

Veles Water Weekly Report

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March 21st 2024

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WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell

CLICK THE LINK BELOW

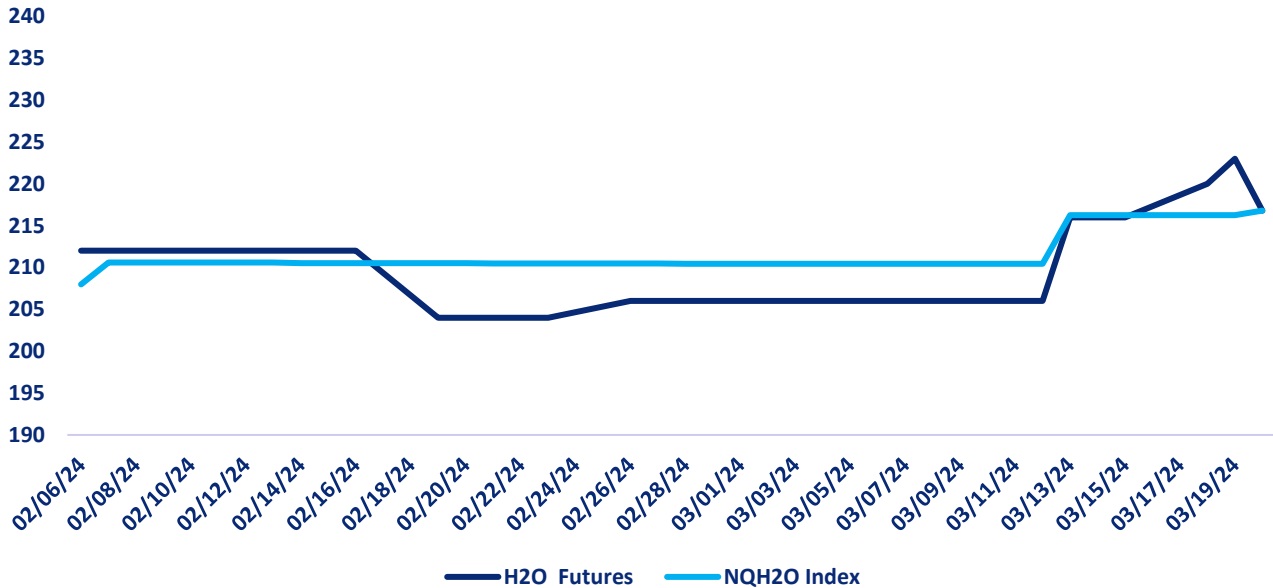
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/925739090?share=copy>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

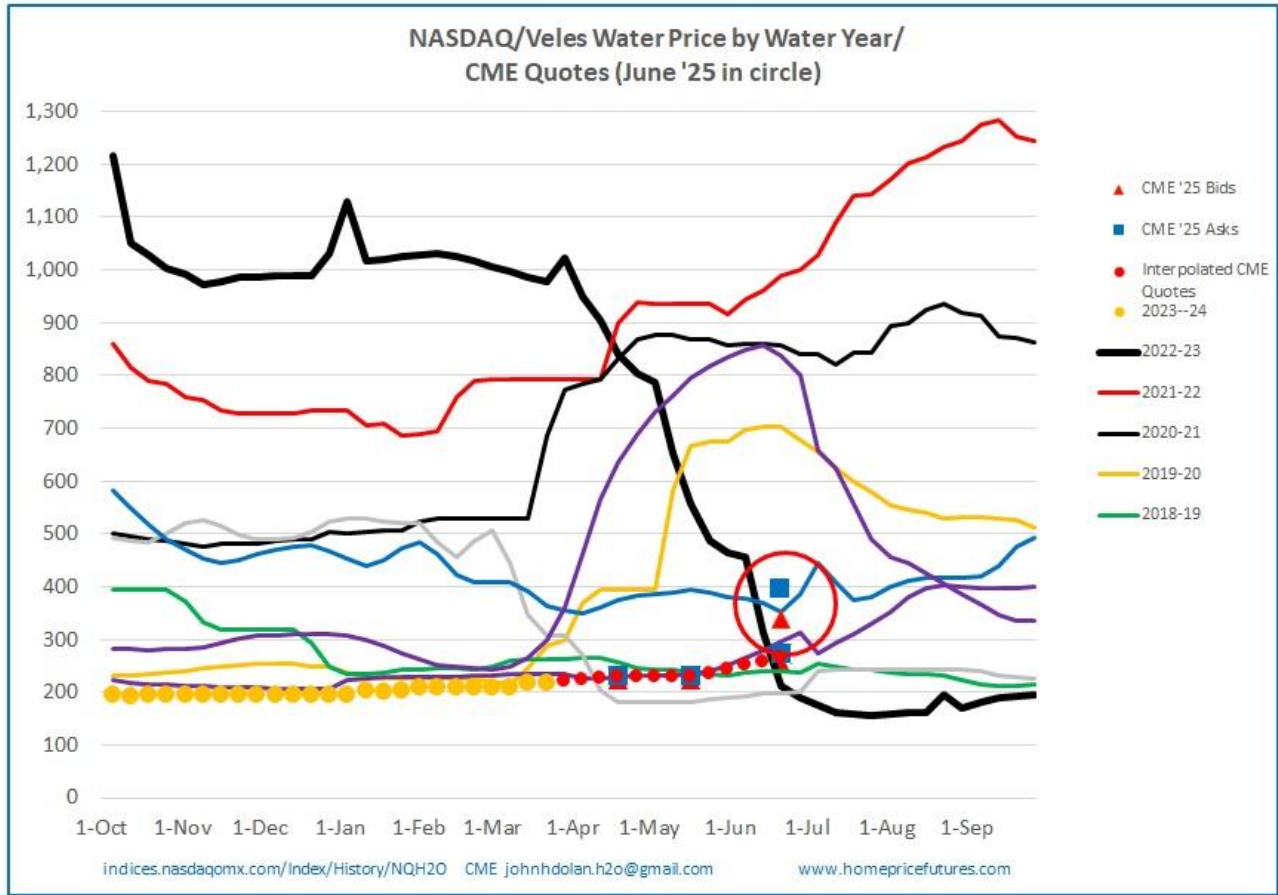
The new NQH2O index level of \$216.80 was published on March 20th up \$0.53 or 0.25% from the previous week. The March contract settled at the new index level and the April contract is considered the front month. The futures have been closing at a discount of \$0.27 to a premium of \$6.73 versus the index over the past week.

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

Apr 24	224@232
May 24	225@254
Jun 24	255@275
Jun 25	339@395



NQH20 INDEX HISTORY



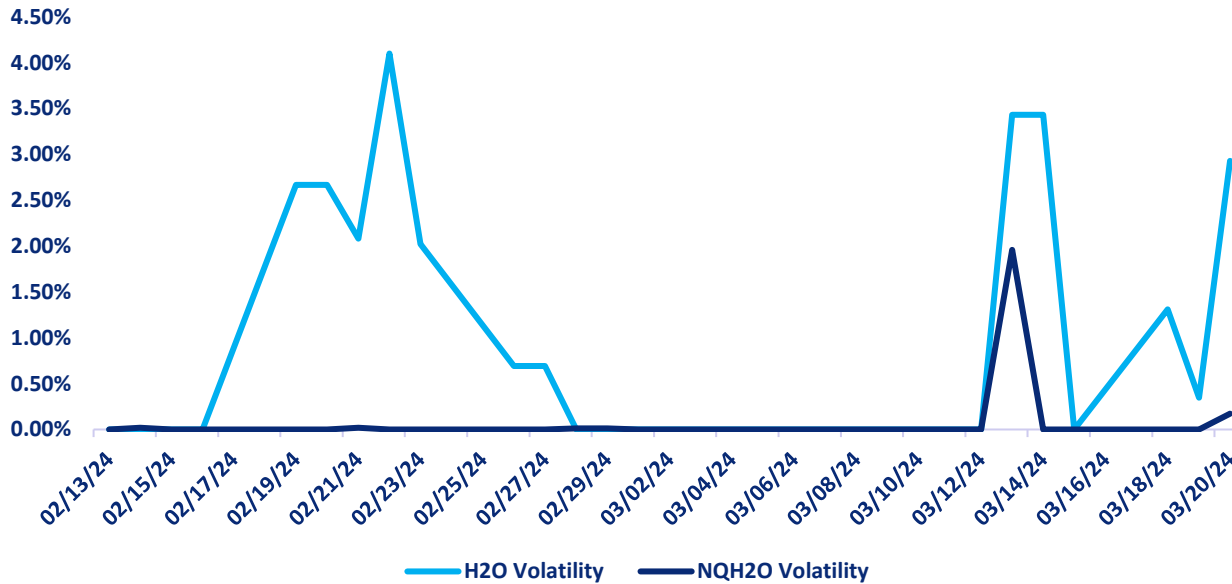
The graph above shows the CME water contracts for April, May and June 2024 (and June 2025) superimposed over historical NASDAQ Veles water indices. A red dotted line has been added to interpolate between the April-June contracts for the 2023-2024 water year.

(John H Dolan, CME Market Maker)



H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the March contract daily future volatility high has been 2.93%.

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	54.25%	3.47%	3.07%	2.53%
H2O FUTURES	N/A	9.73%	6.89%	4.03%

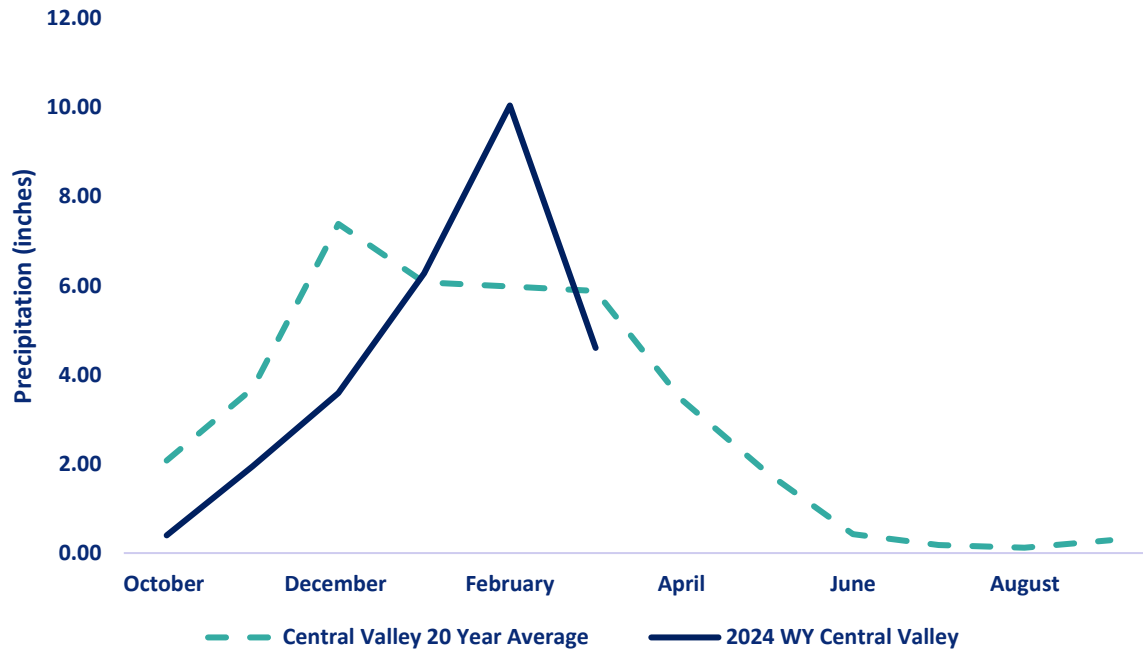
For the week ending on March 20th, the two-month futures volatility is at a premium of 4.68% to the index, up 1.59% from the previous week. The one-month futures volatility is at a premium of 4.42% to the index, down 0.60%. The one-week futures volatility is at a premium 2.08% to the index, down 0.58% from the previous week.

*Above prices are all **HISTORIC VOLATILITIES**. All readings refer to closing prices as quoted by CME.*



CENTRAL VALLEY PRECIPITATION REPORT

Central Valley Precipitation Index



Central Valley

average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 20/03/2024

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2024 WYTD VS 2023 WYTD %	2024 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	4.71	0.33	80.79	185	81
TULARE 6 STATION (6SI)	3.23	0.01	81.75	209	81
NORTHERN SIERRA 8 STATION (8SI)	5.87	0.21	74.66	135	94
CENTRAL VALLEY AVERAGE	4.60	0.15	78.28	176	85

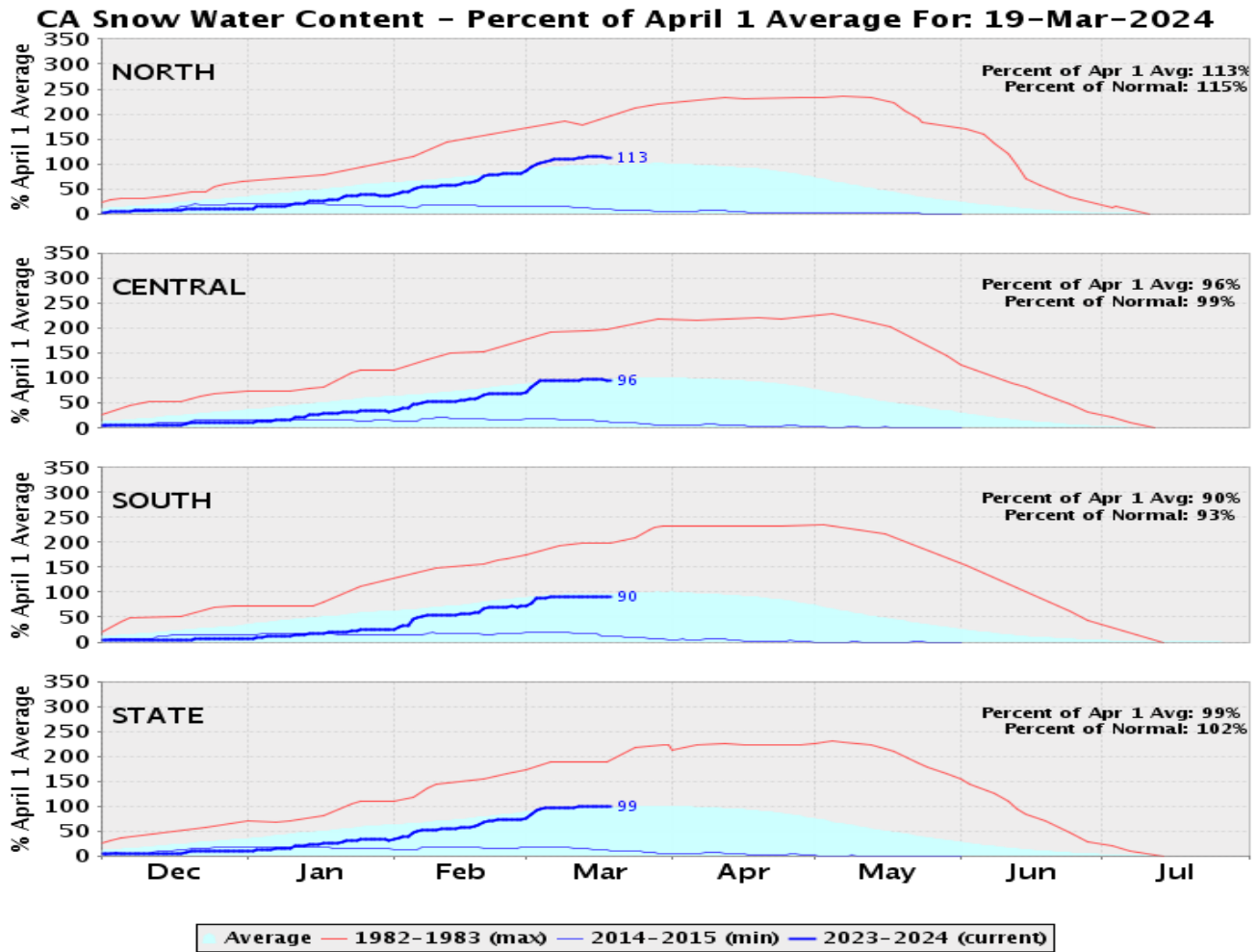
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	*% HISTORICAL AVERAGE
TRINITY LAKE	1,871,483	76	35	107
SHASTA LAKE	3,930,842	86	73	113
LAKE OROVILLE	3,012,272	85	83	126
SAN LUIS RES	1,483,655	73	91	86

*% Historical Average is based on a daily average that is interpolated from historical monthly averages. The monthly averages are computed using monthly data from water year 1991 to 2020. The monthly averages are updated every 5 years using a sliding 30 year period.
[Reference: California Water Data Exchange](#)



SNOWPACK WATER CONTENT



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	32	0.1	178	113	113
CENTRAL SIERRA	26.1	0.9	229	99	96
SOUTHERN SIERRA	20	0.8	258	93	90
STATEWIDE	25.9	1.3	231	102	99

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

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



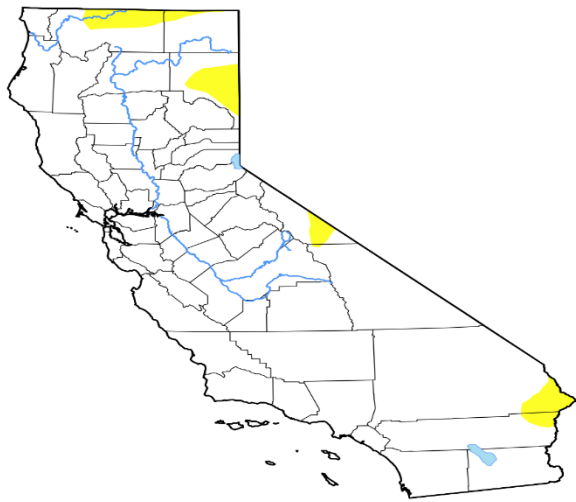
DROUGHT MONITOR

California

[Home](#) / California

Map released: Thurs. March 14, 2024

Data valid: March 12, 2024 at 8 a.m. EDT



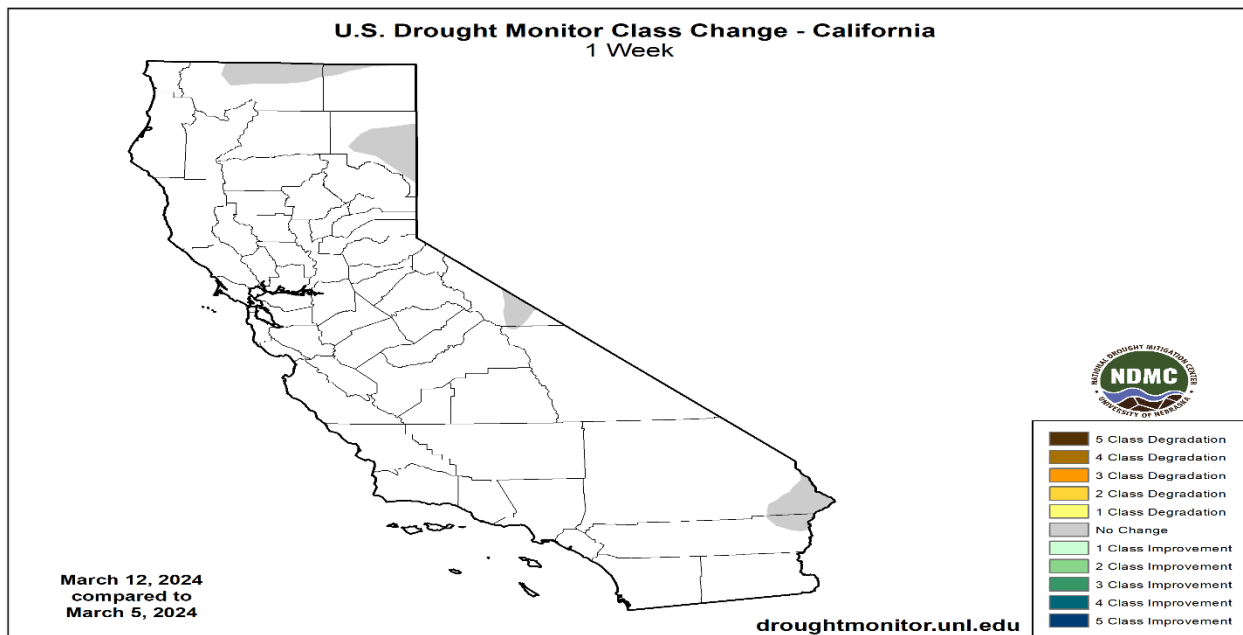
Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):
[Curtis Riganti](#), National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):
[Denise Gutzmer](#), National Drought Mitigation Center



Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2024-03-12	95.46	4.54	0.00	0.00	0.00	0.00	5
Last Week to Current	2024-03-05	95.46	4.54	0.00	0.00	0.00	0.00	5
3 Months Ago to Current	2023-12-12	96.33	3.67	0.00	0.00	0.00	0.00	4
Start of Calendar Year to Current	2023-12-26	96.65	3.35	0.00	0.00	0.00	0.00	3
Start of Water Year to Current	2023-09-26	94.01	5.99	0.07	0.00	0.00	0.00	6
One Year Ago to Current	2023-03-14	44.66	55.34	36.42	8.49	0.00	0.00	100

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

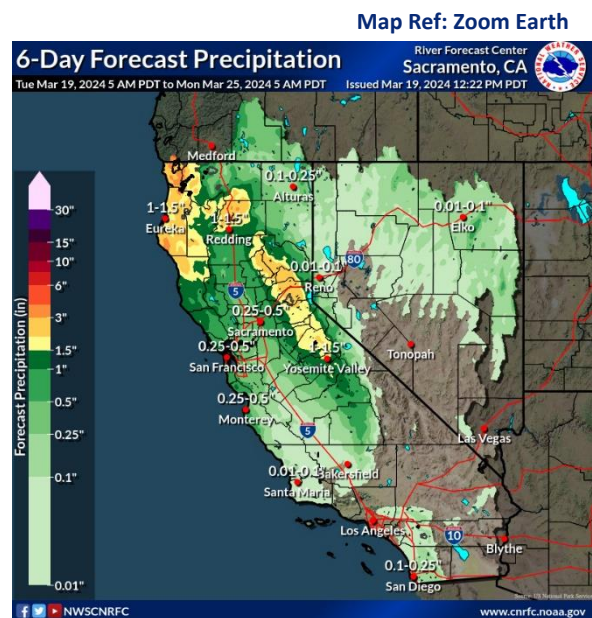
The satellite picture shows a relatively clear continental US with a Pacific frontal system moving into the Northwest and some cloud cover over the southern Midwest. Some precipitation can be expected over Northern California over the week and potentially some rain in Los Angeles region on Saturday. There is no monsoon activity at present.



10 Day Outlook

Models still indicating a shift toward cooler and wetter for the end of the week into early next week as the upr ridge currently overhead shifts off toward the east across the interior...and is replaced by a slow moving upr trof over the northeast Pacific that eventually shifts across the west coast before exiting the area to the east on Sunday. Best precipitation still appears to be focused on coastal areas from the Russian River basin northward and then inland over the southern OR Cascades down across the Shasta Lake drainage and Sierra down to the Merced River basin with 1.00- to 2.50-inches (highest north of I-80). Amounts really trail off across the central CA coast with scattered amounts reaching southern CA and past the Sierra crest over northern NV. Freezing levels start Friday in the range of 6000-feet northwest...8500-feet along I-80...and close to 10000-feet at the CA/MX border. These bottom out as the core of the upr trof moves across the area later Saturday into early Sunday from 3500-feet northwest...4000- to 4500-feet along I-80...and 5000- to 6000-feet for southern CA and southern NV. After this system exits the area...an upr ridge will build over the eastern Pacific pretty much along 145 W with northwesterly flow across the west coast on Monday. Afternoon forecast issuance basically took the previous forecast and blended in the latest NBM and WPC QPF...which overall didn't result in any dramatic changes.

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





WESTERN WEATHER DISCUSSION

Temperatures across the West this week were primarily near normal or colder than normal. Compared to normal, the coldest area was southern Idaho, where temperatures mainly ranged from 6-12 degrees below normal. Portions of central and southeast Montana were 3-6 degrees above normal. Heavy precipitation fell in parts of north-central and northwest California, and along the Oregon and Washington coasts. Elsewhere, precipitation also fell in some of the mountainous parts of the northern half of the West region. After recent heavy precipitation in western Oregon and improvements to streamflow and long-term precipitation deficits, an area of abnormal dryness was removed from west-central Oregon. Given recent wetness, further improvements in the area may occur in coming weeks. In western Montana and northern Idaho, recently improved snowpack and lessening precipitation deficits led to several improvements to ongoing drought and abnormally dry conditions. Due to low evaporative demand and improved long-term precipitation deficits, northeast Utah saw reduced coverage of abnormal dryness this week.

Reference:

Rocky Bilotta, NOAA/NCEI

Ahira Sanchez-Lugo, NOAA/NCEI



CALIFORNIA WATER NEWS

California policy protecting major rivers upheld in long-awaited court decision

A state policy that seeks to protect California's major rivers and creeks by cracking down on how much water is pumped out by cities and farms can move forward despite widespread opposition, the Superior Court has ruled.

The long-awaited decision on what's known as the Bay-Delta Plan denies 116 claims in a dozen separate lawsuits that seek to undo a 2018 update to the policy, most of which are from water agencies saying the limits on their water draws go too far.

The 160-page verdict, released Friday by Sacramento County Judge Stephen Acquisto, specifically notes that arguments made by San Francisco against the regulation fell short. The city, which gets most of its water from the Tuolumne River in and around Yosemite National Park, has claimed that regulators showed preference for safeguarding fish and wildlife instead of defending Bay Area water supplies, ratepayers and economic growth. "This is a win for the (state water) board and the board's authority to help protect fish," Michael Lauffer, chief counsel for the State Water Resources Control Board, told the Chronicle.

The Bay-Delta Plan is intended, most fundamentally, to halt the decline of the Sacramento-San Joaquin River Delta. The region is the hub of the state's river flows and an ecological hot spot. However, decades of overpumping waterways from Fresno to the Oregon border has left less water flowing into the delta, undermining the estuary's ability to both supply water to communities and nurture wildlife, notably salmon runs. It also means less fresh water flowing into San Francisco Bay.

Six years ago, following one of the worst droughts in modern times, the state water board approved what is expected to be the first of several updates to the plan seeking to keep more water in waterways that feed the delta. The update covered the lower San Joaquin River and its three main tributaries, the Tuolumne, Stanislaus and Merced rivers. The update calls for no more than 60% of the natural flow of the rivers, on average, to be taken out by water users during certain months in winter and spring. The average flow now is less than 30% because of pumping, and at times, the channels carry less than 10% of what they naturally would.

"We have built an entire state and society on the backs of these rivers," Lauffer said. "The 2018 plan update was designed to recognize the existing uses but pay attention to the native fish and the communities that rely on those fish."

The changes to the Bay-Delta Plan prompted lawsuits from mostly agricultural water suppliers, which use the bulk of the water in the lower San Joaquin River basin, including



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the Modesto Irrigation District, Merced Irrigation District and Westlands Water District. Municipal suppliers, though, were also involved.

The legal arguments in the suits varied, with challenges to the water board's authority based on the Porter-Cologne Water Quality Control Act, the California Environmental Quality Act, the public trust doctrine and the California Constitution.

San Francisco was represented in a suit brought by the San Joaquin Tributaries Authority. The San Francisco Public Utilities Commission, which manages water supplies for the city as well as about two dozen other communities, has maintained that tighter limits on water draws could force the agency to find new sources of water at a much higher cost to customers. The agency also has expressed concerns about not being able to maintain reliable supplies to support the Bay Area's robust economy.

The SFPUC offered its own scientific assessment of ecological problems in the watershed, concluding that fish and wildlife habitat on the Tuolumne River could be improved without much increase in river flows. Its study flew in the face of what state and independent scientists have found.

SFPUC officials declined an interview Monday, saying they were still reviewing the court ruling. But in a statement to the Chronicle, the agency reiterated its disapproval of the update to the Bay-Delta Plan.

"As a public water provider to 2.7 million residents and thousands of businesses in the San Francisco Bay Area, we remain disappointed in the environmental review that informed the State Water Resources Control Board's 2018 adoption of the Bay-Delta Plan amendments," the statement read. "This 2018 decision could significantly impact our water supply with rationing of up to 50% in extended droughts."

Friday's court ruling is widely expected to be appealed.

A few of the 12 lawsuits that were addressed in the court's decision were filed by environmentalists, representing such groups as San Francisco Baykeeper, the Bay Institute and North Coast Rivers Alliance. These organizations had hoped to see the Bay-Delta Plan do more to protect fish and wildlife. The judge said these arguments, too, didn't pass muster.

Original Article: [San Francisco Chronicle by Kurtis Alexander](#)

The Supreme Court slashed wetland protections. California is trying to fill the gap.

California officials are trying to boost state wetlands protections in order to guard against a 2023 Supreme Court decision that slashed federal oversight of wetlands.

Assemblymember Laura Friedman's A.B. 2875 would declare it the state's policy to ensure long-term gain and no net loss of California's wetlands. And Democratic Gov. Gavin Newsom's administration is proposing to add 38 new positions to enforce the state's existing wetlands protection laws and scrutinize development permits.



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They're both aimed at shoring up state law to supplant weakened federal protections following last year's Sackett v. EPA decision, which changed the definition of federal wetlands, removing at least half of the approximately 110 million acres of wetlands in the continental U.S. from federal oversight under the Clean Water Act.

California's Porter-Cologne Water Quality Act, which preceded the federal Clean Water Act, provides many of the same protections, though legal experts are still reviewing the exact implications of the decision. California officials are casting their proposals as a way to hold on to the state's mantle of national leadership on environmental policy.

Original Article: [EE News by Camile von Kaenel](#)

California Finally Starts Digitization of Water Rights Records

In a Sacramento, Calif., office building, university students carefully scan pieces of paper that underpin California's most contentious and valuable water disputes. One by one, they're bringing pieces of history into the digital era, some a century old and thin as onion skin.

The student workers are beginning to digitize the state's water rights records, part of a project launched by the state's water regulator earlier this year. It may seem simple, but scanning two million musty pages is part of a \$60 million project that could take years.

The massive undertaking will unmask the notoriously opaque world of California water. Right now, it's practically impossible to know who has the right to use water, how much they're taking and from what river or stream at any given time in the state.

The State Water Resources Control Board aims to build a database that integrates a century of water rights records, geospatial mapping and up-to-date water diversion data that's available to the public. This new directory will, most crucially, help regulators make high-stakes decisions on who to cut off when the next drought hits.

"I believe strongly that you must measure it to manage it, especially with water," said Brent Vanderburgh, project manager at the Water Board. "We're looking at how digital tools can help us do our jobs better, more efficiently and according to the modern standards that our society expects."

California may be the country's tech capital, but it still relies on a room filled with aging paper records — maps the size of bedspreads, illegible letters written in bygone cursive and corduroy-bound ledgers — to manage its water supply. Other Western states such as Washington and Oregon have far more modern accounting systems.



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The state's labyrinth system of water rights dates back to the Gold Rush, when miners declared their rights to water by nailing paper notices to trees. The oldest rights holders have seniority, and when the state restricts water use during drought, they are the last to be curtailed, if at all.

A lack of timely and useful data became all too apparent during recent dry spells. After the 2012-2015 drought, new regulations populated a clunky online portal with new water use information, but problems remained in 2021 when regulators were forced to use outdated data to issue drought curtailments.

Since then, the state has committed approximately \$60 million from the general fund to the water rights digitization and data modernization effort underway at the water board. Project managers estimate the new system, called CalWatrs, will be operational sometime in 2025.

A bulk of the project's budget will fund back-end web development, for which the agency has hired a team of consultants from Deloitte. Meanwhile, the water board launched a pair of pilot projects to begin scanning paper water rights with specialty scanners.

That's taking place in the "digitization bullpen" made of cubicle walls at the agency's office, where a group of state workers and student assistants are processing and scanning thousands of pages in a carefully choreographed dance of paper pushing.

The team inspects each water right file, removing any bindings and looking for duplicates. Damaged or fragile records are flagged and sent to a "triage" center for special attention, including for repairs with artifact tape. Once scanned, each page is uploaded to content management software.

There, another student assigns it with metadata tags and geocodes so that someday it can be found with a simple keyword search. Eventually, most of the paper records will go into offsite storage and some may even be housed as antiques at the California State Library.

Water board staff warn that the journey to a data-based water future for California is long. That's not just because properly scanning 2 million pages will take time, but combining that data with accurate and timely water use reporting is even more complicated.



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Through a series of regulations, the agency is requiring water rights holders to report their water diversions more regularly and with high-tech meters. Annual water use reports have been required since 2016, but the data held the board's unwieldy eWRIMS system can be a year old and wildly inaccurate.

Water board staff say the ability to compare timely, accurate reporting data to historic water rights with a new database undoubtedly shed light on the whole system, potentially revealing everything from honest errors in to newfound violations.

“It's one step on the road to growing up into a modern system,” said Felicia Marcus, a visiting fellow at Stanford University and former chair of the water board. “Water rights are so crudely regulated now that it would be a huge leap forward in terms of ability to implement the system and institute fairness.”

Last year, Gov. Gavin Newsom signed legislation giving the board explicit authority to investigate the validity of water rights, including senior rights. A pair of bills that would have given the board broader authority to issue curtailment orders stalled in 2023 but could be brought up again this year in the Legislature.

Perhaps unsurprisingly, not all are happy with the board's data-gathering efforts.

Michael Kiparsky, director of UC Berkeley's Water Wheeler Center, led a 2021 study that found the state's water rights system was ill-equipped to protect people and the environment from climate change — which state officials say will increase drought severity and shrink average supply.

His research team also produced a digital database of water rights from the Mono Basin that helped inform the state's current project. Kiparsky said he encountered “a lot of resistance to changing the status quo, and the status quo in California is about stasis and a lack of clarity.”

Senior water rights holders in that region, according to his report, worried that water rights data transparency would facilitate more regulation and litigation. They also argued that the water board should not be trusted with such information, whether because the agency was too activist or too pliant.

Kiparsky expressed his own caution, not about the agency's regulatory authority, but its ability to deliver on a massive data project. California, he pointed out, has a less-than-stellar track record of modernizing government information technology systems for the internet era.



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The state auditor found last year that projects led by the California Department of Technology, which is involved in the water rights effort, have ended in widespread delays and cost overruns. That history includes the botched FI\$Cal budget database and the pandemic Employment Development Department fraud debacle.

“It’s very difficult to make big databases work well in conjunction with other ones, and part of that is the structure of government,” Kiparsky said. “We’re in a race against the next drought so it would be wonderful if this were put into place before rather than after it comes.”

A public system developed by a mega-consulting could pose future issues with maintenance and ownership, said Gary Darling, California’s first statewide geographic information officer and longtime civil servant at the Department of Natural Resources.

But this time around, he said he has faith in the project’s managers — in part because the stakes are too high to mess up.

“Just because Deloitte doesn’t have the best track record doesn’t mean we’re going to screw this up,” Darling said. “This is one of the most important IT projects California has done in a long time. If this doesn’t come off we’re going to pay for it for decades.”

Project staff at the Water Board say they have taken steps to steer clear of cost overruns, including building a team of 12 new staff members who have expertise in both water rights and data systems.

The one thing that remains unclear? Exactly long it will take to scan millions of pages. Two pilot projects beginning in December didn’t even get through 20,000.

“I don’t think there’s any way we’re getting all these records digitized by 2025,” said Vanderburgh, project manager at the water board. “But our pace right now on the project is fantastic. We’re on budget, on schedule.”

Original Article: [Governing by Ari Plactha/ Sacramento Bee](#)

California’s largest new reservoir project in 50 years gains momentum

Colusa County is known for sprawling rice farms and almond orchards, wetlands full of migrating ducks and geese, staunch conservative politics, and the 19th-century family cattle ranch where former Gov. Jerry Brown retired five years ago.



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But the windswept county in the Sacramento Valley — whose entire population of 22,000 people is just one-third of Palo Alto's — may soon be known for something else: the largest new reservoir anywhere in California in the past 50 years. Last weekend, President Biden signed a package of bills that included \$205 million in construction funding for Sites Reservoir, a proposed \$4.5 billion project planned for the rolling ranchlands west of the town of Maxwell, about 70 miles north of Sacramento. The funding is the latest boost for the project, which has been discussed on and off since the 1950s. Plans call for Sites to be a vast off-stream reservoir 13 miles long, 4 miles wide and 260 feet deep that would store water diverted from the Sacramento River in wet years, for use by cities and farms around the state in dry years.

“We have a definite tailwind at our back,” said Jerry Brown, a civil engineer unrelated to the former governor, and who is executive director of the Sites Project Authority. The authority is a group of government agencies in the Sacramento Valley planning the massive reservoir.

Brown was also the former general manager of the Contra Costa Water District, where he oversaw expansion of Los Vaqueros Reservoir 15 years ago.

“The funding is a vote of confidence and a sign that the federal government sees a significant benefit to this project and it being a sound investment,” he said.

If the project overcomes opposition and a lawsuit by environmental groups, the 1.5 million-acre-foot Sites Reservoir would be California's eighth largest. It would be four times the size of Hetch Hetchy Reservoir in Yosemite National Park, which is the main water supply for San Francisco and the Peninsula. It would provide water to 500,000 acres of Central Valley farmlands, and 24 million people, including parts of Silicon Valley, the East Bay and Los Angeles.

Plans call for groundbreaking in 2026, with construction finished by 2032. If completed, Sites would be the largest new reservoir in California since 1979, when the federal government opened New Melones Lake in the Sierra Foothills between Sonora and Angels Camp.

With the newest funding approved by Congress, the project now has more than 90% of its financing lined up, Brown said, a major hurdle that has killed dozens of other large water storage projects around the state in recent decades.

The sources include:

- A \$2.2 billion loan that the U.S. Environmental Protection Agency invited the project to apply for;
- \$875 million from Proposition 1, a water bond approved by voters in 2014;
- \$389 million from Congress, which includes this month's award;
- A \$450 million loan from the U.S. Department of Agriculture;
- \$250 million in local cash and bonds from other California water agencies;
- \$60 million from Biden's Bipartisan Infrastructure Act.

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



California proposes delaying rules aimed at reducing water on lawns, concerning environmentalists

California regulators this week proposed delaying new rules aimed at reducing how much water people use on their lawns, drawing praise from agencies that said they needed more time to comply but criticism from environmentalists who warn that the delay would damage the state's already scarce supply.

Last year, California proposed new rules that would, cumulatively, reduce statewide water use by about 14%. Those rules included lowering outdoor water use standards below the current statewide average by 2035. On Tuesday, regulators proposed delaying that timeline by five years, until 2040. The State Water Resources Control Board is scheduled to vote on the rules later this year.

The state would not punish people for using too much water on their lawns. Instead, it could punish the water agency that supplied those homes. There are about 405 of these agencies throughout the state that provide water to nearly 95% of Californians.

To comply with the rules, these agencies must convince their customers to use less water. Their options include public education campaigns and incentives, such as paying to install more efficient fixtures and replacing grass lawns with more sustainable plants. They could also raise rates.

State officials estimated it would cost water agencies about \$13.5 billion to comply with these rules — an estimate Chelsea Haines, regulatory relations manager for the Association of California Water Agencies, says is likely too low. Water agencies had asked regulators for more time.

“The challenge is that water suppliers are regulated but compliance will come from Californians making changes to how they use water,” Haines said. “I think there will be a learning curve for residents, and that just takes time.”

The delay means there wouldn't be an incentive for most water agencies to increase conservation until at least 2035, according to Tracy Quinn, president and CEO of Heal the Bay, an organization dedicated to protecting and restoring the coastal waterways of greater Los Angeles.

Quinn fears the delay would push agencies to make much more expensive investments in new water sources, including desalination plants to make ocean water drinkable and recycling wastewater to use again for drinking.

“The smartest thing to do first is the one that is fastest and cheapest. That's conservation,” Quinn said. “It is true that conservation is not free, but the cost of conservation needs to be compared to the cost of other new water.”

The goal of the outdoor water standards for 2040 is to have the majority of a person's yard made up of low-water plants irrigated by a drip system instead of sprinklers, which regulators argue are inefficient in part because they often spray water on sidewalks and asphalt.



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But water agencies wouldn't have to always meet these new outdoor standards. Each agency would have a "water use objective" it must meet that also considers indoor use and how much water is lost from leaky pipes. Agencies could also ask to have even more time to reach these standards, such as if a community uses more water than it should because it has a lot of livestock.

Original Article: [AP news by Adam Beam](#)

Court upholds State Water Board's revised flow objectives for the San Joaquin River

The Sacramento Superior Court has ruled in favor of the State Water Board's 2018 Bay Delta Plan update, denying all 116 claims by petitioners.

In December 2018, the State Water Resources Control Plan adopted revised flow objectives for the San Joaquin River and its three major tributaries, the Stanislaus, Tuolumne, and Merced rivers. The new flow objectives provide for increased flows on the three tributaries to help revive and protect native fall-run migratory fish populations. The Board also adopted a revised south Delta salinity objectives, increasing the level of salinity allowed from April to August

Several petitions were filed in several counties challenging the Board's action. Most hold water rights on the tributaries or represent those reliant on water from the tributaries for ag or municipal uses. A few petitioners represented environmental interests.

The claims were brought under the Porter Cologne Act, CEQA, the public trust doctrine, and article X, section 2 of the California Constitution. Most petitioners challenged the flow objectives, with some saying the Board's objectives required too much water to be released while others argued the new flow objectives did not require enough water to be released. A few challenged the revised southern Delta salinity objective, saying it would degrade water quality and harm crops.

Collectively, there were 116 claims and administrative record totalling over 770,000 pages.

The Court denied all claims, stating in its conclusion:

"The Court has endeavored to address all of petitioner's pending 116 claims. But given the volume of claims, and the nuanced points many of them present, it is possible that not all claims have been addressed to the satisfaction of all parties. It is also possible that certain claims were not specifically addressed. The Court, however, has carefully considered all pending claims, and if any claims were not specifically addressed in this order, the Court did not find them persuasive. Accordingly, as discussed in this order, petitioners' claims are all denied."

Original Article: [Mavens Notebook](#)



VELES WATER WEEKLY REPORT

An invisible water surcharge: Climate warming increases crop water demand in the San Joaquin Valley

University of California researchers from the Secure Water Future project recently found that increases in crop water demand explain half of the cumulative deficits of the agricultural water balance since 1980, exacerbating water reliance on depleting groundwater supplies and fluctuating surface water imports.

California's San Joaquin Valley is home to some of the most fertile soil on Earth. Crops grown here are exported around the world. According to California Department of Food and Agriculture, more than 250 different crops, worth \$30 billion per year, are grown in the larger Central Valley. The area accounts for 75% of the irrigated land in California and 17% of the country's irrigated land. And its farms provide a quarter of the nation's food and 40% of its fruit and nuts.

Growing those crops requires water. To compensate for the lack of precipitation during the growing season in the Valley's Mediterranean climate, irrigation is provided through a combination of surface and groundwater sources.

There is increased reliance on groundwater pumping for agriculture where surface water supplies are limited—such as during droughts—and when crop water demands are high. Both conditions are often present in the San Joaquin Valley, where the region has been subject to accelerating the depletion of groundwater reserves over the past several decades.

Researcher Kelly Moyers, a post-doctoral scholar at the time, was the lead author of the study recently published in PLOS Water about increasing crop water demand as the climate has warmed. The SWF team included UC Merced professors John Abatzoglou and Josue Medellín-Azuara, and UCLA Professor Alvar Escrivá-Bou, as contributing co-authors. SWF Director and UC Merced Professor Joshua Viers was the corresponding and senior author.

Researchers used data to estimate crop water demand in the San Joaquin Valley over the past 40 years. They focused on the climate effects on crop water demand, avoiding the confounding factors of changing land use and management practices.

The researchers called this phenomenon of climate-induced increased crop water demand an invisible water surcharge. They found that in the past decade, this invisible water surcharge on agriculture has increased the crop water demand in the San Joaquin Valley by roughly 650 thousand acre-feet per year, a volume larger than the capacity of Millerton Reservoir on the San Joaquin River near Fresno.

This represents a 4.4% increase with respect to the 1980–2011 baseline used in the study. Through an analysis of cumulative anomalies, researchers showed that the chronic increases in crop water demand over the last four decades explain half of the cumulative deficits in the agricultural water budget, and this trend is expected to worsen in the future.



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Agricultural droughts are not only caused by precipitation deficits, but now more often by insufficient surface or groundwater reserves to fulfill increasing crop demands.

"With a high reliance on surface water imports and groundwater in our region, the combination of groundwater regulation and increased evaporative demands, as shown in this study, will further challenge our water management options," said Medellin-Azuara, co-author in the report. Increased evaporative losses also apply to open water bodies like reservoirs, making managed aquifer storage more attractive during wet years, he added.

"The long-term decline in spring snowpack is a hallmark symptom of a warming climate in the state. Our study shows this hidden tax of increased crop water demands with warming is pouring salt in the wounds from the vantage of agricultural water resources," said Abatzoglou.

Despite potential agronomic adaptation and crop response to climate warming, increased crop water demand adds a stressor to the sustainability of the global fruit and nut supply and calls for changes in management and policies to consider the shifting hydroclimate.

A hallmark of the Secure Water Future approach to building climate resilience throughout the water scarce western United States, Viers concluded is "incorporating high resolution data into decision-making processes not only provides actionable insights for more effective management of our food-energy-water systems, but also demonstrates the value of research conducted in our institutions of higher education."

Original Article: [Phys.org by Patty Guerra](#)

State board to vote on reducing extraction fees for probationary basins

On the eve of its first subbasin probationary hearing, the state Water Resources Control Board announced it will vote on whether to reduce a controversial groundwater extraction fee.

The board will vote at its March 19 meeting on whether to cut the fee from \$40 to \$20-per-acre-foot for well owners in a subbasin placed on probation.

It will hold its first probationary hearing on the Tulare Lake subbasin, which covers Kings County, on April 16. Then the Tule subbasin, in the southern half of the valley portion of Tulare County, will come up for hearing Sept. 17.

The extraction fee would only be charged if the Water Board had to step in and administer a subbasin in cases where it finds local groundwater agencies aren't up to the job.

The \$40-fee had caused a great deal of angst for irrigators not only because they have never had to pay a fee for groundwater, which is considered a property right, but also because of the massive cost.



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In the Tulare Lake subbasin, farmers pumped 516,716 acre feet in 2022, according to the most recent numbers submitted to the state's Sustainable Groundwater Management Act annual reporting website. At \$40-an-acre foot, that would cost farmers \$20.6 million.

In the Tule subbasin, 662,300 acre feet was pumped in 2022, which would cost nearly \$22.5 million.

"A reduction in fees is welcome," said Mark Larsen, General Manager of the Greater Kaweah Groundwater Sustainability Agency. But those fees would only be charged for subbasins that are put in probationary status, which he said Kaweah is hoping to avoid. The Kaweah subbasin is scheduled for its probation hearing in November 2024. Farmers there pumped 842,700 acre feet in 2022. At \$40 an acre foot, that would cost \$33.7 million.

What, many irrigators had asked, would the Water Board be doing to justify charging that much money?

Administration expenses.

In 2017, the extraction fee was listed as \$30 an acre foot, then rose to \$40.

It includes an annual base fee and a volumetric fee, which Water Board staff is now recommending be cut so the total new fee would be \$20 per acre foot.

"This adjustment balances revenue stability for the program with the uncertainty about whether the State Water Board will place any specific basin on probation, how long a basin might remain on probation, how much revenue would be collected from the basin(s), and other factors," states the proposal to lower the fee.

Besides the Tulare Lake, Tule and Kaweah subbasins, the Kern, Chowchilla and Delta-Mendota subbasins also had groundwater plans deemed inadequate and will come before the Water Board starting in January 2025.

Original Article: [SJV Water by Lisa McEwen](#)

**US WATER NEWS****Historic Upper Colorado River Basin Agreement Requires States to Meet with Tribes**

A historic interstate, inter-governmental agreement is finally institutionalizing the much-needed practice of including the six Native American Tribes of the Upper Colorado River basin in Colorado River discussions. On Monday, March 4, 2024, the Upper Colorado River Commission, a multi-state water administrative agency tasked with ensuring the states of Colorado, Utah, Wyoming, and New Mexico allocate water pursuant to the 1922 Colorado River Compact, voted to support the unprecedented agreement, called the “Memorandum of Understanding Among the Upper Colorado River Basin Tribes and the Upper Colorado River Commission.”¹

Despite the fact that Tribes are entitled to approximately a quarter of the water within the Colorado River basin, the 1922 Colorado River Compact says nothing about including Tribes in decision-making mechanisms. In fact, signatures from Tribes were not even required for the Compact to become a binding agreement.

The Memorandum provides that the six Tribes of the Upper Colorado River basin—the Jicarilla Apache Nation, the Navajo Nation, the Southern Ute Indian Tribe, the Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Paiute Indian Tribe of Utah—and Commission, including the four upper-basin states, will meet approximately every two months.² The Memorandum institutionalizes and memorializes a practice that began in August 2022, known as the Upper Basin Tribes-States Dialogue. As part of the Dialogue, Tribes and states “collaborate and exchange information relevant to the Upper Colorado River Basin and to discuss potential collaborative action on interstate issues of mutual interest involving the Colorado River system as appropriate.”³ Per the Memorandum, the Dialogue “will not address any matters relating to the sovereign-to-sovereign relationships that exist between individual Tribes, the individual Upper Division States, and the United States, as such matters are outside the purview and authority of the” Commission.⁴

Although Tribes won't have voting rights or permanent seats on the Commission, the Memorandum is a mark of progress because it formalizes the requirement for continued discussions among Tribes and states in the Upper Basin. The Memorandum has not yet been finalized; while the Commission has approved the Memorandum, each Tribal Council must approve it on their own.

The Memorandum seems to be part of a growing recognition that tribal participation is a necessary component for sustainable use of the Colorado River.⁵ This past December, Amelia Flores, chairwoman of the Colorado River Indian Tribes, noted that “The Biden administration and Reclamation, under the leadership of Commissioner Touton, have done more than any other administration to engage tribal Nations in a meaningful



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way.”⁶ At the state level, Colorado created a Drought Task Force in 2023. The Task Force, which was created in part to “develop programs that address drought in the Colorado River basin,” includes a Sub-Task Force “to address tribal matters.”⁷ The Sub-Task Force includes representatives from Ute Mountain Ute and Southern Ute Tribes.⁸ Such efforts may be useful models for future efforts of institutionalizing tribal engagement.

Original Article: [University of Colorado by Frannie Monasterio](#)

Better snowpack for Colorado River may fend off ‘whiplash’ of recent years

Snowfall this week in the Rockies has improved the water picture for the Colorado River, but one expert says she’s not counting her chickens before they’re hatched.

Current information on the U.S. Bureau of Reclamation’s website shows that snowpack levels in the Upper Colorado River Basin are at 110% of normal for this time of year. That’s an improvement over March 1 when it was at 101%.

Rosemary Carroll, research professor of hydrology for the Desert Research Institute (DRI), said on Friday that important weeks are still ahead, even though the snowpack peak is typically measured on April 1 each year. Reclamation’s map shows snow water equivalent (SWE) — the amount of water contained in the snow.

“It feels like the season is coming to a close, but actually March is an incredibly important portion of the year,” Carroll said. “We should get quite a bit more snow in March and even April in the headwaters of the Colorado River up in the mountains. And so a lot is still left unknown at this point.”

Carroll, who works out of the small town of Crested Butte in central Colorado, said there have been other years when hitting the average on April 1 didn’t translate into a good water year. She said that happened in 2020, a year when April snows just never came. Snowpack that builds up in the Upper Colorado River Basin provides the water that flows down the river to Lake Powell and Lake Mead, the nation’s two largest reservoirs. Lake Mead is currently 37% full, and Lake Powell is 34% full.

But there’s reason for optimism. Projections in Reclamation’s 24-month study released on Friday have been adjusted to show about 2 1/2 feet more water in Lake Mead than previously projected for the end of November this year, and about 5 feet more by January of 2026. Lake Mead’s projected low point in June of next year — 1,044.01 feet — is now expected to come in July 2025 at 1,048.92 feet. (Lake levels are expressed as altitudes: the lake’s surface compared to sea level.)

And Carroll said current snow levels should help to avoid a previous pattern.

“We’ve been experiencing something, if you look through the record in terms of precipitation or snowpack, this thing we call whiplash where we get a really big year followed by a really dry year,” Carroll said. That doesn’t appear to be happening again this year.



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"I was really worried we were going to repeat that after last year, which was a great snowpack," she said.

Original Article: [8 News Now by Greg Haas](#)

Water authority allocated \$20 million by Legislature

A \$20 million capital outlay was granted to the Eastern New Mexico Water Utility Authority by the New Mexico Legislature in its 2022 30-day session that ended Thursday. The outlay was the largest among the capital outlay allocations the Legislature approved for Curry or Roosevelt Counties in its 2022 session.

The outlay allocation, like all legislation passed in the 2022 legislative session, must be signed by Gov. Michelle Lujan Grisham by March 9 or be subject to veto.

Curry County received just over \$26 million in capital outlay allocations, and Roosevelt County received more than \$2.4 million in capital outlays in the session in the capital outlay bill.

Original Article: [AOL](#)

Researchers take deep dive into how much water is stored in snow

A heavy snowpack is fun for skiers and sledders, and it also acts like an open-air storage tank that melts away to provide water for drinking, irrigation and other purposes during dry months.

But exactly how much water is held in snowpacks, and for how long?

That information, critical to water managers around the globe, has taken on new clarity thanks to a new, more holistic calculation technique developed by researchers in the Oregon State University College of Engineering.

"Water managers tend to consider a portfolio of infrastructure options—surface water reservoirs, groundwater recharge programs, etc.—to match supply to demand," OSU's David Hill said. "Increased understanding of how much water is in snow should allow them to make long-term planning decisions for how to adjust that portfolio."

The study by Hill, a professor of civil engineering, and doctoral student Christina Aragon looked at nearly four decades of snowpack data. Through their new metric, which they call snow water storage, they identified a 22% drop in how much water is held annually in the mountain snowpacks of the lower 48 states.

"Unlike other widely used metrics that capture snow variables at a single point in time, like maximum snow water equivalent, or describe snow characteristics in terms of time, such as length of snow season, snow water storage is applicable at numerous time and space scales," Hill said. "It's really just a cumulative sum, not a maximum value; it's like adding up the number of miles you drive in a given year, rather than just thinking about the 500 you did on one day for your road trip."



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In addition to introducing a better tool for gauging how much water is in snowpacks over periods of time, the findings are important because of what the new metric revealed about mountain snowpacks, which play an outsized role in the nation's water storage.

Hill and Aragon note that of all the water stored in the form of snow in the lower 48, 72% of it is in the mountains, though mountains cover just 16% of the total area.

"There are many ways to describe or quantify our snow resources, but some of the traditional measures, such as the April 1st snowpack, increasingly do not tell the full story," Hill said. "We present a new way of describing snow's water storage ability that adds deeper understanding and has more applicability in cases where our snowfall is increasingly intermittent or, regrettably, turning to rain."

The researchers' work, presented in a paper published in *Hydrology and Earth System Sciences*, builds on a commonly used measurement known as snow water equivalent; as its name implies, it's how much water is left in a container after the snow that was placed in it melts.

"By considering the amount of water held in the snowpack and the amount of time the water is stored as snow, we are able to quantify water storage in different types of snowpacks," Aragon said. "This includes persistent snowpacks, like we typically have at high elevations in the mountains; transient snowpacks, which are typically found at lower elevations; and snowpacks that are transitioning from persistent to transient due to climate warming."

Aragon adds that because the snow water storage metric can be applied to multiple types of snowpacks, it may become increasingly valuable for monitoring and predicting water resources "amidst a future of increased climate variability."

Hill points out that the past several years in the lower 48 have seen a "feast or famine cycle of extremes when it has come to the where and the when of our snow and rain." And in general snowpacks have considerably declined over the past 10 to 20 years.

"That particularly matters in places like Oregon, where 15% of the state's total annual precipitation falls as snow, and our snowpack functions like a reservoir," he said. "It holds back winter precipitation and slowly releases it in spring and early summer. This is useful because, at those times, our rainfall has tapered off for the year, but demand for water is on the rise."

As the climate warms and snowpacks become more and more variable—the winter of 2023-24 is a good example, Hill said—a metric like the new one developed at OSU helps to more objectively quantify the reservoir storage aspect of the globe's snowpacks.

From local to regional scales, he notes, municipal and agricultural users of water need to balance demand with supply, and snow storage dramatically influences the timing of the supply side.

"As we move forward, and as we have moved from the past to the present, the relatively good news is that annual precipitation amounts tend to not change that dramatically,"



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he said. "However, changing temperatures greatly influence snow storage and therefore the timing of water availability."

Original Article: [Phys.org by Steve Lundeberg, Oregon State University](#)

GLOBAL WATER NEWS

Failing Water System Is South Africa's Next Crisis

South Africa is facing the prospect of a breakdown in the water supply to its industrial heartland and most-populated region, adding to the woes of an economy battered by power outages, congested ports and a broken freight-rail system.

Rand Water Services Ltd., Africa's biggest bulk-water supplier, on March 16 told three municipalities in the central Gauteng province — Johannesburg, Tshwane and Ekurhuleni, which have a combined population of more than 13 million people — that its system was on the verge of collapse.

Original Article: [Bloomberg by Antony Squazzin](#)

The Panama Canal averts a crisis for now—but at a cost to drinking water

The Panama Canal has avoided the worst of a shipping crunch that threatened to upend the global economy—but at a cost to marine life and the Latin American country's supplies of drinking water.

After imposing strict limits on vessel traffic last year as drought left water levels languishing, the Panama Canal Authority is increasing the number of ships that can cross.



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Thanks to conservation measures, water levels fell just over a foot for the year through March 12, compared with three feet during the same period of 2023.

Those measures, though, come with side effects. The canal recycles water from locks that vessels pass through, instead of simply flushing it into the ocean. This reused water gets saltier, and some of it infiltrates Lake Gatún, an artificial lake that forms part of the channel and is also Panama's largest source of potable supply.

The Panama Canal's challenges highlight how combating climate change carries inevitable tradeoffs. As policymakers take action to limit the effects of global warming, there can be unintended consequences for the environment and the economy. And time is of the essence: Drought is already altering the world's trade flows, creating chokepoints last year on the Mississippi River in the U.S. and the Rhine in Europe.

This year, Panama has had roughly two-thirds of its normal rainfall, said Fred Ogden, a former University of Wyoming civil engineering professor who has done extensive work in the country. Upgrades to the canal have made the situation worse, because new locks opened in 2016 to accommodate bigger ships that require more water.

Climate change means "things are changing at a pace that is basically surprising everyone," Ogden said. The canal expansion has "increased the likelihood of drought restrictions. When you throw a drought on top of that—oh my gosh. What a mess."

The Panama Canal's low water levels and efforts to conserve what's left have made Lake Gatún more salty. Salinity is at the highest since 2020, when the Smithsonian Tropical Research Institute began collecting data, and still growing, said Steve Paton, the director of the institute's physical monitoring program.

The lake's salinity shot up after the new set of locks was inaugurated in 2016. Up until that point it was 0.05 parts per thousand, and with the increased trade flows it quickly rose and reached 0.35 parts per thousand four years ago. It's now nearing that level again and will probably hit or surpass it before the rainy season starts, Paton said.

The canal authority's chief hydrologist, Erick Córdoba, said during an interview in November that finding new sources of freshwater will be critical to ensuring Panama can meet growing demand from the population, shippers and local industry. One plan is to create a new reservoir at a river valley near Lake Gatún to supply additional water. The canal is also looking to invest in more rainwater collection to help reduce salinity in the lake, he said.

Under normal circumstances, the Panama Canal handles about 3% of the world's maritime trade volumes and 46% of containers moving from Northeast Asia to the U.S. East Coast. Bottlenecks at the canal can ripple throughout the global economy, particularly as attacks by Houthis in the Red Sea add to shipping disruptions.

Last year, the El Niño weather pattern led to one of the driest years on record for the Panama Canal and forced it to slash transit. But El Niño is now fading, which means the rainy season should hit in late April or May, allowing the canal to ease shipping limits.



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The authority will allow 27 vessels a day to transit by late March, up from the current 24 but still well below the pre-drought capacity of 38.

"The forced reduction" in vessels "is having the desired effect of lowering total water consumption," said Jorge Luis Quijano, a consultant and former chief executive officer of the canal authority. "However, it is difficult to predict if these favorable changes in weather will be enough to guarantee returning to 38 transits per day sometime later this year or next."

Quijano said the canal could possibly increase to 30 or 32 vessels a day after the dry season ends, and then progressively raise the limit further if rainfall is favorable. In a statement on March 11, the canal authority said it's monitoring water levels and will announce any further changes in a timely manner. It didn't respond to additional requests for comment.

Other observers are more optimistic. Volumes could return to normal in three to five months, said Julia Junnan Zhao, principal data scientist at Dun and Bradstreet, a global data and analytics provider.

Any increase in vessels through the canal will come as a relief to shippers, some of whom paid millions of dollars to jump the queue while others took longer, costlier routes around Africa or South America.

In the meantime, the threats to drinking water and marine life remain. The canal authority's strategy of recycling water could prompt marine species to start traveling between the Pacific and the Atlantic, disrupt coastal environments and even decimate fish stocks that communities along the Pacific and Caribbean rely on for food and tourism, Paton said.

Lionfish are an example of what can go wrong with invasive species. They are suspected to have escaped from aquariums along the U.S. East Coast during floods and storms, and now threaten native fish populations in the Gulf of Mexico and the Caribbean. A new saltwater corridor could wreak similar havoc on both sides of Panama.

Signs of that shift are already emerging. As rising salinity reduces the barrier between the oceans, researchers are seeing an increasing number of marine species in Lake Gatún, Paton said.

It's an example of the risks policymakers are grappling with as they confront the impact of climate change on freshwater supplies. Drought plagued regions all over the world last year, including the Americas, Africa and the Mediterranean.

The parched conditions have "given a big wake-up call to a lot of people," Ogden said. "The future does not look bright for the consistency of water resources that we've been able to rely on up until now."

Original Article: [Phys.org by Peter Millard, Michael McDonald and Eric Roston, Bloomberg News](#)

São Paulo state set to increase irrigation initiatives



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São Paulo state seeks to increase its irrigated areas, which will likely generate new projects.

“Our goal is to double [irrigated areas] coverage in a maximum of four years and reach 15% by 2030,” agriculture and supply secretary Guilherme Piai said in a statement. Currently, only 6% of São Paulo's productive area is irrigated.

The plan is being developed in partnership with the University of Nebraska and company Lindsay, which operates in more than 90 countries.

The state will provide financing for farmers' irrigation initiatives.

Currently, the country's irrigated agricultural areas correspond to less than 20% of the total cultivated area, but are responsible for the production of more than 40% of food, fiber and bioenergy crops.

São Paulo's plans come as extreme weather events are becoming more intense and numerous.

“The effects of climate change are increasingly strong and São Paulo is going through a period of great drought. But those who have their crops irrigated have their production guaranteed,” said Piai.

Original Article: [bnamercias](#)

Wall Street Banks to End Euro Drought With Bonds Worth Billions

Morgan Stanley and JPMorgan Chase & Co. are piling into Europe's bond market to raise money, the first Wall Street banks to do so this year as they take advantage of strong funding conditions.

Morgan Stanley's three-part €5 billion (\$5.5 billion) offering is its biggest since at least 2008, while JPMorgan has already drawn more than €6.2 billion in orders for its €2 billion sale on Monday, according to people familiar with the matter. The former last raised publicly-syndicated euro debt more than a year ago, and three tranches is its most ever.

Original Article: [Bloomberg Law by Ronan Martin](#)

Can Catalonia learn to live with drought?

How is the Spanish region of Catalonia adapting to drought? The main reservoir that feeds Barcelona is almost empty and the water regeneration and desalination plants are at full capacity. Meanwhile private companies are making their own efforts to economise and recycle water. Is it enough?

"We will change because there's no other option for us," says scientist Vicenç Acuña, as he gestures towards the almost empty Sau reservoir in Catalonia. We should be looking at a huge artificial lake, but instead the concrete wall of the reservoir barrage is bare, towering above the valley and the remaining brown water tens of metres below. It hasn't rained enough in this region for nearly four years, and this reservoir, one of the main supplies for the Barcelona region, is below 15% capacity.



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Here in the hinterlands of Catalonia, near the town of Vic, the hills used to be known for cascades and waterfalls, but today they are a draw for tourists and journalists who come to photograph a once-flooded valley turned giant dustbowl. At the beginning of February, the region declared an official drought emergency, limiting water consumption for agriculture, industry, and private use like refilling swimming pools.

Warmest February on record

Our visit to Catalonia comes as the Copernicus Climate Change Service reports that February was the warmest on record globally, with temperature 0.8 degrees Celsius above the 1991-2020 average.

We have now had nine months in a row of record-breaking warm temperatures for the time of year.

In Europe, there were large warm anomalies in many countries. Temperatures in Romania were 6.8 degrees above average for February, Switzerland was 4.6 degrees above average, and England was 2.9 degrees above the average for the month.

The surface temperature of the ocean outside polar regions also broke a new absolute record, averaging 21.06 degrees Celsius in February.

How is Catalonia adapting?

Today there is growing pressure to accelerate adaptation efforts in Catalonia, a region which is no stranger to drought. Many of the installations now in place were built in response to a long period without significant rain in the late 2000s.

The region is not alone in suffering from a lack of rain, either. Long-lasting, above-average temperatures, warm spells and poor precipitation have led to severe drought conditions at the moment across the Mediterranean region, affecting numerous areas across southern Italy, southern Spain, Malta, Morocco, Algeria and Tunisia.

What does adaptation to drought really involve? Acuña, research scientist at the Catalan Institute for Water Research, said that the first step is “to reconsider the activities that you do, and those that you do not want to change for whatever reason, you need to be more efficient in the use of water”.

"You need to use less water for the same purpose, or reuse water locally so that you do not rely so much on natural water from rivers," he added.

Many of the adaptation initiatives in the region come from private companies. The Hotel Samba in the popular seaside resort of Lloret de Mar is often cited as an example of progressive water management. It began recycling water from showers and washbasins for use in the hotel's toilet systems 25 years ago. They saved over 10,000m³ of water in 2023, according to sustainability manager Laura Pérez Flores.

The hotel is now working with scientists to reuse water from showers and sinks to grow plants. "There are a number of edible vegetables that we are experimenting with to see if it's viable to irrigate them with this grey water," Pérez Flores explained.



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Another private water-saving initiative supported by the Catalan Water Partnership is found at meat-processing company Grup Viñas. It invested in its own water treatment plant initially to reduce the fees it paid to the local water company, however it has now begun re-using water in its facilities for cleaning.

Nevertheless, the management expresses frustration at the limitations that Spanish legislation imposes on their water reuse. At the moment, they are only allowed to use 10% of their treated water. Sustainability Manager Nuria Romero told Euronews: "They are asking us to reduce consumption and we are pouring clean water into the sewage system when this water could be used for other purposes."

Today less than half of the water consumed in the Greater Barcelona region comes from conventional sources such as reservoirs. At least 25% of demand is met by the desalination plant at El Prat de Llobregat, close to the airport. The huge facility operates at 100% capacity 24 hours, seven days a week, sucking seawater from the Mediterranean around 2 km offshore and transforming it into potable water for the population.

Original Article: [Euro New Green by Jeremy Wilks](#)

Chile eyes year-end tender launch for first desalination concession

Chile is aiming to launch a tender for its first desalination concession around the end of this year as authorities finetune details of the bidding rules for the US\$286mn plant in Coquimbo region.

"A few things have yet to be defined, such as the business model," Óscar Vásquez, project manager at state water services concessionaire Econssa, said when answering a BNamericas question at the Desalination Latin America 2024 congress in Santiago.

The project entails a plant with capacity of 1,200l/s that is expected to benefit 540,000 residents in the north-central cities of Coquimbo and La Serena.

Vásquez added that tariff models are being discussed, as well as how they will be updated every five years like other water service concessions.

"[Water regulator] SISA is required by law to seek out the most economic scheme, not the most efficient," Vásquez said.

Econssa opened Chile's first fully state-funded desalination plant in 2022, which involved a US\$250mn investment in northern Atacama region.

Vásquez highlighted that nearly half of the construction phase was carried out after the eruption of the COVID-19 pandemic, and that the project obtained broad support from the local community, saying that information meetings and a commitment to employ locals were key.

He said projects should not only offer a service but also make people in the areas of influence part of their development.



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When asked by BNamericas, Vásquez said Econssa rules out planning any desalination plants for other regions, adding that Atacama was a special case in which it was decided only the state-owned concessionaire could have developed such a project at the time.

Original Article: [bnamericas](#)

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