

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

December 16th 2021

Authors:

Lance Coogan - *CEO*

Joshua Bell - *Research Analyst*

research@veleswater.com

+44 20 7754 0342





WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell

CLICK THE LINK BELOW

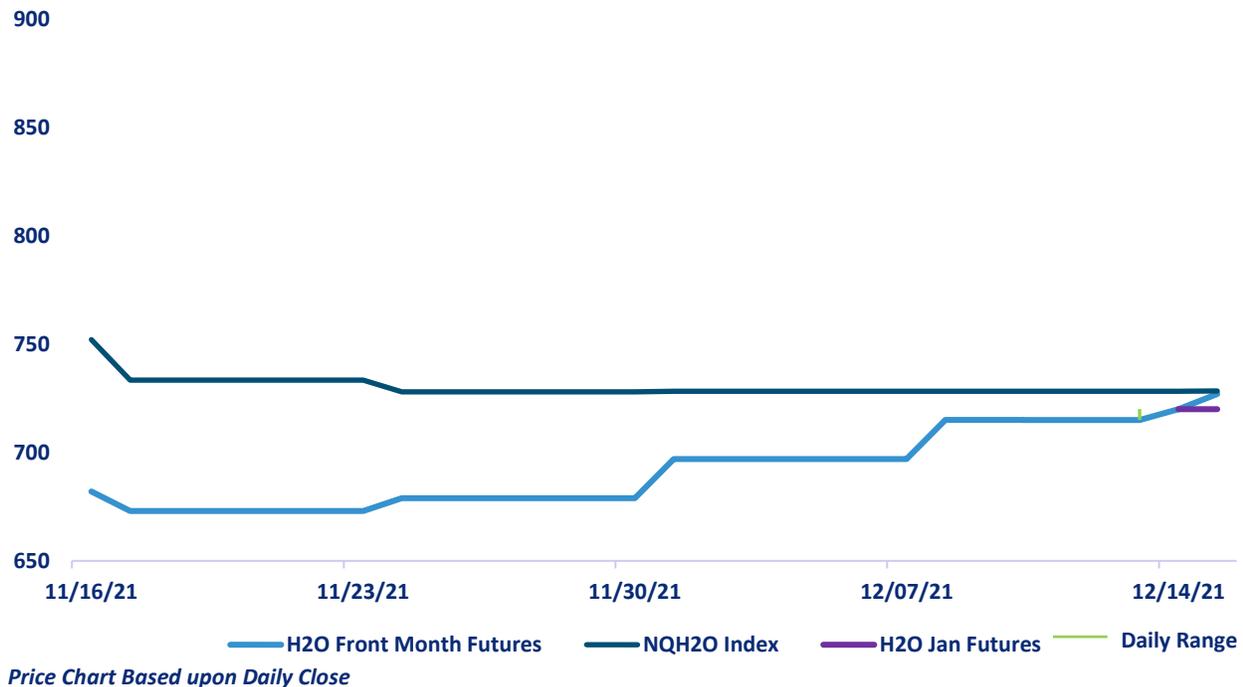
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/657344187>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



The new NQH2O index level of \$728.44 was published on the 15th of December, up \$0.17 or 0.02%, this being the settlement price of the December contract. The discount of the futures to the index has narrowed from minus \$13.27 on the expired December contract to minus \$8.44 on the January contract. We expect this January discount to narrow further in the coming weeks. The January contract has opened at \$720. NQH2O is up 45.74% YTD.

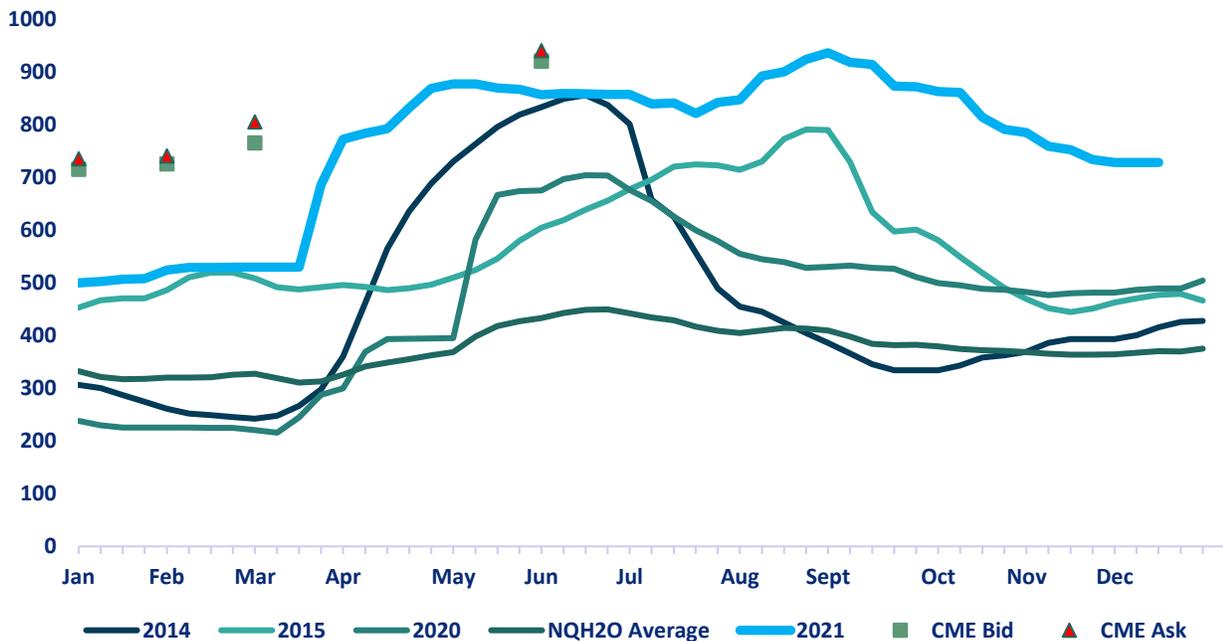
Below are the bid offer prices on different expiries being quoted in the market.

January 22	715@735
February 22	725@740
March 22	765@805
June 22	920@940



NQH2O INDEX HISTORY

NQH2O Seasonal Pricing/ CME H2O Futures Quotes



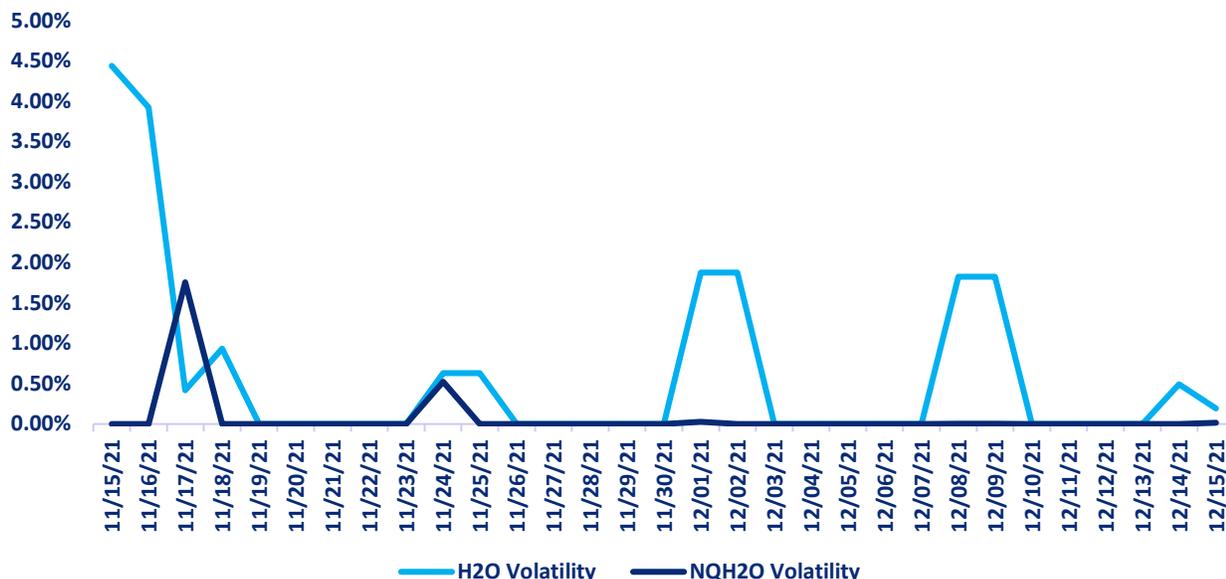
The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and 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.



H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the December future volatility high has been 1.83% on December 9th with lows of 0% on December 10th -13th.

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	34.77%	5.18%	0.76%	0.027%
H2O FUTURES	N/A	8.76%	3.68%	2.26%

For the week ending on the December 15th the two-month futures volatility is at a premium of 3.58% to the index, down 2.17% from the previous week. The one-month futures volatility is at a premium of 2.92% to the index, down 2.31% from last week. The one-week futures volatility is at a premium of 2.23% to the index, down 0.12% from the previous week. This convergence in volatility can be ascribed to the futures and the index finding a new level and showing some price stability.

*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 Precipitation Index



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 15/12/2021

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)	3.53	3.50	51.86%	29	104
TULARE 6 STATION (6SI)	1.6	1.60	31.76%	17	64
NORTHERN SIERRA 8 STATION (8SI)	5.1	4.98	49.45%	30	149
CENTRAL VALLEY TOTAL	10.23	3.36	44.36%	25	106

RESERVOIR STORAGE

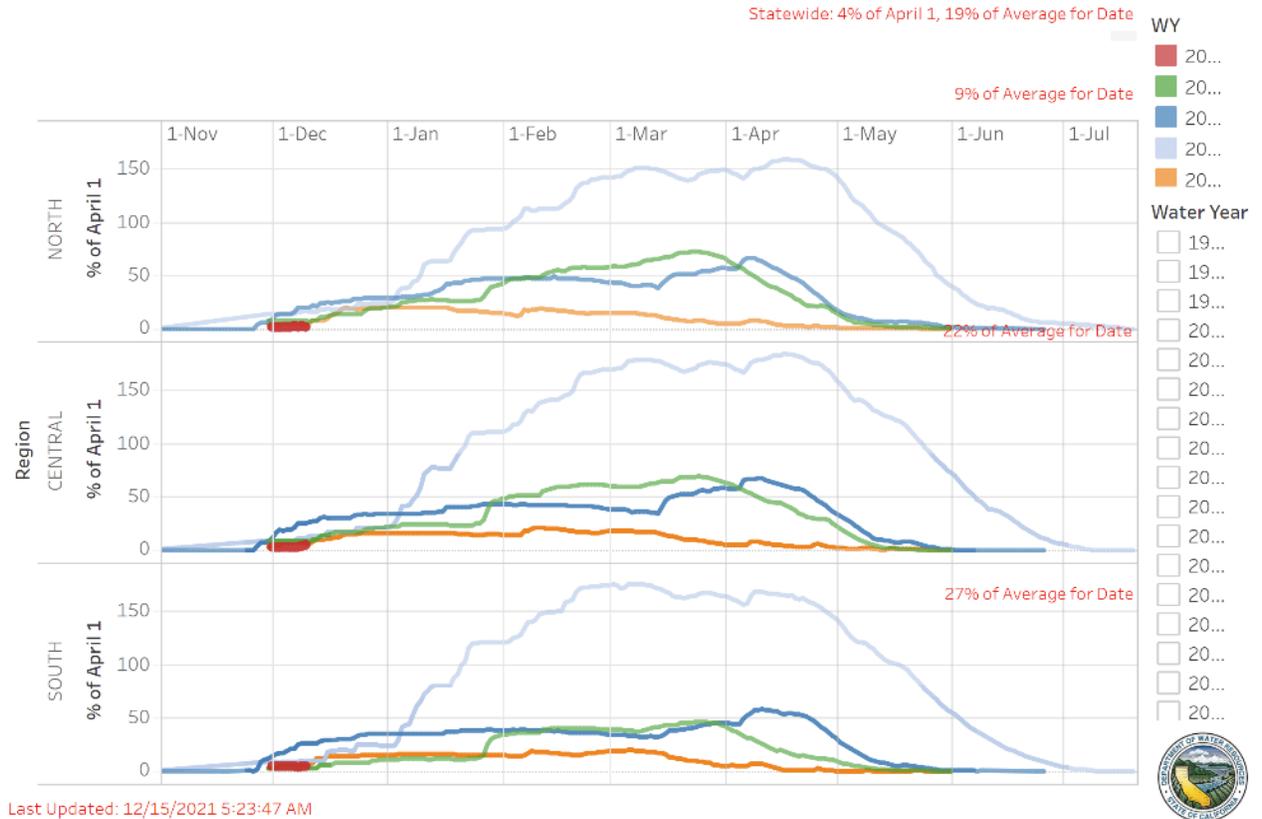
RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	706,995	29	52	49
SHASTA LAKE	1,145,634	25	44	45
LAKE OROVILLE	1,089,293	31	36	61
SAN LUIS RES	486,813	24	46	46

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



SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	4.9	46	71	17
CENTRAL SIERRA	5.8	53	77	19
SOUTHERN SIERRA	4.2	29	76	16
STATEWIDE	5.1	47	76	18

*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.

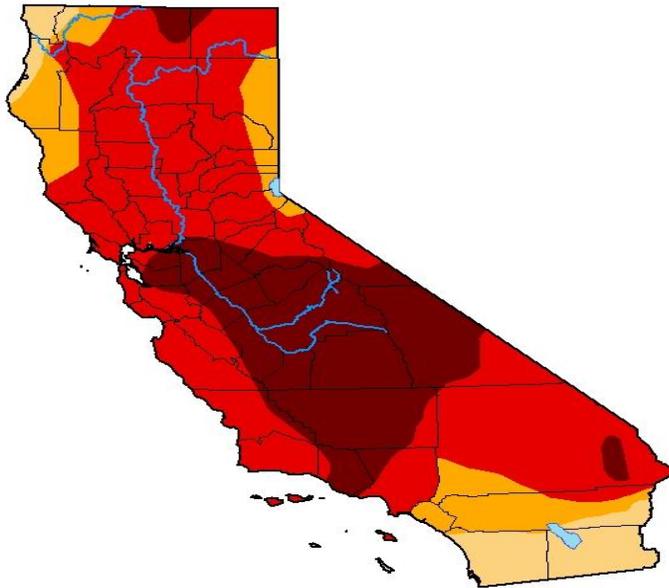
** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.



DROUGHT MONITOR

U.S. Drought Monitor California

December 7, 2021
(Released Thursday, Dec. 9, 2021)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	92.43	80.28	28.27
Last Week 11-30-2021	0.00	100.00	100.00	92.43	80.28	28.27
3 Months Ago 09-07-2021	0.00	100.00	100.00	93.93	87.94	45.66
Start of Calendar Year 12-29-2020	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year 09-28-2021	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago 12-08-2020	0.00	100.00	95.17	66.79	21.30	0.00

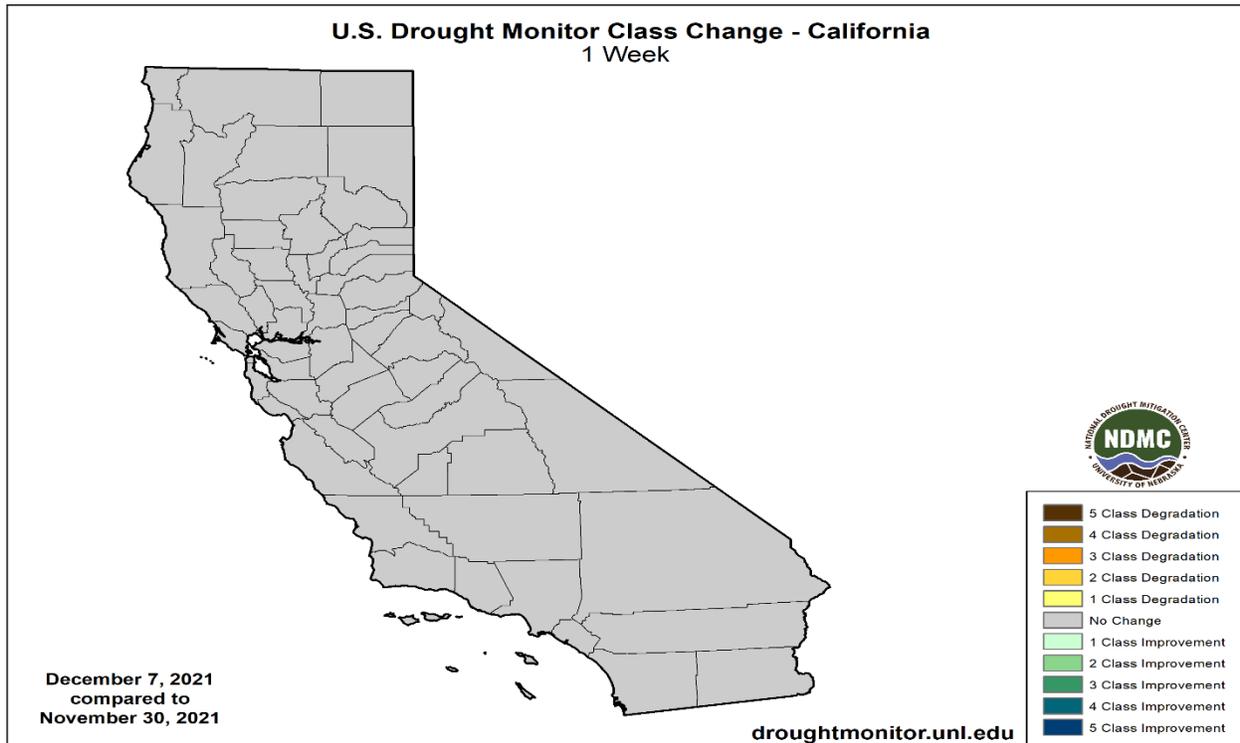
Intensity:
 None
 D0 Abnormally Dry
 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought

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



droughtmonitor.unl.edu



The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been a 0% change in drought conditions in California.

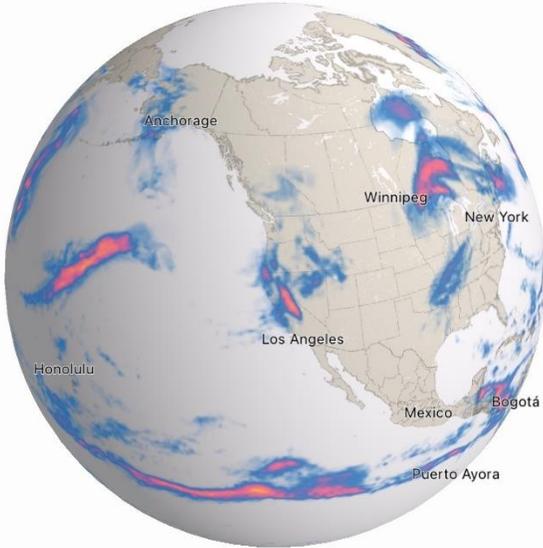
The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC.



CURRENT SATELLITE IMAGERY



The current satellite picture shows the remnants of a frontal system over the northern half of California stretching as far south as the Los Angeles area where some slight precipitation may occur today. There is cloud cover and moisture over the Central Valley region moving and spreading eastwards.



There are a further two weather systems developing, one warmer atmospheric river coming from the Honolulu area and the other a colder frontal system from the NW Pacific. These two systems should bring convergence and further precipitation over the general California area over the next week. Some further snowfall is expected over the Sierras and further inland.

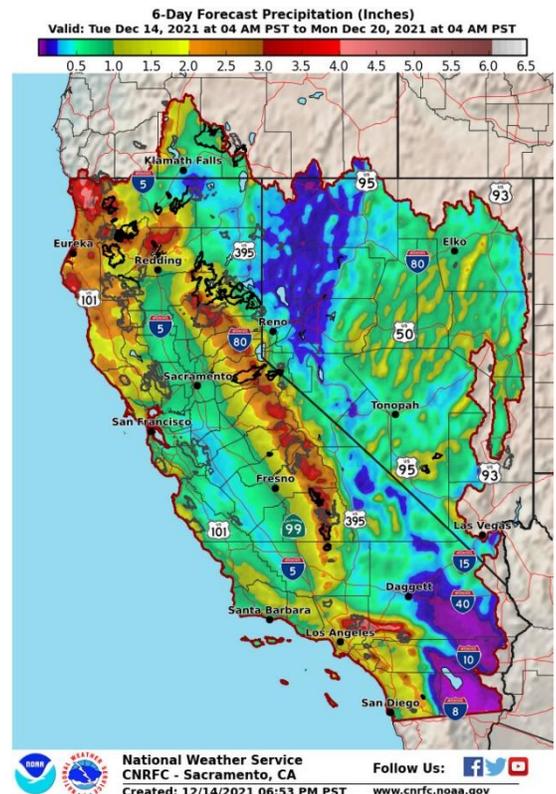
Ref. Dark Sky

There is very little moisture inflow from the South into Southern Arizona and New Mexico. Our models are still showing that there will be more precipitation over the next few months bring relief to the California region.

10 Day Outlook

By Friday morning, expect shower activity to wrap up and leave the region dry through Saturday morning. Another system is expected to push through far northern areas Saturday night into Sunday, but timing and the exact details vary considerably between the EC and GFS. The EC brings the front in slowly on Sunday, very slowly dropping south through NrnCA Sunday day and overnight. The GFS brings a quick punch to the North Coast Sunday morning, but it exits quickly before another round of precipitation is expected Monday. WPC favors the GFS solution, which is more similar to the 06Z GFS and 00Z EC, and have kept that the predominant forcing for the current QPF forecast. All things considered, it does look like early next week has the potential for another series of wet days especially over Northern CA.

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





WESTERN WEATHER DISCUSSION

In the West, the big story continues to be the poor snowpack conditions across the region and growing concern about water supplies after back-to-back dry winter seasons in California as well as in other basins including the Colorado River Basin. In California, the Department of Water Resources announced (December 1) that the State Water Project's initial water allocation for 2022 will be at 0% in an unprecedented step to address the state's water supply in anticipation of another dry winter season. Other impacts of concern across the region include the delayed opening of ski areas across the region which is impacting local economies in mountain communities across the West. However, some positive signs have emerged over the past week and looking ahead in the short-term with a change to a more active weather pattern for the region with heavy mountain snowfall expected in the Cascades, Sierra Nevada, Great Basin, and the Rockies. On the map this week, recent precipitation in the Pacific Northwest led to improvements in drought-affected areas of Washington as well as in northeastern Oregon, and west-central Idaho. Conversely, an area of Extreme Drought (D3) expanded in southwestern Montana due to poor snowpack conditions in the higher elevations.

Reference:

David Simeral, Western Regional Climate Center

Richard Tinker, NOAA/NWS/NCEP/CPC



WATER NEWS

CALIFORNIA WATER NEWS

A Dry 2021 in California Prompts Water Conservation Response

Limited water supply, restrictions on use, and higher costs may be in store for next year if the state's drought conditions persist.

This year has been critically dry and hot for California, resulting in déjà vu as the federal and state governments reinstated drought conservation measures not seen since former California Governor Jerry Brown declared an end to the last drought in 2017. This blog post summarizes the key federal and state actions that have been taken to address California's drought over the past year, along with potential implications for 2022.

Federal Response to California Drought

Pursuant to Section 759.5(a) of Title 7 of the Code of Federal Regulations, the US Secretary of Agriculture is authorized to designate certain drought-stricken counties as disaster areas. On March 5, 2021, US Secretary of Agriculture Thomas Vilsack issued a letter to California Governor Gavin Newsom, designating 50 of California's 58 counties as "primary natural disaster areas due to a recent drought." In his letter, Secretary Vilsack explained that a "Secretarial disaster designation makes farm operations in primary counties and those counties contiguous to such primary counties eligible to be considered for certain assistance from the Farm Service Agency (FSA), provided eligibility requirements are met." FSA assistance includes emergency loans.

While the disaster designation underscores the Biden Administration's keen attention to the climate crisis, Jeanine Jones, interstate resources manager with the California Department of Water Resources (DWR), noted that "the bar is set very low to qualify, because the purpose of the disaster designation is to quickly make financial assistance available to [agricultural] producers." This is in contrast to a declaration of a drought emergency under California's Emergency Services Act, which carries more significant practical effects.

Just two months later, on May 5, 2021, the US Bureau of Reclamation took a further step to respond to California's worsening drought conditions, and announced an update to its 2021 Central Valley Project water supply allocation, suspending water service contractors' north-of-Delta allocation of 5% of their contract supply until further notice. On August 16, 2021, the US Bureau of Reclamation announced the first-ever water shortage for the lower Colorado River basin due to historic drought and low runoff conditions in the Colorado River Basin. Due to dramatic declining water levels in Lake Mead (reaching 1,075 feet), a tier 1 shortage was declared. As such, Arizona, Nevada, and the country of Mexico are required to reduce their use of Colorado River water by 18%, 7%, and 5%, respectively. Lake Mead is the largest reservoir in the United States in terms of water capacity and a key source of water for California and southwestern US.



VELES WATER WEEKLY REPORT

If Lake Mead water levels decline to below 1,045 feet, further use reductions will be imposed on Arizona and Nevada, and California will be forced to reduce its use as well.

California State of Emergency Proclamations and Additional Drought Response Measures

On April 21, 2021, due to drought conditions in the Russian River Watershed, Governor Newsom issued the first of four state of emergency proclamations (the April Proclamation) in Mendocino and Sonoma counties. Since then, Governor Newsom issued three additional proclamations, on May 10, 2021 (the May Proclamation), July 8, 2021 (the July Proclamation), and October 19, 2021 (the October Proclamation), extending the drought state of emergency statewide. On July 8, 2021, the same day that he issued the July Proclamation, Governor Newsom issued Executive Order N-10-21, which called for “all Californians to voluntarily reduce their water use by 15 percent from their 2020 levels.”

Newsom’s state of emergency proclamations unveil a host of orders to combat drought conditions across the state. The proclamations encourage water conservation and hint at the potential need for curtailment. For instance, the April Proclamation ordered state agencies to partner with local water districts and utilities to make Californians aware of the drought and “encourage actions to reduce water usage” by promoting “water conservation programs.” Within the Russian River Watershed in Mendocino and Sonoma counties, the State Water Resources Control Board (Water Board) was ordered to consider “adopting emergency regulations to curtail water diversions” under certain limited water supply scenarios. The April Proclamation also mobilized state agencies to “develop groundwater management principles” to assess and minimize impacts to drinking water wells.

In a similar vein, the May Proclamation directed the Water Board to consider modifying requirements for reservoir releases or diversion limitations to conserve water upstream later in the year. Likewise, under the July Proclamation, to ensure protection of water in the proclaimed drought counties, the Water Board was ordered to consider “emergency regulations to curtail water diversions when water is not available at water right holders’ priority of right or to protect releases of stored water.” Furthermore, the October Proclamation enabled the Water Board to ban wasteful water practices, including the use of potable water for washing sidewalks and driveways. The October Proclamation also directed local water suppliers to implement water shortage contingency plans that are responsive to local conditions and prepare for the possibility of a third dry year.

Apart from safeguarding water resources, the proclamations aim to protect wildlife and natural habitats. For example, the April Proclamation ordered state and local regulatory agencies to “prepare for and address potential Delta salinity issues” and to “manage temperature conditions for the preservation of fish” in areas of the Sacramento River. The April Proclamation also ordered the Department of Fish and Wildlife (DFW) to “take actions to protect terrestrial and aquatic species.” The May Proclamation further



VELES WATER WEEKLY REPORT

ordered the Water Board and DFW to evaluate actions needed to protect native fishes in critical stream systems in the state, and the July Proclamation ordered state agencies to act to protect salmon, steelhead, and other native fishes. These measures demonstrate that California is committed to a holistic approach to drought mitigation, encompassing both human and environmental water needs.

More recently, on December 1, 2021, DWR announced that the State Water Project will not provide water to California farmers unless drought conditions improve in 2022, marking the first time since 2014 that California farmers have gotten a zero allotment for water from the state.

Original Article: [JD Supra by Latham & Watkins LLP](#)

California Economic Summit Forges A Path To Water Resiliency

The health of California's economy depends on an adequate supply of clean water. Fortunately, the ideas of innovative water leaders across the state are making their way into state action plans.

In recognition of the threat to water supplies from increasing droughts and floods, UC Agriculture and Natural Resources Vice President Glenda Humiston – a California Economic Summit work group leader and a member of the California Stewardship Network – invited 25 of the State's most innovative local elected officials and land use planners and 25 progressive leaders from local water districts to a symposium on land use and groundwater recharge. The year was 2016. Most of the participants were already locally implementing cutting edge policies connecting land use and the recharge of groundwater aquifers. Also participating at Symposium were university researchers and top-level members of the Brown Administration.

The group was asked to respond to the questions, "what are you doing to assure future groundwater supplies and what can the California Economic Summit do to help?" Responses to the first question were diverse and inspiring. Responses to the second question were unanimous, flood control and irrigation districts need to be at the table. A year later in 2017, Humiston hosted a second symposium which added leaders of forward-thinking flood control and irrigation districts to the original group. Again, we asked, "what are you doing and how can we assist you in bringing your innovations to scale?" By that time the Sustainable Groundwater Management Act had been signed into law and these issues had become even more relevant.

At additional symposiums held the following two years, the need to add more partners and focus on multi-benefit groundwater recharge projects became increasingly apparent. The Symposium invitation list grew to include environmentalists, growers, developers, and more.

Also of key importance, researchers at Stanford and UC Davis had begun locating primary aquifers, assessing their holding capacity, and piloting the use of a geophysical electromagnetic method to identify exact locations for maximum groundwater recharge



VELES WATER WEEKLY REPORT

where water can seep through sandy soil, avoid clay layers, and travel rapidly to the deepest aquifer.

Group recommendations at the fall 2019 Symposium further crystallized the path forward: “We need to form partnerships for multipurpose groundwater recharge projects and identify and preserve prime groundwater recharge sites in both urban and rural areas.” They agreed that the state should create incentives for these actions.

Original Article: [CA FWD by Judy Corbett](#)

Water Users Achieve 20% Reduction; Zone 7 Patterson Pass Project Nears Completion

The Zone 7 Board of Directors received mostly good news during its latest meeting on a variety of topics, including water conservation; progress on the Patterson Pass Water Treatment Plant construction effort; and the impacts of recent wildland fires on local water quality.

Angela Ramirez-Holmes, board president, noted that Tri-Valley residents achieved a 20% reduction in water usage in October compared to 2020, exceeding the 15% target. “It was very helpful to get some rain in October so that people will feel more comfortable turning off their sprinklers,” she said. “We’ve proven that it works. If you turn off your sprinklers, good things happen. I just wanted to thank the Tri-Valley for conserving. Of course, we’re continuing those efforts. Even though we got some notable rain, that does not take us out of the very deep drought. We are continuing with conservation, and we are asking people to do most of that through their outdoor landscaping.”

Patterson Past Project Nears Completion

A three year project to upgrade the Patterson Pass Water Treatment Plant — located in East Livermore — is in the home stretch according to an agency official. Speaking during the board meeting, Mona Olmsted, associate engineer with Zone 7, said the project is expected to begin operation in the spring of next year.

“The project is approximately 85% complete, and we are about two-and-a-half years into a three-year plan,” Olmsted explained. “The contractor, Overaa, has projected a one- to two-month delay in completing the project. We currently expect to produce water in the February or March timeframe.”

The project’s objectives include doubling the water treatment production capacity of the plant from 12 million gallons per day (MGD) to 24 MGD. The plant will also increase its storage capacity of treated water by 5 million gallons with the construction of a new storage tank. Aging infrastructure within the plant, which first became operational in 1962, will be replaced in a bid to improve the facility’s reliability. Finally, the addition of ozone treatment capabilities is expected to improve the quality of finished water.

“The Patterson Pass Water Treatment Plant is being upgraded and expanded so that Zone 7 can continue to meet our commitment to providing safe and reliable water,” Olmsted said.



VELES WATER WEEKLY REPORT

Water is fed to the Patterson Pass facility from either the South Bay Aqueduct, which brings water allocated from the State Water Project (SWP), or from storage at Lake Del Valle. Improvements to the facility are expected to carry a \$110 million price tag. Funding comes from increased water rates, new connection fees and \$19 million in bonds. To date, approximately 83% of the budget has been spent.

Original Article: [The Independent by Tony Kukulich](#)

State delivering 5% of allocated water, Arroyo Grande wants in

After implementing water conservation requirements and fines, the Arroyo Grande City Council recently made plans to deal with ongoing water shortages, which includes purchasing water from other agencies, recycling and buying into the state water program.

Last week, the city ordered residents to reduce their water usage or face fines that increase incrementally from \$50 to \$200. Depending on past usage, the city is requiring residents to lower their water use from 7% to 14%, with a goal of lowering usage by 10% citywide.

Violators can attend water school in lieu of their first fine.

Currently, the city provides Lopez Lake and groundwater to its residents, which are both in limited supply because of “extreme drought” conditions.

At a meeting several weeks ago, the council voted on plans for short-term and long-term supplemental water sources.

For short-term options, the city council voted unanimously for staff to pursue a temporary agreement to purchase water from Oceano, which cost roughly \$1,800 an acre foot during the previous drought. In addition, city officials voted to pursue an agreement to purchase water from Golden State Water Company during shortages, which will require the construction of a 300 foot connection.

As for a long-term reliable water source, the council voted to continue moving forward with Central Coast Blue, a regional recycled water project. At a Phase 1 cost of \$2,400 acre foot, and a Phase 2 cost of \$1,800 an acre foot, the 225 to 250 acre feet of water the facility is slated to provide would likely end the city’s water shortage issues, according to city staff.

The city council also voted to pursue a ballot measure to permit the city to purchase a long-term supply of state water as a drought buffer even though state water is unreliable during drought years.

California is contracted to deliver about 4 million acre feet of water a year, but generally is able to deliver only about half that and at times only 5% or less of what it is obligated to provide.

The remaining non-existent water is called paper water, expressed in the form of water entitlement certificates. And while these only exist on paper, it’s a high-priced commodity which can be bought and traded on the open market.



VELES WATER WEEKLY REPORT

In 2021, the State Water Project allocation was initially 10% of entitlements, but because of increasing dry conditions, it was lowered to 5%, according to the California Department of Water Resources. In 2022, the State Water Project is planning zero water delivery allocations.

Original Article: [Cal Coast News by Karen Velie](#)

As Drought Worsens in Parts of Southern California, San Diego Helps With Supplies

The San Diego County Water Authority has stepped up to provide additional water supplies to drought-ravaged areas in three Southern California counties.

Under an agreement with the Metropolitan Water District of Southern California, San Diego will provide water from an underground storage facility in Kern County to serve parts of northern Los Angeles County, Ventura County and San Bernardino County.

“Metropolitan is committed to doing everything we can to bring more water to communities in our service area that are particularly challenged by the drought. We’re thrilled to have the Water Authority partner with us in this effort, supporting the well-being of all Southern California,” said Metropolitan Water Chair Gloria D. Gray.

“We’re all in this together. And we all need to do our part, including using water as efficiently as possible,” added Gray.

Under terms of the agreement, Metropolitan Water will purchase 4,200 acre-feet of the Water Authority’s reserves in the Semitropic Water Bank next year and lease an additional 5,000 acre-feet from the Water Authority’ account.

Original Article: [Times of San Diego by Chris Jennewein](#)

Metropolitan Board Takes Actions to Alleviate Drought

As drought continues to stress the state’s water supply, Metropolitan Water District took new actions today to ensure Southern Californians have the water they need.

The actions, approved today by Metropolitan’s Board of Directors, include new infrastructure investments and water exchanges with other agencies that will allow Colorado River water and stored supplies to be more readily distributed throughout the region. The strategies will preserve limited State Water Project supplies for areas, including parts of Ventura, Los Angeles and San Bernardino counties, that depend heavily on water from that system.

“We’re entering the third year of drought in California. And while we hope conditions will improve this winter, we’re doing everything we can to ensure the entire region has reliable water if drought continues,” Metropolitan board Chairwoman Gloria D. Gray said.

Southern California gets on average 30 percent of its water from the northern Sierra via the State Water Project. But drought has slowed those deliveries to a trickle. While much of the region can turn to Colorado River water or their own local supplies, some communities aren’t physically connected to the Colorado River supply and have limited



VELES WATER WEEKLY REPORT

local supplies, leaving them much more challenged by the state's severe drought conditions.

Under an agreement approved today with the San Bernardino Valley Municipal Water District, the agency will make up to 7,000 acre-feet of its State Water Project supplies available to these communities in early 2022. In exchange, Metropolitan will later return those SWP supplies to Valley District. Metropolitan will also pay the cost of Valley District's shift to more groundwater, making other SWP supplies available. In addition, Valley District will provide up to 1,000 acre-feet per month of local groundwater to Metropolitan that can be delivered to State Water Project-dependent communities. Metropolitan will cover the costs of receiving the water and returning a like-amount in the future.

Together, this agreement could provide enough water to serve more than 50,000 homes in 2022.

"We really value the collaborative partnership we enjoy with Metropolitan," commented Valley District CEO/General Manager Heather Dyer. "The wholesale water agencies of our region need to work together strategically to make every drop of water count during these very challenging water conditions. We look forward to working together in creative ways to help each other wherever possible."

Metropolitan's board also approved an agreement with the San Diego County Water Authority under which Metropolitan will purchase 4,200 acre-feet of groundwater the SDCWA has stored in the Semitropic Water Bank in Kern County. This water can be delivered to the SWP-dependent communities that need it because the Semitropic Water Bank is located along the state project system. In addition, Metropolitan will lease 5,000 acre-feet of the SDCWA's "take capacity" – a function of groundwater pumping and distribution size – allowing Metropolitan to withdraw more of its own groundwater stored in the Semitropic Water Bank. Together, the agreement allows for 9,200 acre-feet of additional water to be delivered to SWP-dependent areas – enough to serve nearly 30,000 homes for a year.

Looking to a longer-term solution, Metropolitan's board also voted today to advance infrastructure improvements that would allow water stored in its Diamond Valley Lake in Riverside County and, potentially, Colorado River water, to be moved to some of these State Water Project-dependent areas that cannot currently receive that water source. The action allows project planning and preliminary design to begin on three different projects, which range in cost from \$10 million to \$26 million. Construction on two of the projects could start by the middle of next year.

Today's actions build on steps taken by Metropolitan earlier this year to bring greater reliability to the SWP-dependent areas, including infrastructure improvements and partnerships with Metropolitan's member agencies to shift to using Colorado River water instead of state project water, leaving it for others.

"This drought revealed some system improvements we can take to provide more equal water reliability to all of Southern California," Metropolitan General Manager Adel



VELES WATER WEEKLY REPORT

Hagekhalil said. “We’re taking actions in the immediate-term, mid-term and long-term through our One Water approach, and we’re grateful to our partners for their help.”

Hagekhalil stressed that today’s board actions, and today’s rainfall, don’t mean people should stop conserving.

“These new investments and partnerships are going to help improve reliability for the entire region. And the storms hitting our state this week will certainly help too. But many of our state reservoirs are very low, and we all need to keep using water as efficiently as possible. It is only by working together that we’ll get through this,” he said. “That includes our state and federal partners. We need their financial support to accelerate projects in water efficiency, recycling and storage. Climate change is creating a new normal, and while we’ve done a lot, we need to do more, working together as one.”

Original Article: [Business Wire by Metropolitan Water District of Southern California](#)

‘The most significant storm of the season’: The harsh weather coming to California on Tuesday

Good morning, and welcome to the Essential California newsletter. It’s Tuesday, Dec. 14. I’m Justin Ray.

If you are in California, chances are you are seeing precipitation. Photos show that for some, that means rainfall. For others, that means hefty snow.

A storm system that began in the Gulf of Alaska has worked its way into the Pacific Northwest and down through Northern California.

Let me start with the good news: The Times’ Alex Wigglesworth reports that fire officials say the system will lower the curtain on Southern California’s wildfire season. They believe that the southern portion of the state will see a reduced risk of large fires over the next couple weeks due to below-normal temperatures and near to slightly above-normal precipitation.

The bad news: Certain areas may be heavily affected by the weather system. What’s going to happen in your neck of the woods? Let me walk you through it:

Southern California

“The most significant storm of the season” is expected to blow into Southern California early Tuesday morning, weather officials said.

The main storm front will roll through Los Angeles County on Tuesday morning, a meteorologist with the National Weather Service Oxnard office previously told The Times. Residents can expect a constant deluge of rainfall until late Tuesday afternoon.

One to 3 inches of rain are forecast for the valley and coastal areas of the county, while the mountains may see 3 to 6 inches of precipitation, according to the weather service. Emergency officials in Los Angeles County released mud and debris flow forecasts for roads and neighborhoods near the mountain burn areas.

If you live in San Diego or Los Angeles, we have a live radar you may want to check out.

Northern California



VELES WATER WEEKLY REPORT

The National Weather Service advised residents in the area that there may be “significant travel delays with extremely difficult to impossible travel over the mountains.” Additionally, strong winds will affect visibility.

Moderate to heavy snow showers are expected to continue into Tuesday; extreme conditions were expected to last until 10 p.m. today. The agency has extended winter storm warnings in Northern California, including in Shasta, Tehama and Trinity counties. For the latest information on highway conditions, visit the California Department of Transportation website or call 1-800-427-7623.

Bay Area

When it comes to the Bay Area, the biggest concern is flooding. Cal Fire tweeted a video of two people in San Mateo County who were trapped in their vehicle by floodwaters.

“Reports of flooding on the highways and local roads continue to come in,” National Weather Service Bay Area tweeted. “Please do not attempt to drive through flooded roadways.”

The National Weather Service issued a flood watch for a large portion of the greater Bay Area, including the East Bay hills and the Diablo Range, San Francisco, the San Francisco peninsula coast, and the Santa Clara Valley including San Jose and the Santa Cruz Mountains.

On Monday, KTVU meteorologist Steve Paulson said on Twitter that San Francisco already had surpassed the total rainfall last season, which amounted to 8.96 inches. He added: “More on the way today and tomorrow.”

Central California

Widespread rain is expected to continue Tuesday in the area, according to the NWS. High winds have also caused the agency to issue wind advisories for the stretch of the San Joaquin Valley from Merced to Bakersfield and for the westside mountains along Interstate 5, according to the Fresno Bee.

Sustained winds are expected to blow from 15 to 25 mph in areas of Fresno, Merced, Kings, Kern, Madera and Tulare counties, according to the Bee. “Winds can blow around unsecured objects, cause tree limbs to blow down, and cause possible power outages,” NWS Hanford warned.

Yosemite Valley was expected to see 1 to 3 inches of snow between Monday and Tuesday, meteorologist Jim Bagnall told the Bee. Temperatures in Fresno may fall into the mid-30s overnight Tuesday into Wednesday.

A third system will move through late Wednesday afternoon after a brief break in the morning, ABC 30 reported. Showers will continue Thursday but should clear out by Friday.

Original Article: [The Los Angeles Times by Justin Ray](#)



VELES WATER WEEKLY REPORT

Is this Fresno storm a drought buster for Valley, mountains? Here's what experts say

While this week's winter storm in central California is certainly welcome, it's just a typical winter storm and won't be a drought buster, according to state water officials and meteorologists. Since California and the San Joaquin Valley have had a few dry years in terms of the water year, the current storm does have a few benefits to the region, said Jeanine Jones, interstate water resources manager for the California Department of Water Resources. First, this storm is colder than the last big storm at the end of October, so it will be good for the Sierra snowpack, she said. This storm also will cover a larger swath of the state than the last one, so southern California will see more precipitation this time around. "This would basically be a normal winter storm," she said. "Although certainly much welcome, it is not by itself a drought buster, by any means." Because the October storm was warmer, reservoirs in the region saw an immediate increase. The storm will benefit the snowpack this time, and reservoirs won't see runoff until late spring, Jones said.

Brian Ochs, a meteorologist with the National Weather Service in Hanford, said the storm would be good for drought conditions in the short term. However, the outlook for the rest of the wet year through April still remains below-average precipitation. To stay on pace with the average snow and rain totals, the region needs to see several more storms like this one, both Jones and Ochs said. "We're just now entering our really wet period of the winter season. One or two storms this early in the season is certainly not definitive," Jones said. "So don't get too excited about this storm. We need to have more of these going forward." For this time of year, Fresno's average rain total is about 2 inches. This year, Fresno has seen about 1.98 inches of rain, Ochs said. Fresno could see about 1-1.5 inches of rain. Further north, Merced could receive up to 2 inches of rain. Foothill areas such as Oakhurst and Mariposa could receive up to 5 inches of rain.

Original Article: [Fresno Bee by Brianna Calix](#)

Bakersfield mandatory water restrictions take effect Dec. 14

The city on Monday announced mandatory water restrictions effective Dec. 14 for all Domestic Water System customers to help fight worsening statewide drought conditions.

"The City's Water Resources Department has worked closely with California Water Service to monitor the conditions during the second years of the current drought. Both water providers have entered Stage 2 of their respective drought mitigation plans, implementing mandatory reductions in use of potable water for irrigation and outdoor cleaning," the city said in a news release.

It goes on to say, "These restrictions are for City of Bakersfield water system customers only and are similar to those mandated for Cal Water customers."

The restrictions do the following:



VELES WATER WEEKLY REPORT

- Prohibit the use of potable water for washing sidewalks, driveways, buildings, structures, patios, parking lots, or other hard-surfaced areas.
- Require shut-off nozzles on hoses for vehicle washing with potable water.
- Limit outdoor landscape and turf water usage to three days per week and only after 6 p.m. and before 9 a.m.
 - Odd number addresses water on Tuesdays, Thursdays and Saturdays.
 - Even number addresses water on Wednesdays, Fridays and Sundays.
 - No outdoor watering is permitted on Mondays.
 - Highly recommend limiting outdoor landscape and turf water usage to two days per week (Odd: Tuesdays and Saturdays; Even: Wednesdays and Sundays).
- Prohibit outdoor water usage during and 48 hours after a rain event resulting in measurable precipitation.

Original Article: [KGET by Jason Kotowski](#)

Here's what it would take to fill California's reservoirs and end the drought this winter

Dire warnings about communities and farms running dry next year. Headlines proclaiming a potentially dry La Niña winter. Reservoirs already so low they look like sets for post-apocalyptic movies. California seems poised for a continuation of its crippling drought next summer. And that might well be the case. It also might flood. Experts who study California's weather patterns say it's too early in the rainy season to make any predictions about the state's water supply.

They say that even though the water situation appears bleak — and residents and farms could very well be rationing water next summer — there also have been plenty of years when Californians have looked out at low reservoirs at this time in December only to see them full to the brim by spring. “One way of putting it is that California is a state of extremes, hydrologically speaking, and we often swing from very wet to very dry,” said Jeanine Jones, California's drought manager for the Department of Water Resources. “That's just part of our climate system, and it's also something that we expect to be enhanced by climate change.”

WHAT'S AN ATMOSPHERIC RIVER?

California's boom-and-bust rainy season is so difficult to predict due to the powerful storms that form in the Pacific Ocean and strike the West Coast. These storms are known as atmospheric rivers. A “strong”-sized one was forecast to hit the north state beginning late Saturday night and blanket the Sierra with snow through Tuesday.

The storms form when high-powered winds drag a fire hose of tropical moisture across the ocean's surface. The 500-mile wide conveyor belts of water can last for days and can hit California in wave after wave. They provide up to half the state's rain and snowfall each year. The largest storms can produce as much rain as a major hurricane. The biggest of these storms have played havoc on the state for much of its recorded history, including a relentless 1862 downpour that forced Gov. Leland Stanford to take a rowboat



VELES WATER WEEKLY REPORT

to his Sacramento inauguration. In the decades since, similar storms have killed dozens of Californians, inflicted billions of dollars in damage, and in 2017, blasted apart the spillways at Oroville Dam, the nation's tallest. Nearly 200,000 people were evacuated. They can be drought busters.

The state's last drought, which spanned five years, officially ended due to the storms that hammered Oroville Dam. A similar drought in 1977 was busted in just one season. That year, Shasta Lake, the state's largest reservoir, was down to 13% of its total capacity — the lowest it's been since the dam was completed in 1945. By the spring of 1978, the lake was nearly full, thanks to atmospheric rivers. "The difference between a wet year and some of the wettest years on record and some of the driest years on record, is just a few storms," said Jay Lund who heads the UC Davis Center for Watershed Sciences.

Original Article: [The Sacramento Bee by Ryan Sabalow](#)

Merced Irrigation District in battle with state over water rights

Local water officials are urging residents to get involved in a battle with the state over water rights.

The State Water Board had a lengthy meeting Wednesday and discussed how to proceed with implementing the Bay Delta Plan.

The Merced Irrigation District says the plan will take up to half of eastern Merced County's water supply from Lake McClure and send it north to the Bay Delta.

The state board maintains the movement of water from the Valley is needed during the drought to combat water shortages in the Delta Watershed.

But MID says the state is stealing the supply and that the economic impacts would be devastating to local residents.

"We're a severely disadvantaged community and the water supply that the Merced Irrigation District holds for the eastern Merced County residents is the most valuable thing we have probably, and they're coming for it," says MID General Manager John Sweigard.

The Merced Irrigation District says Lake McClure, Yosemite, Don Pedro, New Melones and smaller reservoirs that feed into farms and provide groundwater recharge to the county and cities would be impacted.

The group is encouraging eastern Merced County residents to call Governor Newsom.

Original Article: [ABC 30](#)



US WATER NEWS

States to sign voluntary cutbacks of Colorado River water

To help stave off another round of mandatory cutbacks, water leaders for Arizona Nevada and California are preparing to sign an agreement that would voluntarily reduce Colorado River water to the lower basin states by 500,000 acre-feet — enough to supply about 750,000 households for a year — for both 2022 and 2023.

The agreement, known as the “500+ Plan”, would require millions of dollars from each state over two years — \$60 million from Arizona, \$20 million from Nevada and \$20 million from California with federal matching dollars — to fund payments for water use reduction and efficiency projects that result in supply savings throughout the lower basin.

The signing is expected to take place Wednesday at the Colorado River Water Users Association annual meeting in Las Vegas amid urgency to negotiate new rules for managing the depleted river beyond 2026 when the 2007 interim guidelines expire.

Lake Mead, the largest reservoir in the United States, hit record lows this year, spurring reduced 2022 deliveries for junior water rights holders in Arizona, Nevada and Mexico.

Lower levels would automatically lead to even more cutbacks at certain thresholds. There is currently no plan for how the supply would be managed should Lake Mead drop below 1,025 feet (312.42 meters) above sea level. Modeling suggests that could likely happen as soon as 2024 if the 500+ Plan is not adopted.

Every foot of elevation lost in Mead reduces Hoover Dam's hydropower generation by about 6 megawatts — it's currently running around 75% capacity. If levels ever fall below 950 feet (289.56 meters), the dam's turbines, which generate power for 1.3 million people in three states, would stop running altogether.

For California, which receives more than half the hydropower, the deal is particularly urgent, says Adel Hagekhalil, general manager of Metropolitan Water District of Southern California.

Original Article: [The Independent by Brittany Pearson / AP News Wire](#)

Tribes seek to secure their water rights as Colorado River dries

Historically excluded from Colorado River negotiations, tribes are demanding to be included in policy discussions on how the water is managed.

Ahead of a conference of the Colorado River Water Users Association in Las Vegas, a group of conservationists and tribal leaders held a press conference on the overuse of water within the Colorado River Basin Monday.

“There’s a wide range of people who are a part of this but what weight does each individual state have when they come to the table? What weight does each tribe have?”



VELES WATER WEEKLY REPORT

said Timothy Williams, Chairman of the Fort Mojave Indian Tribe. “I don’t see any tribe at that signing table, yet our water is being used.”

The Fort Mojave Tribe, whose reservation lies partially within Nevada, is one of 10 federally recognized tribes with reserved water rights in the Colorado River Basin.

Yet, the tribe has been left out of the policymaking process for the river despite having a senior priority date that supersedes even that of the Southern Nevada Water Authority in Clark County, meaning they take precedence over most other water users whose rights have later dates.

In 1922, seven states in the Colorado River Basin — Colorado, Utah, Wyoming, New Mexico, Arizona, California and Nevada — signed the Colorado River Compact, an agreement on how to divide the river water equitably among states.

However, tribal members, who weren’t considered U.S. citizens at the time, were excluded from negotiations. Tribal nations were again excluded from policymaking in 2007 when states renegotiated water divisions due to increasing drought conditions.

That agreement is set to expire in 2026, meaning states will need to agree on a new set of Colorado River rules. Tribes are now pushing to be included in those negotiations for the first time.

“Being left out of those groups and trying to squeeze in at different times has been something,” Williams said, during the conference. “The table keeps moving and moving and moving.”

Williams said tribes have now built the capacity to demand a spot at the negotiating table. Part of that capacity is the work of the Colorado River Basin Tribes Partnership, also known as the Ten Tribes Partnership, created in 1992 by federally recognized tribes to strengthen tribal influence in water policy.

“Hopefully when the 2026 guidelines come out you’ll see tribes,” Williams said.

Basin tribes hold water rights to about 3 million acre-feet of Colorado River water, which equates to about 25% of the river’s current average annual flow. That percentage will only increase as climate change continues to reduce the amount of water available to states with newer water rights. That water allocation makes Basin tribes a powerful force in negotiations, said Williams.

Original Article: [Nevada Current by Jeniffer Solis](#)

In rural West Texas, the demand for well water is growing

Out in the ghost town of Terlingua in remote West Texas, craggy mountains loom high in the distance, largely uninhabited save for a few houses dotting the hillside. But on a morning in late November, there was a change to this landscape, where a drilling rig cut into the horizon, spewing dark shale into the air. As Kade Killingsworth, owner of Arrowhead Drilling, made his way up to the rig, he said that they would probably have to drill 1,000 feet to hit water — but even then, it’s not a sure thing.

“You just don’t know what to expect out here,” Killingsworth said. “Hopefully, we’ll find the water.”



VELES WATER WEEKLY REPORT

Statewide, since the start of the pandemic, more people have been moving out to rural areas. And in far West Texas, where municipal water supplies aren't readily available, the first thing newcomers have to do is drill a well.

In far West Texas, 81% of the water supply comes from groundwater, according to data from the Texas Water Development Board. Ranchers have been putting wells on their land for decades, but now large landowners are breaking up their property and selling smaller parcels off to newcomers. All of those new residents need water, too. But officials are concerned that there isn't enough to go around.

Killingsworth, a third-generation well driller, does a lot of that work, but he said even if they find water, there are risks moving to West Texas.

"If I were to buy a piece of property, I myself would want to know whether that's sustainable or not for me to drill a water well for me to live there," Killingsworth said.

Lately, Arrowhead Drilling has been getting calls from many places. As more people drill wells in the desert, however, Killingsworth said there's no way to know that the water will last.

Original Article: [Market Place by Zoe Kurland](#)

Is Utah already overusing its share of water from the Colorado River?

Western states in the upper half of the Colorado River Basin have claimed for years that they're entitled to far more of the water than they've historically pulled from inside the river's banks. Utah in particular has said it should be getting up to 300,000 more acre-feet than the 1.1 million it uses a year, a claim that has been cited to support various water diversion proposals, such as the Lake Powell pipeline now under review.

Such claims may have been true decades ago, but under pressure from climate change the river's flows have declined to the point that Utah, New Mexico and Colorado are now using about 500,000 acre-feet more than their annual share, according to a study released Monday by Utah Rivers Council and several other environmental groups.

The new 85-page report, titled "A Future on Borrowed Time," highlights what its authors say are uncomfortable truths for water managers who seem to operate in denial of the West's thinning snowpacks and shrinking reservoirs. And the deficit may only get worse should flows continue dwindling in the face of warming temperatures and reduced precipitation in the West

"The water crisis in the Colorado River Basin gets more dire everyday," said Jen Pelz, Wild Rivers Program Director for WildEarth Guardians, said in a call with reporters Monday. "This report makes plain that additional dams and diversions from the Colorado River are not only irresponsible, but put the entire basin and the communities that benefit from its water at risk of economic, environmental and cultural collapse. We need real and immediate commitments, especially from the Upper Basin states, to live within the river's means."



VELES WATER WEEKLY REPORT

The Utah Department of Natural Resources was not able to make an official available Monday to provide a rebuttal. The release of the report was timed to coincide with Tuesday's start of the Colorado River Water Users Association's meeting in Las Vegas.

Some 40 million people in the fast-growing American Southwest rely on the Colorado for at least some of their water. Under a century-old agreement between seven Western U.S. states in the Colorado Basin, the Upper Basin is to release an average 7.5 million acre feet of the river's flow into the Lower Basin, plus Mexico's share. The four upper states divide what is left, and for Utah that share is 23%.

Utah water officials have long pegged the volume of that share at 1.3 million acre-feet per year, at least 200,000 more than the state draws out. This year, the state established the Colorado River Authority of Utah with the specific aim of ensuring Utah gets what official's say in Utah's full share of the river.

But the figure the state cites assumes the Upper Basin should receive 5.7 million acre feet, as was the norm before longterm "megadrought" set in at the end of the 1990s. During the first 20 years of the 21st century, flows are on average 19% less than what they were over the proceeding century, according to Zach Frankel, executive director of the Utah Rivers Council and a key author on the report along with policy analyst Nick Halberg

"There is a 500,000-acre-foot deficit of water use in the four Upper Colorado River Basin states, specifically Colorado, Utah and New Mexico are overusing their rights to water," Frankel said in Monday's call with reporters. "The Colorado River has shrunken flows, and as that's happened, the reservoirs of the Colorado have shrunk alongside it."

Original Article: [The Salt Lake Tribune by Brain Maffly](#)

Amid drought, one tribe seeks to offer water for lease, another moves to conserve more

As Arizona tribal leaders prepare to take a greater role in a regional forum on Colorado River issues, a new bill to allow at least one tribe to lease water is making its way through Congress, while another tribe tries to forestall further cuts to water delivery.

The tribes are increasingly concerned that a persistent drought, worsened by a 20-year-long period of hotter and drier conditions in the Southwest, has already led to the federal government's first-ever shortage declaration for Arizona water users. One tribe is worried that it may be asked to reduce its own water deliveries.

Jason Hauter of the law firm Akin Gump, which represents the Gila River Indian Community, said the only sure way to deal with increasingly dire conditions on the Colorado River is to reduce demand. But there's another facet to the tribe's desire to conserve water, he said.

"Gila River is the one tribe that has a large entitlement, that in times of shortage is not 100% firm," he said. "So it has an incentive to do more to protect its supply."



VELES WATER WEEKLY REPORT

Tribes expect to play a key role at a gathering of more than 1,000 water managers, government leaders and policymakers beginning Tuesday at the annual Colorado River Water Users Association conference in Las Vegas.

Tribal leaders and representatives will be on hand and ready to discuss issues ranging from projections on snowpack to the effects climate change is expected to have on future water flow, as well as legislation and new, innovative ways to adapt to a drier Southwest.

Bill would allow water leasing

In advance of the conference, Sen. Mark Kelly, D-Ariz., introduced the Colorado River Indian Tribes Water Resiliency Act of 2021 which, if enacted, would allow the Colorado River Indian Tribes — known as CRIT — to lease part of its Arizona water allocation to off-reservation users. Sen. Kyrsten Sinema, D-Ariz., signed on as a co-sponsor of the bill. The 4,600-member tribe has senior rights to 719,248 acre-feet of the Colorado's flow. Currently, CRIT farms about 84,500 of its 300,000-acre reservation straddling the Colorado River, with another 50,000 acres available for development, according to the Inter Tribal Council of Arizona.

CRIT Farms produces crops such as alfalfa, sorghum, cotton, wheat, potatoes, garlic and onions. The tribal community has engaged in agriculture for millennia, and its farm operations play a major role in the tribe's economy.

The tribe has long wanted to lease part of its water allocation, said CRIT Chairwoman Amelia Flores. She told The Arizona Republic that tribal members authorized the proposal in 2019 through a ballot referendum.

If the bill passes, CRIT plans to offer water saved from fallowing some fields, moving to less water-intensive crops and installing more efficient water delivery systems.

"This legislation protects the life of the river, protects Arizona's fragile groundwater resources, and, for the first time in more than 156 years, allows our people to receive the full benefit from our water rights," said Flores in a statement.

At least one other Arizona tribe would like to see that bill expanded to include more tribes. Gila River Indian Community Governor Stephen Roe Lewis said his tribe does not support the bill as written because it would give CRIT an unfair advantage over other tribes in the Colorado River basin. He told The Republic he intends to work with the Arizona delegation and other river tribes to include other communities with river allocations.

Concerned by the ongoing drought in the Southwest and dropping water levels in Lake Mead, Gila River and other Arizona tribes with river allocations have turned to conservation protocols to forestall more drastic shortage declarations.

Gila River has announced several initiatives to conserve water. The 21,000-member tribe, which has a 640-square-mile reservation just south of Chandler, has a centuries-long agricultural history. The tribe was deprived of its Gila River water for more than a century, but a historic 2004 water settlement restored senior water rights.

Original Article: [AZ Central by Debra Utacia Krol](#)

**Officials highlight infrastructure act's water recycling provisions**

With President Biden last month signing a historic \$1 trillion infrastructure bill into law to fortify roads, bridges and waterways, among other things, Western states stand to gain major water infrastructure investments.

On Sunday, U.S. Secretary of the Interior Deb Haaland joined Nevada Democratic Reps. Susie Lee and Dina Titus in Las Vegas to tout the Biden administration's bipartisan Infrastructure Investment and Jobs Act that includes more than \$50 billion for water infrastructure programs.

Haaland opened her remarks with a land acknowledgement of Las Vegas as the ancestral land of the Paiute people. Haaland pledged federal resources and cooperation with state, local, and tribal governments.

"Unfortunately drought conditions in the West continue to worsen and water allocations are at historic lows," Haaland said. "Drought doesn't impact just one community, it affects all of us."

The bill includes \$8.3 billion for water and drought resilience that will fund water efficiency and recycling programs, rural water projects, and WaterSMART grants.

Haaland also highlighted the \$2.5 billion in Indian water rights settlements the law provides to help Interior fulfill its obligations to tribes. Those settlements will help tribes build clean water infrastructure, a much needed investment. Native American households are 19 times more likely to lack piped water services than white households, according to a report from the Water & Tribes Initiative.

"We at the department are committed to upholding our trust responsibilities and delivering long promised water resources to tribes," Haaland said.

The infrastructure act guarantees \$450 million for water recycling projects within the Bureau of Reclamation's seventeen western states.

Lee was one of the original sponsors of the water recycling provision, which establishes a competitive grant program within the Department of the Interior for water recycling projects that have a total estimated cost of at least \$500 million.

The grant could help fund a regional water recycling project that will produce enough water to serve more than 500,000 households in Southern Nevada and California.

Original Article: [Nevada Current by Jeniffer Solis](#)

Interior Secretary addresses West's worsening drought crisis

U.S. Interior Secretary Deb Haaland was in Las Vegas on Sunday to address the worsening drought crisis in the West.

Haaland and Assistant Secretary for Water and Science Tanya Trujillo held a listening session with local elected officials, business leaders and stakeholders to hear about the impacts that the ongoing drought is having on their communities.

"There is an urgent need to minimize the impacts of drought and develop a long-term plan to facilitate conservation and economic growth, because drought doesn't impact



VELES WATER WEEKLY REPORT

just one community, it affects all of us, from farmers and ranchers, to city-dwellers to tribes,” she said.

Haaland also touted the Bipartisan Infrastructure Law that invests \$8.3 billion in water and drought resilience that will fund water efficiency and recycling programs and rural water projects.

The law also invests \$2.5 billion in Indian Water Rights Settlements to help the Interior Department fulfill its obligations to tribes, the Las Vegas Review-Journal reported.

“We at the department are committed to upholding our trust responsibilities and delivering long-promised water resources to tribes, certainly to all their non-Indian neighbors, and a solid foundation for future economic development for entire communities dependent on common water resources,” she said.

Haaland’s department is trying to meet its goal of permitting at least 25 gigawatts of onshore renewable energy by 2025 by collaboratively partnering with states, cities and tribal communities.

On Saturday, Haaland and California Congressman Raul Ruiz visited Palm Springs where they toured onshore renewable energy projects in line with the Biden-Harris administration’s ambitious renewable energy goals.

They also visited the Desert Sunlight Solar Farm and saw other lands with the potential to be sited for future clean energy projects.

Original Article: [AP News](#)

Faster construction of Red River water project would save over \$100M, officials say

Officials are making the case that speeding up construction of the Red River Valley Water Supply Project could save more than \$100 million in the cost of delivering Missouri River water to eastern North Dakota.

The project is budgeted at \$1.22 billion and would pump water out of the Missouri River near Washburn, North Dakota, and send it through a pipeline to an outlet near Cooperstown into the Sheyenne River, a tributary of the Red River.

The construction timeline on the state and local project will largely depend on the pace of state appropriations, which totaled \$36.4 million in the 2019-21 budget and \$50 million for 2021-23.

Leaders of the Garrison Diversion Conservancy District, which supervises the project, told legislators they will have a \$200 million shovel-ready construction project, mostly laying pipeline, ready for 2023-25, and that accelerated construction will save money.

That message was delivered Tuesday, Dec. 7, to the North Dakota Legislature’s interim Water Topics Committee, which is examining a list of water supply and flood-protection projects.

So far, legislators have appropriated \$112.3 million for the project, or 9.2% of the estimated total. Extrapolating construction progress to date would translate into a construction timeline of 30 or more years, Duane DeKrey, Garrison Diversion’s general manager, said in an interview on Wednesday.



VELES WATER WEEKLY REPORT

He expects to ask for at least that much money in the 2023 session in the hope that the project, which has been on the drawing board for years, can gain greater headway.

“If they are serious about getting it done, I think that’s the minimum we would ask for,” he said.

Legislators said during the last session that the Red River Valley Water Supply Project will rise to the top of the funding priority list once funding plans are in place for major flood control projects, including those protecting Fargo, West Fargo and Minot.

Those plans now are in place, so the water supply project for the Red River Valley — which will be capable of serving almost half of the state’s population — should now be high on the list, DeKrey said.

Original Article: [The Dickinson Press by Patrick Springer](#)

GLOBAL WATER NEWS

Gridco allays fear of possible power crisis

Even as depleting water level of major reservoirs in south Odisha has given rise to speculations of a possible electricity crisis in the State during next summer, the bulk power supplier Gridco on Monday expressed confidence of meeting the peak demand without hiccups.

Allaying fears of a crisis, Gridco MD Trilochan Panda told officials at a high-level meeting chaired by Chief Secretary Suresh Mahapatra on Tuesday that as per contracted capacity with power generating companies, the State has total power availability of 7,651 MW including 1,295 MW from renewable sources. The current peak demand is around 3,350 MW which is nearly half of the availability. It is expected that the demand during peak hours of summer season may cross 4,000 MW.

The State, however, had witnessed a shortage of around 1,700 MW of power in April this year which was attributed to sudden shutdown of a few units of NTPC and OPGC. The Chief Secretary directed the Energy department to ensure no load shedding is imposed in the State during the summer months. Power generating companies were asked to meet the demand of the State at the time of crisis by maximising generation for which proper maintenance and upkeep of all their thermal units is required.

He further directed the Odisha Hydro Power Corporation (OHPC) to judiciously use reservoir water in consultation with the Water Resources department so that water could be used for irrigation and hydro-power generation to meet peak hour demand in the summer.



VELES WATER WEEKLY REPORT

The water level of Upper Indravati, Balimela, and Upper Kolab hydro power reservoirs due to less rainfall in the river basins is a cause of concern as the three hydro-power stations have a combined generating capacity of 1,430 MW.

Live storage available in Upper Indravati with a generating capacity of 600 MW is more than five metre compared to the reservoir level this day last year and 10 metre less than the full reservoir level (FRL).

The water level in Balimela reservoir is 16 feet less than this day last year. With an FRL of 1,516 feet, the live storage is 1482.10 feet. In Upper Kolab, the water level is 6 metre below the FRL. The Balimela hydro power station has 320 MW generating capacity.

Original Article: [New Indian Express](#)

Iran's water is running dry. Now its water woes are worsening.

Iran faces an acute water crisis that has been the root of persisting and reoccurring nationwide protests and regional disputes. With the Islamic Republic disregarding the environmental and human costs of erratic development projects, coupled with the climate catastrophe that the world is facing, Iran has plunged headlong into a crisis with no safe shore in sight.

In November, thousands of Iranians flooded the dry bed of the Zayandeh Roud River in the central city of Isfahan, protesting what they saw as an unfair distribution of water. Over the past four decades, numerous dams have been constructed in Iran to generate electricity and direct water to unsustainable industries. As rainfall levels plummeted in Iran (just like the broader Middle East and North Africa region), and with the state prioritizing industries and mines for water allocation, the farmers' share of the shrinking resources dried up to a meager trickle.

Seeing their sole source of income at risk, Iranian farmers rallied in Isfahan and several other cities, with many joining the protest in solidarity.

The protests started around November 7 and went on for twenty days. People gathered under the watching eyes of security forces, with one group of farmers setting up tents on the dry riverbed of Zayandeh Roud, starting a sit-in.

Until November 25, gatherings were held with almost no impediments and even officials described farmers' demands as "legitimate" and promised a "rapid response." State media also grasped the opportunity to build a narrative around the Islamic Republic's "tolerance" towards "legitimate protests".

As part of its narrative-building effort, the state-run Islamic Republic of Iran Broadcasting aired footage of protests, mainly consisting of prerecorded interviews with handpicked farmers plus live videos of the gatherings. The live footage was mostly superimposed with nationalistic anthems to likely curb the risk of broadcasting anti-establishment chants of protesters, including people booing Supreme Leader Ayatollah Ali Khamenei. Around the same time, similar rallies were held in the southwestern Chaharmahal and Bakhtiari province. However, the gatherings did not get much media coverage.



VELES WATER WEEKLY REPORT

On November 25, the Iranian state media reported that a deal had been forged between a farmers' association and the state. As part of the deal, authorities demanded an end to the farmers' sit-in. A group of farmers refused to bow down and, in response, the Islamic Republic unleashed brute force against peaceful protesters, who had been described as "honorable and noble" up until that point.

Original Article: [Atlantic Council by Sahab Bahar](#)

Murray-Darling basin: 'flawed' flood water giveaway could reverse decade of reforms

A decade of reforms to save the Murray-Darling basin could be undermined by New South Wales' plans to license too much flood water harvesting, with insiders warning that NSW's processes will result in irrigators being licensed to take billions of litres of flows without proper environmental assessment.

Two members of the four-person Healthy Floodplains Review committee, which hears appeals from irrigators about their proposed flood plain water entitlements, say the system is "sloppy", "flawed" and should be reviewed immediately.

They say over the last 12 months the committee has been swamped with more than 400 appeals, involving 1,300 separate flood plain harvesting structures; the committee is overwhelmed and applications are often accompanied by poor evidence.

Irrigators, they say, are now "consultant shopping" to achieve outcomes many times larger than the initial assessment by the Natural Resources Access Regulator, which conducted an on-the-ground survey of dams and other structures used in flood plain harvesting.

The two members – a NSW Farmers Association member, Xavier Martin, and the Nature Conservation Council's representative, Bev Smiles – have written to the head of the NSW department responsible to detail their grave concerns.

A decade of reforms to save the Murray-Darling basin could be undermined by New South Wales' plans to license too much flood water harvesting, with insiders warning that NSW's processes will result in irrigators being licensed to take billions of litres of flows without proper environmental assessment.

Two members of the four-person Healthy Floodplains Review committee, which hears appeals from irrigators about their proposed flood plain water entitlements, say the system is "sloppy", "flawed" and should be reviewed immediately.

They say over the last 12 months the committee has been swamped with more than 400 appeals, involving 1,300 separate flood plain harvesting structures; the committee is overwhelmed and applications are often accompanied by poor evidence.

Irrigators, they say, are now "consultant shopping" to achieve outcomes many times larger than the initial assessment by the Natural Resources Access Regulator, which conducted an on-the-ground survey of dams and other structures used in flood plain harvesting.



VELES WATER WEEKLY REPORT

The two members – a NSW Farmers Association member, Xavier Martin, and the Nature Conservation Council's representative, Bev Smiles – have written to the head of the NSW department responsible to detail their grave concerns.

“This will be the largest removal of water from irrigators to the environment since the Basin Plan, and will be a difficult adjustment for farmers losing water access, but everyone agrees flood plain harvesting needs to be reduced, licensed and metered,” said the chief executive, Claire Miller.

The question is how to do it.

The committee members' letters were obtained by Guardian Australia after a call for papers by the Greens in the NSW upper house.

The result, they warn, is that NSW could be licensing an unsustainable amount of water that will have long-term implications for the future health of the river system and wetlands in western NSW.

Southern basin farmers are also concerned that they will be left short on their allocations of water from the river because of the reduced flows reaching the river.

The growth in flood plain harvesting – the practice of capturing small floods as they move across plains toward the river, using giant storages, levees and channels – has been blamed for the 20% shortfall of water in the Murray-Darling river system compared with what was expected.

Over the last three decades the practice of taking this water – which can be taken for free (unlike river water which requires a licence) – has increased. Large cotton farms have laser-levelled plains and built huge shallow storages which are fed by elaborate systems to direct water into them.

Now the NSW government wants to license flood plain harvesting as required under the Murray-Darling basin plan, a move which both environmentalists and farmers agree is necessary.

Original Article: [The Guardian by Anne Davis](#)

The neglected water economy

By reading this, you are one of the very few people in Pakistan who recognise the importance of water economy, and I wish a few of the economic policy managers could also do so.

Since independence, the population of Pakistan has increased approximately fivefold while fresh water availability per person has decreased five times. With this trajectory, it is not difficult to foresee the situation in the medium to long term.

While it is widely recognised that Pakistan is going to face severe water shortage in the near future and in the long term, there are no clear and feasible pathways to deal with it. There are political announcements to build dams but that is just one, and not immediate, part of the required holistic solution.

It is high time to see water from an economic perspective, treat it as a key sector of economy and recognise, internalise and manage the water economy accordingly.



VELES WATER WEEKLY REPORT

This, however, is politically challenging, particularly when it comes to pricing the water. Unfortunately, there is no other option left as we can neither generate more fresh water sources nor does it appear that water consumption is going to stagnate or reduce in future.

Agriculture is the sector that consumes more than 90% of the fresh water in Pakistan. This is almost free for farmers and should stay the same, but someone has to pay attention to the cost of this free water.

The main cost is due to water wastage during irrigation. More than 50% of water of the Indus River system never reaches agricultural land.

According to different estimates, between 30% and 50% of water is wasted during the tail-end irrigation process. It costs a lot to the economy.

While it needs a better estimation, the current estimates put an impact of 3-7% of gross domestic product (GDP) if no irrigation water is available. In today's terms that would be between \$9 billion and \$21 billion, and wasting 50% of irrigation water means we are wasting around \$4-10 billion every year.

This is not an amount to be taken lightly. There could be an effort to invest a few hundred millions every year in on-farm water management and save these billions. There is also a need to promote, subsidise and invest in water-smart agriculture. We need to focus on trade-offs between crops that consume proportionately more water, such as sugarcane, and interestingly sugar is not an economically efficient sector anyways.

But talking about such inefficiencies of major industrial sectors of Pakistan is a taboo.

Gradual price rise

Another option could be to explore a gradual increase in water prices for agricultural use, to see the impact on reduction in wastage, though this has to be done carefully in order not to burden smallholder farmers with this cost.

Consumption of fresh water in cities is another neglected area from the economic policy perspective.

To start with, prices of water are certainly lower than the optimum. A differential or tiered pricing system is needed for water as well, similar to other utilities like electricity and gas. This will surely result in reduction in water wastage in urban areas.

The second neglected economic policy aspect of fresh water, particularly in urban areas, is the supply of drinkable water. If we sum up the amount that Pakistani consumers pay every year for bottled drinking water, we may be surprised about this necessity-turned-luxury.

On top of that, many of such companies are foreign and repatriate their hefty profits out of Pakistan.

All we need to do is to recognise the opportunity cost of not making the water drinkable in urban areas. Imagine the extra cost of bottled drinking water for the middle class, particularly when this is "imported", ie supplied by foreign companies who are repatriating profits from this water. A small investment in ensuring access to clean



VELES WATER WEEKLY REPORT

drinking water on a larger scale would save billions of dollars in the form of repatriated profits and mitigating the public health cost by reducing water-borne diseases.

Original Article: [The Express Tribune by Ahmad Mukhtar](#)

Glacier loss pushing India's mountain region towards water insecurity

Himachal Pradesh, a state that has five important perennial rivers fed particularly by glaciers, has witnessed a decline in snowfall over the past year. The area under snow cover in the state has declined by 18.5% between 2019-20 and 2020-21 according to a report by the State Centre on Climate Change (SCCC) Shimla and Space Application Centre (ISRO) Ahmedabad.

The study revealed that the area under snow cover in 2019-20 was 23,542 sq km, which dropped to 19,183 sq km in 2020-21, a decline of 3,404 sq km or 18.52%. Usually, in the winter season, about one-third of the geographical area of the state, which amounts to about 18,556 sq km, remains under thick snow cover. Most of the major rivers like Chenab, Beas, Parvati, Baspa, Spiti, Ravi, Satlej and their perennial tributaries originating from the Himalayas depend upon the seasonal snow cover for their discharge dependability.

S. S. Randhawa, the principal scientist at SCCC, who headed the study team, said, "Considering the importance of snowfall in the region, we did this study by analysing the data from satellites. We observed a shift in snowfall patterns in the last few years and snow cover is continuously declining. We also observed a decreasing trend in four river basins of the state which put long-term implications on water availability in the river basins."

The report added that the snow cover in the Chenab basin fell from 7,154.12 sq km in 2019-20 to 6,515.92 sq km in 2020-21, a reduction of 638.2 sq km or 8.92%. The Beas basin shows a decrease of about 19% with its average snow cover area having decreased from 2,457.68 sq km to 2,002.04 sq km, a loss of 455 sq km. The Ravi basin saw an overall reduction of 23% in the total area under snow cover.

The snow cover in the Sutlej Basin, which covers 45% area of Himachal and is the longest river in the state, shrunk the most by 23.49% or 2,777 sq km. It was 11,823.28 sq km in 2019-20 and 9,045.51 sq km this year. Another study published in 2019 said that the Sutlej River basin glaciers are melting fast and may shrink significantly by as soon as 2050. The research estimates that the melting would cause 33% of the glaciers to disappear by 2050 and 81% by the end of the century.

Surender Paul, head of the Indian Metrological Department, Shimla, said, "The winters in the northern hemisphere are defined by downward winds from the North Pole. Polar Vortex, a low-pressure area lying at Earth poles, is strong due to which the intensity of jet streams and western disturbances is less in the northern hemisphere including India." He added, "Apart from this, the jet streams and western disturbances are moving at higher altitudes due to which low lying areas don't get much snowfall. Global warming is warming the poles, thus also impacting Polar Vortex and jet streams. As a rising global



VELES WATER WEEKLY REPORT

temperature warms poles quicker than the rest of the world, the temperature contrast that drives jet streams has decreased which is the main cause for the lack of snowfall.”

Original Article: [India Mongabay by Kapil Kaja](#)

Egypt dug 75 underground water wells, 7 dams in Uganda: Minister

Egypt has dug 75 underground water wells and established 7 dams in Uganda, said the Egyptian Ministry of Water Resources and Irrigation in a statement on Friday.

Egypt’s support for Ugandans in the field of water was not limited to the Egyptian government’s support, but expanded through individual initiatives to dig wells in disadvantaged areas in Uganda, said Egyptian Water minister and irrigation Mohamed Abdel-Atti in a statement during his visit to Uganda. The projects were established in Kiboga, Wakiso, Sironko, and Adjumani.

He added that such an individual initiative was launched under the supervision of the Egyptian irrigation mission in Uganda, noting that 20 groundwater wells were drilled by self-effort in different Ugandan provinces.

The Minister said that the depth of a well ranges between 20 and 30 meters and it serves about 100 families comprising about 800 individuals in one area.

“This initiative began when engineers of the Egyptian irrigation mission in Uganda donated part of their salary to dig a clean water well with a depth of about 30 meters to help about 150 local families, with more than 1,000 individuals,” he added, noting that the initiative encouraged many Egyptian citizens and civil society organizations in Egypt to participate in digging additional wells in many Ugandan provinces.

“This matter has greatly contributed to alleviating the suffering of citizens who are facing trouble and hardship to water access,” the Minister said.

Original Article: [Egypt Today](#)

China's Southern Megacities Warn of Water Shortages During East River Drought

China's major southern cities Guangzhou and Shenzhen have warned of severe water shortages lasting into next spring as the East River, a tributary of Guangdong's Pearl River, continues to be hit by its most severe drought in decades.

Authorities in both cities are asking citizens to reduce water consumption, with rainfall between January to October this year down by a quarter compared to average levels over the last decade, according to the Guangzhou government.



VELES WATER WEEKLY REPORT

The inflow of water into the East River Basin, a major supply of water for both cities, will remain at around 50-60% its usual level into next spring, according to an official notice on Monday.

The company in charge of Guangzhou's water supply is taking emergency measures to deal with increased salt tides, where the water supply becomes increasingly saline due to a lack of fresh water, it said on Wednesday.

Hong Kong also imports much of its water from the East River.

Original Article: [US News by Reuters](#)

Mega-merger of French water firms wins EU greenlight

The EU's top antitrust authority authorised Tuesday the merger of France's two water and waste giants Veolia and Suez, a 13 billion euro (\$14.7 billion) operation sealed in the spring after months of battles between the two historic rivals.

This decision by the European Commission, the guardian of fair competition in the EU, paves the way for Veolia to conclude a takeover bid for Suez in the coming weeks.

To obtain the green light, Veolia, the world leader in the sectors, had to agree to sell activities, including Suez's stakes in municipal water markets in France.

"Thanks to the very comprehensive commitments put forward by Veolia, the Commission has been able to approve the concentration of Veolia and Suez," said the EU's competition commissioner, Margrethe Vestager.

The company wants to become a global leader in helping firms and cities reduce their environmental impact, including by recycling waste and reducing the use of resources.

According to the merger plan, Veolia's workforce will increase from 180,000 to 230,000 employees and its turnover will increase from 26 to 37 billion euros.

A new and leaner version of Suez will be spun-off from the operation, leaving it less than half its current size and to be delisted from the stock market.

Veolia, which currently holds 30 percent of Suez, had launched a takeover bid in July 2020 for the remaining 70 percent for an amount of about 9 billion euros.

After eight months of furious wrangling between the two groups, which have been rivals for 150 years, Suez finally agreed to the takeover in April.

Suez's acquisition price was raised to 20.50 euros per share, valuing it at some 13 billion euros.

Original Article: [Macau Business by AFP](#)



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