

Veles Water Weekly Report

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VelesWater



WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell

CLICK THE LINK BELOW

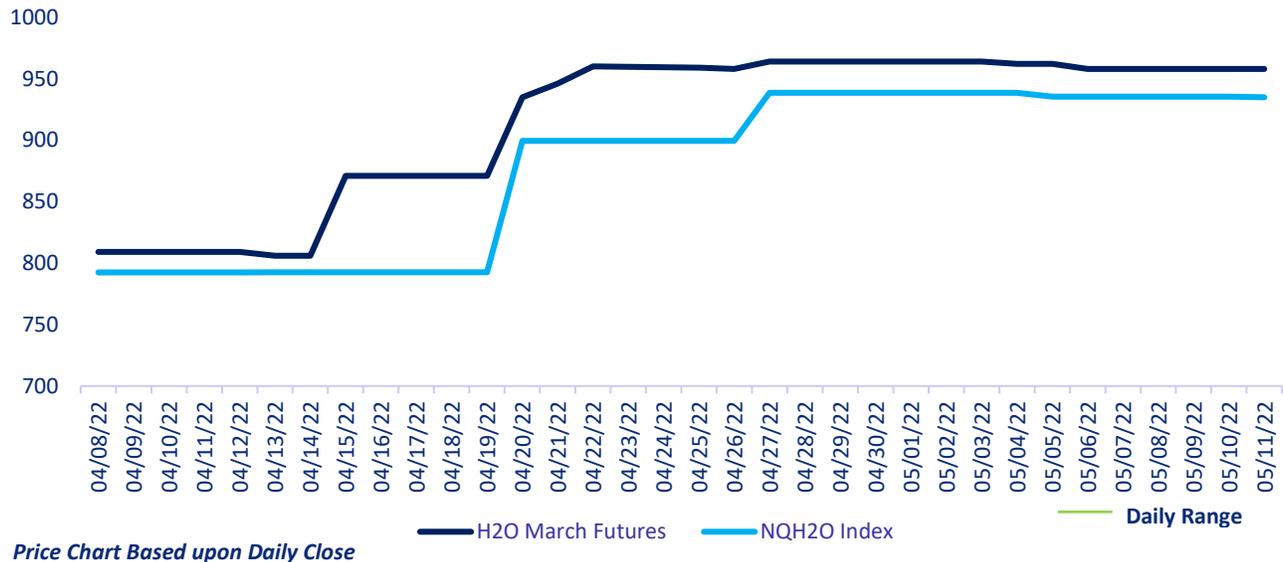
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/709000202>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



The new NQH2O index level of \$934.90 was published on the 11th of May, down \$0.68 or 0.07%. The front month or May contract has been trading at premium of +\$22.42 - \$23.10 to the index over the past week. The July contract traded for the first time on the 11th May.

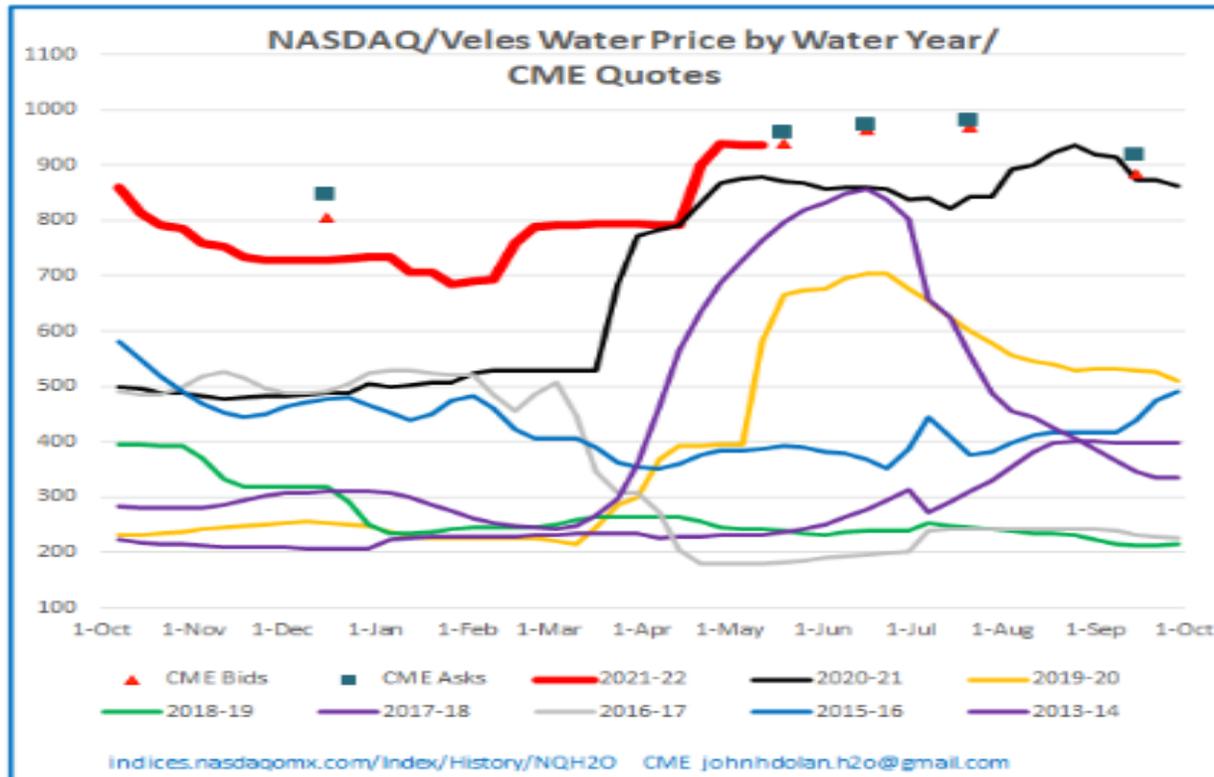
NQH2O is up 32.35% Year to Date.

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

May 22	939@958
June 22	964@972
July 22	970@981
Sept 22	874@912
Dec 22	784@847
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.

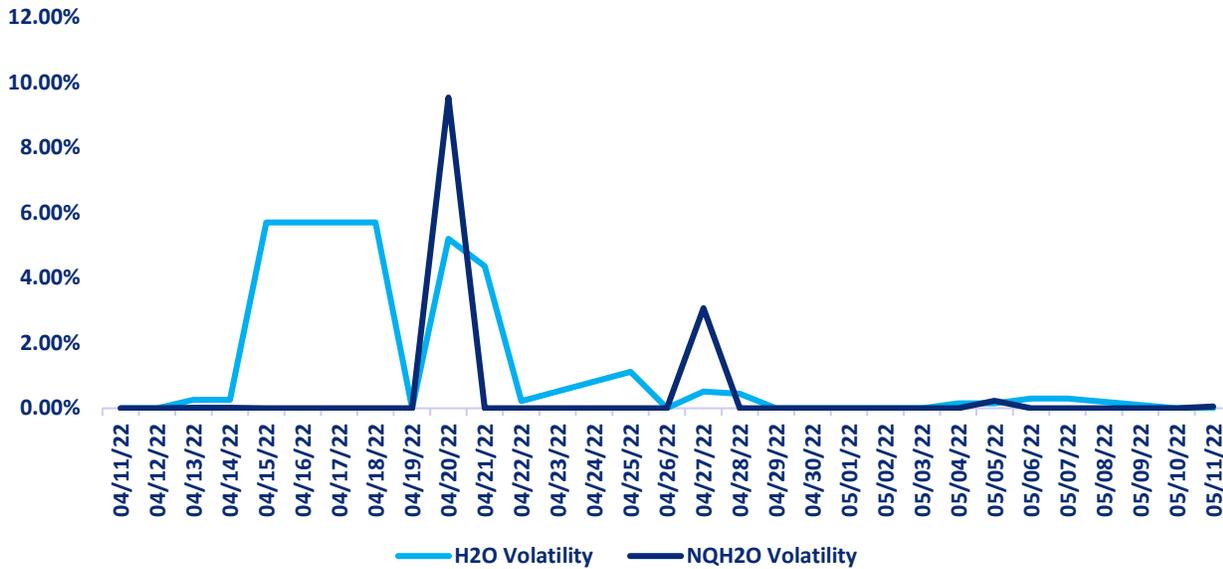
Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and prices may not fall seasonally as much as they have in prior dry years.

(John H Dolan, CME Market Maker)

VELES WATER WEEKLY REPORT
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 0.29% on May 7th and a low of 0% on May 10th.

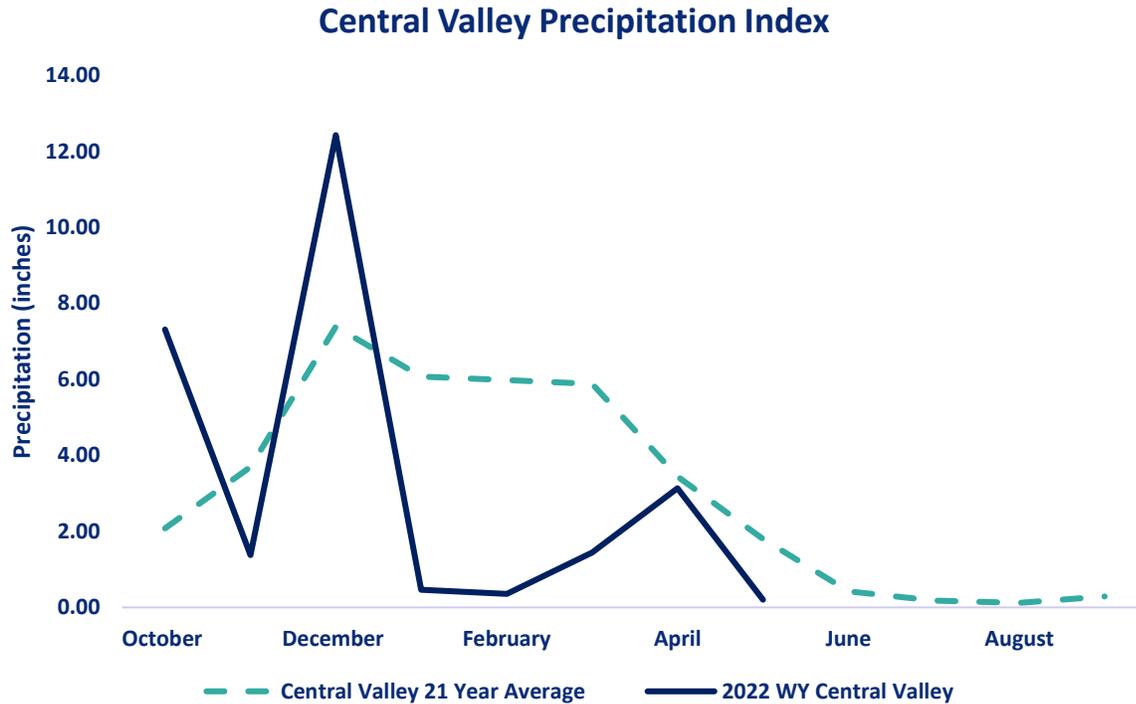
ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	21.62%	12.31%	12.90%	0.248%
H2O FUTURES	N/A	13.76%	10.67%	0.42%

Mixed signals for the week ending on the May 11th the two-month futures volatility is at a discount of 1.45% to the index, a reversal of 2.94% from the previous week. The one-month futures volatility is at a discount of 2.24% to the index, down 0.01% from last week. The one-week futures volatility is at a premium of 0.17% to the index, a reversal of 4.64% from the previous week.

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



CENTRAL VALLEY PRECIPITATION REPORT



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 11/05/2022

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)	0.03	0.03	1.63	49	65
TULARE 6 STATION (6SI)	0	0.00	0.00	36	61
NORTHERN SIERRA 8 STATION (8SI)	0.31	0.31	12.81	46	80
CENTRAL VALLEY AVERAGE	0.11	0.11	4.81	44	69

RESERVOIR STORAGE

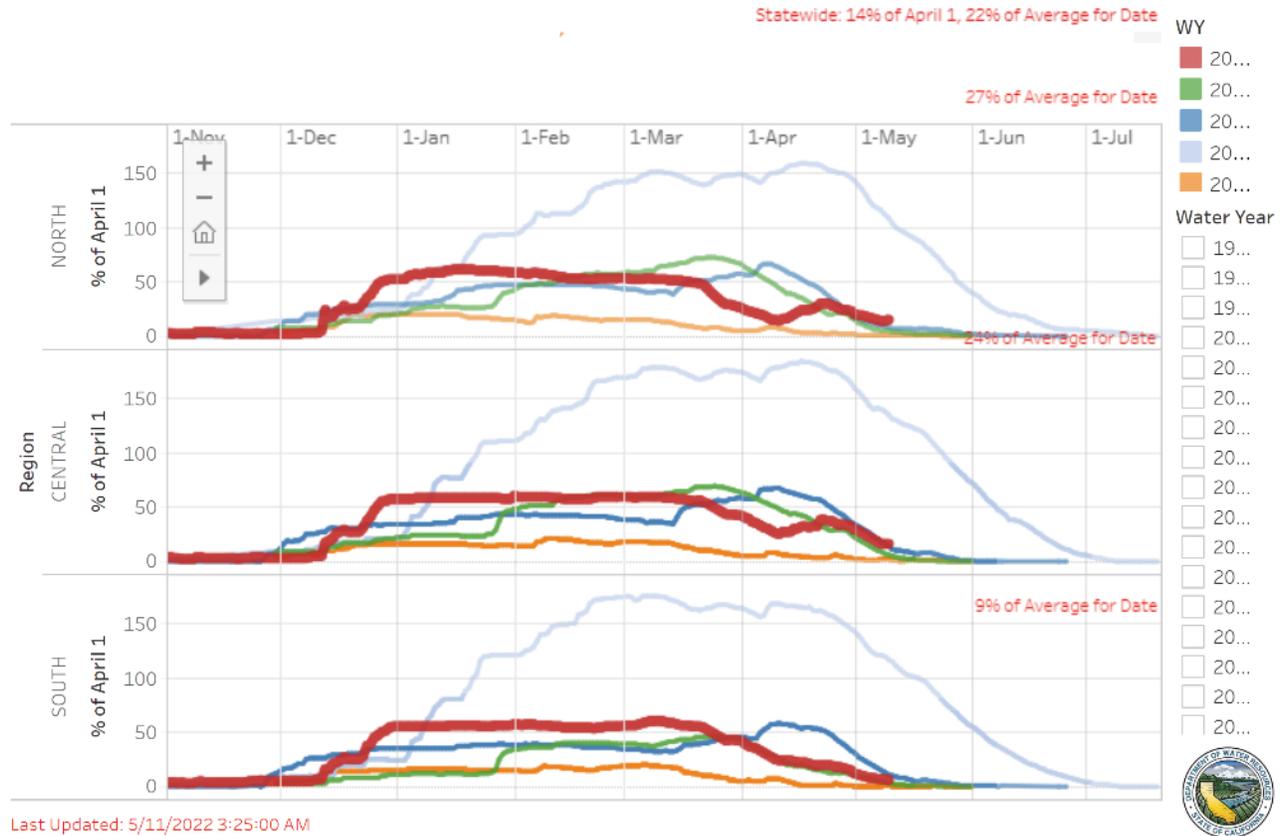
RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	757,038	31	53	39
SHASTA LAKE	1,821,095	40	49	48
LAKE OROVILLE	1,940,413	55	42	70
SAN LUIS RES	945,916	46	51	59

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



SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	4.3	-1.20%	9	27	15
CENTRAL SIERRA	4.9	-3.20%	9	24	16
SOUTHERN SIERRA	1.6	-1.50%	4	9	6
STATEWIDE	3.9	-2.20%	8	22	14

*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.

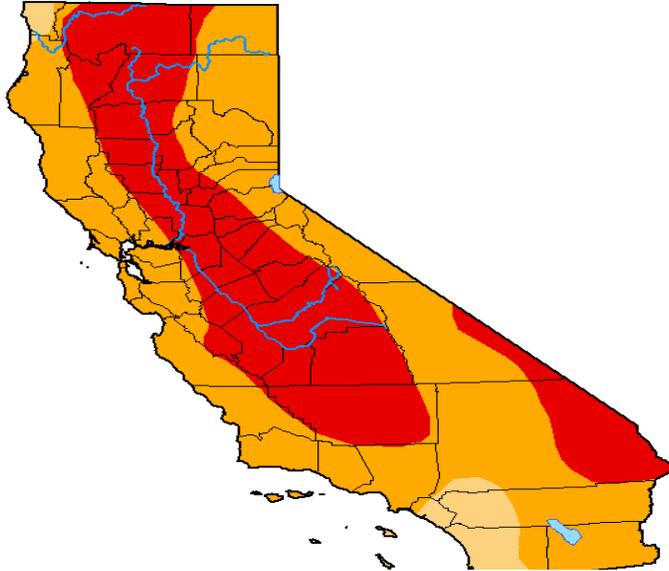
** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.



DROUGHT MONITOR

U.S. Drought Monitor California

May 3, 2022
(Released Thursday, May 5, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	95.18	40.51	0.00
Last Week 04-26-2022	0.00	100.00	100.00	95.18	40.56	0.00
3 Months Ago 02-01-2022	0.00	100.00	99.25	66.39	1.39	0.00
Start of Calendar Year 01-04-2022	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year 09-28-2021	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago 05-04-2021	0.00	100.00	97.52	92.88	73.31	5.36

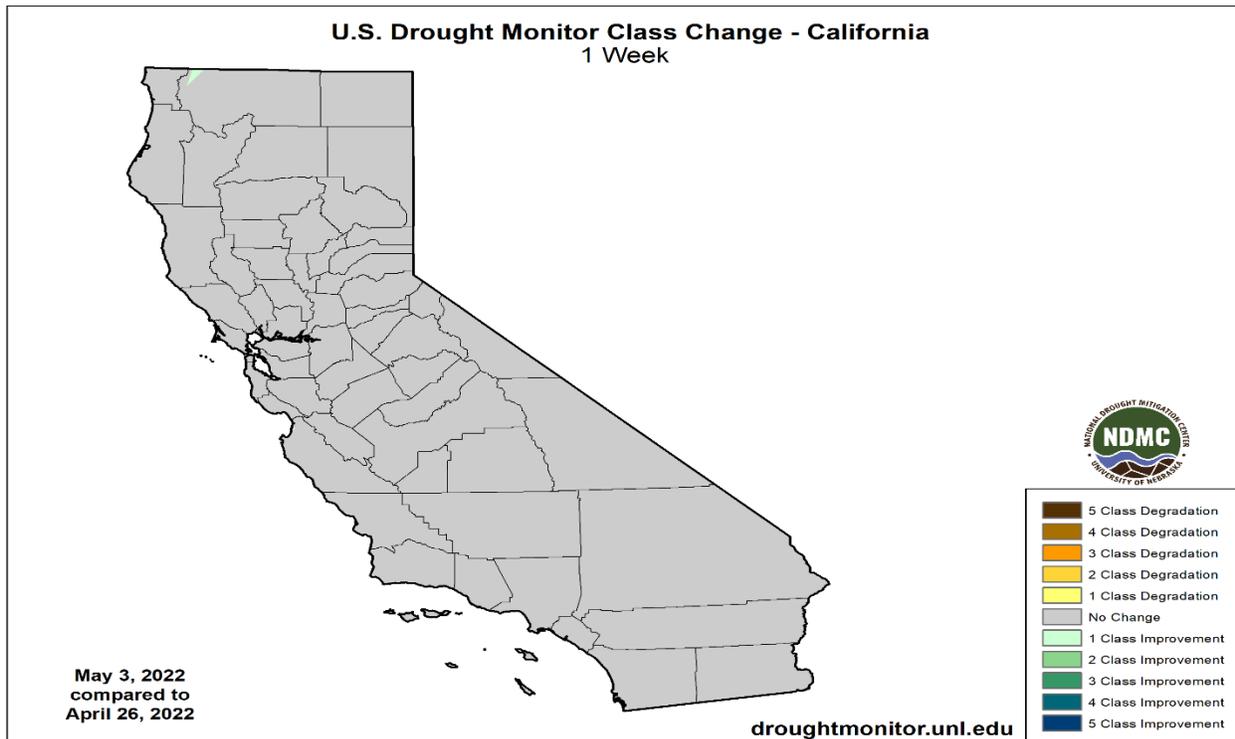
Intensity:

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

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

Author:

David Simeral
Western Regional Climate Center

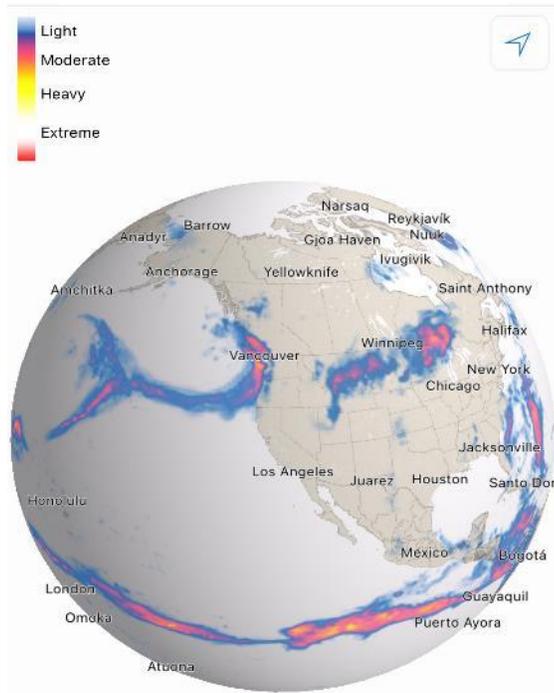


The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week the has been 0.05% Class 1 improvement in D3 Extreme Drought conditions.

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 a frontal system with a long tail connected to a second frontal system, hitting the coast of Western Canada and the Northwestern US with some precipitation occurring in Northern California. This is expected to move eastwards bringing precipitation to those regions but is only likely to affect the very Northerly portions of the Central Valley.

The second frontal system will arrive a few days later and have a very similar path and precipitation effect as the first one. The North Central US has cloudy cover and is experiencing some precipitation in these regions, moving westward. There are some weather systems off the coast of the Northern Florida up past South Carolina to the sea east of New York.

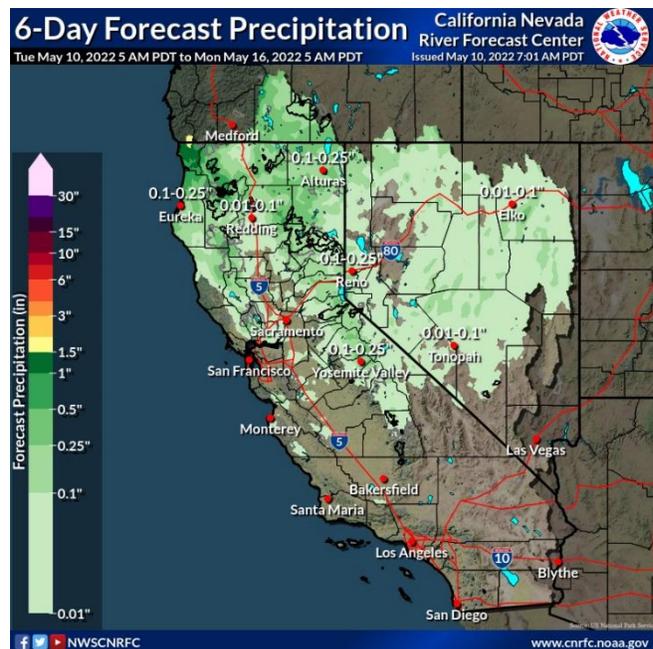
Map Ref: Dark Sky

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

There is no Monsoon activity at present and can only be expected in the next few months.

10 Day Outlook

Dry conditions will return for the rest of Wednesday and into Thursday as we transition between systems. A surface/upper low will move into the Gulf of Alaska early Thursday with a cold front just offshore of the PacNW/norCal. The ECMWF has the front just slightly ahead of the GFS, but both agree on the front moving through norCal and the PacNW the rest of Thursday and into early Friday. Most of the precipitation is expected north of the region aside from the north coast. Little to no precipitation is expected south of Cape Mendocino. From 12z Thursday to 12z Friday highest amounts





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over the Smith Basin at 0.50-0.75+" tapering off to the south down to 0.10-0.25" around Cape

Mendocino. Another system will approach the PacNW from the west late Friday into early Saturday allowing light showers to possibly continue along the far northwest coast of CA and along the CA/OR border. There are some differences between the GFS/ECMWF with this system in placement and timing. The GFS brings the surface low just offshore of BC Saturday evening while the ECMWF is still further westward over the Gulf of Alaska. The GFS also brings the front to the coast more quickly. Either way, neither model is showing much precipitation over the region with only light showers currently expected over northwest CA at no more than a few hundredths of an inch Saturday/Sunday. The rest of the area will be under the influence of high pressure most of Friday and over the coming weekend. This will allow temperatures to rise to about 5-15 degrees above normal.

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

WESTERN WEATHER DISCUSSION

Out West, several storm systems moved through the norther tier of the region bringing light to moderate snowfall accumulations to the higher elevations of the Cascades, northern Great Basin, and the Central and Northern Rockies as well as light rainfall to coastal areas and low-lying inland valleys of Idaho, Oregon, and Washington. Improvements were made in areas of Moderate Drought (D1), Severe Drought (D2), Extreme Drought (D3), and Exceptional Drought (D4) in Oregon in response to a combination of factors including normal to above-normal SWE, recent storm events, and improved soil moisture levels and streamflows. Likewise, improving conditions in northern Wyoming led to removal of areas of Extreme Drought (D3) in the Big Horn Mountains where current SWE is 108% of median. Elsewhere, conditions deteriorated on the map in northwestern Arizona and across much of New Mexico. Looking at snowpack data across the West at a regional scale (2-digit HUC), the NRCS SNOTEL network (May 3) reported the following median SWE levels: Pacific Northwest 111%, Missouri 99%, Souris-Red-Rainy 116%, California 60%, Great Basin 62%, Upper Colorado 76%, Arkansas-White-Red 50%, Lower Colorado 36%, and Rio Grande 33%. According to NRCS National Water and Climate Center's reservoir summary report (April 1), statewide reservoir storage levels were below normal in all western states with exception of Washington state. In California, the state's two largest reservoirs are at critically low levels moving into the dry season with Shasta Lake currently at 40% of total capacity on May 3 and Lake Oroville at 55% of capacity. In Southern California, the Metropolitan Water District of Southern California announced (April 27) that one-third of its users will be subject to restrictions that limit outdoor watering to one day per week as a measure



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to reduce water usage. In the Colorado River Basin, Lake Powell was at 24% of capacity and Lake Mead 31% of capacity on May 3, according to the USBR. In the Rio Grande Basin, New Mexico's Elephant Butte Reservoir was 13% full.

Reference:

David Simeral, Western Regional Climate Center
Curtis Riganti, National Drought Mitigation Center

WATER NEWS

CALIFORNIA WATER NEWS

Westlands Water District awarded \$7.6 Million Grant by the California Department of Water Resources

Today the California Department of Water Resources (DWR) awarded Westlands Water District, which serves as the Groundwater Sustainability Agency (GSA) for the Westside Subbasin, a \$7.6 million grant as part of the Department's Sustainable Groundwater Management (SGM) Proposition 68 Implementation Grant Program. This grant provides critical investment in the District's efforts to ensure a sustainable groundwater basin.

"As we enter the third year of historic drought, Westlands remains committed to utilizing the most proactive, innovative, and scientifically-sound strategies in groundwater management," said Tom Birmingham, general manager of Westlands. "This grant funding from DWR will be instrumental to the District's implementation of the Sustainable Groundwater Management Act and to achieving groundwater sustainability. We are grateful for the support and investment in these vital projects."

The grant funding will further three key efforts within the Subbasin: the Storage Treatment Aquifer Recharge (STAR) Program, Phase 1; the Westside Subbasin Groundwater Sustainability Plan (GSP) 5-year Update; and the Westside Subbasin Geophysical Investigation for Recharge Potential.

The STAR Program will establish a network of treatment and aquifer storage and recovery (ASR) facilities in the Westside Subbasin. These facilities will treat water from the unconfined upper aquifer and provide temporary storage of surplus supplies. Based on current design, each treatment facility could treat up to 10,000 acre-feet a year and each ASR well could inject up to 1,200 gallons per minute to be stored for later use. Phase 1 of the STAR Program includes planning and identification of locations for the treatment facilities.



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The funding will also support the District's 5-year review and update of the Westside Subbasin GSP. This update enables the District to assess the implementation of the GSP and incorporate the latest information on groundwater conditions, technology, and science. The 2025 update will reflect progress towards achieving the Westside Subbasin 2040 sustainability goals, key groundwater project, and SGMA regulations compliance.

Lastly, the grant provided by DWR will also provide funding for the Westside Subbasin Geophysical Investigation for Recharge Potential. This Investigation consists of conducting geotechnical examinations on lands within the Westside Subbasin to identify groundwater recharge potential. The data collected will help interested parties, such as growers and/or the District, determine if a proposed site is feasible for groundwater.

Original Article: [California AG Today](#)

Calif. awards \$150M for groundwater management

In an effort to boost water supply reliability for millions of Californians, the California Department of Water Resources (DWR) has announced its first round of funding to 20 agencies responsible for managing critically overdrafted groundwater basins throughout the state.

A total of \$150 million in funding is being awarded to regional groundwater agencies through the Sustainable Groundwater Management (SGM) Grant Program. The funding will go toward projects focused on water efficiency, groundwater recharge, feasibility studies for alternative water supplies, and the installation of monitoring wells.

The grant funding is made possible by a \$171 million investment from the Budget Act of 2021 and will support other benefits such as improving drinking water quality and restoring habitat.

"Groundwater is a critical lifeline for millions of Californians and that is especially true during severe droughts like the one we're experiencing right now," said DWR Director Karla Nemeth in a press release. "We are dealing with the real-time impacts of a warming climate, and we know that less snowpack, precipitation, and surface water supply will lead to an increased reliance on groundwater. This first round of grant funding will help strengthen groundwater management, improve the reliability of those supplies statewide, and ensure access to safe and clean water for all Californians."

This funding will support 119 individual projects across 20 groundwater basins, with 102 of those projects benefitting underrepresented or severely disadvantaged communities including Tribes. The awards include \$40 million dedicated to projects within the San Joaquin Valley basin, a critically overdrafted region that is home to millions of Californians.

Outside of the San Joaquin Valley, projects located in the cities of Paso Robles and San Miguel, once completed, will deliver approximately 5,000 acre-feet per year of recycled water from wastewater treatment plants to use as irrigation for parks and agriculture.



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This direct use of recycled water will reduce the need to pump groundwater from the basin and further improve the sustainability of the city's water supply and provide a supplemental water supply to irrigators in the basin.

Projects that will help improve drinking water supplies include the Santa Cruz Mid-County Groundwater Agency's Aquifer Storage and Recovery Beltz Well 10 Project, which will store surface water, treated to drinking water standards, into the Santa Cruz Mid County Groundwater Basin for use as an underground storage reservoir. The drinking water will serve as a water supply during periods of water supply shortages or drought.

Additionally, a project through the Fox Canyon Groundwater Management Authority will identify and destroy up to 10 wells in the Oxnard Subbasin to reduce cross-contamination between two aquifer systems that serve multiple underrepresented communities in the area.

In addition to developing projects in these communities, the grant funding will help groundwater sustainability agencies revise their existing groundwater sustainability plans or plan alternatives. A full list of projects awarded funding can be found [here](#).

Several non-governmental organizations in the state will partner with the GSAs to help implement these projects, including the Central Coast Wetlands Group, Stanford Foundation, River Partners, Sustainable Conservation, Self-Help Enterprises, Sequoia River Alliance Trust, Tulare Basin Watershed Partnership, California Partnership, and Borrego Valley Stewardship Council.

California is home to 515 groundwater basins, with the majority of residents relying on groundwater for some portion of their water supply. During dry years, groundwater contributes up to 60 percent of the statewide annual supply and serves as a critical buffer against the impacts of drought and climate change.

The SGM Grant Program will provide additional support for groundwater basins through a second funding solicitation later this fall, which will offer more than \$200 million for planning efforts and projects in medium and high priority groundwater basins to help local agencies reach their groundwater sustainability goals under SGMA.

Original Article: [WaterWorld](#)

2022 Is California's Driest Year on Record So Far – an Ominous Sign for Summer and Fall

California had its driest start to a year since the late 19th century, raising drought and wildfire concerns heading into the summer.

In data released Monday, NOAA's National Centers for Environmental Information found January through April precipitation in the state was the lowest on record dating to 1895.

The statewide precipitation of 3.25 inches was only 25% of average, topping the previous record-dry January through April from 2013, according to NOAA statistics.



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This is troubling on several fronts.

First, this unusually dry stretch happened during much of the state's wet season, when the majority of precipitation usually falls.

San Francisco picks up over 90% of its annual precipitation from November through April, when the jet stream typically pushes moisture-laden Pacific storms into the West Coast.

Secondly, California is headed into its dry season.

From late spring through early fall, the jet stream moves well north, and aside from occasional, isolated summer thunderstorms, much of the state is dry.

During the dry season, runoff from snowmelt in the high country – particularly the Sierra – typically recharges the state's rivers, reservoirs and aqueducts, supplying almost one-third of the state's water for cities and agriculture.

But this year, the snowpack was paltry, began melting early and wasn't generating much runoff.

According to the May 6 update by the California Department of Water Resources (CDWR), the state's snowpack peaked March 8 at only 57% of average and over three weeks earlier than usual.

While some more recent systems dumped modest snow in the Sierra, the state's snowpack was only 21% of average as of May 9.

And the modest snowmelt that's happening is seeping into dry ground rather than running off into reservoirs, according to Desert Research Institute climatologist Dan McEvoy.

According to the CDWR update, the state's reservoirs were at 71% of average storage for early May, in better overall shape than this time in 2015, during California's exceptional mid-2010s drought.

But California's two largest reservoirs are at "critically low levels," according to the May 5 Drought Monitor summary. Shasta Lake is at its lowest early May level since the drought of 1976-77, while Lake Oroville is only 70% of its early May average.

California is in its third year of the latest drought, which accelerated in early 2020.

Original Article: [The Weather Channel by Jonathan Erdman](#)

California desert water agencies win \$100 million in U.S. funding for aging dams, canals

Southern California desert water districts with aging or failing infrastructure won big federal funding Monday, with more than \$100 million allocated for major dam and irrigation canal upgrades that will benefit the Coachella Valley and Imperial County.

The projects are part of \$240 million awarded from Bipartisan Infrastructure Law funds by the U.S. Department of the Interior on Monday.

Among the biggest beneficiaries is the Coachella Valley Water District, which will get \$60 million for lateral replacement irrigation pipelines and more for work on the Coachella



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Canal. Nearly 60,000 irrigated acres of fruits and vegetables and forage crops with a value of \$574 million were produced last year in the region, according to CVWD's annual agricultural report. Clean, reliable water piped in from the Colorado River system is essential for those crops.

“As western communities face growing challenges accessing water in the wake of record drought, these investments in our aging water infrastructure will safeguard community water supplies and revitalize water delivery systems,” Interior Secretary Deb Haaland said in a news release.

CVWD's entire distribution system off of the Coachella branch of the All-American Canal is pipeline buried underground, and the funds will pay for replacement pipelines for irrigation.

In a news release, Interior officials said CVWD had been "proactive" in identifying critical capital projects in the area. "Without timely replacement, meeting water deliveries could be completely jeopardized due to lack of redundancy in the design of the system," the Interior Department officials said. "These projects have been designed and are shovel-ready. They will mitigate existing failures, provide more durable materials, and reduce losses due to age of the system."

In a statement, CVWD engineering director Carrie Oliphant said they were excited to receive the funding, adding the funds will allow "critical infrastructure projects to be executed well in advance of their presently planned date."

"CVWD will be able to shift the focus from fixing the urgent repairs to looking forward to broader projects with larger impacts, including water conservation, water recycling, and efficient water use throughout the Coachella Valley," she added.

Another \$27.2 million was awarded for sludge pipe replacement at the Imperial Dam, north of Yuma, Arizona along the California border. It was identified as "a significant need with a significant cost to underfunded California users of Colorado [River] water." Water diverted at the dam for use in the Imperial Valley travels through a desilting basin, which is used to clarify the water. The three large basins — 540 feet wide by 770 feet long — are equipped with 72 scrapers to remove 70,000 tons of silt per day.

Original Article: [Desert Sun by Janet Wilson](#)

Ventura agrees to 20-year deal to lease its state water supply. Here's why

Ventura has struck a 20-year deal with a Riverside County water wholesaler that would save the city millions of dollars in costs to maintain its rights to imported state water.

Under the agreement approved last month, the city would lease its share of imported water to the San Geronio Pass Water Agency in Beaumont, an arrangement that would reap \$1.1 million this year and cover nearly half of the \$2.27 million it will owe to keep its state water entitlement. San Geronio would increase its share of the costs starting next year.



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Ventura has had rights to State Water Project supplies since the early 1970s, paying up to \$1.5 million annually, but it has no inter-tie to access the project, a network of dams, pumps and aqueducts that draws snow and rain runoff from Northern California.

The city has an all-local water supply that comes from the Ventura River, Lake Casitas, groundwater and recycled water. A planned seven-mile pipeline from Camarillo to Ventura would change that, allowing the city to connect to lines that carry imported water through eastern Ventura County. But the start of construction is still years away. To recoup some of its costs, Ventura has leased its share of state water to the San Geronio wholesaler annually for the past four years. But, now, new state rules allow such agreements to span multiple years.

Ventura's City Council and the San Geronio agency's board approved the agreement in late April, but the deal also needs the approval of the Ventura County Board of Supervisors and the state Department of Water Resources. Those votes are expected in the next few months.

Betsy Cooper, Ventura Water's assistant general manager, said the multi-year agreement would allow more economic certainty for the city and save time and effort in negotiating yearly leases.

"Twenty years is good for the city because it guarantees extra revenue for us to cover these ongoing costs," she said.

City officials estimate the fixed costs to range from \$2.3 million to \$2.75 million annually. San Geronio, taking on most of the financial risks, also needed a long enough time span to balance out the annual fluctuations of state water allocations seen in wet and dry years, Cooper said.

The city has an annual entitlement of 10,000 acre-feet, but the allocations typically come up short because they vary by how much water is available.

In dry years, officials release just a portion of requested allocations to the 29 municipal and agricultural districts under contract to receive State Water Project supplies.

This year, the state set allocations at 5% citing two years of drought conditions. Ventura's allocation would drop to 500 acre-feet. Under the agreement, San Geronio would receive the city's entire allocation for only half the cost. Starting next year, however, the water agency would pay all of the city's reimbursable fixed costs and have rights to Ventura's full allocation.

That arrangement will continue until the city finishes its pipeline. City officials expect the project, currently in the design phase, to go out to bid late next year. Construction then would take roughly two additional years.

When the pipeline is built, the city plans to keep 2,000 acre-feet of its yearly allocation and pay 40% of the costs. San Geronio would pay 60% of the costs and receive the remaining water.

Original Article: [VC Star by Cheri Carlson](#)



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Local districts pull out of Kern Groundwater Authority

Fractures have appeared within Kern County's largest groundwater agency as pressure mounts for it to show the state how it plans to address the region's massive groundwater deficit.

Four water entities recently notified the Kern Groundwater Authority they were pulling out of the 16-member group to write their own groundwater sustainability plan. That will add a sixth plan covering the Kern subbasin, which extends across the San Joaquin Valley portion of the county.

This comes as members of the authority, and other groundwater sustainability agencies in the subbasin, are working to respond to the Department of Water Resources (DWR), which found all groundwater plans in Kern County incomplete in January.

Those responses are due to the state by July 27.

That made the timing a bit awkward when the authority was notified on April 21 that four of its members were bailing out.

The Arvin-Edison Water Storage District, Wheeler Ridge-Maricopa Water Storage District, Tejon-Castac Water District and Arvin Community Services District, collectively, formed the South of Kern River Districts Groundwater Sustainability Agency.

They intend to have their own, separate groundwater management plan to the state by July 21, said Jeevan Muhar, general manager of Arvin-Edison.

"We'll be ready," he said.

The Sustainable Groundwater Management Act (SGMA) mandates water agencies bring overdrafted aquifers into balance by 2040. That, generally, means more water shouldn't be pumped out than goes back in.

The entire San Joaquin Valley is considered critically overdrafted. In Kern, the aquifer is being over pumped by a a whopping 320,000 acre feet a year – likely more during drought.

The state also requires that all plans covering a subbasin be coordinated, something that's proven difficult for Kern..

"The foundational deficiency for the Kern subbasin was a lack of utilizing the same data and methodology across the existing five groundwater sustainability plans," said Paul Gosselin, Deputy Director of Sustainable Groundwater Management for DWR. "So, adding a sixth plan may increase the complexity of that."

In its evaluation that found Kern's plans incomplete, DWR specifically called out what's known as "minimum thresholds," or the lowest allowable groundwater levels set by groundwater agencies, and asked for a better explanation for how those levels were set and potential impacts on other water users.

One of the districts mentioned in DWR's evaluation was the Semitropic Water Storage District in northwestern Kern County.



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Semitropic set its minimum thresholds an average 189 feet below the current water table, meaning its farmers could, theoretically, pump the aquifer down that much more before the district would take action.

In some cases Semitropic's minimum thresholds are hundreds of feet lower than those of its neighbors making it difficult to see how those districts would be able to maintain their water levels.

Semitropic's General Manager Jason Gianquinto told SJV Water in a previous story that the district is managing groundwater on a "glide path," which includes numerous programs to keep the district from hitting those lowest levels.

It remains to be seen if that approach is acceptable to DWR.

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

Huntington Beach desalination plant is a crucial tool in California's climate change arsenal

On May 12, the California Coastal Commission is expected to consider final approval of the Huntington Beach desalination plant. Poseidon Water has weaved through the state's complex and evolving regulatory landscape for nearly two decades in pursuit of that development permit.

Signing off on this project would demonstrate that seawater desalination — a proven water resource technology relied upon around the world to combat the effects of climate change and drought — has a future in California.

For decades, California has been at the forefront of policies to clean our air and waterways and protect endangered species, but as the climate change challenges we face become more complex, this commitment will be tested.

California is well into its third year of drought and is experiencing the driest 22 years in more than a thousand years. Water allocations from federal and state water projects are at or near zero. Mandatory water use restrictions for millions of Californians are being invoked in many parts of the state.

It once may have been enough to embrace more stringent conservation efforts, but now, as some of the easy solutions have been exhausted, we will face far more difficult and nuanced choices in how we manage our state through frequent and prolonged droughts. One solution that is immune to snowpack levels and dry years is desalination. There's no reason why an environmental leader such as the Golden State shouldn't embrace this technology.

The Legislature first declared that California had a primary interest in the development of water desalination in 1965. A coastal desalination plant could eliminate the need for or supplement imported water in favor of a locally available and easily managed water supply.

Today, Gov. Gavin Newsom's administration promotes a portfolio of actions to ensure the state's long-term water supplies and ecosystem health in the face of climate change.



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The governor's plan includes developing more seawater desalination facilities to enhance regional water supply diversification. Seawater desalination is the only 100% climate-resilient new water supply available to California.

Desalination facilities around the world are producing drinking water each day. For example, several large-scale seawater desalination plants have been built in Australia since 2000, and Israel secures more than 70% of its drinking water from the Mediterranean Sea.

To protect public health and safety and its economy, Santa Barbara successfully reactivated a facility initially built in the early 1990s. In addition, the city of Carlsbad hosts the largest, most technologically advanced and energy-efficient desalination facility in the Americas. To date it has produced 87 billion gallons of drought-proof drinking water, and more is on the way.

State Senate Pro Tem Toni Atkins has called Carlsbad a model for seawater desalination done right in the state of California. Other facilities — large and small, coastal and inland — are in various stages of planning, providing hope that the full potential of the technology can be realized in the near future.

The proposed Huntington Beach facility will set new environmental standards for desalination projects. The facility already has been found by local and state environmental agencies to comply with all applicable environmental laws and standards, and state regulators have determined that the facility will use the best available site, design, technology and mitigation measures feasible to protect marine life. The facility, sited on industrial land, is 100% carbon neutral and seeks to be the first desalination facility in the Western Hemisphere to be powered with 100% renewable energy.

California has exhausted the easy and simple solutions to climate change. Going forward, we will have to embrace a variety of measures to establish water resilience and continue the fight against climate change. The Coastal Commission will have that chance on May 12.

Original Article: [Cal Matter by Mark Donovan](#)

California declares unprecedented water restrictions amid drought

Amid a once-in-a-millennium prolonged drought fuelled by the climate crisis, one of the largest water distribution agencies in the United States is warning six million California residents to cut back their water usage this summer, or risk dire shortages.

The scale of the restrictions is unprecedented in the history of the Metropolitan Water District of Southern California, which serves 20 million people and has been in operation for nearly a century.

Adel Hagekhalil, the district's general manager, has asked residents to limit outdoor watering to one day a week so there will be enough water for drinking, cooking and flushing toilets months from now.



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“This is real; this is serious and unprecedented,” Hagekhalil told Al Jazeera. “We need to do it, otherwise we don’t have enough water for indoor use, which is the basic health and safety stuff we need every day.”

The district has imposed restrictions before, but not to this extent, he said. “This is the first time we’ve said, we don’t have enough water [from the Sierra Nevadas in northern California] to last us for the rest of the year, unless we cut our usage by 35 percent.”

Depleted reservoirs

Most of the water that southern California residents enjoy begins as snow in the Sierra Nevadas and the Rocky Mountains. The snowmelt runs downstream into rivers, where it is diverted through reservoirs, dams, aqueducts and pipes.

For most of the last century, the system worked; but over the last two decades, the climate crisis has contributed to prolonged drought in the west – a “megadrought” of a scale not seen in 1,200 years. The conditions mean less snowfall, earlier snowmelt, and water shortages in the summer.

California has enormous reservoirs, which Hagekhalil likens to a savings account. But today, it is drawing more than ever from those savings.

“We have two systems – one in the California Sierras and one in the Rockies – and we’ve never had both systems drained,” Hagekhalil said. “This is the first time ever.”

John Abatzoglou, an associate professor who studies climate at the University of California Merced, told Al Jazeera that more than 90 percent of the western US is currently in some form of drought. The past 22 years were the driest in more than a millennium in the southwest.

“After some of these recent years of drought, part of me is like, it can’t get any worse – but here we are,” Abatzoglou said.

The snowpack in the Sierra Nevadas is now 32 percent of its typical volume this time of year, he said, describing the warming climate as a long-term tax on the west’s water budget. A warmer, thirstier atmosphere is reducing the amount of moisture that flows downstream.

The dry conditions are also creating a longer wildfire season, as the snowpack moisture keeps vegetation wet enough to resist carrying fire. When the snowpack is low and melting earlier in the year, vegetation dries out faster, allowing flames to sweep through the forests, Abatzoglou said.

With less water available from the northern California snowpack, Hagekhalil said the district is relying more on the Colorado River. “We’re lucky that in the Colorado River, we have built in storage over time,” he said. “That storage is saving the day for us right now.”

But Anne Castle, a senior fellow at the University of Colorado’s Getches-Wilkinson Centre, said the river that provides water to communities across the west is experiencing another “extremely dry” year. The river, which flows southwest from Colorado to the



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northwestern tip of Mexico, is fed by the snowpack in the Rocky Mountains and the Wasatch Range.

Two of the largest reservoirs in the US are at critically low levels: Lake Mead is about a third full, while Lake Powell is a quarter full – its lowest level since it was first filled in the 1960s. Lake Powell is so parched that government agencies fear its hydropower turbines could become damaged, and are mobilising to divert water into the reservoir.

Original Article: [Aljazeera by Hilary Beaumont](#)

Calif. awards \$22M for 17 drought relief projects

Following the driest three-month stretch in the state's recorded history and with warmer months ahead, the Department of Water Resources (DWR) announced its seventh round of grant awards for local assistance through the Small Community Drought Relief program.

In coordination with the State Water Resources Control Board, DWR has selected 17 projects located in Plumas, Napa, Butte, Glenn, Tulare, Humboldt, Fresno, Kern, Marin, Mendocino, and Yolo counties to receive funding for projects that will help strengthen drought resiliency.

Of the 17 projects, 14 will directly support disadvantaged communities, including three Tribes, and will replace aging infrastructure, increase water storage, and improve drinking water quality and supply.

“Climate change has fundamentally altered our state's water cycle — intensifying extreme weather and leading to longer, drier periods. As the world continues to warm, we must work together to manage California's water supply. That work starts with protecting the health and safety of our communities,” said Kris Tjernell, DWR Deputy Director of Integrated Watershed Management.

DWR, in coordination with the State Water Resources Control Board, determined these funding commitments, which complement the State Water Board's historical and ongoing financial assistance to small, economically disadvantaged communities for their water infrastructure needs.

Original Article: [WaterWorld](#)

In drought-ravaged California, water use is up dramatically

California's water use jumped dramatically in March, state officials said Tuesday, as one of the driest stretches on record prompted a wave of homeowners to start watering their lawns earlier than usual in defiance of Gov. Gavin Newsom's pleas for conservation amid a severe drought.

Newsom last summer asked residents to voluntarily cut water use by 15% compared to 2020 as climate change intensified a drought that threatened to drain the state's reservoirs to dangerously low levels. Water conservation increased gradually through



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December, aided by some intense fall and early winter storms that reduced water demand.

But the first three months of 2022 have been the driest on record. Californians averaged 77 gallons (291.48 liters) per person per day in March, an 18.9% increase from March 2020. It's the most water Californians have used in March since the middle of the previous drought in 2015. Statewide, water consumption is up just 3.7% since July compared to 2020, woefully short of Newsom's 15% goal

Newsom responded on Tuesday by pledging to spend \$100 million on a statewide advertising campaign to encourage water conservation. The campaign will include traditional radio and television spots while also paying people with large followings on social media to urge others to save water. He also promised to spend an \$211 million to conserve more water in state government buildings by replacing plumbing fixtures and irrigation controls.

“Conservation actions are most impactful when they account for the diversity of conditions and supply needs around the state,” Newsom's office said in a statement. “We are hopeful these actions will significantly contribute to the state’s overall water reduction goals as outdoor watering is one of the biggest single users of water.”

In Los Angeles — the second most populous city in the U.S. — Mayor Eric Garcetti said residents and businesses would have to reduce outdoor landscape watering from three days per week to two. Irrigation makes up 35% of the city’s water use.

Urban water use accounts for a relatively small percentage of California's overall water use when compared to agriculture. But the state's farmers have been suffering, too, as state and federal officials have reduced water allocations to zero in some places.

Demand for non-agriculture water is typically low in March, which comes near the end of the state’s rainy season. It can sometimes rain so much in March that it makes up for the rest of the year, a phenomenon officials have dubbed the “March miracle.”

But California got just 1 inch (2.54 centimeters) of precipitation in March while the temperatures were 3 degrees warmer than usual, further increasing water demand.

A series of April storms have improved things slightly since March. Still, most of the state's reservoirs are well below their historic averages. The reservoirs depend on melted snow from the Sierra Nevada to replenish them for the dry summer months. But the statewide snowpack was at just 27% of its historic average as of April 1.

“This is what we have. This is what we're going to get. We can't expect anything significant past this date,” said Jeanine Jones, manager for interstate resources with the California Department of Water Resources.

Original Article: [SF Gate by Adam Beam](#)



US WATER NEWS

Water is so low in the Colorado River, feds are holding some back so one dam can keep generating power

The federal government on Tuesday announced it will delay the release of water from one of the Colorado River's major reservoirs, an unprecedented action that will temporarily address declining reservoir levels fueled by the historic Western drought.

The decision will keep more water in Lake Powell, the reservoir located at the Glen Canyon Dam in northern Arizona, instead of releasing it downstream to Lake Mead, the river's other primary reservoir.

The actions come as water levels at both reservoirs reached their lowest levels on record. Lake Powell's water level is currently at an elevation of 3,523 feet. If the level drops below 3,490 feet, the so-called minimum power pool, the Glen Canyon Dam, which supplies electricity for about 5.8 million customers in the inland West, will no longer be able to generate electricity.

The delay is expected to protect operations at the dam for next 12 months, officials said during a press briefing on Tuesday, and will keep nearly 500,000 acre-feet of water in Lake Powell. Under a separate plan, officials will also release about 500,000 acre-feet of water into Lake Powell from Flaming Gorge, a reservoir located upstream at the Utah-Wyoming border.

Officials said the actions will help save water, protect the dam's ability to produce hydropower and provide officials with more time to figure out how to operate the dam at lower water levels.

"We have never taken this step before in the Colorado Basin," assistant Interior Department secretary Tanya Trujillo told reporters on Tuesday. "But the conditions we see today, and what we see on the horizon, demand that we take prompt action."

Federal officials last year ordered the first-ever water cuts for the Colorado River Basin, which supplies water to more than 40 million people and some 2.5 million acres of croplands in the West. The cuts have mostly affected farmers in Arizona, who use nearly three-quarters of the available water supply to irrigate their crops.

In April, federal water managers warned the seven states that draw from the Colorado River that the government was considering taking emergency action to address declining water levels at Lake Powell.

Original Article: [CNBC by Emma Newburger](#)

Arizona farmers see booming tech industry as competition for water

Arizona farmers struggling to grow crops because of drought conditions now have another challenge — tech companies that also rely on large amounts of water are expanding throughout the state.



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McGuire said the competition for water comes at a time when farmers are getting less water from the Central Arizona Project and other sources.

Historically low water levels from the Colorado River triggered the U.S. Bureau of Reclamation to announce last August that it would be reducing water allocations for some users who receive water through the CAP.

“Big semiconductor plants, cloud servers, databases, warehouses — all of this coming in, it does create competition against agriculture,” said Chelsea McGuire, director of government relations for the Arizona Farm Bureau.

Farmers in Pinal County were among the hardest hit. In January, they started receiving about a third of the water supply that’s normally available to them.

“It’s kind of a literal drop in the bucket, but anything is going to help,” McGuire said, referring to the amount of water farmers are now getting through the CAP canals.

Water cutbacks have forced farmers to diversify or reduce the amount of crops they’re able to grow.

Some in Pinal County have had to cut back production by half. They now worry tech companies, including the semiconductor plants expanding in Arizona, will create competition for water use.

Chris Camacho, president and CEO of the Greater Phoenix Economic Council, disagrees. Instead, he believes water conservation efforts have made it possible for the agriculture and tech industries to coexist in Arizona.

“These new fab plants, most people think that they consume a lot of water,” Camacho said. “In reality, we’re still using less than 5% of our water allocation for these industrial users. And at the same time, they recycle and reuse and reinject into the aquifer over 90% of their process water used.”

He added these companies are a huge boost to Arizona’s economy.

The two massive semiconductor plants Intel is building on its Chandler campus and the plant that Taiwan Semiconductor Manufacturing Co. is building in north Phoenix, for example, collectively will generate up to \$30 billion over the next few years, according to Camacho. They will also create between 5,000 and 10,000 jobs.

“These companies can choose anywhere around the world to locate these high-valued plants, and they’re creating high-wage jobs,” Camacho said. “At the end of the day, they’re creating a new tax base that helps diversify our economic base.”

McGuire said she understands the economic benefits these companies bring but emphasized the state has limited water resources. She added she worries about the future of Arizona’s \$23 billion agriculture industry.

“We welcome any kind of economic development,” she stressed. “But let’s make sure that we’re not developing one sector of our economy at the expense of our food security.”

Original Article: [KTAR News by Griselda Zentino](#)



Biden-Harris Administration Announces \$10 Million in Bipartisan Infrastructure Law Investments for Tribal Water Systems

The Department of the Interior today announced that \$10.65 million provided by President Biden’s Bipartisan Infrastructure Law will be used for vital repairs and upgrades for Indian Affairs-owned water systems. These systems serve Tribal workplaces, schools, detention centers and more.

The Bipartisan Infrastructure Law invests more than \$13 billion directly in Tribal communities across the country, including a total of \$466 million to the Bureau of Indian Affairs over five years, which includes funding for water and sanitation projects.

“Thanks to President Biden’s Bipartisan Infrastructure Law, historic investments in Tribal water infrastructure will help ensure every community has access to safe, clean drinking water,” said Secretary Deb Haaland. “This critical funding in water sanitation and water systems will facilitate much-needed repairs and upgrades for Tribal water systems, supporting our efforts to safeguard sacred water resources and water rights in Indigenous communities.”

“Operational, efficient and resilient water systems are necessary to protect our communities and fulfill our agency’s trust responsibilities,” said Assistant Secretary for Indian Affairs Bryan Newland. “This investment will allow us to address challenges such as climate change and chemical contamination that impact the aging water systems of Indian Affairs, so that we can continue to provide safe drinking water for Indigenous communities.”

These funds will be used to address Environmental Protection Agency (EPA) notice of violations, contamination issues, critical risks of system failure, and other system upgrades as needed.

Original Article: [U.S Department of the Interior](#)

The Colorado River needs a big moisture boost. Runoff forecasts suggest it won’t come from spring snowmelt

Spring snowmelt likely won’t deliver the big water supply bump the drought-stricken Colorado River and its reservoirs need, data from the latest federal river forecast shows. The May to July season is a crucial time for the river, which is replenished by snowmelt running off the mountains on the Western Slope, and the system is in need of a major moisture boost amid a 20-year drought fueled by climate change.

Lake Powell is expected to get only 59 percent of the amount of water that usually flows into the reservoir between May and July, according to the National Weather Service’s Colorado Basin River Forecast Center. That’s not great for the vital reservoir and hydropower source, which is sitting at its lowest level on record.

The amount of water forecasted to flow into Lake Powell is a good marker for the overall health of the upper half of the Colorado River system. The reservoir on the Utah-Arizona



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border, the nation's second-largest, supplies water and electricity to millions of people in the West.

The federal forecast zooms in on Colorado and the major river basins that feed the Colorado River and predicts below-normal runoff in each of them. In the White and Yampa River basin in the northwest, the range of runoff is expected to be between 65 and 95 percent of normal. South of that, in the Upper Colorado Headwaters basin, runoff is expected to be between 55 and 95 percent of normal.

The runoff forecast is worse in the south, where hydrologist Cody Moser said warmer-than-average temperatures have caused the snowpack to melt sooner and quicker. In the Gunnison River basin, runoff is expected to be between 50 and 95 percent average. South of that, runoff in the Dolores River basin is expected to be between 45 and 60 percent of normal, and in the San Juan Basin, 55 to 70 percent of normal is forecasted. Moser said that parts of the upper Colorado River basin have gotten near-normal amounts of precipitation since fall of 2021. But because the soil is drier with warmer temperatures, it soaks up a lot of the snowmelt before it reaches rivers and reservoirs. The U.S Bureau of Reclamation recently announced emergency plans to protect Lake Powell by holding back water releases to downstream states. This is the first time the agency has moved to delay a release of water from Lake Powell that normally goes to Arizona, California and Nevada.

Instead, the federal agency plans to keep more than 480,000 acre-feet of water in the reservoir to prop up supplies to protect hydropower production.

Original Article: [CPR News by Michael Elizabeth Sakas](#)

High cost of water hits home

The questions -- the mental calculations for basic needs -- are relentless. Can she go another day or two without doing laundry? Do those dishes need to be cleaned now or can they wait until tomorrow or the next day?

Water conservation is a constant negotiation for Summer, a 58-year-old Oak Park resident. Unlike for most people, it's also a survival strategy.

Summer said she has to be stingy with water to make her monthly budget pencil out. Water, sewer, storm water, and garbage collection are all part of the same bill. To keep it in the \$120 range she washes clothes once a week, sometimes every other week. She receives a fixed income from disability payments. With all her other bills, waste is a luxury she can't afford.

"Well, it is stressful, of course, because you can't really live a functional life without water," said Summer, who did not want her real name to be used in order to keep her personal struggles private. "And you know, it puts you in a scary place, a stressful place, where you're concerned that your water's going to go off and if it goes off, you're going to have to pay all of the reconnection fees."



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Water rates are rising across Michigan as communities undertake long-needed upgrades to hobbled water, sewer, and drainage systems. These are necessary investments for the state's future that nonetheless are exposing Summer and other low-income households to financial stress.

Data compiled by the Institute for Public Utilities at Michigan State University shows that water prices are climbing quickly -- more quickly, until recent price spikes, than most other goods and services. Since the mid-1980s, water prices grew at a higher rate than garbage, electricity, and natural gas, as well as the broader Consumer Price Index, which is a national measure of inflation.

Other studies indicate that public officials should be worried about water price increases and their consequences for the state's poorest residents. A comprehensive University of Michigan report published last year found that average water prices in the state, when adjusted for inflation, had nearly doubled between 1980 and 2018.

The Michigan chapter of the American Water Works Association, in an informal survey conducted a year ago during the depths of the pandemic, asked its member utilities about past-due bills. The utilities that responded indicated that customers, in aggregate, owed \$252 million. Neither the AWWA nor the Michigan Department of Health and Human Services, the agency that is administering the state water assistance program, has updated those numbers.

Urban areas in the state's southeastern counties, where Oak Park is located, have been particularly hard hit. In the last half-century, Detroit, Flint, Pontiac, River Rouge, Inkster and others had to contend with rising costs, aging systems, declining populations, spendthrift emergency managers, and high poverty rates. But the University of Michigan data also revealed that rising water prices affect every corner of the state, with high-cost pockets in the Thumb and Upper Peninsula.

Water leaders are taking notice.

"Affordability is an issue no matter where you are," said Jaime Fleming, a board member with the Michigan chapter of the American Water Works Association, a utility group that recently completed a six-month discussion series on affordability. "It's not just an urban issue. It is a rural issue, with some smaller systems or people that are way out away from a city. We have people struggling all across the state."

What happens to those people when bills are high and residents cannot afford to pay them? Late fees accumulate, adding to the financial strain. Oak Park residents who receive a shutoff notice in the mail have to pay \$10 to the utility for the warning. If the water is shut off, residents pay \$90 to get it turned back on -- but that fee applies only during regular business hours, Monday to Thursday between 8:00 a.m. and 3:00 p.m. Otherwise residents have to pay a \$150 overtime rate. Kevin VanDeWalle, the Oak Park water supervisor, said the fees are designed to pass along the cost of operations.

Neighboring cities also use fees. Shanir Smith, a West Bloomfield resident whose water was shut off in February for past-due bills, said that the three-month payment plan the



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utility designed for her to catch up has a 9 percent interest rate. “It makes it harder,” Smith said.

Overdue payments can result in a tax lien against the property -- another financial penalty that, in Oak Park, comes with a 10 percent fee on the overdue balance. In a rare but worst-case scenario liens can lead to foreclosure. Most often, residents have their water service shut off. Though Michigan placed a moratorium on the practice during the pandemic, utilities can once again turn off water to the home to compel payment.

Though the rising cost of water is a state and national phenomenon, there is no clear-cut definition for affordable water. The concept is complicated because water affordability is relative. It is not only the size of the bill, but how it compares to the income of the household receiving it and to the cost of other essential expenses like food, housing, energy, and healthcare.

Original Article: [Michigan Radio NPR by Brett Walton \(Circle of Blue\)](#)

DWR Habitat Council Allocates \$4M to Habitat Restoration, Wildlife Projects

Roughly \$4 million was allocated to selected habitat restoration projects at the recent annual Utah Division of Wildlife Resources Habitat Council funding meeting.

The DWR Habitat Council was created in 1995 by the Utah Legislature as a way to provide funds for the enhancement, preservation, management, acquisition and protection of fish and wildlife habitat, and for improving hunting and fishing access. These funds are a portion of the revenue from license, permit, stamp and certificate of registration fees related to hunting and fishing.

The Habitat Council consists of eight individuals who act as an advisory board. They provide recommendations regarding the use of the funds received annually each year from the sales of hunting and fishing licenses. Members include four public representatives and four DWR or Department of Natural Resources employees.

“We are very appreciative of the hunters and anglers who are the backbone of wildlife conservation,” DWR Habitat Conservation Coordinator Daniel Eddington said. “Anyone who buys a hunting and fishing license helps fund many of the crucial habitat restoration projects that help to maintain fish and wildlife populations for future generations to enjoy.”

Original Article: [ETV News by Traci Bishop](#)

AP analysis finds growing number of poor, high-hazard dams

Constructed four generations ago, the massive rock and clay dam at El Capitan Reservoir is capable of storing over 36 billion gallons of water, enough to supply every resident in San Diego for most of a year.

Today, it’s three-quarters empty, intentionally kept low because of concerns it could fail under the strain of too much water.



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During “a big earthquake, you never know what’s going to happen, if this is going to hold,” said Samuel Santos, a longtime resident who frequently fishes near the dam.

Seismic instability and a spillway in need of “significant repair” led El Capitan to be added to a growing list of dams rated in poor condition or worse that would likely cause deaths downstream if they failed.

An Associated Press analysis tallied more than 2,200 high-hazard dams in poor or unsatisfactory condition across the U.S. — up substantially from a similar AP review conducted three years ago. The actual number is likely even higher, although it’s unclear because some states don’t track such data and many federal agencies refuse to release details about their dams’ conditions.

The nation’s dams are on average over a half-century old and often present more of a hazard than envisioned when designed because homes, businesses or highways have cropped up below them. Meanwhile, a warming atmosphere can bring stronger storms with heavier rainfall that could overwhelm aging dams.

“All of a sudden, you’ve got older dams with a lower design criteria that now can potentially cause loss of life if they fail,” said Del Shannon, an engineer who is president of the U.S. Society on Dams.

“The number of deficient, high-hazard dams is increasing,” he said, adding that without investment in upgrades, that number will continue to rise.

Decades of deferred maintenance has worsened the problem. But a changing climate and extreme floods — such as the one that caused the failure of two Michigan dams and the evacuation of 10,000 people in 2020 — have brought a renewed focus to an often overlooked aspect of America’s critical infrastructure.

The \$1 trillion infrastructure bill signed last year by President Joe Biden will pump about \$3 billion into dam-related projects, including hundreds of millions for state dam safety programs and repairs.

Original Article: [AP News by David A. Lieb, Michael Casey and Michelle Minkoff](#)

Gov. Doug Ducey’s plan to use desalinated water in Arizona will be pricey, expert says

Arizona Gov. Doug Ducey is making a push to bring desalinated water to the state with a potential \$1 billion investment, but an expert says that is going to be expensive.

“That water will cost a lot more money than what we’re used to paying now, at least double, or in some case triple, for the raw water,” Tom Buschatzke, director of the Arizona Department of Water Resources, told *KTAR News 92.3 FM*.

Buschatzke estimates an acre-foot of desalinated water could cost in the ballpark of \$3,000, while non-desalinated water is typically \$50 to \$150 per acre-foot.

He said a family of three in the metro Phoenix area uses about 1 acre-foot of water a year and that cities would decide what the final water prices are for consumers.



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Buschatzke said the state is probably around a decade away from being able to use desalinated water, which he stresses does work.

“The technology for (desalinated) is proven and the cost because of the technology improvements is going down,” he said.

The city of Goodyear has a small desalination plant where it takes underground water that is salty, which Buschatzke calls brackish groundwater, and cleans it for use.

The plan includes helping fund the building of a desalination plant in the Sea of Cortez in Mexico. The state would not own the plant but would buy water from it. Buschatzke estimates the cost to build the plant would be in the neighborhood of \$2.5-3 billion.

Ducey’s plan now hangs in the balance of the state legislature and it is expected to be voted on by the end of the session.

Original Article: [KTAR News by Taylor Tasler](#)

GLOBAL WATER NEWS

Financial firms face \$225 billion in water-related losses, analysis estimates

Financial institutions face losses of at least \$225 billion from risks related to water, with a third of them doing nothing to assess the potential impact, a report by leading environmental disclosure platform CDP and Planet Tracker estimates.

The U.N. has warned of a 40% shortfall in supply by 2030 if water consumption and production patterns do not change and so-called water risk, through flood, drought or pollution, is set to become a growing issue for companies over the next decade.

The most common impacts flagged to CDP, whose data is used to inform investment decisions by financial firms managing more than \$130 trillion in assets, included reduced production, increased costs and lower revenues.

In its first such analysis, CDP and non-profit Planet Tracker analysed submissions to a survey on water security from 1,112 companies, in which 69% flagged a risk of a "substantive" impact on their business.

Of the 377 listed financial institutions reporting to CDP, 33% said were not assessing their exposure to the connected risks, which can include fines and other liabilities, shareholder lawsuits or an inability to get insurance.

By underestimating the risk, banks, investors and insurers could be allocating too much capital to companies and projects that may ultimately prove uneconomic, leading to the assets becoming "stranded" and the investment or lending written off.



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"Financial institutions need to understand how exposed they are to these risks and take immediate steps before it's too late," said Cate Lamb, CDP's global director of water security.

CDP analysed the \$225 billion value at risk from a sub-set of 499 of the largest corporates to have disclosed a financial projection of potential related costs. So the figure for all companies in the world would be higher.

The water crisis is already causing billions of dollars in losses, CDP said, pointing to related writedowns across the oil and gas, electric utilities, coal and metal and mining sectors.

CDP and Planet Tracker also identified the state and public institutions most closely linked to 42 of the world's most water-impacted companies, through shareholdings or lending.

They found the 20 most exposed held a combined \$2.7 trillion in equity and had lent \$2.5 trillion over the last decade. The firms also have around \$327 billion of financing due to mature over the next five years.

Original Article: [Nasdaq/ Reuters by Simon Jessop and Tommy Wilkes](#)

Why Barnaby Joyce's 'gift' to farmers of a \$5.4bn dam could create the 'most expensive water' in Australia

If the \$5.4 billion Hells Gates Dam project, recently announced by Deputy Prime Minister Barnaby Joyce, goes ahead in north Queensland, it could create the most expensive water in the country, according to a water engineering expert.

"If you were to follow the principles of the National Water Initiative and have some sort of cost recovery built into the price of water, to cover the cost of constructing that infrastructure, I can't put a number on it, but it would be the most expensive water in the country," said Professor Stuart Khan, of the University of New South Wales.

"[It would be] well out of the range of current prices that farmers pay for water either in the Murray-Darling Basin or in parts of Far North Queensland where irrigated agriculture already exists."

Mr Joyce announced the funding for the long-talked-about project in March and it dwarfs almost any announcement made so far during the federal election campaign.

Holding 2,100 gegalitres of water, the Hells Gates Dam would be the largest in Queensland and proponents believe it could turn some of the state's driest cattle country into a 60,000-hectare irrigated food bowl.

Professor Khan, from the School of Civil and Environmental Engineering at UNSW, was, until recently, a member of the federal government's National Water Grid Advisory Body.

He said Mr Joyce abolished the body just days after announcing Hells Gates Dam had received budget funding, and revealed that the government had not sought its advice on the project.



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"It was really frustrating and disappointing to see decisions being made that aren't consistent with the principles of the National Water Initiative ... and really look like they're being made in the lead-up to a federal election, potentially as a way of winning votes," Professor Khan said.

Hells Gates Dam was originally conceived by the renowned engineer John Bradfield in the 1930s and has long been championed by North Queensland crossbench MP Bob Katter.

But despite numerous government-commissioned reports over many years, no government has built it.

Professor Khan last week said he remained doubtful the dam would ever be built, noting the federal government's \$5.4 billion commitment was subject to a business case that was not expected to be released publicly until June.

Late yesterday, however, Townsville Enterprise — the organisation preparing the \$24 million federally-funded business case for the dam — told the ABC its report had already been completed and had proved the dam concept was economically viable.

Townsville Enterprise chief executive Claudia Brumme-Smith provided a statement to the ABC but said the organisation was not authorised to share the business case document, which was commissioned by the federal and Queensland governments.

"After two and a half years of comprehensive research, technical investigation and economic modelling, the Detailed Business Case has been completed," Ms Brumme-Smith said.

"[It] presents a Benefit to Cost Ratio of greater than one, which means that, economically, the project benefits outweigh the costs according to a 50-year assessment of the development."

Original Article: [ABC News by Eliza Borrello and Jade Toomey](#)

Research Has Found That Much Of The Groundwater Is Hidden Beneath The Antarctic Ice Sheet

New research finds, Antarctica Debris beneath the ice sheets is abundant Groundwater. Researchers believe this could be a major factor in the speed at which Antarctic ice sheets move like "water slides".

This study assumes that Antarctica These may affect the direction of a large number of avalanches Groundwater System control. The study determined what was happening in the foothills below western Antarctica, but researchers believe this is true of many other parts of Antarctica as well as underground debris.

An ice stream is a relatively fast moving ice structure. Ice streams in Antarctica can move up to 6 feet a day. Scientists have found that 90% of ice loss from the Antarctic continent is in the form of ice streams.

They chose the west as the Villains Ice Stream research object in Antarctica because the current information about the area is relatively rich, and another member of the



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Cooperative Group discovered in 2007 through satellite data that there appears to be a lake beneath it. Region .. This information aroused the interest of researchers.

Previous studies had limited ice to shallow drilling to obtain samples for analysis, but Gustafson decided to use a technique with a team. Magnetotelluric (Magnetotellurics) New method of investigation. "Magnetotelluric is like taking the Earth's MRI (nuclear magnetic resonance) scan," Gustafsson said.

In 2018, the exploration of the four finally began. This is a very dangerous journey, and if there is any danger, it is difficult to wait for rescue. Before entering the deceptive wild atmosphere, they settled for two weeks at an American research center on Rose Island in Antarctica. Gustafsson told Gizmodo, a tech blog site, "Thousands of people live there during the peak season of the year. It's like a small town with famous restaurants, hotels, a gym and two bars."

Over the past two weeks, in addition to packing tents, sleeping bags, and food, they learned from a climber how to build makeshift shelters in the snow, run slides, and set up tents, as well as other survival skills. Eventually they reached their destination, the Villains Ice Stream on the western Antarctic ice sheet.

There they selected eight locations and buried the electromagnetic signal receivers one foot below the snow. After 24 hours, they were taken out and moved to a location several kilometers away and then buried to continue receiving signals, thus for six weeks.

Analyzing the collected signals, they found that the debris beneath the Villains ice stream contained a lot of water. This is the marine remnant that existed when Antarctica was an open ocean millions of years ago. The analysis reveals that it was deposited at a depth of half a kilometer to 2 km. Glaciers After the water has melted, the water in the bottom residue begins to contain salt, and the deeper the water, the more salt there is. They speculate that the salt in the groundwater may have been reduced by the accumulation of these ancient remains. Later, as the upper ice sheet thickens, the salts in the freshly frozen seawater are pushed under the ice and into these debris, dissolving in the groundwater. But sometimes the icebergs melt and the seawater fills up again. Of course, all of this is just speculation right now.

Gustafson said groundwater would have a significant impact on Antarctica's glaciers. "Let's just say it's like these icebergs are climbing on a water slide. There's water in the debris below.

Original Article:: [Swords Today by Jake Pearson](#)

Releasing the chokehold on Australia's water

The Murray Darling Basin (MDB) catchment is the lifeblood of the southeast of Australia, made up of 77,000 kilometres of river, spanning across four states and one territory with over 40 First Nations in the Basin. The Basin supports the irrigation of 7,300 agricultural



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business, contributing over \$22 billion to the Australian economy. The Basin contains over 100 nationally important ecological or cultural sites, including many internationally important sites protected under the Ramsar Convention. It is managed by the Murray-Darling Basin Authority (MDBA) together with the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Basin Aboriginal Nations (NBAN); the two main First-Nation based organisations that primarily focus on natural resource management.

Managing the MDB is a constant juggling act between the amount of water available and the urgency of environmental and agricultural needs, achieved through the constant trading of water and water level management through flooding, draining, and storage practices. With climate change comes additional challenges, like more extreme drought events, rainfall and flooding events. Recently the MDBA has announced a forty billion gegalitres trading surplus at the Barmah Choke portion of the Murray River. How does water trading work, where did this surplus come from, and how does this help the management of the MDB?

Trading Water

Water is traded as entitlements, which are a perpetual right to a share of water from a particular resource, such as a river or underground aquifer. Water allocations are the right to access a volume of water, made available under a water entitlement, in a given year. This water can be used, traded (sold) or carried over. The entitlement always remains the same each year, but the allocation will differ depending on water availability and need. For example, if a farmer had an entitlement of 100 megalitres a year, but it was a particularly dry year, they may only receive 50% allocation of their entitlement, equal to 50 megalitres.

The main driver of water allocation prices in this open water market are driven by water supply, which is highly reliant on rainfall. During the Millennium drought (that spanned from 1996-2010), rainfall dropped by 17%, which led to unprecedented allocation price highs. When floods occurred during 2011, 2012 and 2016, prices declined to near zero. Since then, because of recent droughts, prices have risen again.

From 2008, the federal government began a buyback scheme to purchase water entitlements for environmental use. While this somewhat controversial scheme ended in 2020, over 2,877,111 megalitres of entitlements were purchased for environmental water holdings, though not without the hefty pricetag of A\$2.6 billion.

“There are the state and federal water holders, for example there’s the Victorian Environmental Water Holder, and then there is the Commonwealth Environmental Water Office which holds the majority of the water,” explains Keith Ward, the senior wetland ecologist for the Victorian side of the Goulburn Broken Catchment Management Authority.



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“If there are any water savings, like from when Lake Makoan was decommissioned, this additional water is divided up for different environmental requirements, between the state and federal governing bodies.

“There is never too much water though.”

The Barmah Choke

The Barmah Choke is a narrow section of the Murray River, that runs through the Barmah-Millewa Forest, located on Yorta Yorta land between Echuca and Cobram near the NSW border of Victoria.

“The Choke formed from geological uplifting, about 75-25 thousand years ago, so is very young in geological times. It is an internationally significant Ramsar site, and one of six iconic River Murray locations,” explains Ward.

The Choke consists of three key ‘choke points’: the Tocumwal Choke, the Barmah Choke and the Edward Choke, that restrict the flow of water to just 7,000 megalitres per day (estimated at Picnic Point), the lowest flow rate across any Murray River stretch. This makes the management of this system incredibly important in ensuring flow regimes continue during peak demand periods in Spring and Summer, but also that flooding out into the Barmah-Millewa forest is maximised during wet seasons.

“The Barmah-Millewa forest undergoes flooding annually, usually naturally,” says Ward.

“This acts as a natural pressure release valve, allowing surplus water to escape into the Barmah-Millewa floodplains, preventing potentially more destructive flooding from happening further downstream. The water isn’t lost either, it returns back to the river slowly. But without the Choke and the floodplain, water-dependent species, such as the river red gum (*Eucalyptus camaldulensis*) wouldn’t survive on rainfall alone, which is only about 700mm annually.”

Original Article: [Cosmos by Qamariya Nasrullah](#)

United Utilities investigates after Bolton households left without water

RESIDENTS in parts of Bolton are without a water supply this morning.

Households in the BL3 are were left without water, or experienced low pressure on Friday evening.

United Utilities said the fault had been fixed yesterday morning and that supplies should have returned to normal.

But this morning, customers have said they are again without water.

United Utilities explains why people in Bolton were left without water

In a statement issued today, a United Utilities spokesman said: "We’ve had reports that some customers in the area are experiencing no water, or poor pressure, we are sorry if you are affected by this at the moment.

"Our team are on their way to investigate and hope to have your taps flowing and toilets flushing again as soon as possible.

"Thanks for your patience whilst we get this sorted.



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"We will provide you with an update once we know more."

The water company said a fault developed on Friday night.

The problem was due to an issue at a pumping station which helps transfer water for the area.

Engineers from United Utilities started working that evening to resolve the issues and throughout the morning, with supplies returning to normal around 11am.

Water supplies from other sources were re-routed into the area and the company's water tanks were used to pump extra supplies in to help the situation.

United Utilities set up some local water delivery, providing bottled water free of charge yesterday and today.

Mike Wood, Water and Wastewater Network Director at United Utilities, said: "The technical issue presented us with a very significant challenge and we had staff working around the clock to either fix the issue or help to reduce the impact as much as possible on customers.

"Some may notice their water has slight discolouration, which is due to naturally occurring sediments and minerals which can get disturbed from the bottom of the pipes every now and then, normally when we have carried out a repair on the network. This will gradually clear."

Original Article: [The Bolton News by Saiqa Chaudhari](#)

Chile's parched mines race for an increasingly scarce commodity: water

A record-breaking drought in Chile is impacting mining operations and forcing companies to escalate their search for more sources of water, from water treatment and pricey desalination plants to even encouraging workers to use less water in the shower. The Andean nation, the world's no. 1 copper producer and the no. 2 producer of battery metal lithium, is battling a historic drought that is now entering its 13th year. That has led capital Santiago to roll out unprecedented plans to ration water for residents.

Mines are also feeling the effects.

Anglo American (LON:AAL)'s flagship Los Bronces mine in central Chile saw production fall 17% year-on-year in the first quarter of 2022, partly due to water scarcity, the firm said in April. Antofagasta (LON:ANTO) Minerals said drought led to a 24% first-quarter drop in production at its Los Pelambres mine.

Tensions over water use having been building over years for Chile's miners, who need it for pumping minerals like lithium to the surface, copper smelting, and in the concentrator, which breaks down raw ore and processes it into usable material.

Traditionally, they have relied on continental waters - land-based water from lakes, rivers and reservoirs.

"Our main challenge is to find other sources beyond continental waters," Maximo Pacheco, chairman of state-owned mining giant Codelco, told Reuters.



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Pacheco said Codelco was planning to recycle more water and reduce water use through efficiency savings, but gave few details on specific measures.

Mining firms such as Anglo American and Antofagasta have targeted tailings of mine waste to increase recirculation, reduced water loss from pipes, and reused greywater.

'EVERY DROP COUNTS'

In Los Pelambres in the northern region of Coquimbo, mine workers are reminded as they eat their lunch to reduce personal water use by screens around the dining room, part of the mine's "Every Drop Counts" program to save water.

Antofagasta's mine also has a desalination plant coming online in the second half of the year and is targeting 90% of the mine's water coming from the ocean or recirculation by 2025.

Jorge Cantallopts, head of research at government copper commission Cochilco, told Reuters that mines high up in the Andes in central Chile were facing the biggest challenge, with the drought likely to persist and issues creating desalination plants far from the ocean.

Cantallopts pointed to Los Bronces as the most notable example, but said others like Codelco's Andina and El Teniente could soon confront similar issues.

"They will face the same problems in a few years and we have to do something," he said.

Mining undersecretary Willy Kracht told Reuters the government was pushing mining firms to share water infrastructure and plans to establish a forum to boost coordination.

Anglo American said in response to Reuters queries that Los Bronces was looking to make production more efficient and find water sources that "don't compete with human consumption."

The firm has already increased water efficiency and reduced freshwater extraction, though it has warned its copper production projections of 660,000 to 750,000 tonnes this year could be affected by water availability and COVID-19 impacts.

POLITICS OF WATER

Water use is also becoming increasingly political, with leftist President Gabriel Boric keen to toughen environmental regulations.

Regulators have already looked to sue or fine some mining firms for excess water use, especially in the Atacama desert region, a major source of lithium which is in hot demand to make electric vehicle batteries.

Cochilco estimates fresh water use will decline by 45% by 2032 due to desalination, according to a report last month. But the process is expensive, uses lots of electricity, and is not always feasible in high-altitude Andean regions inland.

BHP Group (NYSE:BHP), an early mover, now meets water demand at its huge Escondida mine with the technology and has a desalination plant at its Spence mine, but still depends on continental waters for the smaller Cerro Colorado deposit.

Antofagasta has said that the continuity of its Zaldivar mine depends on the extension of continental water rights since its size would not justify the cost of a desalination plant.



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Kracht said protecting water resources and the environment and spurring economic growth in the mining-dependent country was a tough balancing act.

"We have to take care of this drought. Then there's climate change and policies being promoted at a global level, but we are also being tasked to develop more mining. So there is a kind of contradiction we have to learn how to balance," he said.

Original Article: [Investing.com by Fabian Cambero \(Reuters\)](#)

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