

Veles Water Weekly Report

1. **WATERTALK**
TECHNICAL ANALYSIS BY JOSHUA BELL
 2. NQH2O INDEX VS H2O FUTURES PRICE PERFORMANCE
 3. NQH2O INDEX HISTORY
 4. NQH2O INDEX AND H2O FUTURES VOLATILITY ANALYSIS
 5. CENTRAL VALLEY PRECIPITATION REPORT
 6. RESERVOIR STORAGE
 7. SNOWPACK WATER CONTENT
 8. CALIFORNIA DROUGHT MONITOR
 9. CLIMATE FORECAST
 10. WESTERN WEATHER DISCUSSION
 11. WATER NEWS
 - I. CA WATER NEWS
 - II. US WATER NEWS
 - III. GLOBAL WATER NEWS
-

April 28th 2022

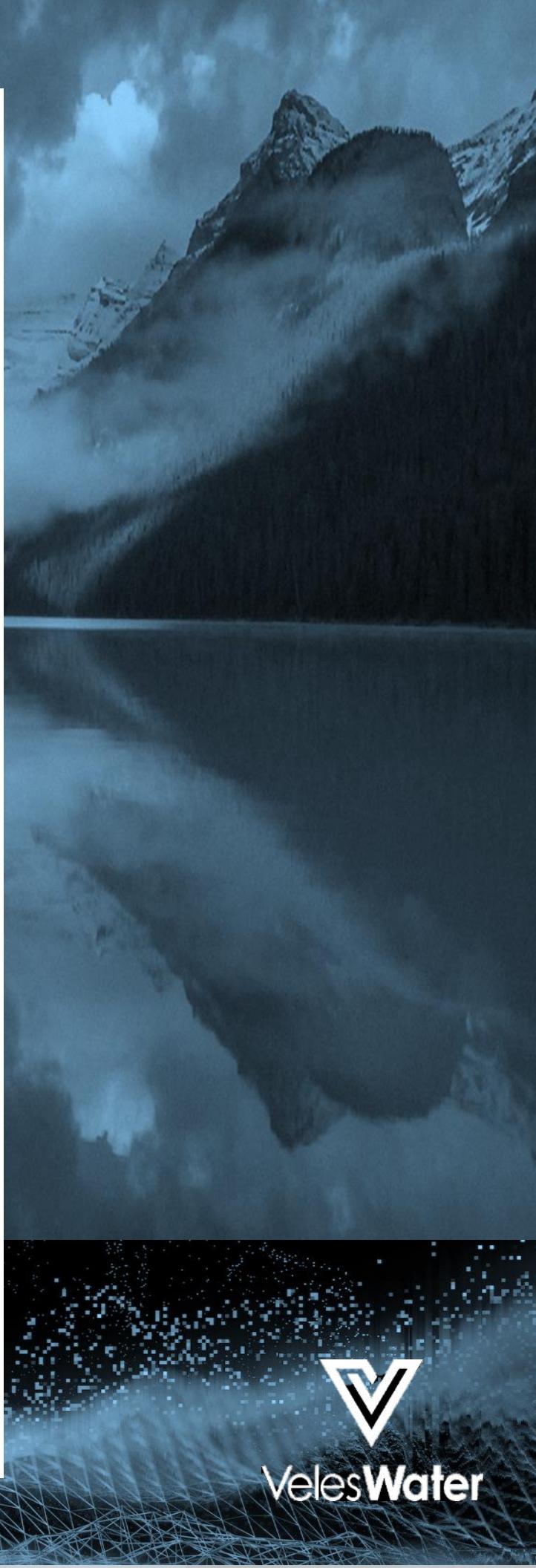
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VelesWater



WATER FUTURES MARKET ANALYSIS

Welcome to **WATERTALK**

by Joshua Bell

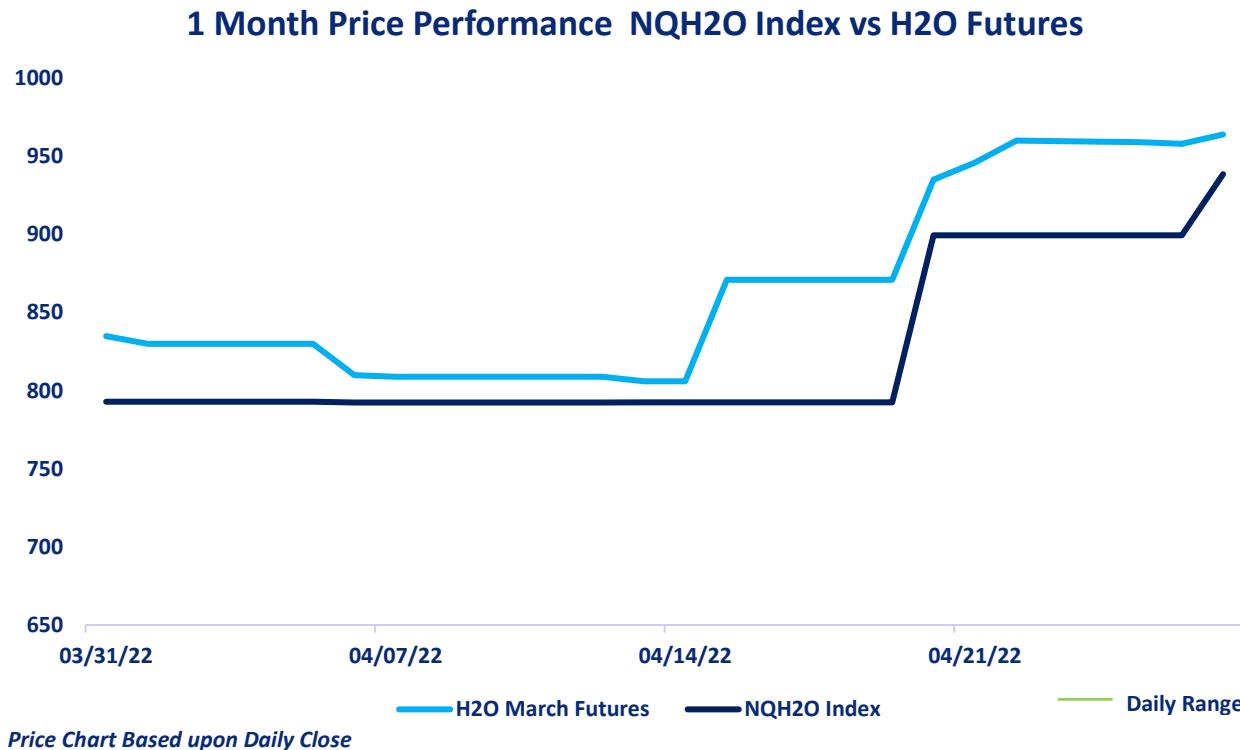
CLICK THE LINK BELOW

"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/704050710>



NQH2O INDEX PRICE vs H2O FUTURES PRICE



The new NQH2O index level of \$938.59 was published on the 27th of April, up \$39.09 or 4.35%. The front month or May contract has been trading at premium of +\$25.41 - \$60.50 to the index over the past week.

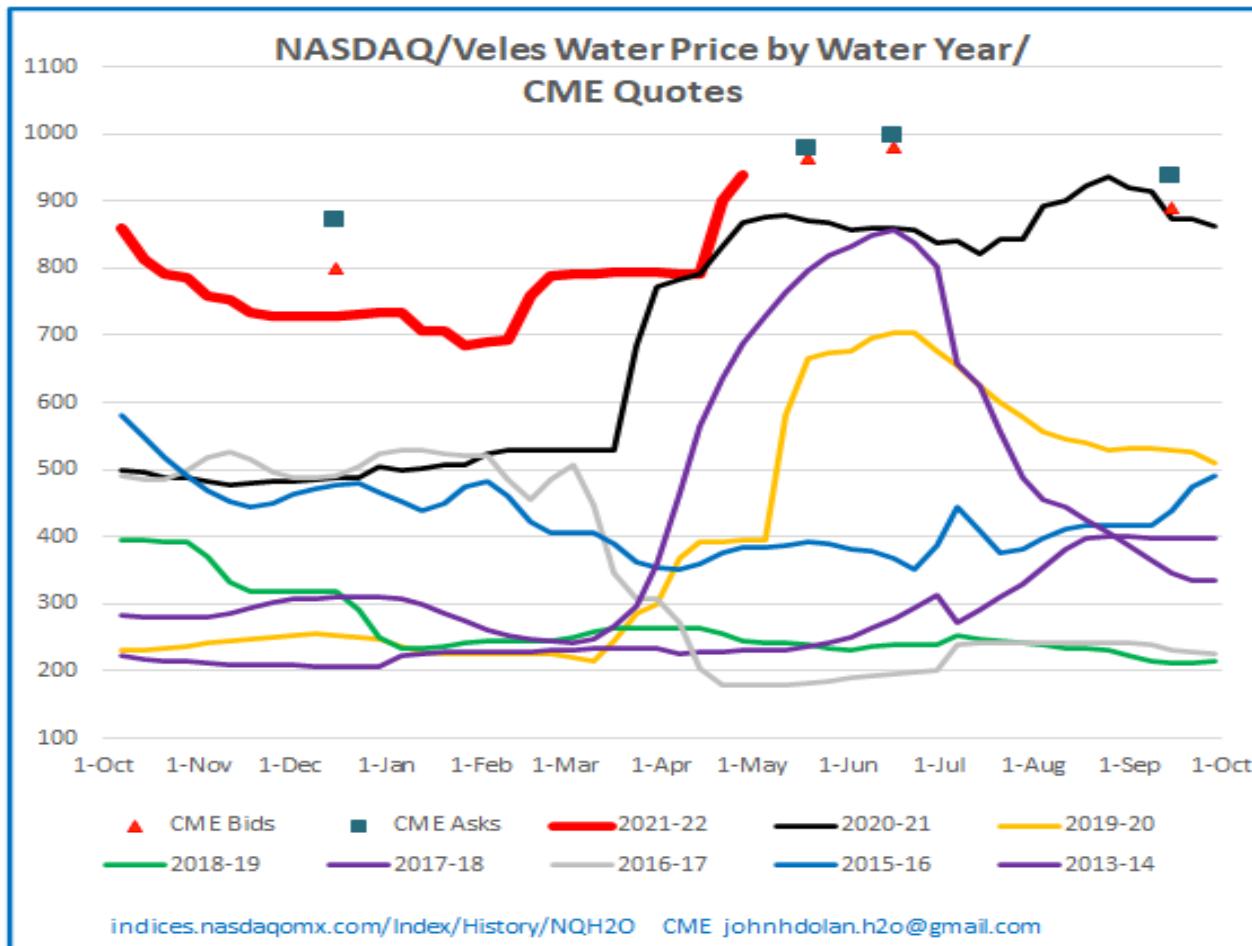
NQH2O is up 32.87% Year to Date.

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

May 22	964@976
June 22	980@995
Sept 22	890@935
Dec 22	800@870
Jun 23	960@1020



NQH2O INDEX HISTORY



The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and the possibility of rain/snow. The restricted ability to “carry” water, much like one can do with financial contracts, gives this index the same type of seasonal pattern that one sees on some other commodities.

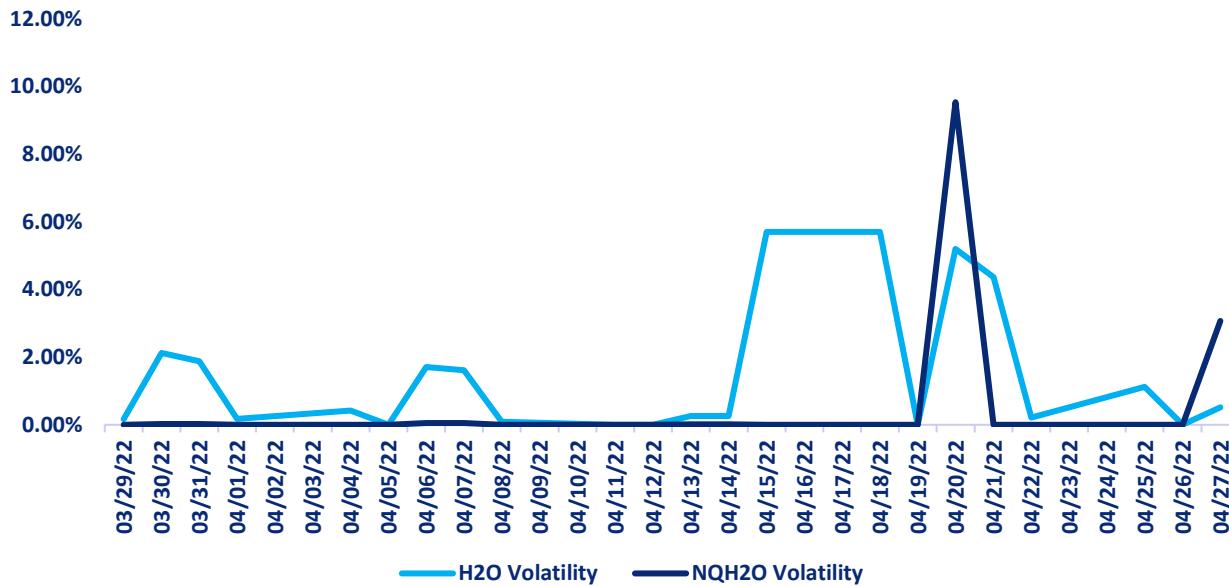
The graph for 2021 is highlighted in red. It shows the same seasonal climb, but at record-high values above each of the last eight years since February. Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and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

(John H Dolan, CME Market Maker)



H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the April daily future volatility high has been 4.36% on April 21st and a low of 0% on April 26th

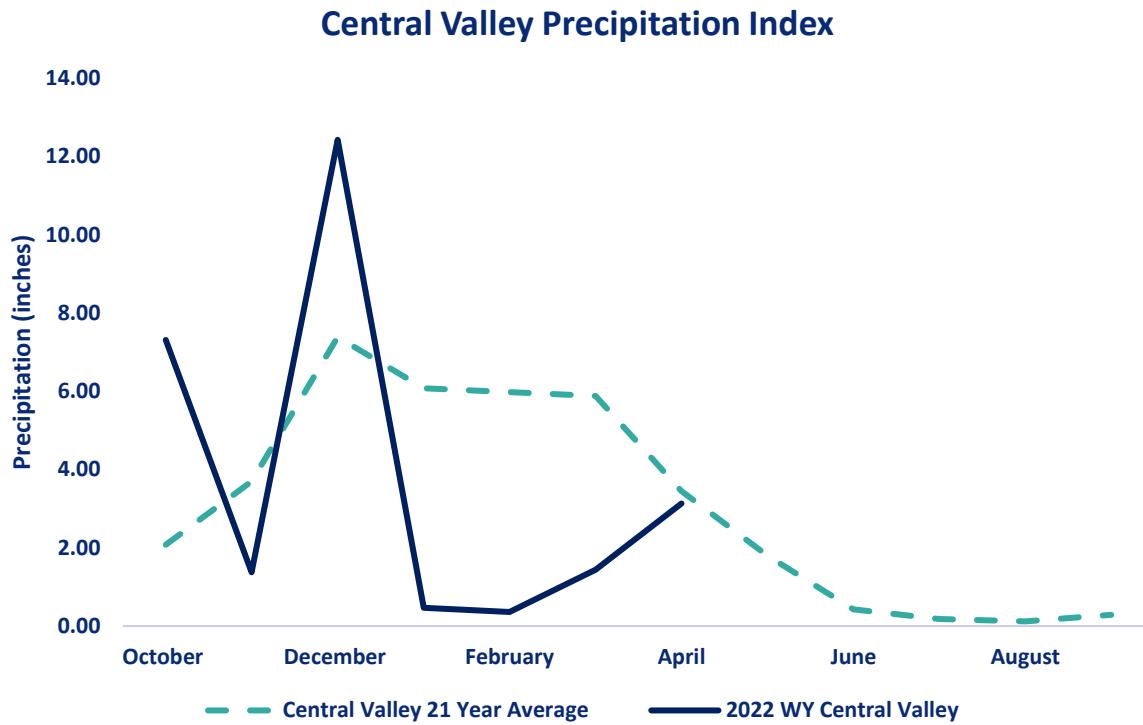
ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	22.03%	12.22%	12.74%	9.14%
H2O FUTURES	N/A	13.97%	11.18%	1.62%

For the week ending on the April 27th the two-month futures volatility is at a premium of 1.75% to the index, up 0.85% from the previous week. The one-month futures volatility is at a discount of 1.76% to the index, down 0.20% from last week. The one-week futures volatility is at a discount of 7.52% to the index, this has increased by a further 7.26 % from the previous week. The index volatility has increased as the 1 month and 1 week futures volatility are now both at a discount to the index. The most likely scenario is some convergence where index volatility decreases.

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



CENTRAL VALLEY PRECIPITATION REPORT



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 27/04/2022

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2022 WYTD VS 2021 WYTD %	2022 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	2.21	1.23	62.02	49	68
TULARE 6 STATION (6SI)	1.15	0.86	44.76	37	63
NORTHERN SIERRA 8 STATION (8SI)	6.05	1.87	143.64	46	82
CENTRAL VALLEY AVERAGE	3.14	1.32	83.47	44	71

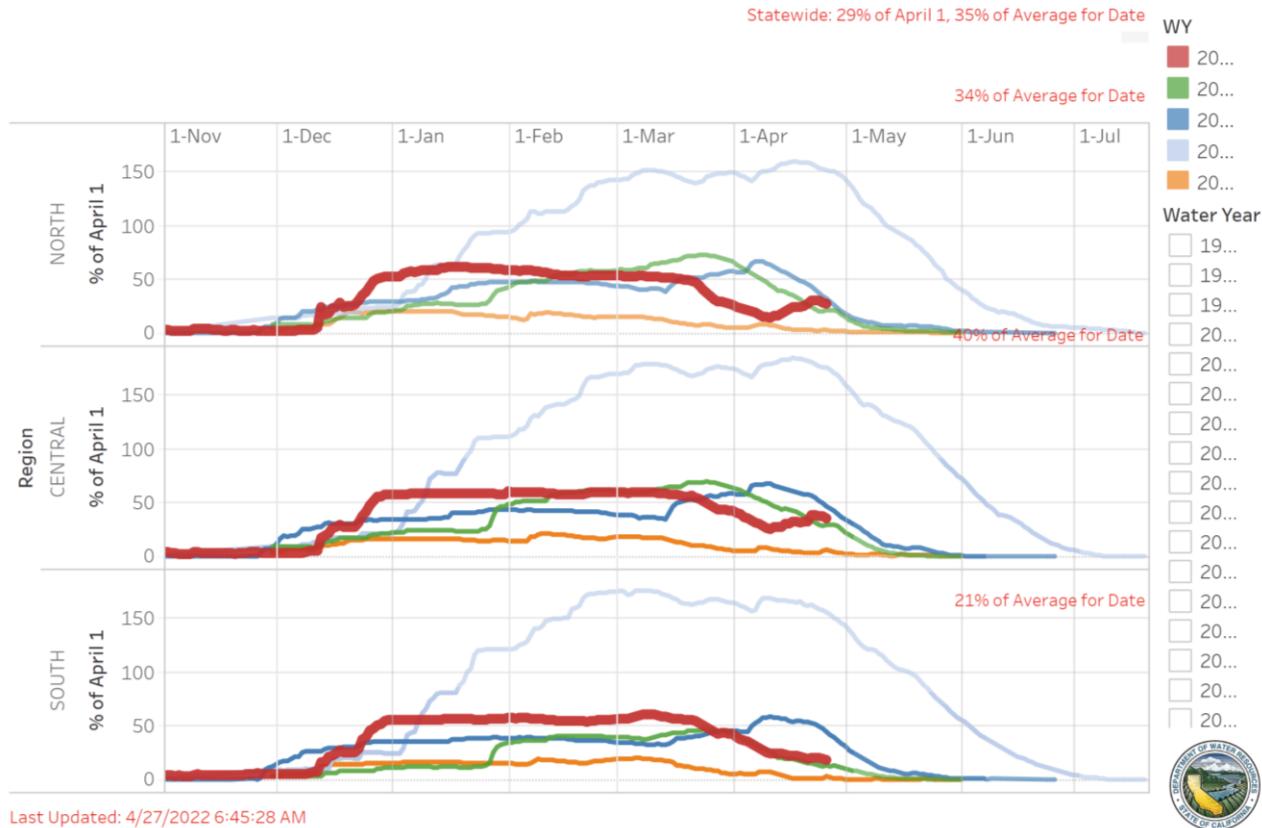
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	772,069	32	54	41
SHASTA LAKE	1,791,425	39	51	47
LAKE OROVILLE	1,875,643	53	42	70
SAN LUIS RES	942,087	46	51	55



SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



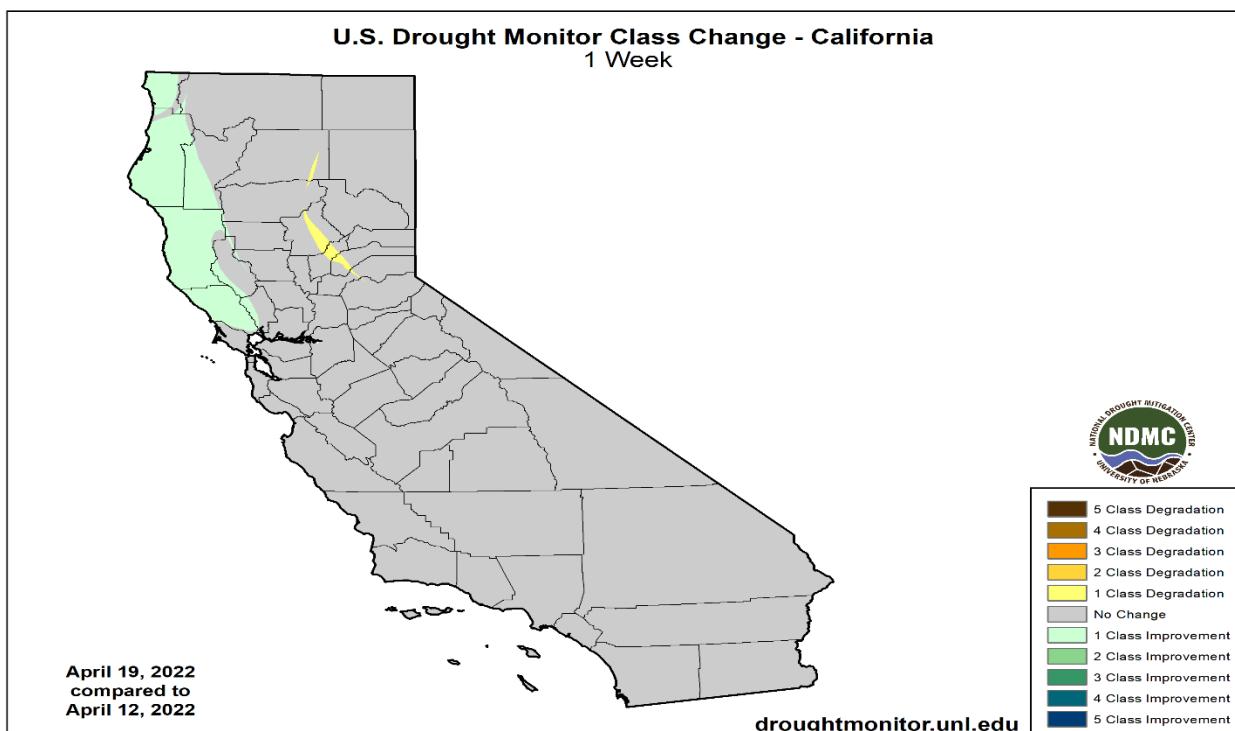
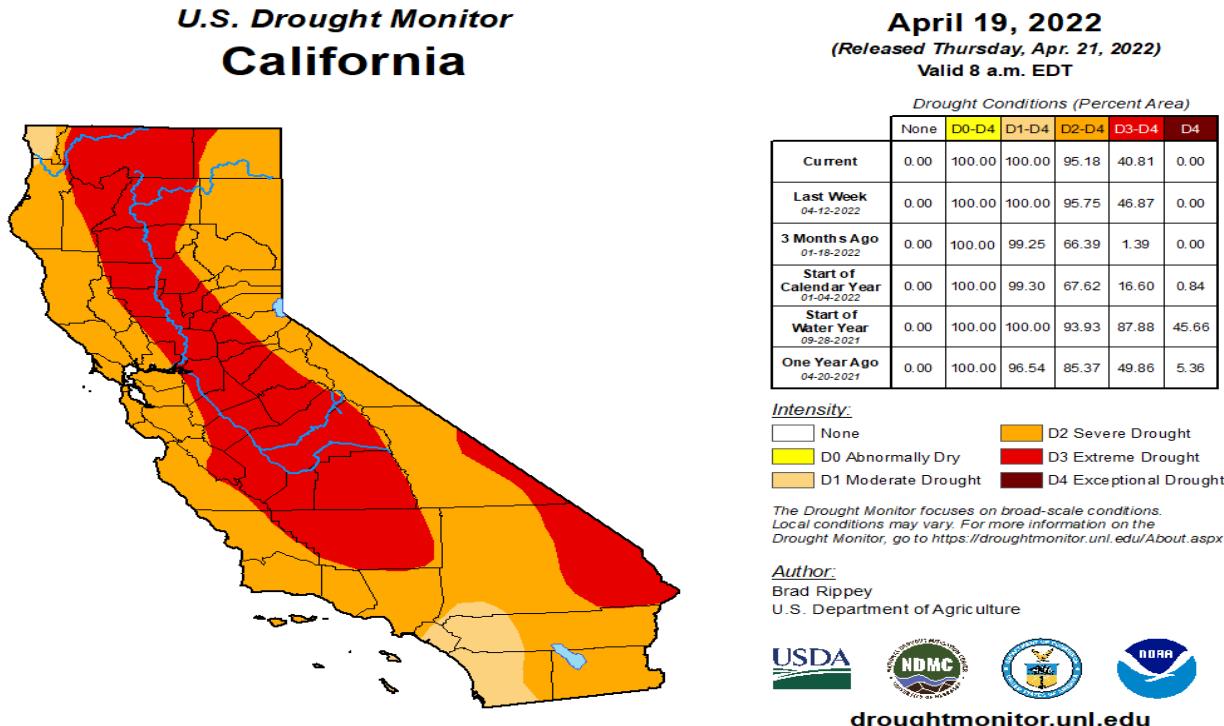
REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	7.6	0.60%	27	34	27
CENTRAL SIERRA	10.4	0.90%	34	40	35
SOUTHERN SIERRA	4.6	-0.60%	15	21	18
STATEWIDE	8.1	0.50%	27	35	29

*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

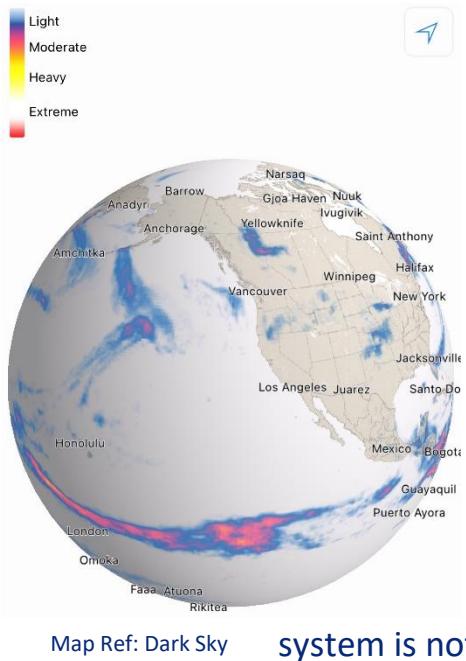


The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been 6.06% Class 1 improvement in D3 Extreme Drought conditions and a Class 1 improvement in D2 Severe Drought conditions.

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



CURRENT SATELLITE IMAGERY



The satellite picture shows some light and scattered cloud cover over parts of the Northwest, plus some small cloud cover over the Midwest and patchy clouds over portions of the East. There is a frontal system approaching from the Pacific Northwest and we expect this to hit landfall over the weekend.

This will bring light precipitation to the Northwestern regions as far south as Northern California. Another frontal system is brewing over the Northwest Pacific and we expect this to bring showers to the Northwest later next week.

The LA area and the Central Valley region will be relatively dry throughout.

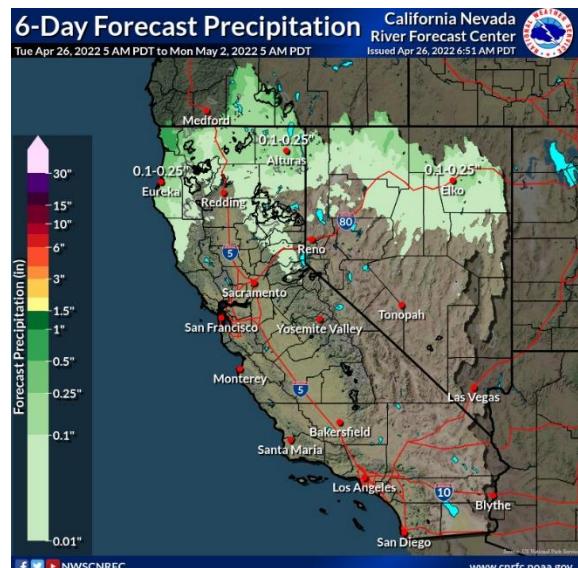
There is no Monsoon activity prevalent and this weather system is not active at this time

10 Day Outlook

Look for west to southwest flow aloft to develop across the area as the cool airmass remains anchored to the north just off the BC coast. One weak disturbance will move across the Pacific Northwest on Wednesday keeping the precipitation to the north of the area...while a secondary weak s/wv trof moves across southern CA. At this time...this feature is expected to not bring any measurable precipitation to the region. Next chance for precipitation will once again be near the CA/OR border as a sharpening s/wv trof approaches the northern CA coast on Thursday with the best opportunity for precipitation remaining over the upper Klamath River basin...far northeast CA...and extreme northern NV.

Amounts look to be slightly lower as compared to the first system from Mon/Tue (0.10-inch or less). Freezing levels will range from 4000- to 6000-feet. A transitory upper ridge will slide across the area on Friday for dry conditions...while the next system expected on Saturday will cross the Pacific Northwest coast during the morning hours. At this time...thinking is that most of the precipitation will remain north of the area.

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





WESTERN WEATHER DISCUSSION

A classic La Niña regime has developed in recent weeks, providing beneficial moisture across northern California and the Pacific Northwest, eastward to the northern Rockies. At the same time, dry, often windy weather has affected the nation's southwestern quadrant. As a result, deterioration has been observed in parts of the Southwest, particularly in New Mexico. According to the U.S. Department of Agriculture, Montana (85%) led the West in topsoil moisture rated very short to short on April 17, followed by New Mexico (80%). New Mexico, in addition to the McBride Fire, has been dealing with several other blazes, including the 7,573-acre Hermits Peak Fire, which started as a prescribed fire northwest of Las Vegas on April 6 before escaping containment. More recently, the Crooks Fire has been actively burning south of Prescott, Arizona, with numerous evacuations in effect. Farther north, however, the recent spell of cool, damp weather has generally boosted topsoil moisture, has locally improved water-supply prospects, and has provided a late-season boost in high-elevation snowpack. Snow briefly fell at lower elevations, too, with the airport in Portland, Oregon—which had never experienced a measurable April snowfall—receiving 1.9 inches on April 11-12. The airport's previous latest snow had fallen on March 25, 1965, when 0.3 inch fell. Downtown Portland, hit with 2.0 inches of wet snow on April 11, also set a record for its latest accumulation (previously, 0.1 inch on April 10, 1903). Measurable snow fell in Great Falls, Montana, each day from April 11-17, totaling 12.2 inches. Farther west, the first-ever measurable April snow fell at the agricultural experiment station in Wenatchee, Washington. Incredibly, the Wenatchee Experiment Station received 10.4 inches of snow on April 14, boosting its month-to-date total to 13.1 inches. A neighboring station, the Wenatchee Water Plant, received a storm total of 5.4 inches, breaking its April 1935 record of 0.5 inch. The net effect of the Northwestern precipitation was to result in slight trimming of moderate to extreme drought (D1 to D3). However, there was often a fine line between areas that received beneficial precipitation and those that did not.

Reference:

Deborah Bathke, National Drought Mitigation Center
Brad Rippey, U.S. Department of Agriculture

**WATER NEWS****CALIFORNIA WATER NEWS****California drought plan could exclude cannabis as growers prepare for dry summer**

Heading into another brutally dry summer, struggling cannabis growers in California could be excluded from the state's latest assistance plan to save water.

A proposal by Gov. Gavin Newsom would pay farmers to not plant crops, known as fallowing, this year as drought conditions worsen.

The plan with some of the state's largest water providers earmarks \$268 million in upfront payments for voluntarily leaving fields uncultivated, or fallowing.

The area targeted is near two critical watersheds that emanate from the Sierra Nevada mountain range in Northern California.

The fallowing proposal aims to cut production of water-intensive crops such as rice, alfalfa and nuts.

Some advocates are upset cannabis hasn't been placed on the list.

"It's an unfortunate double standard that some farmers are deemed worthy of receiving this kind of support, but cannabis farmers, who are still fighting to have cultivating cannabis plants recognized as agriculture, are in a position where they have no ability to pause their operations and their tax burden without endangering their ability to remain in the licensed market," said Michael Katz, executive director of the Mendocino Cannabis Alliance.

"If we don't see more support programs that factor in the drought ... we will see the continuing loss of small independent cannabis businesses."

The state's Department of Cannabis Control (DCC) pointed out that the policy is still being developed.

"It is our understanding these policies are in their preliminary stages of discussion and development and have not defined sectors they will be allocated to," DCC spokesperson Maria Luisa Cesar said.

She added that the department "is committed to supporting the administration's efforts to respond to California's drought and will continue exploring policies that assist small farmers and recognize their responsible stewardship of the environment."

The fallowing initiative is part of Newsom's \$2.9 billion water-quality control plan that aims to free up a dedicated annual supply of fresh water while maintaining, restoring and replenishing fish and wildlife habitats, reservoirs, aquifers and other water basins through mandated conservation practices.

The Origins Council, which represents nearly 900 licensed small and independent marijuana businesses, has been advocating state and local governments for six months to enact fallowing policies because of drought conditions.

VELES WATER WEEKLY REPORT



"To date, they have not committed to create a fallowing policy," the organization's executive director, Genine Coleman, told MJBizDaily.

"The state has an ethical obligation to support our cannabis farmers in being able to fallow during this unprecedented historic drought."

Original Article: [MJBiz Daily by Chris Casacchia](#)

California State Senate Approves Water Conservation Standards Built for New Climate Reality - Senator Hertzberg's SB 1157 Updates State Indoor Water Use Standards Reflecting Historic Drought and Climate Emergency

As California faces the driest stretch the West Coast has seen in 1,200 years, the Senate took action last Thursday and approved historic water conservation standards, moving the state closer to achieving water efficiency as a way of life.

SB 1157, authored by Senate Majority Leader Emeritus Bob Hertzberg (D-Van Nuys), aligns California's indoor water use standards with recommendations from the State Department of Water Resources (DWR) and State Water Resources Control Board (SWRCB) based on years of data they collected.

"This kind of water policy is what we like to call raging commonsense. As we stare down potentially endless, worsening cycles of drought in California, our water policy must match and support efforts to conserve," Senator Hertzberg said. "If we don't update standards and change what conservation and efficiency means, we will be in big trouble because climate change has thrown out all the rules. We must go on offense to keep faucets flowing for all Californians."

In 2018, the Legislature approved SB 606 (Hertzberg) and AB 1668 (Friedman), which established a foundation for long-term water efficiency improvements to enhance the state's resiliency to drought. State agencies determined Californians' water use was already in line with the existing goal set for 2030 and recommended they be updated as water efficiency improves. The current median water use is 48 gallons per capita daily – this bill updates the standard to 47 gallons starting in 2025 and 42 gallons in 2030.

Californians have become more efficient with their water usage over time, and the changing climate and dwindling water supply requires the state continue making strides in water conservation and efficiency – not only to respond to the current "megadrought," but to better prepare for the next one.

"Water efficiency is a fast and inexpensive way to stretch limited water supplies, especially during the extreme drought conditions Californians are living through now," said Victoria Rome, NRDC's (Natural Resources Defense Council) Director of California Government Affairs. "SB 1157 establishes a roadmap for indoor water use standards over the next decade to truly make conservation a California way of life."

"Ensuring water systems plan and design their rates to encourage conservation is a step in the right direction towards achieving the Human Right to Water in California," said Kyle Jones, Policy & Legal Director with Community Water Center. "As climate change



VELES WATER WEEKLY REPORT

continues to limit what little water we have, indoor water efficiency is fundamental to all communities having access to affordable and accessible water moving forward."

Original Article: [Sierra Sun Times/ Bob Hertzberg](#)

April Showers Won't Bring an End to Local Water Restrictions

While April's rain showers certainly helped bring up Bay Area rainfall totals, they won't be enough to stave off the state's third year of drought, and that means round of strict city-level restrictions.

As of Friday, the state had received 15.63 inches of rain, 75 percent of the historical average, according to California Water Watch, which offers an online map searchable down to the zip code level. The San Francisco watershed fared slightly better, with 16.2 inches for the year to date, 79 percent of the average for the full water year through Sept. 30.

The Western Regional Climate Center's latest drought index map, updated April 11, showed coastal regions of the San Francisco Bay Area in a moderate drought, with some South Bay areas, south to Big Sur, already in severe conditions. The National Weather Service Bay Area said Sunday the rainfall for the week ending April 19 resulted in Sonoma County being downgraded from extreme drought to severe drought but in most areas drought classifications were unchanged.

Following three of the driest months on record, as of April 1 California's snowpack levels were well below average, and the outlook for water deliveries was grim. Officials from the California Department of Water Resources conducted their annual April 1 Sierra Nevada snowpack survey and found that levels were just 38 percent of average.

All this, along with Gov. Gavin Newsom's January emergency drought declaration, means another summer of water restrictions on local water customers.

The state emergency regulations mean residents must:

-- Turn off decorative water fountains;

Original Article: [NBC Bay Area](#)

Major funding secured for water resiliency projects in northern Sonoma County

In response to the ongoing drought, three key water resiliency projects have secured \$17 million in funding from the State of California's Department of Water Resources to supplement local funding.

The Alexander Valley Flood-Managed Aquifer Recharge (Flood-MAR) project received \$7 million toward a \$9.6 million recharge project; the City of Healdsburg received \$7 million toward a \$13.9 million pipeline; and the City of Cloverdale received \$3 million for systemwide improvements.

VELES WATER WEEKLY REPORT



According to a press release from the County of Sonoma, several agencies partnered up to apply for the state funds through its 2021 Urban and Multibenefit Drought Relief Program.

"Historic challenges require historic action," said James Gore, chair of the Sonoma County Board of Supervisors. "This section of North County is one of the most fragile for water security, and these investments, taken in conjunction with conservation, will help secure our water resiliency."

To help offset the use of potable water during the drought, the City of Healdsburg is planning to construct a 4.5-mile distribution network to deliver disinfected recycled water to the city's parks, schools, golf courses, athletic fields and cemetery.

The use of recycled water is expected to offset approximately 40 million gallons of potable water use and help the city in mitigating the effects of the drought when water for public consumption is in short supply.

"We are thrilled to have recently secured a \$7.1 million grant from the State of California to fund the purple pipeline for water distribution," Healdsburg Mayor Ozzy Jimenez said in a statement. "This grant is a significant victory. We are still pursuing a second grant from FEMA to have the needed budget to officially begin construction. The grants and the planning of the purple pipeline will enhance our resilience to future droughts. Use of recycled water is expected to offset approximately 40 million gallons of potable water use each year."

The City of Cloverdale plans to use its funding for four water supply and distribution projects, including replacing and upgrading approximately 1,700 existing water meters for advanced metering infrastructure radio read capability; expanding the current supervisory control and data acquisition system at the city's water treatment facility to integrate portable water distribution infrastructure at seven remote sites; and replacing two city-owned supply wells.

Original Article: [SoCo News by Katherine Minkiewicz-Martine](#)

Third year of drought pushes price of water to \$2,000 an acre foot

A sale of agricultural water within the Panoche Water District on the upper west side of the San Joaquin Valley hit the eye-popping price of \$2,000 per acre foot recently.

The buyer bought 668 acre feet in a deal that was brokered by Nat DiBuduo with Alliance Ag Services. The buyer, whose name was withheld, was willing to pay that cost to assure the future of his crops this year, according to the brokerage company.

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

Kern groundwater plans not all on the same level, sparking fears of state intervention

Kern County agricultural water districts are giving major side-eye to one of their own over what's known as "minimum threshold" groundwater levels.

VELES WATER WEEKLY REPORT



The grumbling is aimed at the sprawling Semitropic Water Storage District in northwest Kern, where minimum thresholds are set, in some cases, at levels that would allow farmers to pump down the water table by more than 350 feet from where it is today. Its water levels are also often far below those of neighboring water district. "(Semitropic's) minimum thresholds impact our water users," said Dan Bartel, general manager of Rosedale-Rio Bravo Water Storage District. "We can't maintain our own minimum thresholds with much lower minimum thresholds around us."

Minimum thresholds are a sort of groundwater red line under state's Sustainable Groundwater Management Act (SGMA). They represent the lowest level the water table can drop without worsening water quality, harming wells or adding to the chronic depletion of the aquifer. If groundwater agencies hit those minimum thresholds, that is supposed to be a trigger to enact measures to bring up the water table.

Water managers were supposed to calculate all those factors plus historic water tables in setting minimum thresholds as part of their groundwater sustainability plans filed with the state two years.

But the state Department of Water Resources found minimum thresholds inconsistent in the Kern subbasin and specifically called out Semitropic to explain how it came up with its levels. That was one of three deficiencies cited by DWR in finding Kern's overall groundwater plan "incomplete" earlier this year. Groundwater agencies have until July to address those issues and resubmit its plan to the state.

If DWR still finds the plan unacceptable, the whole Kern subbasin could be found noncompliant, which could potentially lead to enforcement actions by the State Water Resources Control board, including pumping limitations, fines and steep fees for every acre foot pumped.

So, the stakes are substantial.

Some districts with lower minimum thresholds have agreed to bump them up in the face of that DWR evaluation.

"We have been working with neighboring districts and we've been able to coordinate minimum thresholds with all of them," Rosedale-Rio Bravo's Bartel said. "Except for Semitropic."

For its part Semitropic said minimum thresholds are just one piece of the groundwater puzzle. Its groundwater plan includes a full suite of actions, some that have already been implemented, to make sure the water table doesn't approach those minimum thresholds, said Jason Gianquinto, General Manager of Semitropic.

He said the water table in Semitropic has remained relatively flat in recent years because of actions the district has already taken to retire land, recharge water and reduce pumping.

"We're not waiting until we get to those minimum thresholds before we do anything," Gianquinto said. "We've given our landowners water budgets that ramp down over time and set rates to enforce those budgets."



Still, Semitropic's minimum thresholds and even its measurable objectives, higher groundwater levels that managers are supposed to try and maintain, are set significantly lower than historic and current water levels.

Groundwater monitoring wells detailed on the Kern Groundwater Authority data management system show the disparities in stark relief.

Original Article: [Bakersfeild.com/ SJV Water by Lois Henry](http://Bakersfeild.com/SJV%20Water%20by%20Lois%20Henry)

California desalination plant hits regulatory hurdle

A proposed California desalination plant that would produce 50 million gallons of drinking water per day failed a crucial regulatory hurdle on Monday, possibly dooming a project that had been promoted as a partial solution for sustained drought.

The staff of the California Coastal Commission recommended denying approval of the Huntington Beach plant proposed by Poseidon Water, controlled by the infrastructure arm of Canada's Brookfield Asset Management (BAMa.TO).

Report ad

The commission's staff said the project was more susceptible to sea-level rise than was understood when it was first proposed more than two decades ago. The plant is expected to produce 50 million gallons (189.3 million liters) of drinking water per day, enough for 16% of the homes in the Orange County Water District, where 2.5 million people live.

The commission staff also deemed the project harmful to nearby fish and bird habitat, said the ground beneath the plant posed a seismic risk, and that the higher cost of the plant's water would squeeze low-income consumers.

The Coastal Commission, which is scheduled to consider the matter on May 12, could defy the staff recommendation and vote to approve the project.

The 12-member commission is made up of six local elected officials and six members of the public who are appointed by the governor, a senate committee, and the assembly speaker.

"When Poseidon first proposed its facility at this location nearly 25 years ago, sea level rise projections were much lower and adaptation planning was in its infancy," the staff report said. "Since that time, our understanding of the severity and consequences of climate change and sea level rise have grown exponentially."

It also raised the risks of sea-rise elsewhere in California. The proposed desalination plant would be on low-lying land about 30 miles (50 km) south of Los Angeles.

"By 2050 to 2070, the surrounding area may be flooded regularly," the report said.

Environmentalists have long campaigned against the plant, saying desalination decimates ocean life, costs too much money and energy and soon would be made obsolete by water recycling.

Poseidon has operated a similar plant, the largest in the United States, down the coast in Carlsbad since 2015.



VELES WATER WEEKLY REPORT

The company, which was hoping to break ground on the \$1.4 billion Huntington Beach plant by the end of this year, said the commission staff "erred in its recommendation" and called on political leaders to save the project.

"California's elected officials and regulators should consider the dire consequences that this recommendation will have for desalination in California," Poseidon said in a statement.

"If this recommendation stands, it will be the death knell for desalination in California," it said.

But some environmentalists, while praising the conclusions of the report, were not celebrating yet.

"This is not a win. We still need to go through the (May 12) hearing," said Andrea Leon-Grossmann, director of climate action for ocean conservation group Azul.

Susan Jordan, executive director of the California Coastal Protection Network, urged the commission to reject the project, saying, "We should never sacrifice our coast to drive profits for this foreign \$650 billion corporation or any corporate polluter."

California Governor Gavin Newsom had offered conditional support for the project, so long as it could be done responsibly.

Original Article: [Reuters by Daniel Trotta](#)

US WATER NEWS

Low water levels: New pumping station operating for Southern Nevada

The Southern Nevada Water Authority said that water levels have gotten so low at Lake Mead that they now have to implement a new way of pumping water into the Las Vegas Valley.

The water authority says the pumping station includes a shaft that is 26 feet deep in diameter and is 500 feet deep. Construction of the new pumping station was completed in 2020. It cost 650 million dollars and can pump 900 million gallons each day.

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Original Article: [KTNV Las Vegas](#)



Deliveries to be cut as Lake Powell approaches crisis level

Lake Mead's "bathtub ring" is set to become even more pronounced this year.

The lingering drought is the overriding reason that the lake's water level will fall again in 2022, but it's also because less water will be released upstream on the Colorado River from Lake Powell.

This month, the seven Colorado River Basin States — Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming — agreed with federal officials' recommendations to institute a 480,000 acre-foot reduction from Glen Canyon Dam on Lake Powell to reduce the risk of the lake declining below 3,490 feet.

The Department of Interior sent a letter April 8 to the seven Colorado River Basin states making the suggestion, stating that "it is our collective judgment that additional cooperative actions should be taken this spring to reduce the risk of Lake Powell declining below critical elevations."

The basin states, in a response letter, expressed concern that the water level of Lake Powell would decline below critical elevations, making the dam inoperable. With low-runoff conditions and record droughts over the past two decades, water storage in the Colorado River reservoirs is at a historic low, the states' letter says.

Lake Powell is at 25% capacity, and Lake Mead is around 35% capacity. The basin states are concerned that the water level of Lake Powell will decline below critical elevations, which would require any further releases to be made through massive outlet tubes at the foot of the dam.

Glen Canyon Dam was not envisioned to operate solely through the outlet works for an extended period of time, Tanya Trujillo, the assistant secretary of the interior, wrote in the letter. Operating at this low lake level "increases risks to water delivery and potential adverse impacts to downstream resources and infrastructure," she wrote.

Those adverse impacts include generating electricity for parts of the Western U.S. and providing drinking water for the city of Page, Ariz., and the LeChee Chapter of the Navajo nation, Trujillo wrote.

Water released from Lake Powell flows down the Colorado River and into Lake Mead, where it is stored and used by Nevada, California, Arizona and Mexico. Releasing less water from Lake Powell has the potential to reduce Lake Mead by about another seven feet in elevation, said Bronson Mack, public information officer with the Southern Nevada Water Authority.

Taylor Hawes, the Colorado River program director for the Nature Conservancy, said the reduction in water release was a reflection of the unprecedented nature of conditions in the Colorado River Basin. The Upper Basin states also recommended releasing 500,000 acre-feet of water from Flaming Gorge reservoir in Wyoming to protect Lake Powell.



“We are in uncharted territory,” Hawes said in an email. “These dire conditions affect everyone in this region — whether a city dweller who gets drinking water from the Colorado River system, a farmer, rancher, or someone who recreates on or near rivers.”

The proposed changes should be a call to action to change the way parties use and manage the river and its tributaries, Hawes said.

Southern Nevada has been “preparing for this for 20 years,” Mack said, investing in water conservation and water infrastructure.

It invested \$1.3 million in new infrastructure in Lake Mead with its deep-water intake No.3 pump and a low lake level pumping station Both give the water authority access to the water supply regardless of Lake Mead’s elevation level, Mack said.

Original Article: [Las Vegas Sun by Jessica Hill](#)

Federal money to replace lead pipes is just a first step to cleaner drinking water in Chicago

Seven of the top 10 states with the most lead pipes carrying drinking water into homes are in the Great Lakes region, according to the Natural Resources Defense Council. Illinois and Chicago also have the dubious honors of being at the top of the lists as the state and city with the most lead pipes of anywhere in the country.

This means that millions of people drink and cook with water delivered through aging lead pipes. With water bills on the rise, many households are paying more for water that they don’t trust due to the threat of lead contamination. There is a sad irony to the fact that even though we sit on the shores of the largest freshwater lake system on Earth, residents may not be able to safely drink or afford the water coming from their taps.

We are fortunate to have a champion in Congress who understands and is working on this issue: Sen. Tammy Duckworth held a hearing recently at the Shedd Aquarium to examine the implementation process of the bipartisan infrastructure bill passed by Congress last year, with \$15 billion allocated for lead pipe removal, which her lead pipe replacement legislation was folded into.

As Duckworth said during the hearing, this money should be seen as a down payment. While it’s a big help, it’s only a first step, since estimated costs to replace all lead pipes in the country are between \$45 and \$60 billion.

To replace this toxic infrastructure, water policy leaders at all levels of government must prioritize equitable investment and affordability strategies. Great Lakes cities like Chicago have the opportunity to be national leaders in addressing the twin threats of lead contamination and rising water bills. As Justin Williams with Metropolitan Planning Council testified at the hearing, every level of government must play a part in ensuring adequate funding for lead pipe replacement and an implementation strategy everyone can afford.

VELES WATER WEEKLY REPORT



The city has begun to tackle this legacy issue after decades of neglect, but progress has been slow. To maximize federal water infrastructure funding, the city should prioritize community input and accountability, cost efficiencies and coordinated capital planning, and expedited progress with equitable workforce development and affordability strategies. This will ensure residents don't have to choose between clean water and affordable water bills. Investment in physical water infrastructure must be matched by an investment to build a diverse workforce equal to the task of modernizing our water systems, as Anthena Gore of Elevate shared in her testimony.

As Duckworth noted, the U.S. EPA's first allocation of lead service line replacement funding from the infrastructure bill was based on an outdated formula: Illinois and other states with large lead pipe inventories did not receive funding commensurate with need. That funding gap is estimated at hundreds of millions of dollars each year for Illinois alone, so it is critical that the EPA update their Drinking Water Needs Assessment formula to account for this discrepancy. Directing states to invest nearly half of the \$15 billion from the infrastructure law for lead pipe removal into historically disadvantaged communities is a good first step.

Original Article: [Chicago Sun Times by Anna-Lisa Castle](#)

DWR to make proactive fish stocking changes to lower impact of drought

As it did in 2021, the Utah Division of Wildlife Resources (DWR) is implementing proactive changes to lower the impact the drought may have on fish stocking at waterbodies around the state.

With nearly half of the state still experiencing drought conditions, Utah Gov. Spencer Cox recently ordered an emergency drought order for the state.

In response to that order, the DWR is strategically determining what rivers or lakes will have fish stocked this year. This is intended to eliminate or reduce fish being stocked into waterbodies where fish could die because of low water levels.

According to the DWR, smaller amounts of water warm up quicker. Warm water holds less oxygen for fish than cooler water.

Through research, the DWR identified waterbodies that are expected to have poor angler access or low fish survival. As a result, the DWR will either reduce stocking fish or eliminate it all together at these locations.

"The best management action we can take at these waterbodies is to reduce the number of fish in these waters. Because when water levels are low, we are more likely to maintain a fishery that has fewer fish than one that has a lot of fish," DWR Sportfish Coordinator Randy Oplinger said in a press release. "We try, whenever possible, to continue to provide a good fishing experience for anglers. Up until we think that water levels will hit a critical level."

According to the DWR, several of the waterbodies that figure to have low water levels are the same ones from last year.



"The number of fish in these waters is lower this year than it was at the same time last year, due to last year's drought, fish stocking changes and the temporary harvest limit increases we implemented," Oplinger said.

Original Article: [KSL News Radio by Mark Jones](#)

Colorado legislature sets aside \$60 million for groundwater sustainability in the Rio Grande, Republican River basins

Colorado is moving toward putting \$60 million into a new groundwater compact compliance fund for the Rio Grande and Republican River basins that would be created and funded through a bill championed by state Sen. Cleave Simpson of Alamosa.

Senate Bill 28 would create the Compact Compliance Fund that would be administered by the Colorado Division of Water Resources. The fund would receive an appropriation of \$60 million from Colorado's share of federal COVID relief money from American Rescue Plan Act.

The bill, cosponsored by Sen. Jerry Sonnenberg, R-Sterling, originally only established the fund, and then an amendment unanimously adopted Thursday by the Colorado House Agriculture, Livestock, and Water Committee added \$60 million into it.

The bill will next be heard by the House Appropriations Committee.

"Given the unanimous votes every step of the way, so far, I am hopeful the bill with the appropriation will become law in the next week or two," Simpson, a Republican, told Alamosa Citizen. "The timing of the availability of federal dollars and the growing sense of urgency in both basins created a unique opportunity that will serve both of these communities well. Still some work to do, but things look very promising for both of these Colorado communities."

If the Compact Compliance Fund is adopted by the Colorado legislature it would pay for efforts to meet groundwater sustainability targets in the Rio Grande Basin and interstate compact requirements for the Republican River Basin.

Each basin would get an earmark of \$30 million to pay for efforts like retiring groundwater wells and other conservation and water sustainability measures. The goal would be to spend all \$60 million within the time constraints put on federal COVID dollars, whether it's a 50-50 split or not.

The threat to livelihood for farmers and ranchers and economic disaster for the regions tied to irrigated agriculture in the Rio Grande and Republican River basins was made loud and clear in the House Agriculture, Livestock, and Water Committee.

"These farmers and ranchers have done everything they possibly can," said Marisa Fricke, one of the Rio Grande Water Conservation District's program managers. "They grow produce for us and hay for our cattle."

Farmers and ranchers in both basins have levied property taxes on themselves through the water conservation districts to pay for their efforts to help the Rio Grande and

VELES WATER WEEKLY REPORT



Republican River meet groundwater sustainability and interstate compact compliance goals set by the state.

It has meant fallowing of crop fields, permanently retiring irrigated acreage, taking groundwater wells off line either temporarily or permanently, and compensating farmers and ranchers for their efforts to help offset loss from less irrigated acres.

State Reps. Marc Catlin, R-Montrose, and Dylan Roberts, D-Montrose, made impassioned pleas for including \$60 million of the ARPA money into the compact compliance fund during their presentation of the bill in the House Agriculture Committee. Both are House sponsors of the bill.

"This is an opportunity with these funds to say, 'We're with you,'" said Catlin of the risk farmers and ranchers take their sacrifices to address compact and sustainability issues on the Republican River.

Original Article: [The Colorado Sun by Alamosa Citizen](#)

Ferrovial wins Texas water projects worth \$279m

Spanish infrastructure group Ferrovial, through subsidiary PLW Waterworks, has won three water treatment projects in Texas together worth \$279m.

Georgetown has picked PLW to undertake the largest project in the city's history, in which PLW will build a \$175m treatment plant to supply drinking water to one of the fastest-growing population areas in the state.

The scope of work includes construction and commissioning of the structures for the new plant, a new water intake, and a pumping station on South Lake. The project is scheduled for completion in 2026, Ferrovial [said](#).

The City of San Angelo has also selected PLW Waterworks, a subsidiary of Webber and Cadagua, to upgrade the Hickory groundwater treatment plant. Scheduled for completion in 2024, the project will expand the infrastructure's capacity by 30 million litres a day to more than 45 million litres.

The contract value is \$53m and the work includes building a triplex low-head pump station, two new precast concrete clear wells and the expansion of the oxidation contractor system.

The third contract consists of building the Manadas Creek wastewater treatment plant in Laredo for \$51m. PLW will build a wastewater treatment plant with a capacity of 18 million litres a day as well as a gravity outfall pipe to carry the treated water to Manadas Creek Tributary 2.

Ferrovial said the projects contribute to its "Horizon 24" plan, which identifies the US as a core market.

Original Article: [Global Construction Review by Rod Sweet](#)



New Jersey could be opening new front in war for clean water

The state of New Jersey wants two companies accused of polluting the groundwater in a Bergen County borough to answer a question: what's the value of a glass of clean drinking water?

That question was posed in the form of a civil suit filed earlier this month, holding the companies accountable and seeking money for the harm done to the ecosystem, which has left residents in Lodi, New Jersey with contaminated groundwater.

It's a legal tool that environmental health experts say should be used more often as state governments seek ways to reduce pollution in frontline communities that are hard hit with environmental hazards.

It's a good way to address the broader harms inflicted on a community when groundwater is polluted and suffers a devaluation, said environmental health scientist Sacoby Wilson, an associate professor at the University of Maryland where he serves as director of the Center for Community Engagement, Environmental Justice and Health.

"If you do not have safe water, it basically is a way that kills, destroys communities," said Wilson, noting how polluted water can hinder economic growth by dissuading businesses and new residents from locating in those areas.

The suit seeks to hold two companies, Hexcel Corporation of Connecticut, and its related corporation, Fine Organics, liable for discharging fuel oil and industrial chemicals at a facility, located in the borough of Lodi, that damaged and destroyed the state's natural resources, the complaint states.

The area around the former chemical plant is classified as "overburdened" according to the state's Environmental Justice law, and has a large population of residents who are low-income, and people of color. The New Jersey Attorney General's office filed the suit in state court and is seeking compensation for groundwater restoration and other damage related to the spillage.

Some of the substances released included volatile organic compounds, polychlorinated biphenyls (PCBs), and petroleum products such as oil fuel – contaminants that came from leaking storage tanks and the plant's regular operations, which spanned as far back as 1973, when Hexcel acquired the site in a merger with a chemical manufacturing facility that had existed there for nearly 30 years prior.

Original Article: [Grist by Yvette Cabrera](#)

Colorado River states agree to federal request to hold back water in Lake Powell

In a letter sent Friday, the seven states that use the Colorado River agreed with the U.S. Department of Interior and recommended that federal water managers take an emergency action aimed at stabilizing a dwindling Lake Powell, one of the main storage reservoirs on the river.

VELES WATER WEEKLY REPORT



Earlier this month, federal water managers warned the states, including Nevada, that they were considering an emergency action to hold water back in Lake Powell, an attempt to stabilize the reservoir at serious risk of losing the ability to generate hydropower and deliver water to Page, Arizona, a city with roughly 7,500 residents, and the LeChee Chapter of the Navajo Nation.

Under the existing operating rules governing the Colorado River, the federal government was required to release 7.48 million acre-feet of water from Lake Powell downstream to Lake Mead, which stores water for Arizona, California, Nevada and the country of Mexico (an acre-foot is the amount of water that can fill one acre of land to a depth of 1 foot). But such a release would have led to further declines at Lake Powell, adding to the risk facing the Colorado River Basin.

As a result, the U.S. Department of Interior asked the states to consider a deviation from the existing operating rules — to hold back 480,000 acre-feet in Lake Powell. On Friday morning, representatives from the seven states within the Colorado River Basin sent the Department of Interior a joint letter agreeing with the proposed action, but requested that it “be implemented in a manner that is operationally neutral” so as not to trigger cuts for any state.

“It is our collective judgment that additional cooperative actions should be taken this spring to reduce the risk of Lake Powell declining below critical elevations,” state representatives wrote.

In an interview Friday, John Entsminger, the general manager of the Southern Nevada Water Authority, said that the letter “underscores the seriousness of the hydrologic situation as a very real threat to the infrastructure of Glen Canyon Dam,” which holds back Lake Powell.

“But,” Entsminger added, “it also represents that the seven states that share the river continue to be able to come together and make uniform proposals for how to address the situation.”

While such a move would bolster the water elevations at Lake Powell, curbing an immediate risk of hydropower losses, it would accelerate the physical decline of Lake Mead by about 7 feet. Over the past two decades of drought, the country’s largest manmade reservoir has dropped, with a notable bathtub ring marking where the water line once stood when the lake was full.

The elevation of Lake Mead is an important marker for Arizona, California and Nevada, the Lower Colorado River Basin states that rely on it. Lake Mead’s elevation is what triggers water cuts and reductions, in accordance with a Drought Contingency Plan that was signed in 2019. In the letter, all seven states agreed that keeping water in Lake Powell should not trigger deeper cuts.

But a deeper tier of cuts could be coming regardless, as the amount of water consumed by the states continues to exceed the amount of water entering the Colorado River in recent years. In addition to existing imbalances between supply and demand, scientists

VELES WATER WEEKLY REPORT



have observed a decline in snowmelt and runoff into the river, attributed to higher temperatures fueled by climate change.

The Colorado River Basin has seen two back-to-back dry years — with another below-average season of runoff expected this year. Indeed, forecasts already suggest that Lake Mead could drop below a critical elevation, triggering a new round of cuts for Lower Basin states next year.

But for now, the focus is on addressing the immediate crisis that is unfolding at Lake Powell by adjusting where water is stored throughout the system. In addition to the action outlined in the letter, states in the Upper Colorado River Basin — Colorado, New Mexico, Wyoming and Utah — have agreed to send more water, about 500,000 acre-feet, downstream in Lake Powell.

Original Article: [The Nevada Independent by Daniel Rothberg](#)

Nebraska Governor signs a law to build a canal in Colorado to divert water

The canal building plan comes nearly 100 years after Colorado, Nebraska and Congress agreed to a water rights agreement that gave Nebraska the authority to pull from the South Platte River during non-irrigation months in Colorado.

Gov. Pete Ricketts announced in January that he would seek legislative approval for reviving the canal, at a cost of at least \$500 million. Last week, Nebraskan lawmakers passed the bill, LB 1015, with a 42-4 vote and Gov. Pete Ricketts signed it into a law. Gov. Ricketts said in a statement:

LB 1015 helps protect the South Platte River water we depend on for drinking water, agricultural irrigation, and to nourish our natural environment. The Unicameral passed LB 1015 to protect Nebraska's South Platte River water flows from aggressive developments in Colorado. The state of Colorado is planning nearly \$10 billion of water projects in the South Platte River Basin to prevent water from leaving the state. Nebraska has a compact with Colorado that guarantees the state of Nebraska minimum flows of South Platte River water throughout the year.

However, water experts in Colorado have expressed their concerns over the building of a canal in a changed landscape. Kevin Rein, State Engineer for Colorado Division of Water Resources, said:

That is an agreement that was made between the states back 100 years ago when competition for the water was ramping up, and the states decided it was a good idea to get it in writing how they were going to share the water. Colorado is going to be very protective of our water rights, of our allowances under the compact, and our ability to make sure that, if they are going to divert water, they are doing it in strict compliance with the compact.

VELES WATER WEEKLY REPORT



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Original Article: [Polarbear](#)

Builder, water broker merging in \$291 million deal

A water broker holding nearly 900-acre-feet of Carson Valley surface water rights is merging with a national builder in a \$291 million deal announced on April 14.

Vidler Water Resources Inc. purchased most of the 874-acre-feet of East Fork water rights from Carson Valley ranches that were under development.

The oldest rights predate Nevada's statehood, according to a review of filings with the Douglas County Recorder's Office by The Record-Courier.

Vidler purchased most of the rights between 2007-2009.

They also helped finance a pipeline carrying Minden water north to Johnson Lane, Indian Hills and Carson City by purchasing 1,613-acre-feet a year of ground water in 2009.

Builder DR Horton Inc. will pay \$15.75 a share in the all-cash transaction with Vidler.

"Vidler owns a portfolio of premium water rights and other water-related assets in the southwestern United States in markets where D.R. Horton operates that require water for development but face a lack of adequate supply," officials said. "Vidler's highly experienced management team has a proven track record of accessing, developing and realizing value for premium water assets while expertly navigating local regulations and working with governmental entities."

Post-closing, Vidler will operate as a separate operating division within D.R. Horton.

Following completion of the merger, the common stock of Vidler will no longer be listed for trading on the Nasdaq.

Original Article: [Record Courier by Kurt Hildebrand](#)

Justice requests \$250M to tackle water and sewer infrastructure

An addition to the agenda for legislators to consider during a special session called Monday by Gov. Jim Justice would aid rural communities with water and sewer issues. During his pandemic briefing Monday, Justice said he is asking for a supplemental appropriation of \$250 million to the Economic Enhancement Grant Fund in House Bill 4566.

The money will be used as matching funds to leverage money from the infrastructure bill, he said.

VELES WATER WEEKLY REPORT



“These are major dollars and they are badly needed,” he said of places in the state without reliable utilities. The fund will provide matching grants to municipalities for use in upgrading infrastructure such as water and sewer systems.

“It’s a problem that goes back decades – long before I walked in the door as Governor,” he said. “With this Legislation, we’d be taking a huge step forward. These funds will allow us to improve water and wastewater systems in communities across the state, providing more reliable and efficient utilities where they’re needed most.”

The Economic Enhancement Grant Fund is managed by the West Virginia Water Development Authority, working with the West Virginia Infrastructure and Jobs Development Council and the West Virginia Department of Economic Development.

Justice issued his call for a special session on Friday last week to give the Legislature the opportunity during April Legislative Interim Meetings to address bills from the regular session that “were vetoed for purely technical reasons, among other items.”

Sixteen bills were initially included.

The special session began at noon on Monday.

On pandemic related matters, state COVID-19 Czar Dr. Clay Marsh continued to urge residents, especially those over 50, to be fully vaccinated and boosted.

Marsh said a new study shows that about 920,000 of the almost 1 million COVID-related deaths in the U.S. were over the age of 50.

“Since last Friday, we’ve only had one death. As encouraging as it is that our number of deaths have gone down and down in recent months, we need to keep pulling the rope together, because there’s no way this thing is just flat gone,” Justice said. “I remind you over and over to get your booster shots. You’ve got to get that done, especially if you’re 50 or over.”

Original Article: [BlueField Daily Telegraph](#)

Gov. Wolf Announces \$199 Million Investment in Water Infrastructure Projects

Governor Tom Wolf recently announced the investment of \$199 million for 13 drinking water, wastewater, stormwater, and non-point source projects across 11 counties through the Pennsylvania Infrastructure Investment Authority (PENNVEST).

“Ensuring the reliability of our most precious infrastructure is vital to the road to recovery for many of our communities,” said Gov. Wolf. “As we prepare for much-needed increases in federal and state resources, like those in the Infrastructure Investment and Jobs Act that will bring more than \$240 million to Pennsylvania next year alone for clean water infrastructure, I am confident that these projects will pave the way for successful growth and revitalization.”

The funding for these projects originates from a combination of state funds approved by voters, Growing Greener, Marcellus Legacy funds, federal grants to PENNVEST from the Environmental Protection Agency, and recycled loan repayments from previous



PENNVEST funding awards. Funds for these projects are disbursed after expenses for work are paid and receipts are submitted to PENNVEST for review.

"PENNVEST continues to make valuable and prudent use of the state revolving fund," said Gov. Wolf. "As we continue to soar past the landmark of \$10 billion invested in clean water projects, it is evident that there is still a need for infrastructure improvement and I'm proud to be part of a successful system that provides efficient support while saving Pennsylvanians money."

Original Article: [My ChesCo](#)

A million-acre feet of water won't save Lake Powell. But the deal is still a win

The seven Colorado River basin states have a plan to temporarily stabilize Lake Powell. It contains some pain and not a lot of gain.

Yet no one balked. And that's a win.

That should signal how dire the circumstances have become.

The U.S. Department of the Interior noted in an April 8 letter to the basin states that the reservoir is dangerously close to hitting 3,490 feet of elevation, a level so low that power could no longer be generated at Glen Canyon Dam and water could no longer flow to the nearby city of Page and an adjacent Navajo Nation community.

Because water could no longer flow through the power turbines, millions of acre-feet of water would flow downstream through smaller backup pipes at the base of Glen Canyon Dam – a risky prospect that could spell calamity for Lake Mead, which relies on Powell's releases, if any one of those four pipes were damaged by the heavy flows and had to shut down.

Lake Powell needed immediate action.

Interior proposed taking the unprecedented action of withholding 480,000 acre-feet (that's more than 156 billion gallons) in Lake Powell that otherwise should have flowed to Lake Mead, among other measures.

Two weeks later, the seven states responded with a singular voice: We get how dire this is, and we're on board.

"We recognize the urgency created by current conditions in the Basin; in fact, hydrologic conditions in the Basin have continued to decline since your April 8, 2022, letter to the Governors' representatives," they wrote in an April 22 response. "It is our collective judgment that additional cooperative actions should be taken this spring to reduce the risk of Lake Powell declining below critical elevations."

That means the upper basin states will agree to release 500,000 acre-feet from the upstream Flaming Gorge Reservoir, as part of a newly cemented 2022 Drought Response Operations Plan. (That's a lot more than the 161,000 acre-feet that was released from upstream reservoirs last year to prop up Lake Powell.)



VELES WATER WEEKLY REPORT

Meanwhile, the lower basin states, including Arizona, will agree to keep 480,000 acre-feet in Powell, though the states have asked for that amount not to count against shortage determinations.

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

Millions must cut water use in drought-stricken California

Southern California's gigantic water supplier took the unprecedented step Tuesday of requiring about 6 million people to cut their outdoor watering to one day a week as drought continues to plague the state.

The board of the Metropolitan Water District of Southern California declared a water shortage emergency and required the cities and water agencies it supplies to implement the cutback on June 1 and enforce it or face hefty fines.

"We don't have enough water supplies right now to meet normal demand. The water is not there," Metropolitan Water District spokesperson Rebecca Kimitch said. "This is unprecedented territory. We've never done anything like this before."

The Metropolitan Water District uses water from the Colorado River and the State Water Project to supply 26 public water agencies, which provide it to 19 million people, or 40% of the state's population.

But record dry conditions have strained the system, lowering reservoir levels, and the State Water Project, which gets its water from the Sacramento-San Joaquin River Delta, has estimated it will only be able to deliver about 5% of its usual allocation this year.

January, February and March of this year were the driest three months in recorded state history in terms of rainfall and snowfall, Kimitch said.

The Metropolitan Water District said that the 2020 and 2021 water years had the least rainfall on record for two consecutive years. In addition, Lake Oroville, the State Water Project's main reservoir, reached its lowest point last year since being filled in the 1970s. California Gov. Gavin Newsom has asked people to voluntarily reduce their water consumption by 15%, but so far residents have been slow to meet that goal.

Original Article: [AP News by Robert Jablon](#)

GLOBAL WATER NEWS

Reservoirs at 39% of the storage capacity at Full Reservoirs Level: Central Water Commission

Live storage of 140 important reservoirs on the week ending April 22 is 68.739 billion cubic meter (BCM), which is 15.235 BCM more than the average of the last 10 years, said the Central Water Commission.



This equals to 39% of the storage capacity at Full Reservoirs Level (FRL). The 113 reservoirs used for irrigation are at 43% of their capacity.

Last year the reservoirs were at 63.344 BCM during the corresponding period. Around 120 reservoirs have 80% of the storage average of last 10 years.

Original Article: [The Economic Times India by Shambhavi Anand](#)

Depletion of Aquifers Posing Serious Threat

Poor rainfall and growing population in recent decades have led to the reduction of Iran's groundwater reserves, such that the level of groundwater in alluvial aquifers has decreased by an average of 4.7 billion cubic meters annually.

Firouz Qasemzadeh, director general of the National Water Data and Information Office at the Iran Water Resources Management Company, said the average annual depletion of water in the country's alluvial aquifers during the last water year (ended September 2021), which had very little precipitation, was more than 7.1 billion cubic meters, which is a huge figure, ILNA reported.

Alluvial aquifers are generally shallower than sedimentary and fractured rock aquifers and water levels often fluctuate due to varying recharge and pumping rates.

Original Article: [Financial Tribune](#)

New study on water resources in Himalaya

A new study featuring contributions from British Antarctic Survey (BAS) scientists has identified 100 pressing research questions on climate change and water resources in the Upper Indus Basin (UIB) that must be answered to protect the communities that live there.

The UIB is a mountainous region in the Himalayas which feeds the river systems that supplies the world's largest network of irrigated agriculture. Hundreds of millions of people across Pakistan, India, China, and Afghanistan depend on these water resources and so adapting to climate change is essential.

BAS scientists have unique expertise in glaciology and airborne radar techniques which is applicable to research in Antarctica and mountainous regions the world over and the Himalayas is the focus of ongoing BAS research.

Now, a new study—published in the journal Earth's Future—has employed a "horizon scanning" technique to identify 100 essential questions required for successful adaptation to ongoing and future climate change in the UIB. The aim of the study is to identify knowledge gaps and opportunities in social and natural sciences to help inform climate plans, water management, and development policy.



The questions identified push the boundaries of current thinking and are grouped into overarching topics of governance and policy, socioeconomic processes, and earth system processes. Examples of the pressing questions that the study poses include:

- How do international tensions and conflicts affect the feasibility of climate change adaptation strategies in the UIB?
- How will socioeconomic well-being and resource demands in rural and urban areas of the UIB be affected by hydroclimatic changes?
- How are hydroclimatic extremes (floods and droughts) expected to change over the UIB in the future?

By raising awareness of these pressing knowledge gaps researchers, funding bodies, practitioners, and policy makers may be able to address them.

BAS Climate Scientist, Dr. Andrew Orr who led the study, says:

"Water resources in the UIB are under a range of ever-increasing pressures including population growth, industrialization and of course the serious threat posed by climate change. If we are going to successfully adapt to ongoing and future hydrological and climate change in this region we must address pressing knowledge gaps in social and natural sciences. The coming years will likely see dramatic changes to this area, and the questions we have identified must be addressed if we are to be prepared."

The study demonstrates the exciting potential for the international community to develop water management, climate plans, and policies which will secure and protect the UIB for generations to come.

Original Article: [Phys.org by British Antarctic Survey](https://phys.org/news/2023-03-water-management-climate-policies.html)

Five states extract almost 50% of groundwater, shows Govt data

Five states -- Uttar Pradesh, Rajasthan, Bihar, Madhya Pradesh, and Kerala -- account for 49 per cent of the overall extraction of groundwater in the entire country while the rest of the country accounts for 50 per cent, government data between 2004-2020 has shown.

"However, it was only in 2009, that Andhra Pradesh replaced Madhya Pradesh," said an official associated with Jal Jeevan Mission (JJM), the flagship programme of the Jal Shakti Ministry.

Groundwater is of vital importance as it sustains ecosystems, maintains the base flow of rivers and prevents land subsidence and seawater intrusion, he said.

"These top five states withdraw about 24.37 billion cubic metres (BCM)," the data from the Ministry of Jal Shakti showed adding, between year 2004 and 2020, groundwater drawl has increased from 18.09 BCM to 27.31 BCM implying an average annual increase of 576 million cubic metres.

However, these are not the highest groundwater withdrawing states in terms of absolute volume. The stage of ground water extraction is very high in Delhi, Haryana,



Punjab and Rajasthan, where it is more than 100 per cent, which implies that in these states, the annual ground water consumption is more than annual extractable ground water resources.

In the states of Himachal Pradesh, Tamil Nadu, Uttar Pradesh and UTs of Chandigarh and Puducherry, the stage of ground water Extraction is between 70-100 per cent.

In the rest of the states / UTs, the stage of ground water development is below 70 per cent.

As per the 2017 assessment of Dynamic Ground water resources, the total annual ground water recharge for the entire country has been assessed as 432 BCM and total natural discharges worked out to be 39 BCM, making the annual extractable ground water resources for the entire country to be at 393 BCM.

The total annual ground water extraction of the entire country for the year 2017 has been estimated as 248.69 BCM with the agriculture sector being the predominant consumer of groundwater resources.

About 89 per cent of total annual ground water extraction i.e. 221.46 BCM is for irrigation use. Only 27.24 BCM is for domestic & industrial usage, which is about 11 per cent of the total extraction.

At global level, groundwater sources provide almost half of all drinking water worldwide, about 40 per cent of water for irrigated agriculture and about 1/3 for the industry.

The Central Ground Water Board (CGWB) statistics shows that the contribution of groundwater is nearly 62 per cent in irrigation, 85 per cent in rural water supply and 50 per cent in urban water supply, the officer said.

Original Article: [Business Standard by Jal Shakti Ministry](#)

Brunei committed to tackling water challenges, says minister

Brunei continues to stand for multilateralism, unity and regional cooperation, especially in tackling water challenges. Thus the Sultanate is committed to working with the community, regional members and global participants to manage water sustainably.

The Sultanate's commitment in addressing water challenges was shared by Minister of Development Dato Seri Setia Ir Awang Haji Suhaimi bin Haji Gafar in his address at the 4th Asia-Pacific Water Summit (4thAPWS) in Kumamoto, Japan yesterday.

Dato Seri Setia Ir Awang Haji Suhaimi also iterated Brunei Darussalam's full support and commitment in principal for the non-legally binding Kumamoto Declaration to be adopted as a way forward in achieving mutual goals.

The minister said, "We are confident that the declaration can bring us to a heightened and new level of cooperation and coordination in addressing water-related issues."

In dealing with water security as well as facing the challenges of water scarcity and climatic change, he said, "Brunei Darussalam is of no exception to such predicament".



The minister added, “In turn, we would like to share the experiences and current status on the development of water resources and supply in Brunei Darussalam, the challenges and water issues that we face towards achieving sustainability in every aspect.

“We are fortunate that we are able to provide 100 per cent of the population with quality potable water within the World Health Organization International Water Quality Guidelines. These include those living in rural areas, where access by road is unavailable, and supply of water is provided through the installation of individual community water purification system by utilising slow sand filtration systems. The system is well managed by the villages with quarterly monitoring and continuous support from the Department of Water Services, Public Works Department.”

The overall water supply and demand sustainability in Brunei, he said, “is largely achieved due to various factors which includes and not limited to the manageable size of the country’s population; the considerably small geographical land area; adequate available water resources; and relatively strong economic conditions to provide financial support for the sustainability of services”.

However, he also acknowledged that the greatest challenge the country faces is the increasing demand due to population growth and industrial development, coupled with the ongoing issue of global warming and the COVID-19 pandemic.

To ensure a clear vision to address these challenges, he revealed that the ministry formed the Water Security Framework 2021-2035 to address four key strategies to increase robustness of the overall water supply system of the country covering all aspects of water supply management: water resources and production; water network efficiency; water quality; and water governance.

Such efforts, he said, “are reflected in our government’s efforts in the application of reservoir conservation and development, water conservation policies and programmes, water governance and demand management, as well as enforcements to tackle issues related to water pollution and uncontrolled development that pose serious negative impact to water resources”.

He added that Brunei Darussalam is on its way to exploring current technological advancements in addressing and tackling water issues, which include improvements to geographical information system (GIS) mapping, new metre management programme, upgrading telemetry system, planned maintenance programme, and improvement to the water infrastructure maintenance system.

The minister said, “We acknowledge that financing needs of water infrastructure development are huge, where most infrastructure projects tend to be capital intensive. This is one of the many challenges that countries are facing in search of appropriate financing approaches and incentives to suit their conditions.

“There is no ‘one solution’ to the many challenges that we are facing. At the same time, strategic assistance is still required to better the approach and implementation of an

VELES WATER WEEKLY REPORT



integrated water resource management due to the relatively small pool of technical expertise available locally."

Currently, he said, all infrastructure projects in the Sultanate are financed by the national revenue generation.

"With the popular adoption of a public private partnership financial system on infrastructure development worldwide, we will ourselves consider adopting the system too. But consideration will be taken with the low income population in mind, so that full accessibility to basic needs can be enjoyed by all," said the minister.

Original Article: [Borneo Bulletin by James Kon](#)

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