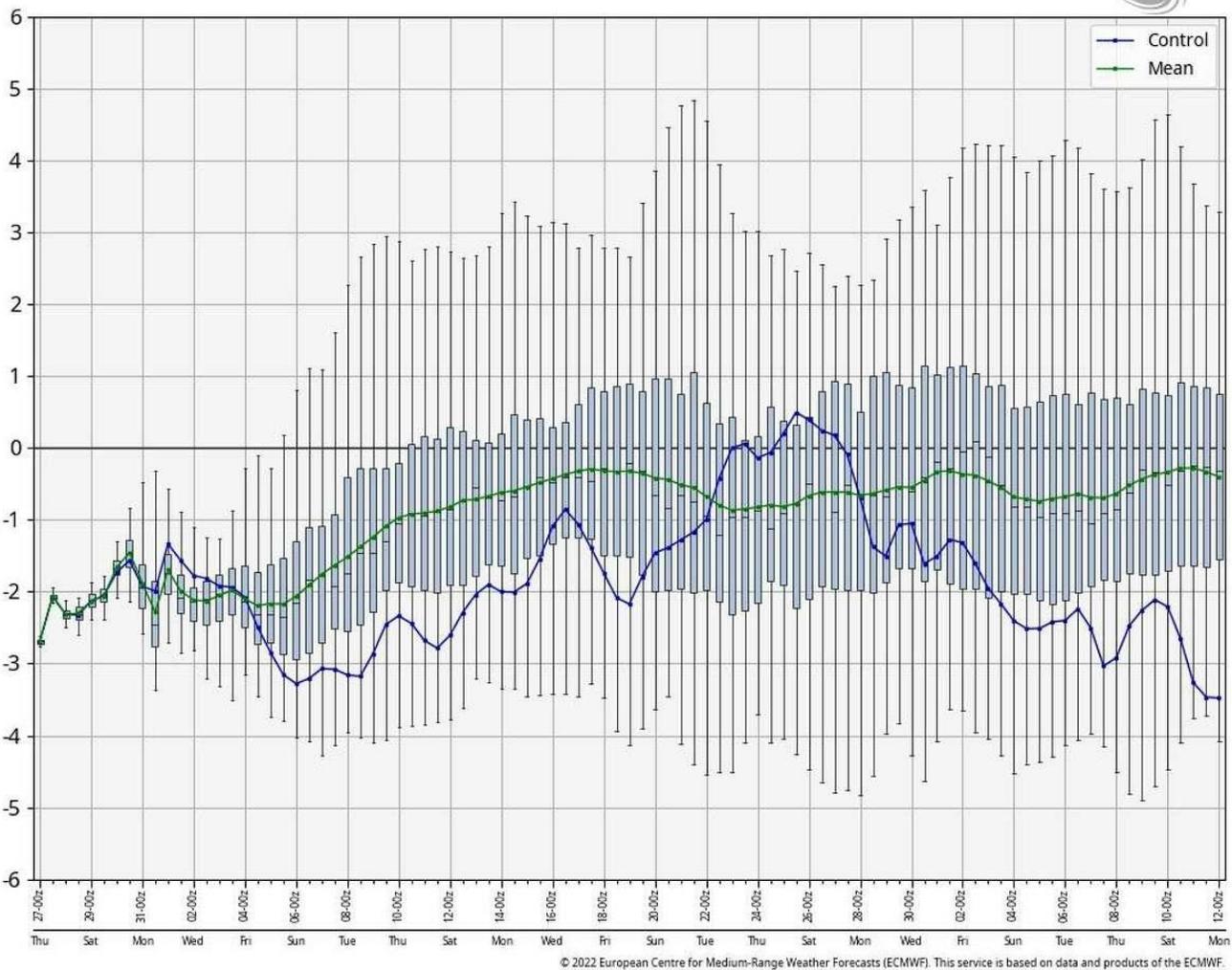
very slim chance for flurries on some of Big Sur’s highest peaks — including Pico Blanco — and trace amounts in the Angeles National Forest, the San Bernardino range and the San Jacintos all the way down to Baja, California. Rainfall totals across Southern California’s basins will likely range from a tenth to a quarter of an inch once all is said and done.

All in all, November will be off to a good start, with beneficial rains and snows set to charge into most of California.

So, will this momentum carry over into the rest of the month?

The European’s extended model outlook is favoring a negative Pacific North American Oscillation (PNA) through the month of November. This is a good indicator for increased chances of rain for most of the month.

ECMWF Weeklies 1.0° Init 00z 27 Oct 2022 • Pacific-North American Oscillation (PNA)



The European’s extended model outlook is favoring a negative Pacific North American Oscillation (PNA) through the month of November. This is a good indicator for increased chances of rain for most of the month.

Gerry Díaz / Weatherbell

But there is a catch



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This PNA outlook only tells us that storms will favor tracks that lead them into California. It doesn't tell us whether these storms have a higher chance of moving into Northern California, the Sierra, Central California or Southern California.

For that, meteorologists turn to the extended model output for the European, American and Canadian weather models, in order to get a sense of where high-pressure and low-pressure systems will dig into over the next few weeks. There will be a lot of wiggle room here thanks to the recent uncertainty in La Niña's ability to drive off waves of moisture from the Pacific Ocean.

But based on recent model guidance for the month of November, it's looking to be a mixed bag between moderate storms - like the one we're set to see this week, that form over the Gulf of Alaska and dip into California — and weaker storms that scrape the California coast. There aren't any specific dates popping out currently, but the status of the PNA would suggest some of the higher chances for storms to sweep the West Coast to be around the second and third week of November.

These weak storms will likely only be able to bring "orographic lift" to the state's coastal mountains. Orographic lift — when air is forced to rise by a natural barrier like a mountain range — will likely be the biggest source for rain and snow showers across the state whenever weak storms roll in from the Pacific Ocean.

Original Article: [The San Francisco Chronicle by Gerry Diaz](#)

### **Feds demand Colorado River water cutbacks**

One must wade through a thicket of bureaucratic jargon to find it, but on Friday federal officials issued what appears to be a serious warning to California and other states that use water from the highly stressed Colorado River:

If they cannot agree on sharp reductions in diversions of the Colorado's water, the feds will impose them unilaterally.

It's the latest wrinkle in decades of interstate squabbling over the river, which has become more heated as the river's flows continue to decline and conditions in its two major reservoirs, Lake Mead and Lake Powell, reach the crisis stage.

The federal Bureau of Reclamation wants California, Arizona and Nevada to reduce diversions by at least 2 million acre-feet a year and as much as 4 million, but negotiations have been fruitless. California, which takes the most water from the river, by far, has offered just a 400,000 acre-foot reduction. An acre-foot is 326,000 gallons.

With talks stalemated, the bureau said it will begin planning for unilateral action "to address the serious operational realities facing the system..." due to "the likelihood of continued low-runoff conditions across the (Colorado River) basin." It would implement cuts by reducing releases from the two reservoirs.

"The Interior Department continues to pursue a collaborative and consensus-based approach to addressing the drought crisis afflicting the West. At the same time, we are committed to taking prompt and decisive action necessary to protect the Colorado River



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system and all those who depend on it,” Interior Secretary Deb Haaland said in a statement.

Bottom of Form

The Bureau of Reclamation is telling the states “that this is kind of their last opportunity for consensus-building, for voluntary action,” Jaime Garcia, a water fellow at the University of Colorado Law School’s Getches-Wilkinson Center, told the Los Angeles Times.

“The fundamental issue is, whatever solution people come up with is going to hurt,” Garcia said. “The river is overallocated. It’s drying up. And we have to find a way to sort of spread out the pain evenly.”

Because California is the largest user of Colorado River water, cutbacks — either voluntary or imposed — would have their greatest impact on the state. However, while the Colorado is a major source of water for Southern California’s more than 20 million residents, the region has other sources for municipal users.

Rather, about two-thirds of the Colorado’s water diverted into California goes to farming, particularly the Imperial Irrigation District in Imperial County. The district takes more water from the river, at least 2.5 million acre-feet a year, than Nevada and Arizona combined. Therefore, if there are major cutbacks, as the feds demand, the Imperial Irrigation District would have to give up the most.

Imperial gets the most because it was the first entity to tap the Colorado more than a century ago, thus establishing its senior water rights. The Imperial Dam and All-American Canal allow the Imperial Valley to have a 12-month growing season, making it a major producer of winter produce as well as a source of alfalfa to feed cattle and milk cows.

The Interior Department has \$4 billion from the newly enacted Inflation Reduction Act to compensate those who would lose water by flow reductions. But the money and the latest warning may not produce agreement among the affected states.

If the Bureau of Reclamation acts unilaterally to reduce diversions, it will likely result in high-stakes litigation that tests Imperial district’s water rights. In a sense what’s happening along the Colorado could be a forerunner of legal showdowns over water rights in other regions of the state, if drought conditions continue.

Original Article: [Cal Matters by Dan Walters](#)

## **Desalination will be key to California’s water future. It needs to improve first**

If the climate crisis is coming, the water crisis is already here.

As rice fields were fallowed in California, Lake Mead water levels almost sunk so low that Hoover Dam could no longer generate power, and life-threatening toxic dust blew off the dried-up Salton Sea.

Thirty percent of the world population will face water shortages of some kind by 2025. Things are only going to get worse.



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Climate change will cause the Colorado River, which supplies water for 40 million people, irrigates 6 million acres of farmland and underpins a quarter of the nation's economy, to lose more than half of its flows by 2100. The depletion of the Ogallala Aquifer in the Midwest threatens agriculture so radically that serious proposals have explored a water pipeline from Louisiana.

Beyond these particular water-strapped cases, of which California has many, warming delivers the one-two punch everywhere, whether it's from lower water supply due to reduced snowpack and higher evaporation, or increased demand because of higher temperatures.

There is no single way out of a future in which all agriculture leaves the West, desert cities from Denver to San Diego are no longer livable, and Native Americans continue to be denied legally enshrined water rights. Measures like better water reuse and more sustainable groundwater management just aren't enough for California.

The water crisis will only be solved if we realize the once quixotic vision of desalination, turning seawater into freshwater. Today, roughly 18,000 desalination plants produce around 1% of the world's freshwater, with production concentrated in regions of high water scarcity such as Israel and Australia.

### Bottom of Form

In 2007, San Diego County approved the largest desalination plant in the Western Hemisphere. The Carlsbad Desalination Plant now delivers 50 million gallons of freshwater per day. And just last month, a smaller desalination plant was unanimously approved to deliver freshwater to Orange County.

Desalination also represents a prominent piece of Gov. Gavin Newsom's State Water Plan. But even state-of-the-art plants still suffer from issues that imperil their ubiquity. The desalination process is so energy-intensive that desalination plants often require carbon-emitting power plants right next door, which can increase costs up to 10 times higher than groundwater. The high-pressure intake of seawater also threatens ocean life, and the output of brine threatens coastal environments.

With high energy use, environmental dangers and high costs forced onto ratepayers, desalination faces strong opposition across the political spectrum. But this resistance overlooks both the necessity of desalination – at least relative to more dire options – and the potential promise of improved desalination technologies.

Saudi Arabia recently authorized a massive solar project to fully power an existing plant, showcasing the potential of a carbon-free desalination future. To its credit, the Orange County plant will use slanted wells that draw water from beneath the sea bed to protect ocean life, and the brine will be treated at a nearby wastewater treatment facility.

Energy recycling, alongside better electronics, are enabling less energy-intensive (and cheaper) methods of desalination, including breakthrough concepts like using shockwaves.



## VELES WATER WEEKLY REPORT

Desalination will be a major piece of California's water future, and its inevitability demands the research, policy and funding attention of an imperiled human right. Safe, efficient and clean desalination means fewer dams, cheaper and broader access to water, and the ability to support population growth while continuing to produce food for the country and world.

The alternative is dry, dusty and deadly.

Original Article: [Cal Matters by Dr Grayson Zulauf](#)

### **How Are California's Cities Managing the Drought?**

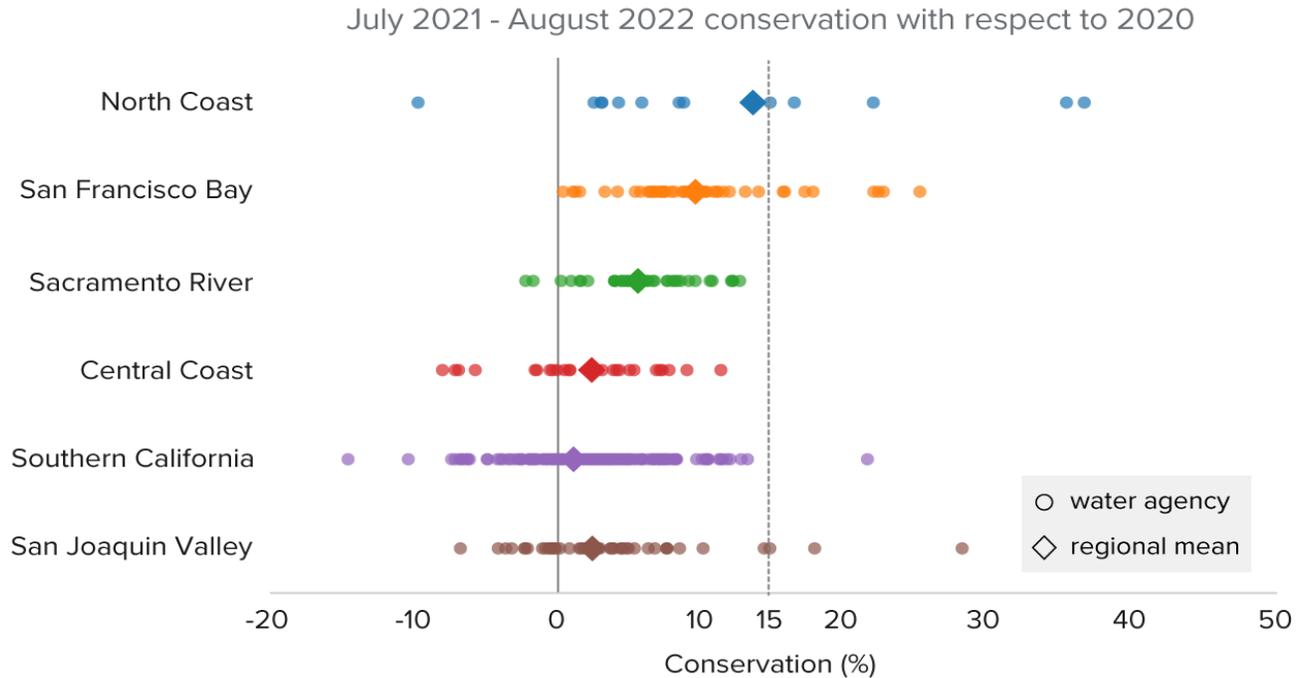
The 2022 water year just ended, and the numbers confirm our suspicions: The 2020–22 drought has been the driest three-year period on record. The drought has harmed California's freshwater ecosystems, dried up thousands of drinking water wells in small communities, and led to fallowing of hundreds of thousands of acres of cropland. Cities, however, have fared better: As in the 2012–16 drought, they have avoided major supply disruptions. But you wouldn't know this from the news, where the main story is that urban water agencies have failed to meet Governor Newsom's July 2021 call for a 15% voluntary reduction in water use. So are cities failing to manage the current drought? Or are we focusing on the wrong metrics?

The complicated metrics of urban water conservation

A bird's-eye view of water conservation across the state suggests that Californians did fall significantly short of Governor Newsom's 15% goal: As of August 2022, water agencies collectively reduced their use by just 4% since July 2021. Just a handful of agencies (4%) had met or exceeded the 15% mark (see figure below).



## Most urban agencies are falling short of the state’s 15% voluntary conservation request



**SOURCE:** SWRCB Urban Water Supplier Monthly Reports, October 2022.

**NOTES:** This chart shows how much urban agencies have conserved between July 2021 and August 2022 compared to a comparable period in 2020. Urban agencies that did not report data during these periods were excluded from the analysis. Water savings are organized by region (Southern California includes the South Coast, South Lahontan, and Colorado River; San Joaquin Valley includes Tulare Lake and San Joaquin River; and Sacramento River includes North Lahontan and Sacramento River). The regional mean is weighted by service area population.

**FROM:** PPIC Blog, October 2022.

But as we explained in a blog post last December, urban water savings are not actually so low when put in context: Most communities went into this drought using much less water than they did in the early years of the 2012–16 drought. Especially in places where water use is already very low—like much of the Central Coast—this makes additional savings harder to come by.

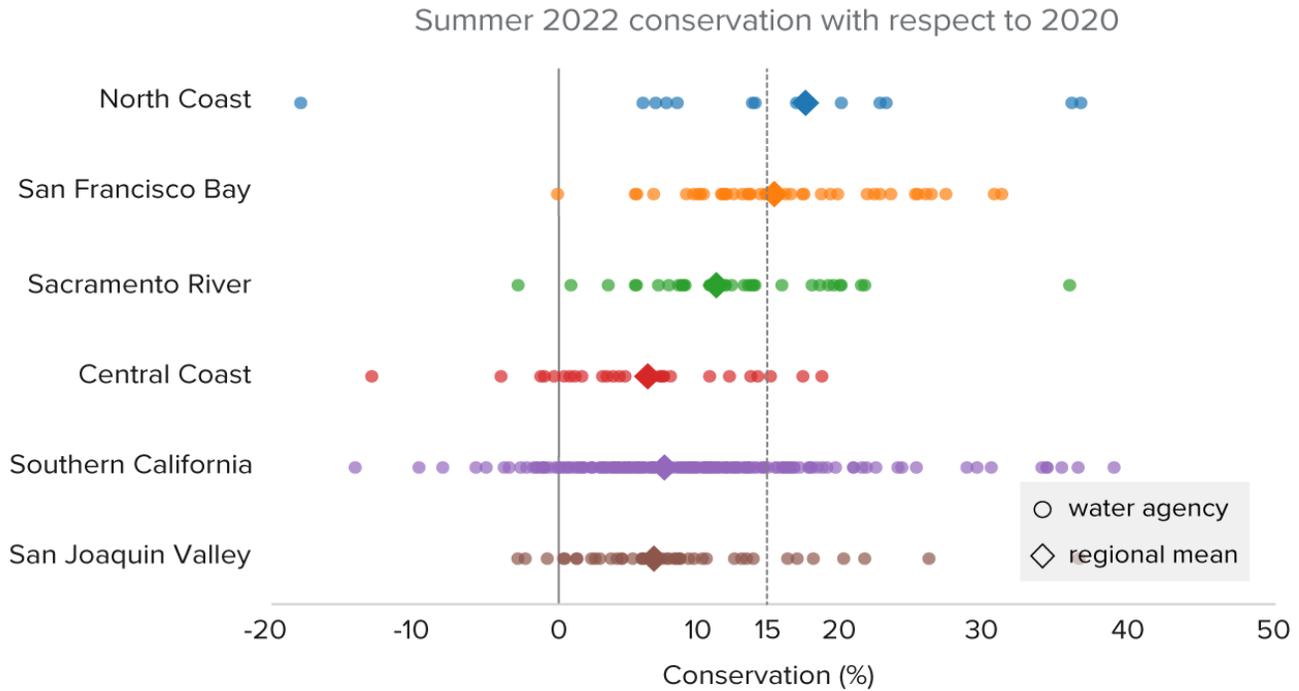
Furthermore, statewide averages can be misleading. The current drought initially hit Northern California hardest. A drought emergency was not declared in Southern California—home to roughly 60% of the state’s population (and urban water use)—until fall 2021, months after the governor’s call for savings. Such regional differences in drought conditions affected the alignment of local conservation policies with the governor’s statewide call. Initially, water agencies in the North Coast and parts of the Bay Area pushed hardest for belt tightening, reflecting local shortages (see figure above). A similar pattern occurred at the start of the last drought, where agencies in the Central Coast and Sacramento regions were the first to take action.



# VELES WATER WEEKLY REPORT

By summer 2022, when drought impacts were more widespread, so were local agency calls for conservation. Statewide savings jumped dramatically—by 9% compared to 2020. More than 91% of all agencies were saving more than in the prior summer, and 23% were exceeding the 15% voluntary goal (see figure below).

## Conservation has increased across regions this summer



**SOURCE:** SWRCB Urban Water Supplier Monthly Reports, October 2022.

**NOTES:** This chart shows how much urban agencies have conserved between June and August 2022 compared to the same period in 2020. Urban agencies that did not report data during these periods were excluded from the analysis. Water savings are organized by region (Southern California includes the South Coast, South Lahontan, and Colorado River; San Joaquin Valley includes Tulare Lake and San Joaquin River; and Sacramento River includes North Lahontan and Sacramento River). The regional mean is weighted by service area population.

**FROM:** PPIC Blog, October 2022.

### The two sides of resilience

Asking customers to conserve more water when supplies are tight is a key component of urban drought resilience. But managing demand is only one side of the equation; the other side is maintaining robust supplies. Having access to a diversified portfolio of water sources—including water in storage—can help avoid the need for severe water rationing during droughts. Urban agencies are generally in decent shape—despite the drought—because they have made massive investments to reduce long-term demand and improve supply reliability over the past few decades.

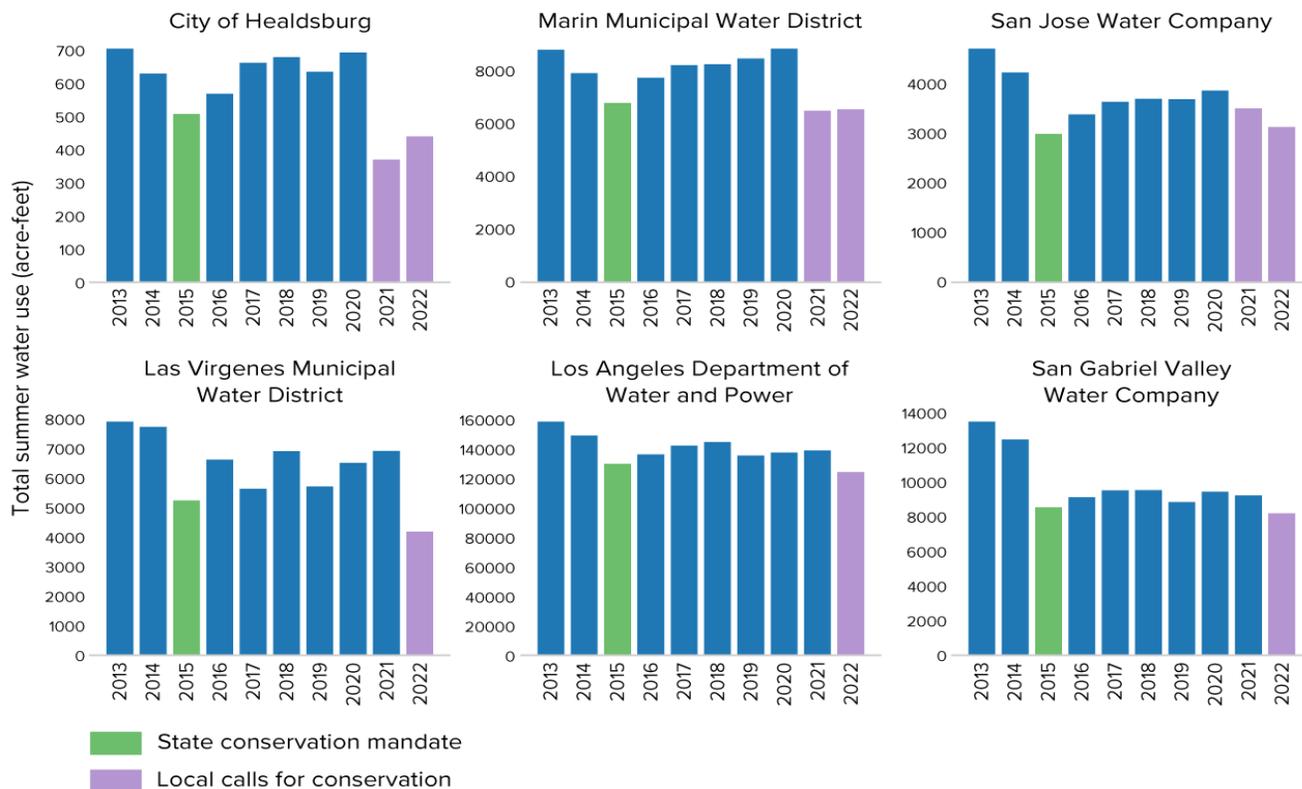
A closer look at water use in summer—when demand is highest—shows that agencies facing acute supply constraints reduced use significantly during this drought (see figure below). Agencies in the top row—from the North Coast and Bay Area—called for big water savings in 2021 to address local shortages. Agencies in the bottom row—Southern California communities that rely heavily on the drought-challenged State Water



# VELES WATER WEEKLY REPORT

Project—adopted major use restrictions in June 2022. In all cases, customers responded to these local drought actions. For most of these agencies (and for 27% of all agencies statewide), recent savings were even larger than in the summer of 2015, when a statewide conservation mandate was in effect.

## Individual agencies with vulnerable supply portfolios have saved significantly



**SOURCE:** SWRCB Urban Water Supplier Monthly Reports, October 2022.

**NOTES:** These bar charts illustrate the total water use of each urban agency during summer months, June through August, from 2013 to 2022.

**FROM:** PPIC Blog, October 2022.

Of course, some communities may need to save more, particularly if it remains dry next year. But focusing only on the cumulative conservation levels since July 2021 can give the mistaken impression that urban water agencies are not prepared to manage this drought.

In sum, conservation is important, but it is only part of a spectrum of actions that lead to true drought resilience—and the 4% statewide conservation number is misleading when you dig into local details. Local action has worked for most agencies during this drought: When locals need to save, they do. Another top priority going forward is to continue building supply resilience in our changing climate—a key to reducing drought risks for California cities and suburbs.

Original Article: [PPIC by Alvar Escriva-Bou, Annabelle Rosser and Ellen Hanak](#)



## VELES WATER WEEKLY REPORT

### **Change is coming to the Westlands Water District board. What will it mean for the future of the sprawling district and its controversial general manager?**

The makeup of the Westlands Water District board will change this election – shifting power to a coalition of growers with a list of new actions, at the top of which appears to be ousting longtime General Manager Tom Birmingham.

“There needs to be a change of leadership, that’s a foundational issue,” said Sarah Woolf, a member of a Westlands farming family, who helped organize the coalition. Woolf also served on the Westlands Board, resigning in 2018 after issuing a letter that publicly called the district out as mired in outdated methods that left it “fighting over the scraps.”

In the years since, Woolf has worked with Jon Reiter, with McConnell Farms, to gather like-minded Westlands growers who want to find ways to enhance water resources regionally rather than leaving farmers completely at the mercy of supplies from the Sacramento-San Joaquin Delta.

Going in to the current election, Reiter and Woolf said, the board already had two so-called “change” directors on the board, Kevin Assemi with Maricopa Orchards and William Bourdeau with Harris Ranch. Though Bourdeau said he is not in any camp, calling himself strictly independent.

This year, there are four director seats up for election. Only one incumbent is running. After hearing from frustrated growers for several years, Reiter and Woolf encouraged a slate of “change candidates” to run for all four seats.

Even if the one incumbent in the at-large race wins, that will still give the change coalition a minimum of three new directors, giving it a majority of five on the nine-member board.

That could mean the end of General Manager Birmingham’s long reign over Westlands.  
**Controversial leader**

Birmingham served as the district’s general counsel for several years before also taking on the job as general manager in 2000. In 2016, the board split up the jobs again, hiring a separate general counsel to “promote more transparency and good government practices,” according to then Board President Don Peracchi.

Birmingham’s heavy focus on lobbying and litigation, as well as his notoriously imperious style, generated controversy within the district.

That came to a public boil in Dec. 2021 when Birmingham succeeded in having his contract extended another three years one full year before it expired. Several growers at that contentious meeting asked for a delay until after this election. But the extension passed 8-1, with Bourdeau the lone “no” vote.

Birmingham declined to comment for this story saying he didn’t want to appear to be attempting to influence votes.



## VELES WATER WEEKLY REPORT

Though Woolf and Reiter said the change coalition's post-election task list contains more than just replacing Birmingham, incumbent director Ryan Ferguson, with Ferguson Farming, who is up for election, said he thinks Birmingham is the group's main focus.

"They aren't putting forth any new ideas," he said. "They're not presenting a plan of what this change will be."

A mailer for the change candidate slate, however, lists several issues:

- Urgently develop groundwater recharge
- Create clear pumping regulations
- Develop a strategic plan that incentivizes farming alternatives including land retirement, conversion to solar or other uses
- Improve relations with other water districts, disadvantaged communities, environmental and drinking water advocacy groups.

"My No. 1 issue is recharge projects," said change candidate Ross Franson, with Woolf Farming. "We won't survive unless we're able to soak up as much water as possible in wet years to get us through the dry ones."

The district's focus on politics, litigation and fighting against the regulatory landscape has neglected possible regional solutions, he said.

Franson was the only change candidate who agreed to be interviewed. The other three change candidates on the slate are Jeremy Hughes, Ernie Costamagna and Justin Diener.

### Pugnacious reputation

Westlands is well known for its many lawsuits, pushing for reforms on delta operations, advocating to raise Shasta Dam and to build the Sites Reservoir near Sacramento.

The district gained even greater notoriety in 2019 when its former lobbyist David Bernhardt was named Secretary of the Interior under the Trump administration. Interior oversees the Bureau of Reclamation, which delivers water to Westlands through the Central Valley Project.

Despite concerns that Westlands benefited from the relationship, an Inspector General's report released last spring found no evidence that Bernhardt violated lobbying laws with regard to Westlands during his time as Secretary.

But the perception of backroom dealing may have cost Westlands the ability to convert its biennial federal water contract to a permanent contract.

Environmental groups sued to block Westlands' contract conversion, calling it a "sweetheart deal" under Bernhardt's administration even though contract conversions are part of a 2016 law signed by former President Obama and are allowed for all CVP contractors. The conversions don't increase water supplies or rights to water for any contractors, including Westlands.

Westlands' conversion was successfully blocked in 2021 and remains in limbo.



## VELES WATER WEEKLY REPORT

That kind of reaction to Westlands is partly the district's own fault for its often pugnacious stance on water issues and partly undeserved, candidate Franson said.

High on his to-do list, if elected, is to create more transparency within the district and reach out to the public to dispel fears of Westlands as a power-mad water grabber.

"Some of (legal fights) may be unavoidable, but I think the money would be better spent elsewhere," Franson said.

The charge for more recharge

Incumbent Ferguson absolutely agreed with the change coalition about one thing, the need for more groundwater recharge. But he insisted the district has been working on the issue already.

Original Article: [SJV Water by Lois Henry](#)

## US WATER NEWS

### **Colorado River managers looking to release less water from Lake Powell**

Colorado River managers looking to protect critical infrastructure at Lake Powell's Glen Canyon Dam are seeking the ability to release less water from Powell next year as they work to rebalance demand on the troubled river.

"We are taking immediate steps now to revise the operating guidelines to protect the Colorado River System and stabilize rapidly declining reservoir storage elevations," reclamation commissioner Camille Touton said late last week in a written statement.

The bureau currently operates the two reservoirs based on rules dictated in the 2007 Interim Guidelines and the 2019 Drought Contingency Plans. In seeking to change operations at Lake Powell and Lake Mead, the bureau must prepare a supplemental environmental impact statement, which it published a notice of intent to do on Friday. The 2007 guidelines expire at the end of 2025 and will be renegotiated in the coming years. The notice Friday makes clear this federal action is not intended to supersede those negotiations, but rather to address more immediate challenges.

"They are very worried about the infrastructure at the dam," said Andy Mueller, general manager of the Colorado River District.

The current operating rules do not allow for the bureau to annually release less than 7 million acre-feet out of Glen Canyon Dam, Mueller said. "They don't have the authority to go lower than that."



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However, after two dry decades and three particularly dry years in a row, Lake Powell is less than 25% full. The water level is low enough that another significantly dry year combined with a 7 million acre-foot release could lead to the Utah reservoir falling below a critical elevation, threatening the dam's infrastructure and its ability to generate hydropower.

Mueller said he thinks it's a smart move for the bureau to give itself more flexibility in how much water it releases out of Powell. "I'm happy to see the bureau seeking authorization to deal with the actual hydrology," he said. "The key is to not let politics influence these decisions and make it on sound, reasonable science."

The bureau is considering an annual release as low as 5.5 million acre-feet, Mueller said. "At some point, we have to operate those reservoirs as run-of-the-river structures," he said. "We no longer have this buffer of storage and so if the inflow into Lake Powell is only 5.5 million acre-feet you shouldn't release more than 5.5 million acre-feet."

Scientists believe the Colorado River Basin is currently experiencing the driest 22-year stretch of the past 1,200 years. In recent years warmer temperatures have dried out soil conditions; those dry soils then suck up valuable runoff from streams.

James Prairie, a hydraulic engineer for the Upper Colorado Region of the Bureau of Reclamation, handles the modeling that top bureau officials rely on when planning for future scenarios at Powell. Prairie said he's preaching preparedness for next year.

"This early I want them to think we have a lot of uncertainty in what we know right now and look at the lower end as a possibility that's plausible and be ready for it," Prairie said. "That's why you saw the notice of intent go out."

In the past two years, water managers have released a total of 661,000 acre-feet of water from Upper Basin reservoirs, including 36,000 acre-feet from Blue Mesa west of Gunnison, to try to keep the water level at Lake Powell from dropping too low. The lower water levels at Blue Mesa kept the reservoir's marinas from opening this year.

Even with the extra water from Blue Mesa and Flaming Gorge reservoir on the Wyoming-Utah border, some bureau models predict the elevation at Powell could drop below 3,490 feet above sea level next year, the lowest elevation at which Glen Canyon Dam can generate hydropower.

One dire model that is based on the particularly dry year of 2002 shows Powell dropping below the 3,490 foot mark as early as July 2023, according to bureau projections.

"It's a big deal that they're trying to figure out how they can change operations in 2023 to release less than 7 million acre-feet from Powell. That's never been done before," said John Berggren, a water policy analyst with Western Resource Advocates. "It demonstrates how concerned they are."

"On alert"

The bureau's Touton indicated this summer that the states would need to come up with a plan to cut between 2 million and 4 million acre-feet of Colorado River water use by the end of 2023 to help balance the system. The Upper Basin states of Colorado,



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Wyoming, Utah, and New Mexico, released a plan in response to the commissioner's call for cuts. The Lower Basin states of California, Arizona and Nevada did not release a combined plan. California recently said it would be willing to cut back its Colorado River water use by 400,000 acre-feet, about 9% of its total allotment.

In her call for water cuts, Touton also said the federal government would be willing to act unilaterally to make the necessary cuts if the states could not come to an agreement. Friday's notice of intent from the Bureau of Reclamation lays the groundwork for that action, said Jennifer Gimbel, a senior water policy scholar at Colorado State University's Colorado Water Center.

"It puts the states on alert that the bureau is considering other possible actions beyond what you all can agree to," Gimbel said.

Original Article: [Colorado Sun by Chris Outcalt](#)

### **Waterlogged wheat, rotting oranges: five crops devastated by a year of extreme weather**

From Hurricanes Fiona and Ian, to flooding in eastern Kentucky and a record dry summer as the western US entered its 22nd year of a once-in-a-millennium megadrought, the US has already seen more than two dozen major climate disasters with losses exceeding \$1bn (£864m).

On top of this economic toll, extreme weather is also upending the food system in the US and much of the world. As the climate crisis causes temperatures to rise, precipitation patterns to shift and drought conditions to lengthen, many crops are struggling to grow – and produce the same yields – as they would under normal weather conditions. In some parts of the country, crops that require dry conditions are getting too much rain, while in others, they're not getting enough.

Changes to growing seasons, limitations on water rights and increasingly powerful storms are all forcing growers to consider whether to shut down, relocate or otherwise alter their operations. Extreme weather events are also disrupting the shipping of food across the country and world.

These five crops tell the story of the havoc the climate crisis is already causing.

Florida's oranges torn off trees

The US Department of Agriculture (USDA) predicted that the state will produce 28m boxes of oranges this season, down 32% from the previous season. This would be the smallest harvest since 1943. And the impact of Hurricane Ian may not yet be over, Royce said. In some areas, the storm didn't just cause fruit to fall, but entirely uprooted or flooded trees.



## VELES WATER WEEKLY REPORT

Although this storm was particularly devastating, he adds that Florida citrus growers have weathered difficult hurricane seasons before, such as Hurricane Irma in 2017. “We’re an industry that’s at the mercy of the weather.”

### Rice left unplanted amid drought

Just three crops – rice, wheat and corn – provide nearly half of the world’s calories. And this year rice had a particularly tough growing season.

In California, rice farmers sowed the lowest number of seeds since the 1950s. According to the California Rice Commission, only 250,000 acres of rice will be harvested this year, about half of a typical season.

“Reservoirs were so low and the snowpack was so bad that literally half the crop was unplanted,” said Daniel Sumner, professor of agricultural economics at UC Davis. Although rice growers generally have very senior water rights, which means they’re the first ones entitled to any available water, there just wasn’t enough water for growers to make it through a season, he said, so many opted not to plant. This past year marked California’s fourth in a row facing drought.

According to a report published by Sumner and his colleagues at UC Davis, California’s Sacramento River valley – which usually exports about half its rice to China and Japan – is facing a \$1.3bn (£1.1bn) economic loss, with 14,300 agricultural jobs lost.

In August, the USDA forecasted that California would only grow 10.5m tons of tomatoes, down 10% from its estimates at the beginning of the year, as drought causes them to dry up on the vine.

California usually produces about 30% of the world’s processing tomatoes – the tomatoes used in paste, sauce and ketchup. But researchers predict that the global supply of processing tomatoes could fall by 6% in the next 30 years due to climate change.

Even though tomatoes are “an incredibly efficient user of water”, Sumner said, the drought “was even worse than people could have imagined”.

The high demand and reduced supply are reflected in tomato prices. Going into this growing season, Sumner says tomatoes reached the highest contract prices on record – about \$100 (£86) per ton compared with last year’s record \$90 (£78) per ton.

As temperatures increase in current tomato-producing regions, like California and Italy, the plants may no longer thrive, and growers could begin shifting their work to cooler climates, like northern California and China.

### Wheat scorched by heat, waterlogged by rains

As the war in Ukraine cut off the country’s large wheat exports, wheat growers across the world faced a difficult year due to extreme weather. Heatwaves across France, Spain, and India scorched wheat crops, while US growers struggled to survive a dry winter and then a waterlogged spring.



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In the US, growers typically plant hard red winter wheat, used in bread, in the fall and sow spring wheat, for bagels and pizza, in the spring. The winter wheat harvest fell 25% this year as drought hit midwestern states like Kansas. Then, high rainfall and a surprise spring blizzard flooded spring crops.

Researchers at the Environmental Defense Fund predict that Kansas will only continue to see winter wheat yields drop – by 2030, 8% of Kansas counties could see winter wheat yields fall by more than 5%. To get ahead of climate change, scientists around the world have begun breeding new varieties of wheat. But according to a study published in Nature earlier this year, climate change still might outpace any yields from those new crops.

Original Article: [The Guardian by Cecilia Nowell](#)

### **Palmer Lake's major financial issues likely leading to water rate increases**

Palmer Lake water customers will likely see their bills increase in the near future as the town looks to boost revenues to its self-sustaining water enterprise, which is projected to have inadequate funding in 2023.

"Inadvertent" incorrect billing of 15 water accounts and the town's failure to increase water rates by 3% annually starting in January 2020, as stipulated by a 2019 town resolution, have caused the budget shortfall, according to administrative and financial documents.

Staff are now "working on the issues" and will "bring options to the (Board of Trustees) to consider," Deputy Town Clerk Julia Stambaugh said by email this week.

Stambaugh reported in a Sept. 29 town memo the water account billing issues had been resolved. It was unclear how long the town had incorrectly billed the water accounts in question.

But now, ballooning loan repayments upcoming in 2024 and the "significant rise" in the cost of materials for infrastructure mean the town's water fund won't have enough money in its projected 2023 budget, finance documents show.

And residents are concerned.

"(The water enterprise) is not being managed to sustain itself," said Marty Brodzik, a resident and town planning commissioner. "... It's a snowball coming down the hill."

Part of the problem, Brodzik said, is the town is still repaying loans it received from itself and the Colorado Water Resources and Power Development Authority. The entity provides state and federal loans to Colorado governments to pay for water, wastewater and other types of infrastructure projects.



## VELES WATER WEEKLY REPORT

In 2009, the town received a loan from Colorado Water Resources for roughly \$1.86 million, to be paid in full by December 2031, to build a water storage tank.

In 2018, it received another loan for about \$1.1 million, payable in full by 2048, to build a second water storage tank. In 2019, Palmer Lake loaned its water fund an additional \$500,000 from its general fund, which must be paid back by 2039, to cover cost overruns, according to the Sept. 29 town memo.

The remaining balance on the 2009 loan is about \$772,000 and the remainder of the 2018 loan is around \$954,000. The town expects to pay \$104,970.98 in 2023 on the 2009 loan and another \$68,168.30 in 2023 on the 2018 loan, Stambaugh said.

Palmer Lake water customers have only been paying back the interest on the 2019 loan — \$10,000 annually. But in 2024, the repayments will rise to \$19,374, and again to \$38,748.12 a year beginning in 2025 as residents begin to pay down the principal.

It was unclear why the town loaned its water enterprise money from its general fund and did not transfer the money to the water fund. Stambaugh said there was no record to explain the prior administration's actions and former Palmer Lake Mayor John Cressman, reached by phone Friday, said he did not know the reasoning.

A 2023 draft Palmer Lake water enterprise budget shows the town also expects a cost overrun of \$327,127 in 2022.

"Think about all this debt they have. Now they're over budget in a single operating year. That's not sustainable," Brodzik said.

It's also unclear what could happen if the water fund cannot maintain itself, as is legally required. Stambaugh said the town is "investigating (its) options."

The town could consider funding options for its water enterprise through the Department of Local Affairs and the Colorado Department of Public Health and Environment through state revolving fund grants and loans, Colorado Municipal League's Executive Director Kevin Bommer said. That could include money from the \$1.2 trillion Infrastructure Investment and Jobs Act the federal government passed last November, he said.

Palmer Lake can also use American Rescue Plan Act funds to address its water and wastewater issues, Bommer said — an option the town has taken.

Palmer Lake received a total of \$752,290 over two years: \$376,145 in 2021 and the remaining half of \$376,145 in 2022, Stambaugh said. The town transferred that money to its water enterprise to pay for water infrastructure improvements including an emergency interconnection line to a water line the nearby town of Monument is constructing, for technology upgrades at Palmer Lake's treatment plant and for distribution line upgrades, she said.

Those federal dollars could not be used to repay loans, Stambaugh said.

Brodzik questioned that decision, saying those ARPA funds could have stayed in Palmer Lake's general fund to help pay for roads, police and fire infrastructure improvements — especially as Palmer Lake voters submit their ballots for the Nov. 8 election. The town



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is asking residents to decide next month whether to increase property taxes by up to about \$1.3 million in 2023 and whether to allow recreational marijuana sales in town to help pay for fire, police, roads and parks services.

Increasing taxes won't help the water fund's issues and means "the general fund will get more money whether it needs it or not," Brodzik said. "But water rates will still go up, too."

Brodzik said she wants a solid solution that includes a plan to pay off the loans with the least amount of interest charged to residents, to build up the water enterprise's capital improvement fund "so when a rainy day hits they don't have to worry about securing a loan," and to determine how much the water rate and water use needs to collect annually to "operate within budget."

Stambaugh said the town is researching its next steps, including raising water rates, usage fees and tap fees, as well as analyzing the water fund's enterprise fund rates "to improve the funding of infrastructure improvements."

Original Article: [The Tribune by Breeanna Jent](#)

## GLOBAL WATER NEWS

### Mega water project in Guangdong moves forward

Excavation of the final five tunnels of the Pearl River Delta water resources allocation project was completed over the weekend on Daling Mountain in Dongguan, Guangdong province, taking construction of the mega project to the next stage in which the raw tunnels will be lined with concrete.

The project has 48 tunnels, which have been under construction for 1,272 days, the Guangdong Water Resources Department said on Sunday.

"Completion of the final tunnels lays a solid foundation for realizing the goal of ensuring water supplies to major cities in the Guangdong-Hong Kong-Macao Greater Bay Area by the end of 2023," the department said.

The project, which stretches 113 kilometers, will draw water from Liyuzhou in Foshan's Shunde district in the western part of the Pearl River Delta and transport it to Guangzhou's Nansha district, as well as the cities of Dongguan and Shenzhen in the eastern part of the delta, it said.



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"The project also will provide emergency standby water for the Hong Kong Special Administrative Region, Guangzhou's Panyu district, Foshan's Shunde district and other areas in Guangdong province, benefiting more than 50 million residents who live along the project, it said.

"The project, which cost more than 35.4 billion yuan (\$5.13 billion), will be able to divert more than 1.7 billion cubic meters of Xijiang River water annually in the western part of Guangdong to the Dongjiang basin in Shenzhen in the eastern part upon completion, playing an important role in alleviating drinking water shortages in Shenzhen and Dongguan.

Construction started in the first half of 2019 and is expected to conclude in 60 months. Most of the major water pipes are built from 40 to 60 meters underground to protect the ecology and environment and minimize land consumption, the department said. It is the largest water conservancy project to be built in Guangdong province.

Original Article: [China Daily by Zheng Caixiong](#)

## Severe drought impacts economies linked to the Danube

The most severe Danube drought in centuries has caused serious damage to countries whose economies are strongly tied with the big Central European river.

Very low-levels of water made the commercial navigation of the river extremely difficult adding further obstacles to trade sectors already affected by the war in Ukraine.

The most critical points are in Romania not far from the Delta and the port of Constanta, Edmon Şandru is a Danube grain transporter.

"We have units of 1,000, to 1,200 Tons, and during the period when there was no water we loaded somewhere around 700, maximum 740 Tons, so almost half. We were only using around 60% of our capacity."

High demand for Ukrainian grain shipments from the Danube ports of Reni and Ismail provided a lifeline for shippers during these dry times. On the Tulcea-Galati-Constanta route, water-levels have allowed barges to reach the port of Constanta close to their limits.

Daniel Georgescu of the Waterways Administration of Constanța, said this year has been one of the worse he's seen.

"I called it a calamity, from my point of view. At Cernavodă, the water-level was 1.4 meters compared to the 4.7 metres that it is now. It was a huge drop, I think this has been the hardest summer in the 11 years since I have been managing this company."

At the beginning of August, the authorities prohibited using water from the Danube Canal for irrigations. For two months, wheat, maize and sunflowers were at the mercy of the rainfall, and now, even autumn crops seem to be at risk.

Further upstream in Serbia there are the same concerns for a living system based of the waters of the Danube. Vladimir Djurdjevic is a climatologist.



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On an annual level we have more or less the same precipitation as in the past, we even have a slight increase in the annual amount of accumulated precipitation, but what is happening is that we have this redistribution during the year, i.e. these dry periods have expanded, and then in short periods we have significantly higher amounts of precipitation

Like a chain reaction, all of the aspects of the drought that affected the level of the Danube will be reflected in the economy. It has already started to be seen in the price increases and it's hard to predict just how bad the situation could become.

Original Article: [Euro News](#)

### **Severe drought and extreme heat pose a new threat to wine production**

In 2022, global wine production volume is expected to be at a level similar to the one observed last year, despite higher average temperatures across the world.

According to data collected by the International Organisation of Vine and Wine (OIV), world wine production is expected to remain stable in 2022 at about 260 mhl. This will be the fourth consecutive year that global production will be slightly below its 20-year average.

However, in the EU, 2022 wine production is expected to be at 157 mhl, recording an annual increase of 3.5 mhl (+2%) compared to 2021.

Positive performances were recorded in Italy, France, and Germany, compensating for the low harvests expected in Spain and Greece, which were particularly affected by the heatwave during summer.

The first harvest forecasts in the USA indicate that production volume will be slightly lower than in 2021 at 23.1 mhl, a decrease of -4%.

After the record-high figures of last year, Southern Hemisphere vineyards produced average volumes, with the only exception being New Zealand, as favourable climatic conditions helped the region achieve its largest production with 3.8 mhl, a 44% increase. Overall, in 2022 the Southern Hemisphere wine production is expected to account for 21% of the world total, with 55 mhl, a -7% drop on 2021.

Meanwhile, a recent report from the European Drought Observatory (EDO), suggested Europe faced its worst drought in at least 500 years this summer, with two-thirds of the continent in a state of alert or warning, reducing inland shipping, electricity production and the yields of certain crops.

The August report said 47% of Europe was under warning conditions, with a clear deficit of soil moisture, and 17% was in a state of alert, in which vegetation is affected.

Original Article: [Hapers by James Bayley](#)



### **El Niño increases seedling mortality even in drought-tolerant forests**

A long-term study finds that seedling mortality increased when severe and prolonged drought occurred in Southeast Asian seasonally dry tropical forests, which are deemed more drought-tolerant than tropical rainforests.

Global climate change may lead to more extreme weather events such as droughts. To predict the impact of climate change on tropical forests, it is necessary to understand more accurately the effects of drought. El Niño often reduces rainfall and causes drier forests in the tropical regions of Southeast Asia. Since tropical rainforests there usually experience rainfall year-round with no dry season, El Niño-induced drought increases tree mortality. Seasonally dry tropical forests (SDTFs), on the other hand, are considered more adaptive to drought given that they experience both wet and dry seasons. However, there remains limited understanding about the effects of El Niño on SDTFs.

Addressing this knowledge gap, a research team led by graduate student Prapawadee Nutiprapun, from the Graduate School of Science at Osaka City University, Professor Akira Itoh, from the Graduate School of Science at Osaka Metropolitan University, and Professor Dokrak Marod, from the Faculty of Forestry at Kasetsart University, monitored seedling recruitment and mortality at an SDTF in a national park in Chiang Mai, in northern Thailand, at monthly intervals for 7 years.

During the study period, an extremely strong El Niño event occurred between 2014 and 2016, resulting in reduced rainfall. In 2016, the dry season was approximately 3 months longer than normal. The collected data show that severe and prolonged drought increased seedling mortality even in the SDTF. In addition, drought-caused mortality was greater in evergreen forests at higher elevations, where drought is usually less severe, than in deciduous forests at lower elevations, where severe drought is more frequently observed.

Only in deciduous forests did the number of seedlings increase significantly during the El Niño period. This was mainly due to a large number of acorns produced by the deciduous oak *Quercus brandisiana* (Fagaceae). El Niño has been known to stimulate mass flowering and fruiting, leading to an increase in seedlings in tropical rainforests in Southeast Asia.

"This study takes us one step closer to understanding the impact of El Niño on seasonally dry tropical forests in Southeast Asia," said Ms. Nutiprapun.

"A decline in the number of seedlings that carry the next generation will affect the entire forest in the long run," concluded Professor Itoh. "We believe that we have obtained useful basic knowledge to develop measures to conserve tropical forest ecosystems in consideration of future climate change."

Original Article: [Science Daily by Osaka Metropolitan University](#)



## **Environment Agency issues drought permits to Yorkshire Water**

Yorkshire Water submitted drought permit applications for the North West Group of Reservoirs across Wharfedale, Bingley, Shipley, Craven, Yeadon, Baildon and the Worth Valley.

The water company's current licences require them to release a certain amount of water from the reservoirs to maintain the health of the river. The permits allow them to reduce the amount released to conserve water in the reservoirs and secure water supplies, while still maintaining necessary environmental protection for the river.

The 12 permits were issued by the Environment Agency on Monday 24 October and will last until 31 March 2023.

Earlier this month the applications were subject to a Planning Inspectorate public hearing after an objection from a member of the public. The Environment Agency considered the Inspector's report when making its decisions.

### **Serious deficiency in water supplies**

Victoria Slingsby, Environment Agency Yorkshire Drought Manager, said:

Despite recent rainfall in Yorkshire, this has not been enough to refill rivers and reservoirs and we are still facing a serious deficiency of water supplies.

We only issue a permit if we are content that there are clear plans in place to mitigate any impact on the environment, along with strong evidence from Yorkshire Water of their ongoing commitment to reduce leaks and improve water efficiency.

We will continue to work closely with Yorkshire Water as it develops the long-term solutions to protect water resources while drought conditions continue across Yorkshire.

### **Yorkshire moved to drought status in August**

If a permit is used, Yorkshire Water will need to inform the Environment Agency before doing so. They will also need to carry out monitoring and mitigation to assess and manage potential environmental impacts.

To reduce unnecessary use of water and protect customer supplies and the environment, Yorkshire Water has already announced a temporary-use ban (TUB), prohibiting use of hosepipes by its customers.

Yorkshire officially moved to drought status on 15 August following six months of below average rainfall combined with high temperatures, which affected most of the country.

Earlier this month the National Drought Group forecast that average rainfall levels over winter will still not be sufficient to avoid impending drought or drought conditions into next year. Some water companies suggested conditions will remain beyond spring in some areas, including Yorkshire, if rainfall remains below average.

Reservoir levels across Yorkshire are 25% lower than they were at this time last year. The exceptional shortage of rainfall this year, and the possibility of a shortage continuing



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over the winter, led to Yorkshire Water applying for these permits to help the North West group of reservoirs to refill.

Further information about drought in Yorkshire can be found online

The 12 reservoirs are:

- Carr Bottom Reservoir (Wharfedale)
- Doe Park Reservoir (Bingley)
- Eldwick Reservoir (ShIPLEY)
- Embsay Reservoir (Craven)
- Grimwith Reservoir (Craven)
- Hewenden Reservoir (Bingley)
- Leeming Reservoir (Worth Valley)
- Leeshaw Reservoir (Worth Valley)
- Reva Reservoir (Yeadon)
- Silsden Reservoir (Craven)
- Weecher Reservoir (Baildon)
- Springhead Weir (Worth Valley)

Original Article: [UK Gov Press Release](#)

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