

Crescenta Valley Water District

Weekly News Articles

January 8, 2023



Fox 11 News

January 8, 2023

Will California's long-term drought improve after atmospheric rivers hammer the West?

Recent California storms help relieve drought conditions

While recent storms throughout the state have helped drought conditions, experts say we'll need more weeks like this one to get out of the drought.

If you are wondering if all the [significant flooding and multiple storms impacting the West](#) will help with long-term drought relief in [California](#), the answer is not as [simple it may seem](#).

"Drought, while it can be considered a weather phenomenon, is also a climate phenomenon. It's all about the duration of said event," said FOX Forecast Center senior meteorologist Jordan Overton.

Weather tends to happen on a shorter scale, he added.

"We talk about storm systems sweeping through the United States over a period of a week – a hurricane that lasts for two weeks; a snowstorm that lasts a few days; a tornado that lasts a few minutes," Overton said.

California drought history

When did [drought](#) begin in the West? Some might tell you it's been ongoing for more than a decade. According to Overton, the most accurate reading of drought conditions available is the U.S. Drought Monitor, which started in 2000.

"From a drought monitor perspective, the most recent drought spell began in early 2020," Overton said. "That being said, California's most intense drought since 2000 started in 2012 and ended in 2016."

After a wetter period in 2017, drought returned in 2018 before ending in the spring of 2019. The ongoing dry spell that began in early 2020 has already reached the same level of severity as the 2012-2016 drought.

In order to understand what it would take to end the current drought, Overton said you must consider what happened to end the 2012-2016 drought.

"This drought started due to lack of rain in California in the rainy season of 2012," he said. "This was then amplified by an extremely dry year in 2013, where San Francisco, which normally records 18 inches of rain in a year, picked up only 3.4 inches."

Overton said the airport in Los Angeles only picked up 3.65 inches that year.

Fast-forward to 2014, SFO picked up more than 20 inches of rain while LAX saw a little more than 8 inches.

"The issue was that most of this rain occurred in December when a series of atmospheric rivers lashed the state," Overton said.

Dry conditions persisted in 2015 when SFO only picked up 8 inches of rain, which was not enough to reverse the trend.

Another factor to consider: Snowpack

Atmospheric rivers tend to greatly benefit snowpack high in the Sierra Nevada mountain range, which is greatly needed to improve long-term drought conditions.

Overton said that the status of the snowpack on April 1 during the years mentioned above closely correlates with drought conditions. That's important because April 1 is widely considered the end of the rainy season.

According to Overton, the April 1 readings for statewide snowpack in 2011 were 165%. During the next 4 years, the snowpack percentage never went above 55%, with a whopping low of just 5% of the average snowpack in 2015 on April 1.

Then, just like the wet period with atmospheric rivers in 2016 and 2017, the snowpack responded in kind.

"California had its best snowpack reading since 2011 when 2016 came in at 86%," Overton said. "That was followed by an even better year in 2017 where the snowpack was an incredible 163% above average."

What did it take to end a drought?

It took back-to-back years of above-average rain in 2016 and 2017 to end the drought in California.

In 2016, SFO ended up getting more than 21 inches of rain, and LAX picked up 10 inches of rain. That was followed by an even wetter year in 2017, according to Overton. This put the drought in reverse and, by almost all standards, officially ended the drought that had plagued the state since 2012.

"If we dive deeper into 2016 and 2017, we are able to find things that did contribute to the end of the drought," Overton said.

The first was a series of extreme atmospheric rivers in March 2016. It was the first time since 2012 that San Francisco picked up more than 5 inches of rain in the month of March.

"This late-season rain – California sees the majority of its rain from October into March – sent a significant boost to the state's reservoirs and watersheds," Overton said.

This, like in 2014, stopped things from getting worse, according to Overton. However, it wasn't enough to end the drought.

"That all changed from November 2016 to March 2017," Overton said. "A persistent series of storm systems lead to nearly six months of above-average precipitation."

So, while this current storm system will help, as demonstrated in recent droughts, Overton said he feels it will take more than this to get out of drought conditions.

<https://www.foxweather.com/weather-news/california-atmospheric-river-storm-weather-alerts-maps-power-outages>

Spectrum 1

January 9, 2023

Despite storms, state reservoirs aren't likely to return to normal levels this year

LOS ANGELES — Even with a sixth atmospheric river in two weeks dumping rain on California, water regulators said reservoirs are not likely to completely refill this year. As of Monday night, the state's 154 reservoirs were at 81% of average, the Department of Water Resources announced Tuesday.

“We’re still below average,” said Jon Yarbrough, assistant deputy director for the State Water Project, the California agency that collects water from Northern California rivers and redistributes it to major cities. “We still have a lot of room in our reservoirs to take in the in-flows that we’re seeing on the horizon here.”

One of the largest reservoirs, Lake Oroville in Northern California, has increased by more than 85 feet since Dec. 1. Still, it remains at 46% capacity, currently holding just 1.6 million acre-feet of its 3.5 million potential. Over the next nine days, Yarbrough expects the rains will deliver another 500,000 acre-feet to Oroville, but it will remain significantly below normal.

The San Luis Reservoir, south of San Francisco, has risen 33 feet and added 287,000 acre-feet since Dec. 1 but remains at 39% of capacity. The Shasta reservoir, operated by the U.S. Bureau of Land Management and with 8.8 million acre-feet of capacity, has gained 400,000 acre-feet since early December and is currently 41% full.

Three more storms are expected in California over the next nine days, according to Department of Water Resources state climatologist Dr. Michael Anderson. Even so, the likelihood of reservoirs getting back to full capacity this year “would be a bit of a challenge,” Anderson added.

“To get them to the top of conservation would take more storms, but what can help as we move later in the spring is snowmelt,” he said. “It takes a while to get the system storage built back up. We have some pretty large deficits to overcome.”

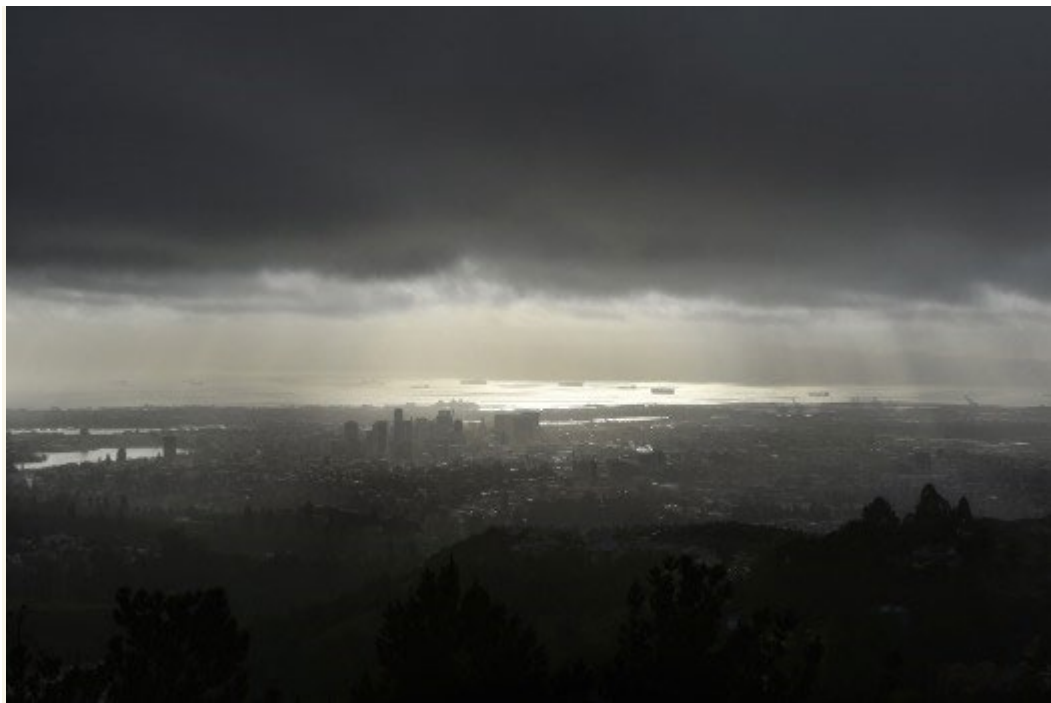
According to the most recent map from the U.S. Drought Monitor, released Jan. 5, the entire state of California continues to experience drought conditions, despite the rain.

<https://spectrumnews1.com/ca/san-fernando-valley-ventura/environment/2023/01/09/despite-storms-state-reservoirs-aren-t-likely-to-return-to-normal-levels-this-year>

San Jose Mercury News

January 9, 2023

NOAA's hurricane hunters are now targeting the West Coast's atmospheric rivers



Dark storm clouds hover above downtown Oakland, Calif., on Thursday, Jan. 5, 2023. The Bay Area was pummeled by heavy rain and high winds during an atmospheric river event. (Jose Carlos Fajardo/Bay Area News Group)

NOAA's hurricane hunters might be just as busy now as they were during hurricane season. However, it's not hurricanes they are flying through, but the atmospheric river systems plaguing California since Christmas week.

Atmospheric rivers may not make headlines in the same way hurricanes do, but they can have extreme consequences.

“Atmospheric rivers can span the whole Pacific. They are long and narrow, but they’re way larger than hurricanes,” [Atmospheric River Reconnaissance Coordinator Anna Wilson](#) said.

They are crucial to the West Coast. Half the rain and snow the West gets comes from atmospheric rivers, which are plumes of moisture coming in from the Pacific Ocean. And they cross an area with very few observation sites, making them challenging to forecast.

CA: STORM - POWERFUL WAVES FLOOD CARMEL

Until the last few years, forecasters had to rely solely on satellites and forecast models for forecasting atmospheric rivers, which can become very muddy without truly knowing what’s happening inside the storms.

The University of California-San Diego, the Scripps Institution of Oceanography, and the Center for Western Weather and Water Extremes have teamed up with the NOAA Hurricane Hunters who are able to drop instruments called “[dropsondes](#)” inside an atmospheric river, to relay pinpointed live weather data. The information is immediately put into weather forecast models, which improves the accuracy of the forecast dramatically.

“With the dropsondes released by the hurricane hunters, we get profiles of moisture, temperature, winds, in the lower part of the atmosphere, which are really critical for understanding the atmospheric river’s structure,” Wilson said.

The information not only improves the overall knowledge of what atmospheric rivers are capable of, but improves immediate forecasts.

“NOAA aircraft are flying in these weather systems and validating the models,” Captain Jason Mansour, pilot and aircraft commander of the NOAA Gulfstream IV Hurricane Hunter aircraft. “Then the NOAA National Weather Service is more prepared to predict where and when these systems will make impact and how much of an impact that’s going to be.”

Mansour is a seasoned veteran of the hurricane hunters. He says the ride might be a little less bumpy for the atmospheric rivers, but the mission is the same.

“We are effectively part of the early warning system for the atmospheric rivers across the board,” Mansour explained.

Parts of California have seen nearly a foot of rain since Christmas weekend. San Francisco has received more than nine inches of rain, while Lake Tahoe has seen more than 11 inches. In the higher elevations, the snow totals have been staggering as well. Parts of the Sierra have [more than twice the snowpack](#) than they would typically see this time of year. Mammoth Mountain has seen nearly 120" of snowfall just since December 26. And that's not all.

This week will begin the fourth week of consecutive rain and snow for California. The series of atmospheric river events, occurring in rapid succession, are being referred to by experts as an “atmospheric river family.”

“Which basically means a series of them one after the other with maybe a day or so in between,” Wilson explained. “If it came by itself, it wouldn't be hugely impactful, but because it came on the heels of three other ones, it has much higher hydrologic impacts than it would otherwise.”

The West has been on the forefront of hydrological woes. Experiencing a mega-drought, resulting in [dry lake and riverbeds](#), [intense wildfires](#) and [potential water shortages](#). The pendulum has now swung, and California is now facing extreme drought and extreme flooding simultaneously, as the current rainfall [won't solve California's drought](#).

“What we need in order to get out of the drought is not an insanely wet month where a lot of that water is not going to be savable because of runoff,” Wilson explained. “What we need is a couple of steady wet years, and it's coming in a way where more of it can percolate into the ground.”

Wilson added she has seen the pendulum swing many times in California, but not like this.

“The swinging back and forth is potentially getting wider and wider,” Wilson said. “California is known for its volatile weather swings, but it does seem like in recent years it’s been, like now, we’re going from this new record of dry to this new record of wet.”

The rain will continue this week for the West, with no real shut-off to the available moisture in the near future

<https://www.mercurynews.com/2023/01/09/noaas-hurricane-hunters-are-now-targeting-the-west-coasts-atmospheric-rivers/>

Newsweek

January 10, 2023

What Will It Take To Get California Completely Out of Drought?

After two weeks of storms that have flooded thousands of homes and caused millions of dollars of destruction, you would think that California's drought woes would have been washed away.

Important [reservoirs have seen huge rises](#) in their water levels, and areas of ["extreme drought" have disappeared](#) following the deluges, with [more wet weather](#) set to hit the state this week.

But California's drought troubles aren't over yet, experts warn, as the storms may have brought too much rain at once, not enough snow that will melt into reservoirs in spring, and don't make up for the fact the past three years have been exceptionally dry.

'A Really Big Hole to Fill'

"The recent rains are very important in helping to prevent another dry year," Richard G. Luthy, a professor of civil and environmental engineering and water infrastructure expert at [Stanford University](#), told *Newsweek*. "2020, 21 and 22 were exceptionally dry years. In 2022, Jan, Feb and Mar, normally wet months, were the driest since records were kept in the late 1800s."

"[Lake Oroville and Shasta](#), the two biggest reservoirs, are still below average for this time of year. We have a really big hole to fill from three drought years in a row."



It will take a lot more rain to refill these surface reservoirs, let alone replenish the groundwater water stores.

But Jacob Petersen-Perlman, a water resources geography expert and assistant professor at East Carolina University, told *Newsweek* it's hard to say exactly how much rain would be needed due to the large number of variables involved.

"It's important to remember that timing and type of precipitation (rain vs. snow) is crucial for staying out of drought," Petersen-Perlman said. "Timing also matters—all the rain at once means that much of it will run off into the ocean instead of filling California's reservoirs. Second, if it continues to rain like it has been raining in California but not enough snow falls in the Sierras, drought may still persist."

'Too Much, Too Fast'

Petersen-Perlman said that if temperatures warm up too fast, much of the snowpack will melt too quickly and maintaining river flows for the

summer will become much more difficult. Additionally, if the rains come too quickly and inconsistently, they may not refill California's aquifers sufficiently to relieve groundwater drought.



"Surface water levels are only part of the picture—groundwater levels will likely still remain chronically low, because (rain or no rain) we deplete more groundwater than is replenished," Aakash Ahamed, a hydrologist and co-founder of the Water Data Lab, told *Newsweek*.

"Over the last 25 years, we have lost more than 150 km³ of groundwater from California, which would take many many years of rain to replace, even if there were no consumptive use for municipal or agricultural purposes."

"Emptying underground groundwater reservoirs show the bigger picture, and we'd need 150 MAF [million acre-foot] of water (3x total storage capacity of 50MAF) to replenish them—that's unlikely to happen anytime soon because we pump groundwater faster than it replenishes every year," Rich Pauloo, a hydrogeologist and co-founder of the Water Data

Lab, told *Newsweek*. "It's a huge problem, and we'll run out of groundwater in 100-400 years at business as usual rate depending on the location."



In a normal year California gets around 200 MAF of rain and snow, and it captures about 25% of this in surface reservoirs (50MAF combined capacity), Paulo said.

"This year, statewide, currently we're 134% of normal for this time of year, but only 53% of normal for the full water year ending September 30, 2022 (we can still have dry Feb-May)," Paulo said. "Our best hydro climate models still can't see more than a few weeks out—drought prediction remains an intractable scientific challenge. Surface reservoirs are at 78% average levels. Groundwater reservoirs are around 10% of normal across the state."

Despite the large amount of rain needed, the current rainfall can be used strategically to ensure maximum groundwater replenishment.

"One opportunity to address this problem is through managed aquifer recharge—diverting surface water to replenish groundwater when abundant surface reserves are available (like now)," Ahamed said.

Wettest Ever Stretch

December 26 to January 4 is now the record holder for the wettest 10-day stretch ever in San Francisco, and on December 31, 5.46 inches of rain fell in a single day in San Francisco.

"Nearly all of California has seen much above average rainfall totals over the past several weeks, with totals 400-600% above average values. This has resulted in nearly saturated soils and increasingly high river levels," said the National Weather Service [in a statement on January 10](#).

How is the current rainfall impacting California's drought status?

100% of CA remains "Abnormally Dry." But we are down to 0%, from 12.7%, experiencing "Exceptional Drought" in the last month.

Last month, last week, current: pic.twitter.com/fcNR2NoB9g

— Hannah (@mshcrowder) [January 5, 2023](#)

This has helped bring down drought levels. U.S. Drought Monitor data shows the ["exceptional drought" classification](#) that covered 7 percent of the state as of December 27 has completely disappeared in the past fortnight.

Additionally, 2.07 percent of California is not classified as being under [drought conditions](#), with some small slivers of "abnormally dry" land present in Del Norte County on the Oregon border, and Imperial County and Riverside County in the south.

On October 4, 2022, only 0.23 percent of the state was classified as "abnormally dry" rather than under the influence of drought. And more rain is forecast for the rest of the week across California.

'We Need More Big Storms'

"The hits keep coming in CA," tweeted the [National Weather Service](#). "The next and most potent storm of the series will bring yet another round of heavy rain on already flooded rivers & saturated soils, high winds that may topple trees/power lines, and heavy snow on top of an enormous snowpack."

However, the outlook for the rest of the 2023 wet season is harder to predict: it might not rain as much as it has for months, putting [the reservoirs](#) and groundwater levels at risk of drying out again.

"We are hopeful that the reservoirs will be full at the end of this season, we just need several more big storms," Luthy said. "But it's hard to predict several months into the future. After a wet December in 2021, spring 2022 was a big disappointment."

KLAS

January 10, 2023

Explaining water flows: Why Sierra Nevada snow won't fix Lake Mead

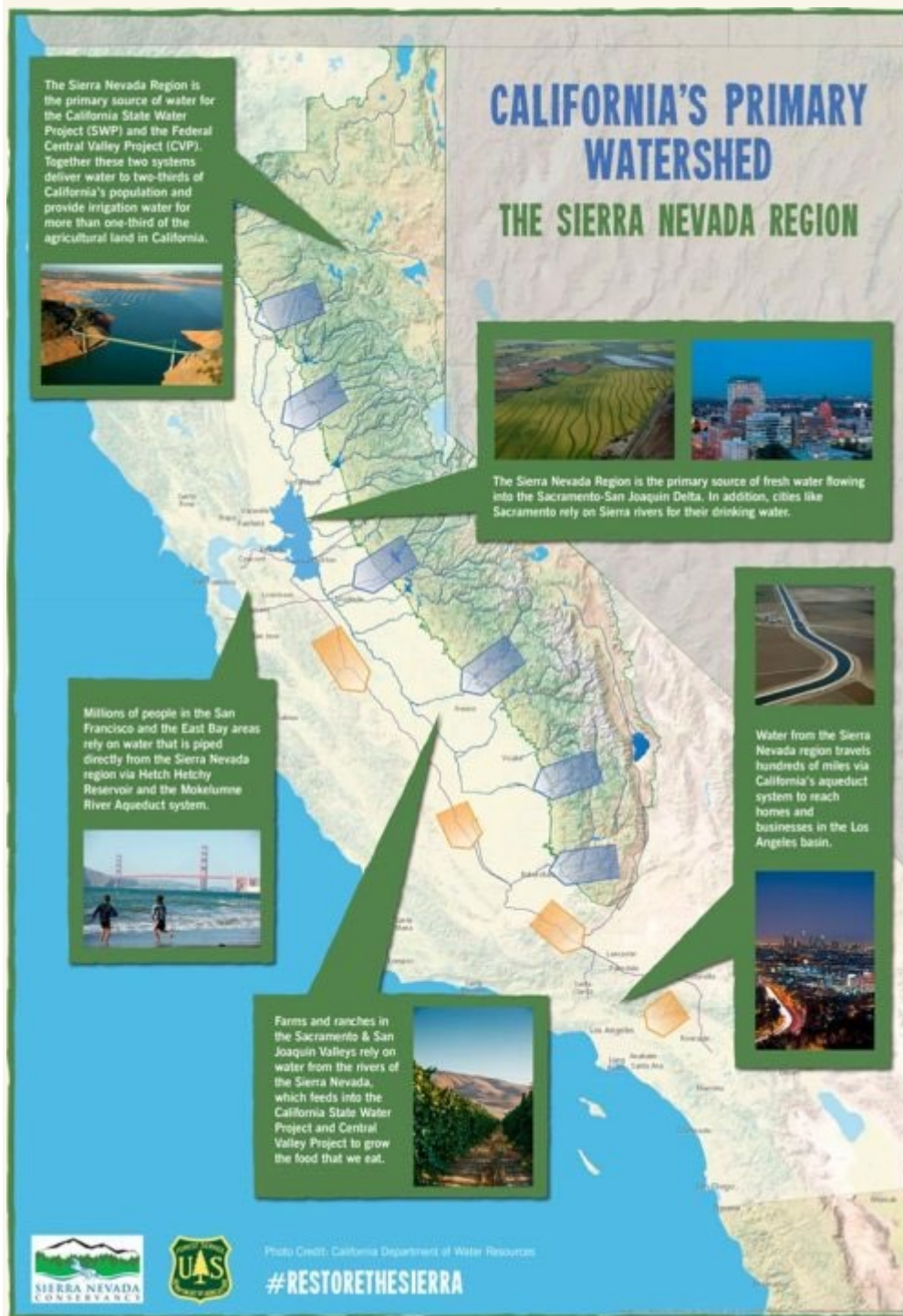


LAS VEGAS (KLAS) — A big snowstorm in California is welcome news, as long as floods and mudslides aren't wrecking lives.

Snow and rain bring some relief from the drought, but it matters where the snow falls. The current storms are drenching central California and dumping snow in the Sierra Nevada, the beautiful mountain range that's home to national parks and scenic mountain trails and roads. That snow is never going to make a difference at Lake Mead — the focal point of the 23-year “megadrought” gripping the desert Southwest.

The Sierra Nevada feeds rivers, lakes and springs that [supply water to two-thirds of California's population](#) by way of the California State Water Project (SWP). About 25 million Californians get water from the SWP and

about 750,000 acres of farmland receive irrigation water from the SWP. The map below shows the drainage from the Sierra: It flows to the west.



(USDA/U.S.

Forest Service graphic)

Lake Mead gets water from the Colorado River, which starts in the Rocky Mountains. And lately, the Sierra Nevada and the Rockies have both been suffering through dry years.

For the first 11 months of 2022, California was going through its second-driest year on record, but an [atmospheric river](#) that started in December turned it to only the ninth-driest year on record for California, NOAA climate monitoring chief Karin Gleason told The Associated Press.

[How much will the rain help California's drought?](#)

A wet winter in one mountain range won't solve problems that belong to another mountain range. Will the rain and snow make a difference? It depends on where it happens.

Water flows downhill. It doesn't matter whether that's north, south, east or west. It just goes downhill. The maps that show how that water flows define "watersheds" — the area of land that drains or "sheds" water into a lake, a reservoir or an ocean. The Colorado River Basin collects water and takes it downstream.



(U.S.

Geological Survey map)

A big rainstorm or a driving blizzard won't matter unless it happens inside the drainage area for the Colorado River.

The future of Lake Mead is tied directly to the snowpack that builds up each year in the Rockies. Water flows down the Colorado River, through Lake Powell and onto Lake Mead, the biggest reservoir in the U.S.

While storms have helped so far this year in the Sierra, there's no guarantee it will continue. A weather pattern known as La Niña is entering its third year. La Niña — which affects the air's moisture content — has typically meant drier weather in the desert Southwest.

And measurements of snowpack, while encouraging right now at 142% of normal, aren't guaranteed to hold through the spring. That's when snowpack measurements really matter. Until then, we're just watching the weather and hoping for the best. Snowpack for the Upper Colorado River Basin hasn't changed over the past week.

[Snowpack at 142% after week of storms in Upper Colorado River Basin](#)

“A normal snow year doesn't mean normal runoff,” according to Kyle Roerink of the conservation group Great Basin Water Network.



Sunken speedboat now points skyward after Lake Mead water level drops. Aug. 14, 2022 (KLAS)

“From what we’ve seen in tributaries in La Niña conditions, the percentage of runoff will be somewhere in the ballpark of 10-20% less than the percentage of snowpack. It is an inexact science. But I think it is important to note that a 100 percent snowpack does not equal 100 percent runoff,” he said.

Roerink says the current method of managing water needs to change.

“We cannot repeat this mistake in the future. The purpose of our collective efforts — funded at great taxpayer expense — should not just be filling reservoirs. It needs to be about changing behaviors,” Roerink said.

<https://www.8newsnow.com/news/local-news/explaining-water-flows-why-sierra-nevada-snow-wont-fix-lake-mead>

KTLA

January 11, 2023

California snowpack outpacing highest year on record



California's snowpack levels continue to rise, now sitting at more than [225% of the average](#) for this time of year. It's welcome news to a state slogging through a prolonged drought, and with more winter storms headed this way, that number is sure to climb.

Snowpack levels in the Sierra Nevada [approached 200% of the yearly average](#) on Monday, driven by multiple atmospheric rivers over the last several weeks.

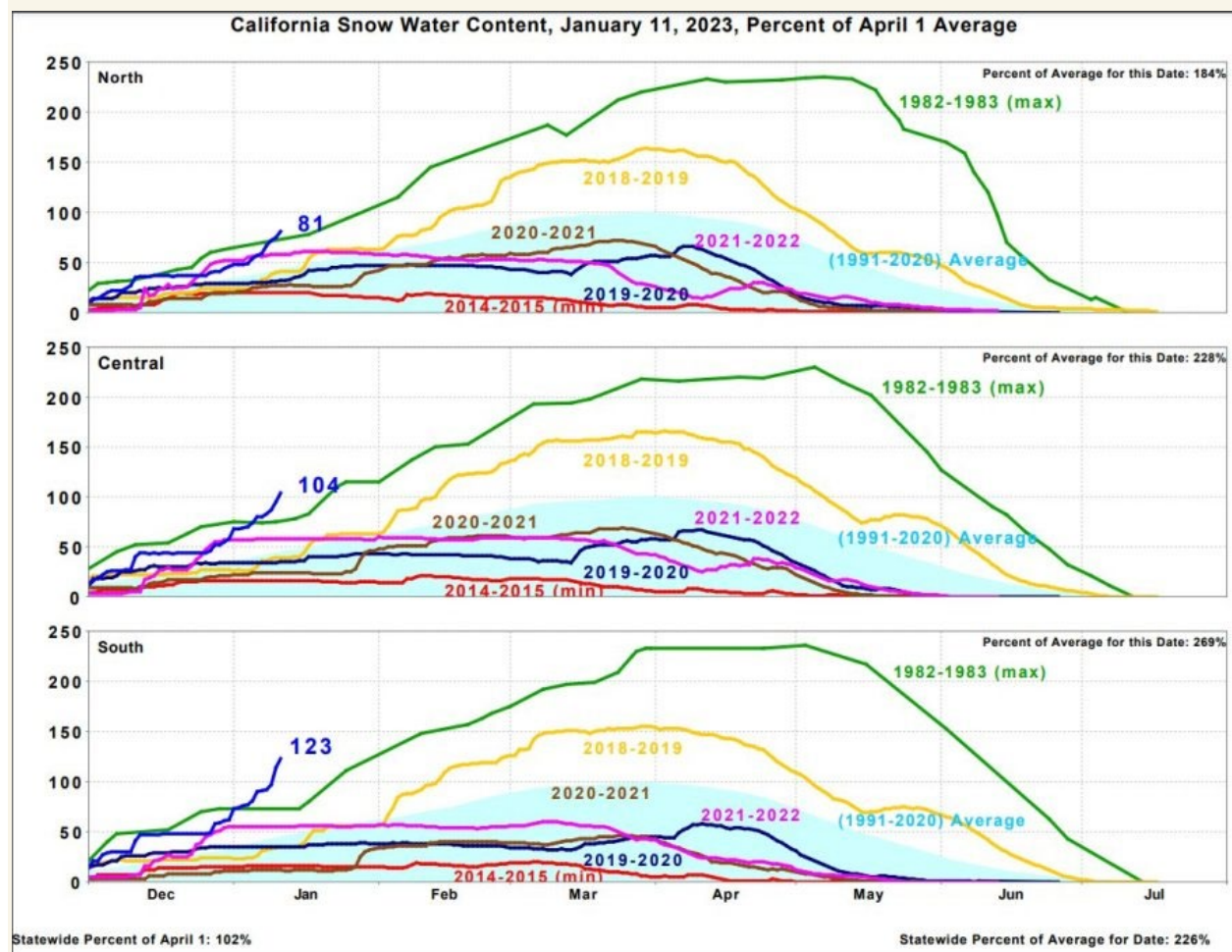
On Wednesday, that total continued to climb to 226% of the yearly average for Jan. 11, according to the National Weather Service.

[Southern California Weather Home Page](#)

Not only is California ahead of its total for January, the state is also outpacing its peak month.

Officials from the [NWS California-Nevada River Forecast Center](#) said the peak period for snowpack in the Sierra is around April 1, and, as of Wednesday, California has already exceeded its April average.

As of Jan. 11, California's snowpack is 102% of its April 1 average.



The state is also currently outpacing its 1982-83 snowpack levels, which are the highest on record. Whether or not the current rate of snowpack

accumulation will continue to keep pace with that record-setting year remains to be seen.

[2 more storms expected to bring rain to Southern California](#)

More rain is expected to arrive in California in the coming days with Northern California expected to bear the brunt of it. Southern California will likely experience a milder storm, but one that is still more powerful than an average January storm, and one that is expected to stay around longer than the last.

The storm is supposed to coincide with colder temperatures in the region, meaning snow could fall elevations as low as 4,500 feet.

One storm is expected to arrive in Southern California on Saturday, before giving way to another storm arriving Sunday night and staying in the area through as long as Tuesday.

<https://ktla.com/news/local-news/california-snowpack-outpacing-highest-year-on-record>

SFist

January 15, 2023

California Reservoir Levels Steadily Rising After All These Storms, According to State Agencies

After three years of drought, this winter's unforgettable rains have replenished at least some of the state's water storage, [KRON4](#) reported.

After consecutive years of droughts, many of the state's reservoirs had dipped to drought emergency levels. California always receives the vast majority of its precipitation between November and March, but recent years hadn't received much precipitation to refill them (a more and more common occurrence as climate change accelerates).

Read more: [Once Again, Lake Oroville and Other Reservoirs Are at Drought Emergency Levels](#) [SFist]

But if you haven't looked outside in the past month, this year has been different. Weeks of "atmospheric rivers," "bomb cyclones," and a "[Pineapple Express](#)" have given us the wettest winter in recent memory – thought it's not without floods, landslides, downed trees, and felled power lines.

California's complex water system has ways to try to capture this excess precipitation, and they've proven relatively successful, according to reports. KRON4 found that while none of the major reservoirs are fully at capacity – most are still less than 50% full – many are at or beating their historical averages for this point in the year.

The California Department of Water Resources has some graphics to show these levels:

CALIFORNIA MAJOR WATER SUPPLY RESERVOIRS CURRENT CONDITIONS

Midnight - January 14, 2023

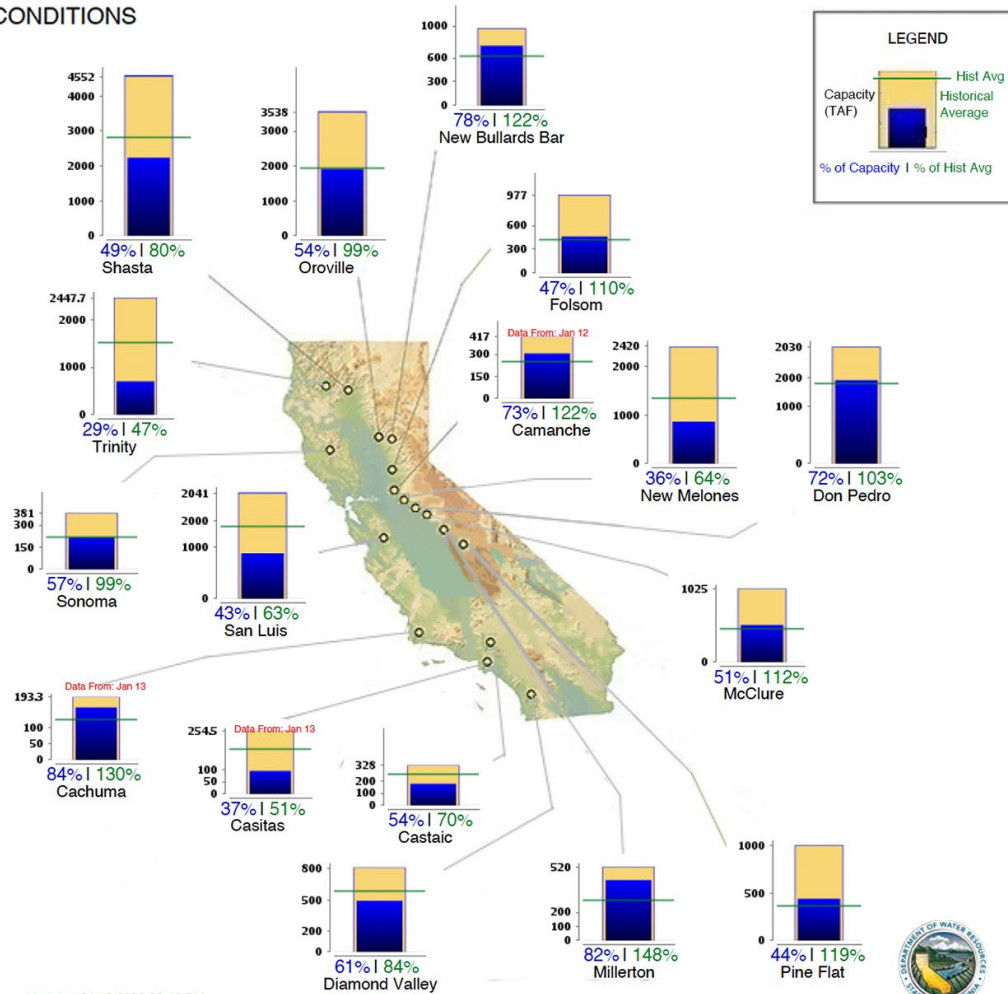


Image: [California Water Watch](https://www.waterwatch.ca.gov/)

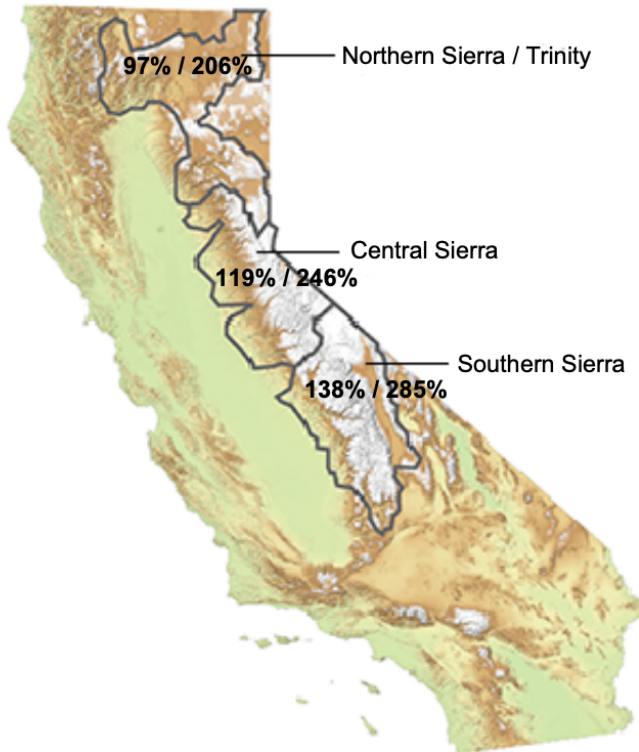
The Chronicle [reported](#) that 9 of the 15 of the state's major water supply reservoirs currently have daily water storage levels that are equivalent to that of their historical averages (from 1991 to 2020). These reservoirs include Sonoma, Pine Flat, New Bullards Bar, Millerton, Camanche, Oroville, Don Pedro, McClure, and Folsom – and even Shasta is getting close.

For example, Folsom, in the Sierra Nevada foothills, is at 110% of its historical average for this time of year, but 47% of total capacity. Butte County's Oroville stands at a level 99% of where it usually is in mid-January (although that is about 55% total capacity).

Snowpack, meanwhile, is extremely high this year. (Seen any pictures of Tahoe lately?) CDWR says that it's 117% of usual.

CURRENT REGIONAL SNOWPACK FROM AUTOMATED SNOW SENSORS

% of April 1 Average / % of Normal for This Date



NORTH	
Data as of January 15, 2023	
Number of Stations Reporting	32
Average snow water equivalent (Inches)	27.7
Percent of April 1 Average (%)	97
Percent of normal for this date (%)	206

CENTRAL	
Data as of January 15, 2023	
Number of Stations Reporting	52
Average snow water equivalent (Inches)	32.8
Percent of April 1 Average (%)	119
Percent of normal for this date (%)	246

SOUTH	
Data as of January 15, 2023	
Number of Stations Reporting	32
Average snow water equivalent (Inches)	31.2
Percent of April 1 Average (%)	138
Percent of normal for this date (%)	285

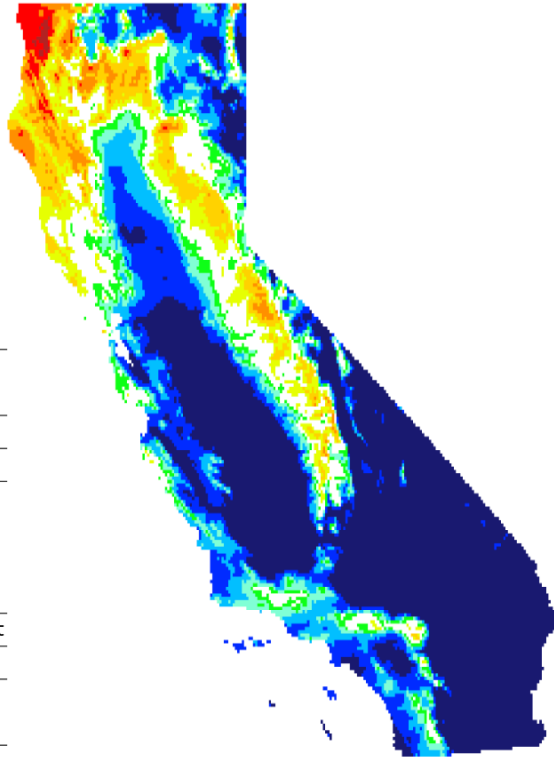
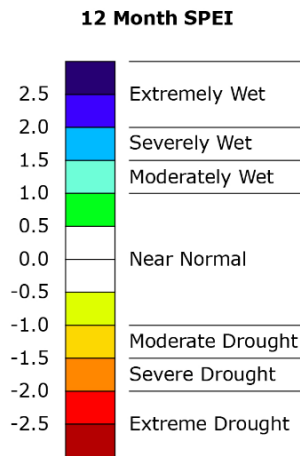
STATE	
Data as of January 15, 2023	
Number of Stations Reporting	116
Average snow water equivalent (Inches)	31.0
Percent of April 1 Average (%)	117
Percent of normal for this date (%)	245

Statewide Average: 117% / 245%

Image: [California Water Watch](#)

Also, while it's too early to fully tell, all of this water could potentially help California out of its drought.

Current Drought Map



*Map shows the most recent 12 month Standardized Precipitation-Evapotranspiration Index (SPEI). This shows rain and temperature effects on moisture. WestWide Drought Tracker, U Idaho/WRCC, [Data Source: PRISM \(Prelim\)](#).

Image: [California Water Watch](#).

We're not out of the water yet, but early signs show that this water could make a dent in our years-long water debt.

Image via Unsplash/[Manny Becerra](#).

<https://www.google.com/url?rct=j&sa=t&url=https://sfist.com/2023/01/15/california-reservoir-levels-steadily-rising-after-all-these-storms-department-of-water-resources-says/&ct=ga&cd=CAEYACoUMTI5NzI2NTI1Njc0NTUwNjgyMjgyHDkyNjBjODk2NzcwMzJjM2U6Y29tOmVuOIVTOII&usg=AOvVaw3-G9YnvN07ZrgEeXWk69ux>