

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

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WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell

CLICK THE LINK BELOW

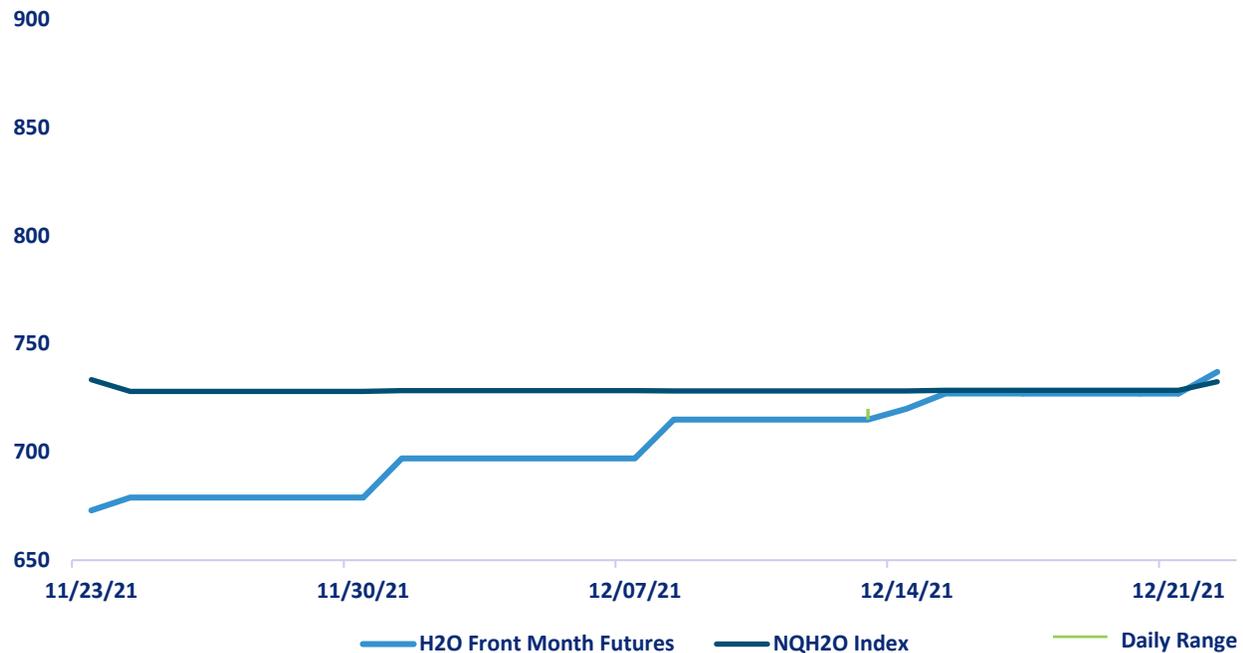
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/659580070>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

The new NQH2O index level of \$732.45 was published on the 22nd of December, up \$4.01 or 0.55%. The Futures have ranged from a discount of \$1.44 to a premium \$4.55. This is the first time the futures have traded at a premium to the index since September 7th 2021.

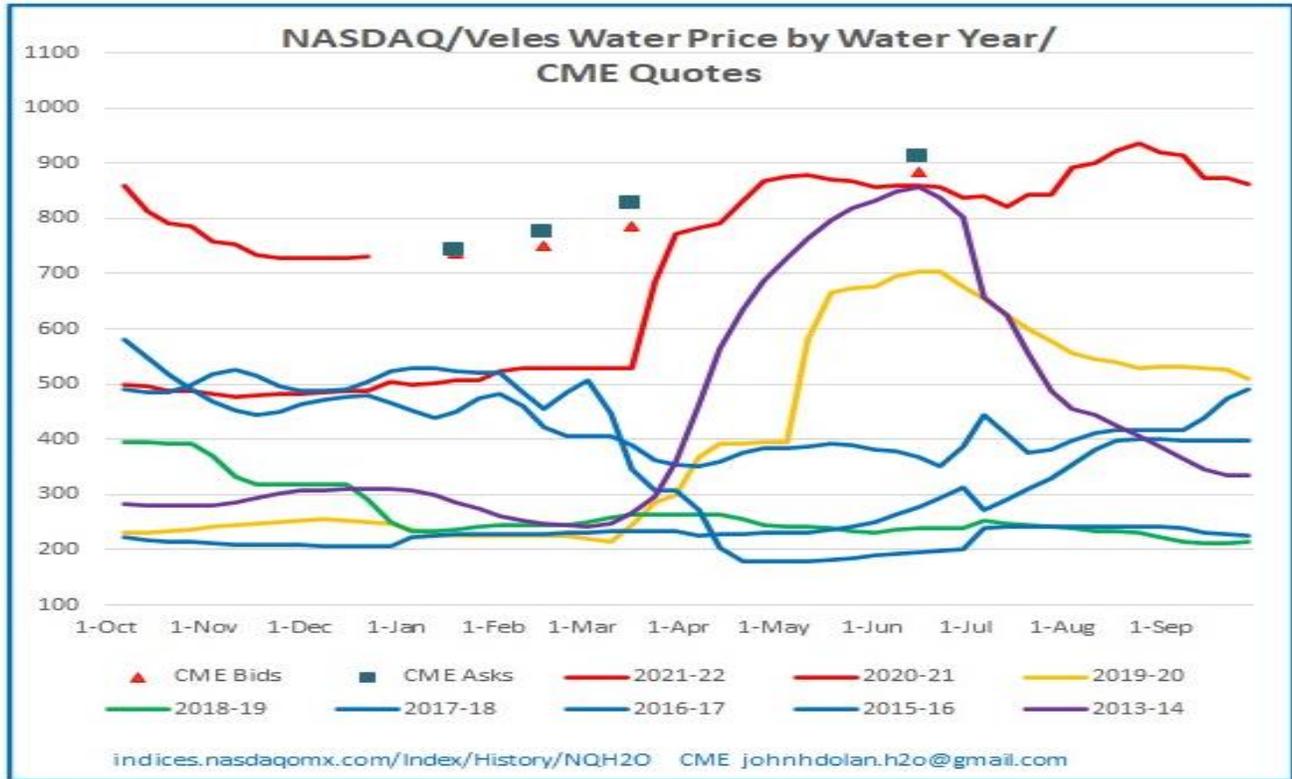
NQH2O is up 46.54% YTD.

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

January 22	737@741
February 22	749@775
March 22	785@827
June 22	886@912

VELES WATER WEEKLY REPORT

NQH2O INDEX HISTORY

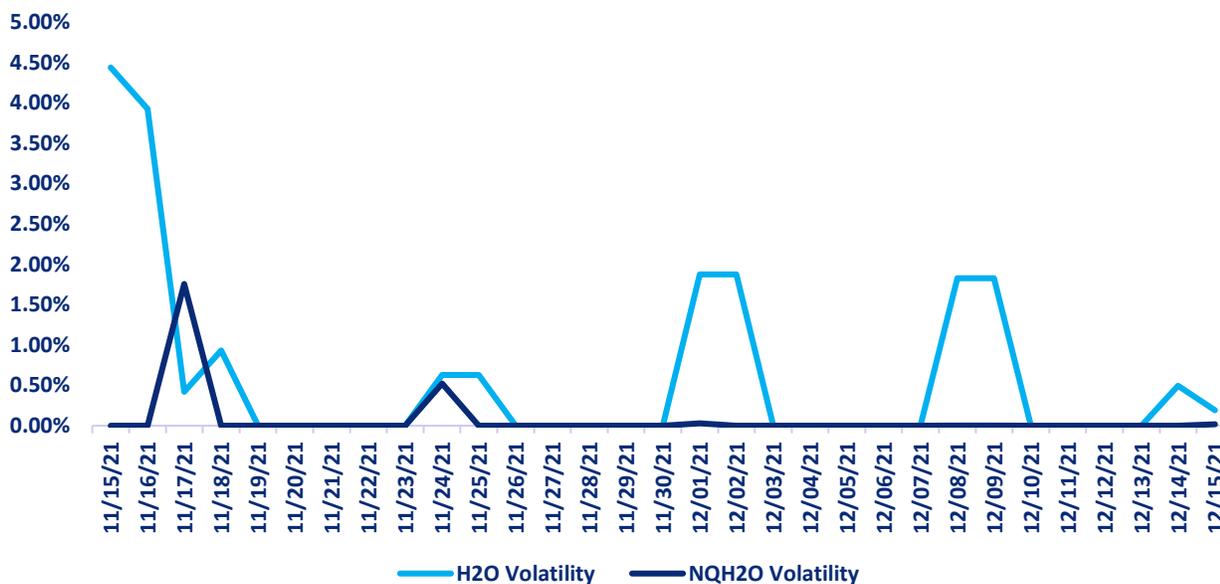


The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and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



Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the December future volatility high has been 0.97% on December 22nd with lows of 0% for the rest of the week..

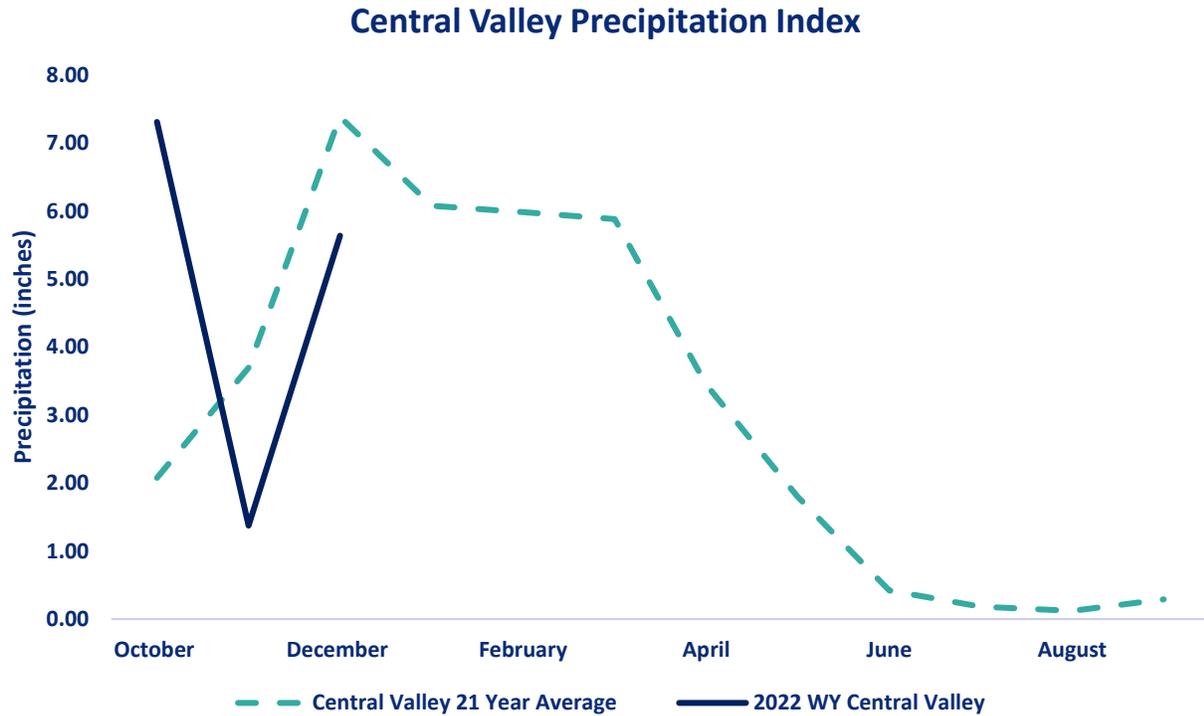
ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	34.76%	3.85%	0.53%	0.527%
H2O FUTURES	N/A	8.76%	3.78%	1.39%

For the week ending on the December 22nd the two-month futures volatility is at a premium of 4.91% to the index, up 1.33% from the previous week. The one-month futures volatility is at a premium of 3.25% to the index, up 0.33% from last week. The one-week futures volatility is at a premium of 1.39% to the index, down 0.74% 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 22/12/2021

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)	5.72	2.19	84.04	39	134
TULARE 6 STATION (6SI)	3.91	2.31	77.61	25	99
NORTHERN SIERRA 8 STATION (8SI)	7.28	2.18	70.58	38	158
CENTRAL VALLEY TOTAL	16.91	2.23	77.41	34	130

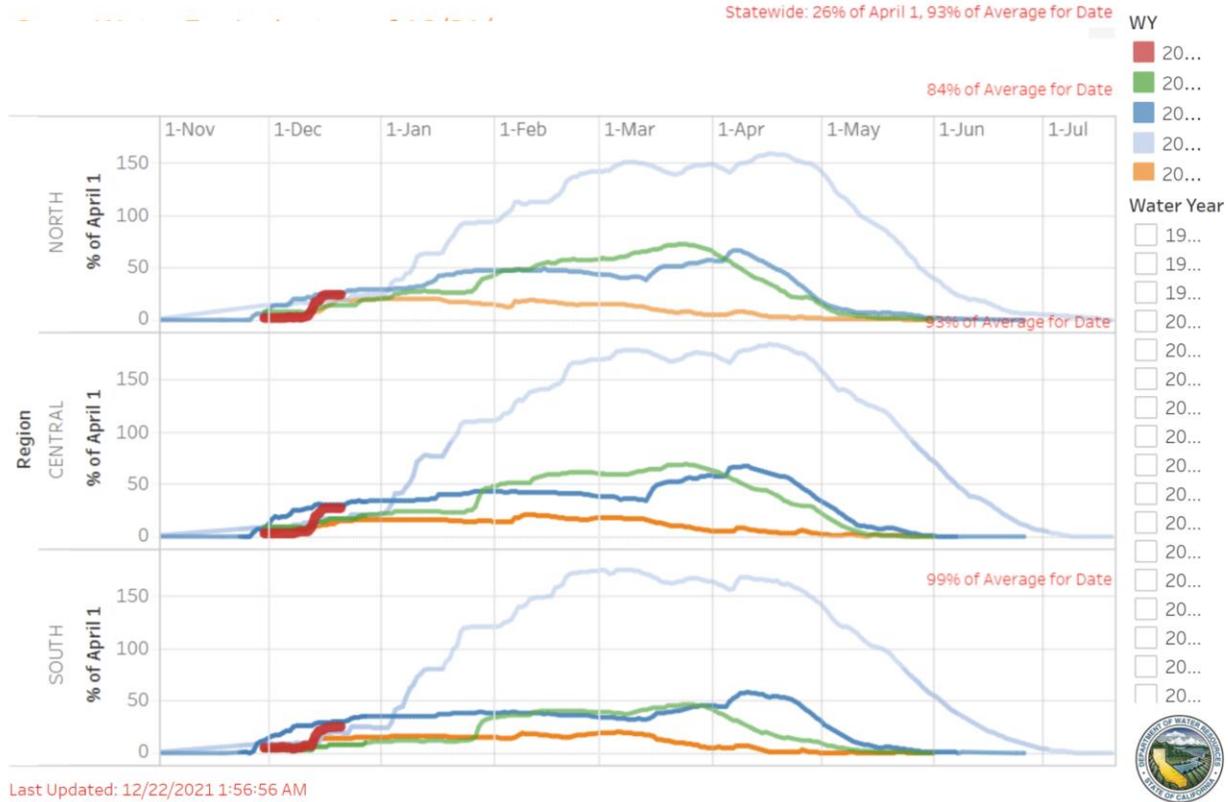
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	710,163	29	51	49
SHASTA LAKE	1,217,410	27	44	47
LAKE OROVILLE	1,163,550	33	35	64
SAN LUIS RES	570,673	28	45	48



SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



Last Updated: 12/22/2021 1:56:56 AM

REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	7.0	2.10	49	84	24
CENTRAL SIERRA	8.1	2.30	59	93	27
SOUTHERN SIERRA	6.4	2.20	32	99	25
STATEWIDE	7.3	2.20	50	93	26

*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.

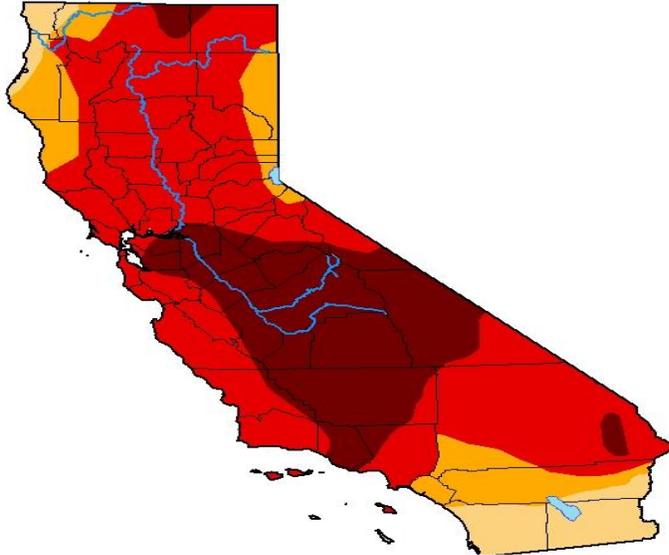
** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.



DROUGHT MONITOR

U.S. Drought Monitor California

December 14, 2021
(Released Thursday, Dec. 16, 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 12-07-2021	0.00	100.00	100.00	92.43	80.28	28.27
3 Months Ago 09-14-2021	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 12-15-2020	0.00	100.00	95.17	74.35	33.75	1.19

Intensity:
 None (white) D2 Severe Drought (red)
 D0 Abnormally Dry (yellow) D3 Extreme Drought (dark red)
 D1 Moderate Drought (orange) D4 Exceptional Drought (dark brown)

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



U.S. Drought Monitor Class Change - California 1 Week



December 14, 2021
compared to
December 7, 2021

droughtmonitor.unl.edu

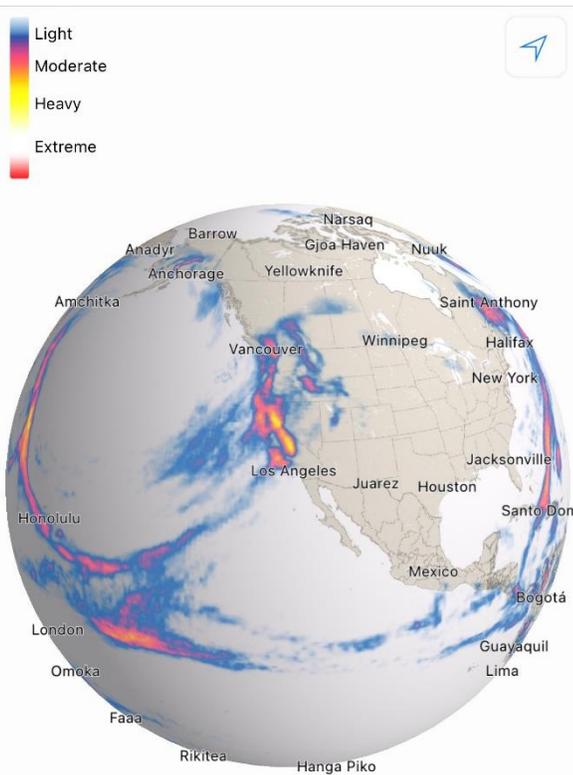


The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been a 0% change in drought conditions in California.

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



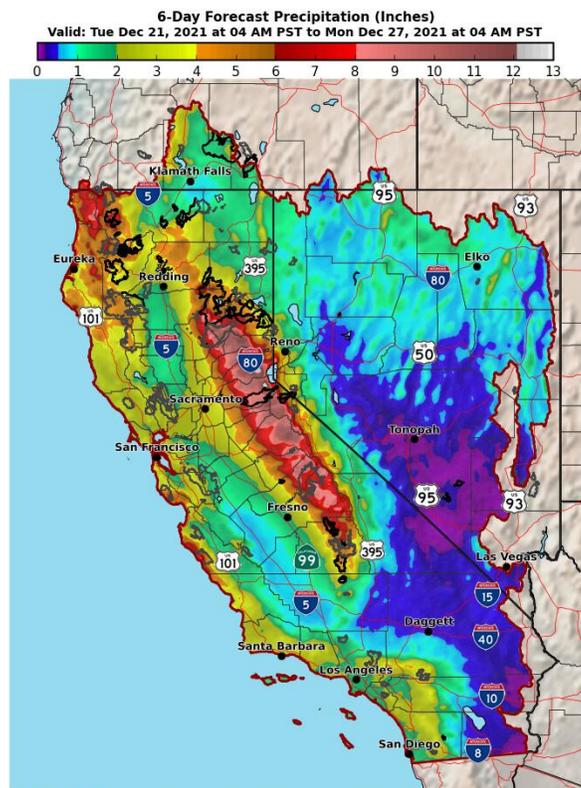
The current satellite picture shows the effects of the convergence of 2 weather systems that have hit the Californian coast at the same time. The warmer system bringing moisture from the Honolulu region is slightly ahead of the colder frontal system coming in from the NW Pacific. This has caused and continues to cause precipitation down the whole coastline of California and into the Central Valley region. There is considerable snowfall over the Sierras and this is expected to continue over the next few days.

This moisture inflow will bring further precipitation, including snow in the higher regions, as it moves eastward.

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

Confidence has begun to increase for the day 4 time frame, as 12Z models continue to push periods of heavy precipitation through SoCal overnight into Friday morning. WPC has finally come into line with this thinking, and the increased QPF in the afternoon issuance reflects this confidence. Added approx. 0.5" to favored terrain in San Bernadino, Riverside, and San Diego Counties. Heaviest time period over the Central and Southern Sierra, along with SoCal, looks to be early Friday morning, when the moisture plume and dynamics line up the best. The Saturday shortwave appears to move through slightly faster than the morning forecast, especially as depicted by the 12Z GFS and WPC, and trended that direction with the forecast. Overall totals stayed the same. Extended models begin to diverge more later





VELES WATER WEEKLY REPORT

Sunday into early Monday, with the EC deepening the trough further than the GFS. WPC forecast is a good middle ground for now, and the forecast was mostly populated with that.

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

WESTERN WEATHER DISCUSSION

Out West, a weak-to-moderate atmospheric river made landfall in the Pacific Northwest on Saturday and moved southeastward bringing coastal and valley rains as well as heavy mountain snowfall accumulations across California and the Pacific Northwest. For the week, rainfall accumulations along the coastal areas from Washington to California ranged from 3 to 13+ inches with the highest accumulations observed in the coastal ranges of northwestern Oregon and along the Central Coast of California. In terms of snowfall during the multi-day storm event, total accumulations exceeded 6 feet in areas of the Central Sierra while areas in the southern Cascades received up to 3 feet. Further inland, areas of the Northern Rockies in Idaho and northwestern Wyoming, observed snowfall totals ranging from 12 to 20 inches. Despite the beneficial nature of this week's storm event, significant precipitation deficits (ranging from 4 to 20+ inches) still exist across California and the state's largest reservoirs are still at critically low levels, with Lake Shasta currently at 46% of the historical average (25% of capacity) and Lake Oroville at 62% of average (31% of capacity). In other areas of the West, basin-level SWE is well below normal, especially in New Mexico where median SWE ranged from 12% to 77% of normal as of Dec 14. On the map, some improvements were made in areas of Extreme Drought (D3) and Exceptional Drought (D4) in Montana, Oregon, and Utah as well as improvements in areas of Severe Drought (D2) and Moderate Drought (D1) in Idaho and Wyoming. According to NOAA NCEI, November 2021 was the 2nd warmest on record for the West and Southwest climate regions. Moreover, California and Wyoming both recorded their warmest average minimum temperatures on record for November while Nevada, Utah, and Colorado observed their 2nd warmest on record. In terms of precipitation, the Southwest Climate Region was notably dry having its 5th driest November on record.

Reference:

David Simeral, Western Regional Climate Center

Richard Tinker, NOAA/NWS/NCEP/CPC



WATER NEWS

CALIFORNIA WATER NEWS

California, Arizona and Nevada agree to take less water from ailing Colorado River

Trying to stave off dangerously low levels of water in Lake Mead, officials in California, Arizona and Nevada have reached an agreement to significantly reduce the amount they take from the Colorado River.

The problem took on new urgency this summer when the federal government declared a first-ever water shortage in the 86-year-old reservoir near Las Vegas.

The agreement, which was signed Wednesday after four months of negotiations, aims to keep an extra 1 million acre-feet of water in the lake over the next two years. Water agencies in Southern California, Arizona and Nevada agreed to find water savings from various sources and split the \$200-million cost with the federal government.

The Colorado River has been chronically overused, and its flows have shrunk dramatically over the last 22 years during a “megadrought” that research shows has been worsened by global warming.

If the lake continues to drop, the Southwest could have no choice but to make deeper cuts.

“We’re experiencing what scientists are calling the new normal, a warmer, drier West,” Camille Calimlim Touton, commissioner of the federal Bureau of Reclamation, said Wednesday during a speech that was livestreamed to the annual conference of the Colorado River Water Users Assn. in Las Vegas. “The basin is at a tipping point.”

The Colorado River provides water for about 40 million people and farmlands from Wyoming to the U.S.-Mexico border.

Snowmelt runoff forms the river’s headwaters. Touton noted that last winter, the amount of snow that fell in the Rocky Mountains was nearly average.

“But due to warm temperatures, dry soil conditions and uptake of soil moisture into plants, we only saw 32% of average runoff,” she said. “That is a staggering difference.”

The latest federal projections, she said, show the “grim reality” of continuing water level declines in Lake Mead and Lake Powell, the two largest reservoirs on the river.

She pointed to daunting “hydrologic deficits across the board” going into this winter.

The first snowfalls in parts of the Rockies this year were among the latest on record.

Discussions about how to adapt to a river with less water dominated the Las Vegas conference, where representatives of the seven states that depend on the Colorado met with counterparts from Native tribes and the U.S. and Mexican governments.

The new deal, called the 500+ Plan, nearly doubles the water reductions that the three states — which make up the lower basin of the river — negotiated in 2019 under what is called the drought contingency plan.



VELES WATER WEEKLY REPORT

Since that time, the water woes on the Colorado River have gotten only worse as extremely hot, dry conditions have baked the watershed, dramatically reducing flows. Lake Mead, which was close to full in 2000 and at 41% of capacity when the 2019 deal was signed, is now at 34%.

Original Article: [The LA Times by Jaweed Kaleem and Ian James](#)

California snow drought ends in dramatic fashion, while other states still deal with shortage

Thanks to multiple atmospheric river events, average snowpack in California has gone from 18% to 98% in just two weeks.

"Increases in snowpack of this size are not common, but also not unprecedented," Julie Kalansky, deputy director of operations for the Center for Western Weather and Water Extremes (CW3E), explained.

Kalansky pointed out previous studies have shown a jump on this scale can happen about twice every three years, but usually over the course of an entire winter, not just the month of December.

While they don't have the exact rankings for each month of the year, "most of the storm events in the study we referenced for the above calculation were in the second half of December and later into the season," Kalansky added.

The sudden change gives California its wettest start to the Water Year in more than 40 years, thanks to several drought-denting rain and snow systems pushing through the area in recent weeks. The Water Year runs from October 1 through September 30 of the following year.

Parts of California are known for whiplash weather, but the rapid changes are quite remarkable given the snowpack was off to such a rough start, after a very warm and dry November for much of the state.

Northern California is doing a little better in terms of its water year, compared to where it was last year. While not at record levels, the National Weather Service (NWS) office in Sacramento tweeted the Northern Sierra precipitation is above average for this time of year, and exceptionally better than the same time last year.

However, Southern California was only able to take advantage of one of the larger atmospheric river systems recently.

"The Tuesday storm that brought 1 to 2 inches of rain to the coastal and valley areas put a dent in our rainfall deficit," the NWS office in San Diego said last week.

The area was so far behind prior to last week's storm, the recent rainfall only brought the region back to where it normally should be at this time of year, rather than ahead.

Original Article: [CNN by Allison Chinchar](#)



VELES WATER WEEKLY REPORT

As water officials repair damage from subsidence, they demand prevention from groundwater agencies

Sinking land has become a sticking point as local agencies seek to advance under the Sustainable Groundwater Management Act

State water officials have asked local groundwater agencies to better prevent land subsidence. Simultaneously, the state is also working to fix the damage caused by sinking land.

Subsidence is caused by the over-pumping of groundwater. It occurs in many parts of California but is especially pronounced in the San Joaquin Valley during drought years. When snowpack is below average and allocations of water stored in reservoirs are low, significant water users like the agricultural industry turn to underground aquifers for their water supply. According to the U.S. Geological Survey, portions of the Valley sank 20 to 30 feet in the 40 years after researchers began observing subsidence in the 1920s, and a NASA analysis of satellite imagery during the last drought found that some areas of the Valley sank as many as 22 inches during a period of just 16 months.

The sinking of land is slowly impairing the complex system of canals that deliver water throughout the state. According to a 2017 report by the Department of Water Resources (DWR), the sinking and buckling of portions of the California Aqueduct, which runs 444 miles from the Sacramento-San Joaquin Delta to the Tehachapi Mountains, has reduced its flow capacity and its ability to store water in overflow pools.

That's a concern to Roger Bales, an engineering professor with the University of California, Merced. "These aqueducts can still move water to users in the San Joaquin Valley or Southern California, but they can't move as much water during wet years as was their design capacity," he said, which also endangers water storage projects that act as an alternative to pumping groundwater. "If we can't store this wet-year water, then we can't pump groundwater sustainably."

Two years ago, entities throughout the state known as groundwater sustainability agencies were tasked with submitting plans to the state that detail how they plan to eliminate groundwater over-pumping by 2042 as required by the Sustainable Groundwater Management Act. But in recent months, as DWR officials have returned their comments on those documents, they've told many water agencies that their plans won't be approved unless they better demonstrate how they'll prevent future subsidence.

Original Article: [NPR for California by Kerry Klein](#)

'Zero Day' for California water? Not yet, but unprecedented water restrictions send a sharp warning

On Dec. 1, 2021, California triggered headlines heard around the world when officials announced how much water suppliers would be getting from the State Water Project. "California water districts to get 0% of requested supplies in an unprecedented decision," one headline proclaimed. "No state water for California farms," read another.



VELES WATER WEEKLY REPORT

The headlines suggested a comparison with the “Zero Day” announcement in Cape Town, South Africa, during a drought in 2018. That was the projected date when water would no longer be available at household taps without significant conservation. Cape Town avoided a water shutoff, barely.

While California’s announcement represents uncharted territory and is meant to promote water conservation in what is already a dry water year, there is more to the story.

California is a semi-arid state, so a dry year isn’t a surprise. But a recent state report observed that California is now in a dry pattern “interspersed with an occasional wet year.” The state suffered a three-year drought from 2007 to 2009, a five-year drought from 2012 to 2016, and now two dry years in a row; 2020 was the fifth-driest year on record, and 2021 was the second-driest.

Coming into the 2022 water year – which began Oct. 1 – the ground is dry, reservoirs are low and, even with a multi-day storm forecast to bring rain and snow, predictions suggest another drier than normal year.

Over a century ago, well before climate change became evident, officials began planning ways to keep California’s growing cities and farms supplied with water. They developed a complex system of reservoirs and canals that funnel water from where it’s plentiful to where it’s needed.

Part of that system is the State Water Project.

First envisioned in 1919, the State Water Project delivers water from the relatively wetter and, at the time, less populated areas of Northern California to more populated and drier areas, mostly in Southern California. The State Water Project provides water for 27 million people and 750,000 acres of farmland, with about 70% for residential, municipal and industrial use and 30% for irrigation. There are 29 local water agencies – the state water contractors – that helped fund the State Water Project and in return receive water under a contract dating to the 1960s.

Original Article: [Lake County News by Lara B. Fowler](#)

What Fallbrook and Rainbow’s revolt says about San Diego’s skyrocketing water rates

To understand why water agencies in Fallbrook and Rainbow are in revolt, consider the squeeze faced by Ismael Resendiz and the 250-acre cut-flower farm where he grows Protea, Pincushions and Banksia.

Resendiz said his flowers are barely getting the water they need to thrive. He said he’s had to cut irrigation in half over the last two years because of soaring rates. Over the last five years, his monthly bill has jumped from about \$25,000 to \$30,000 a month.

Now he’s considering dramatically shrinking his crop.

“I think we have to go down to 75 to 50 acres,” said Resendiz, who has been farming in San Diego County for four decades. “The water is pushing all the growers out of the business.”



VELES WATER WEEKLY REPORT

The situation isn't limited to farmers. Ratepayers in low-to-moderate income neighborhoods are also struggling to pay their bills. The city of San Diego said it currently has more than \$73 million in unpaid water bills.

A debate is now roiling throughout the San Diego region about how best to control the skyrocketing cost of water. The primary issue is that unforeseen conservation has put upward pressure on rates as the region's wholesaler, the San Diego County Water Authority, scrambles to cover an array of fixed costs.

Retail water agencies in Fallbrook and Rainbow argue the Water Authority isn't taking the situation seriously. They say the wholesaler is too fixated on shielding the region from drought-driven state cutbacks and not enough on affordability.

"If you're Del Mar or Rancho Santa Fe, you're fine," said Tom Kennedy, general manager of the Rainbow Municipal Water District, "but if you're someone trying to run an avocado grove or someone in National City on a tight income, it's a big deal."

In search of cheaper water, Rainbow, along with the Fallbrook Public Utility District, have taken the unprecedented step of attempting to cut ties with the Water Authority in favor of joining the Eastern Municipal Water District in Riverside County.

Water Authority officials have countered that any savings that departing agencies reap would be short lived, especially when the state finally gets around to building its new conveyance system in the San Joaquin-Bay Delta, known as Water Fix.

They've also warned that Fallbrook and Rainbow will likely be subject to significantly larger drought restrictions as part of Eastern. Gov. Gavin Newsom has already stopped deliveries through the State Water Project to Southern California and warned that mandatory cutbacks could be on the horizon.

"This really is a risky venture for them," said Sandra Kerl, general manager at the Water Authority. "I don't think any other time could illustrate that more clearly than where we are today."

Kennedy said his constituents are willing to take that gamble.

"If you're an avocado grower, and you're out of business, you don't care about future cutbacks," he said.

Original Article: [The San Diego Union Tribune by Joshua Emerson Smith](#)

Californians have a lot of ideas for how to get more water. Most of them are really bad

When it comes to water, Californians have a lot of big ideas for how to get more of it. One of the latest is in Marin County, where water managers are looking to build an 8-mile pipeline atop the towering Richmond-San Rafael Bridge. The line would allow water to be moved across San Francisco Bay from other parts of the state, to prop up sagging local supplies.

But for every grand plan pushing forward like this one, a dozen others — often more ambitious and sometimes outright wacky — get only eye rolls and a quick thumbs-down.



VELES WATER WEEKLY REPORT

Many of these questionable ideas have been surfacing over the past two years as California has spiraled into one of its worst droughts in modern times.

This year, one of the candidates vying to replace Gov. Gavin Newsom in the recall election called for a pipeline to the Mississippi River. Residents along the Mendocino Coast explored the possibility of importing water from the Bay Area on barges. In some places, there was even talk of — if only in passing — a longtime proposal to tow an iceberg to California.

“I used to get a lot of cold calls with these ideas,” said Heather Cooley, director of research at the Pacific Institute, a think tank in Oakland where she works on the state’s most vexing water problems. “On the one hand, I think it’s useful that people recognize there’s a problem and are thinking about solutions. On the other hand, there’s usually a lot more practical things that we should be doing.”

Perhaps because they’re in widespread use, water pipelines have been particularly ripe for California’s collective imagination.

Before Democratic gubernatorial candidate and real estate agent Kevin Paffrath proposed the Mississippi River intertie in August, there were calls to build conduits to other big water sources, from the Great Lakes to freshwater supplies in British Columbia and the Arctic.

In 2015, during the heart of last decade’s drought, actor William Shatner launched a \$30 billion Kickstarter campaign to finance a pipeline between California and Washington.

“It’s simple,” the “Star Trek” star told Yahoo News at the time. “They did it in Alaska. Why can’t they do it along (Interstate) 5?”

The federal government, in the early 1990s, went as far as studying the possibility of constructing a 2,100-mile aqueduct beneath the ocean from Alaska’s Prince William Sound to California’s Lake Shasta.

Needless to say, none of these proposals make sense financially, said Jay Lund, a professor of civil and environmental engineering at UC Davis and one of the state’s top experts on water.

“The problem is they would cost you more to build and operate than what people would be willing to pay for the water,” he said.

During the drought last decade, when a record snowstorm hit New England, Lund penciled out the price of an internet-fueled idea of bringing snow from the Northeast to California by train. The cost was about \$10,000 for an acre-foot of water, more than 10 times what most water agencies currently pay.

Another proposal put forth in previous droughts, filling up large plastic bags with water from Oregon’s Columbia River and lugging them by tugboat to California, was similarly cost prohibitive.

“Water is just really heavy, and it takes a lot of energy to move,” Lund said. “Technologically, a lot of things are possible. That doesn’t mean they’re worthwhile.”

California’s state and federal water projects, famous for moving supplies over great distances, introduced big thinking to the world of water. The two projects, built more



VELES WATER WEEKLY REPORT

than a half century ago, fueled the state's unparalleled growth by nourishing cities and farms with reservoir water piped from mountains hundreds of miles away.

In recent years, the systems have seen little expansion, however. The infrastructure has gotten more expensive to construct and there just isn't enough new water to make collection and conveyance worth the investment.

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

Big Storm Headed to West Coast Could Boost CA Water Supply

A new storm is expected to deliver rain and snow to California as early as Monday, according to AccuWeather.

"A storm developing off the West Coast on Friday will tap into an atmospheric river of moisture and bring rain and mountain snow to the Pacific Northwest on Saturday," said AccuWeather senior meteorologist Mike LeSeney.

After that, the precipitation will move south over the next several days into California, eventually reaching the southern region of the state.

Until then, Valley weather will be dry and cold today and Saturday before a warming trend begins, said the National Weather Service Hanford in its forecast discussion on Friday morning.

If the rain and snow materialize in California, it will be more good news for a state mired in drought. Even though the drought is far from over, the storm earlier this week boosted the Sierra snowpack from 19% of normal for this time of year to 97% of normal on Thursday.

December is the first of the three big months bringing about half of the state's annual precipitation.

The most recent storm and what's predicted to come this month will deliver "about average" precipitation, but that's far better than the past few years, said state climatologist Michael Anderson.

"But you also started the year in record-setting drought territory. In terms of making up those lost elements of storage, you're making some progress but maybe not as much as you'd like."

Original Article: [GV Wire by Bill McEwen](#)

California, Nevada and Arizona to cut Colorado River water use — Utah says it's about time

On Wednesday, three states announced a voluntary agreement to scale back their use of the Colorado River.

California, Arizona and Nevada, which including Mexico constitute the lower Colorado River Basin, will try to keep an additional 1 million acre-feet of water in Lake Mead for the next two years.



VELES WATER WEEKLY REPORT

The agreement, dubbed the 500+ Plan, goes further than the 2019 drought contingency plan which led to states voluntarily giving up water to reduce the strain on Lake Mead and Lake Powell.

The plan intends to preserve an additional 500,000 acre-feet of water in Lake Mead in 2022, and again in 2023. It will require funding from the lower basin states — roughly \$40 million from Arizona, and \$20 million each from Nevada, California and the Central Arizona Project, which runs a canal system to transport water from the Colorado River to Arizona, according to The Associated Press. The federal government will match the funds, bringing the total to \$200 million.

On Thursday, Utah Gov. Spencer Cox said it was past time for the lower basin states to scale back water use, telling reporters it's "not a secret" that Arizona, California and Nevada have been drawing too much from the Colorado River for years.

"The lower basin has been overusing their portion of the Colorado River for years. Everyone knows that ... The upper basin states have absolutely been underutilizing their amounts compared to the lower basin states, and California being the most egregious example of that," the governor said during his monthly PBS Utah news conference.

The agreement, and Cox's comments, come after a lengthy report from the Utah Rivers Council that alleges Utah is actually using more water than its allotted under the Colorado River Compact.

For years, the state has been operating under the assumption it has a surplus of water — reinforced Thursday by Cox, who said "we have data that shows that we are not using our full allotment."

But the report says that assumption is based on outdated numbers that don't account for the nearly 20% decline in flow over the last 20 years. Taking that decline into consideration, the upper basin, which comprises Utah, Wyoming, Colorado and New Mexico, is currently in a 500,000 acre-foot water deficit. With the exception of Wyoming, each state is contributing to the deficit.

Original Article: [KLS by Kyle Dunphey](#)

Calif. publishes drinking water well management strategies

Yesterday, the Department of Water Resources and the State Water Resources Control Board issued its final groundwater management principles and strategies to help protect drinking water wells from the impacts of drought.

Developed in response to Governor Gavin Newsom's drought state of emergency proclamation in April, the principles and strategies provide a framework for state actions to proactively address impacts on groundwater-dependent communities as droughts become more frequent and intense as a result of climate change.

The framework prioritizes protection of public health and safety, as well as preparation and mitigation for the effects of drought conditions over the long term. Six principles describe how to address drinking well water impacts, and include strategies to achieve



VELES WATER WEEKLY REPORT

drinking water resiliency, integrate equity, identify underlying challenges, use best available data, build trusted relationships, and implement lasting solutions.

These principles and strategies incorporate hundreds of public comments received earlier this fall, including written comments submitted to DWR and feedback at public workshops and webinars.

The final principles and strategies provide a shared policy framework of near-term drought response and long-term resilience actions by state agencies for those that rely on groundwater for drinking water. The strategies build upon existing programs and newly enacted laws, such as the 2021 drought planning legislation (Senate Bill 552), the implementation of the Sustainable Groundwater Management Act (SGMA), and the Safe and Affordable Drinking Water Fund for Equity and Resilience (SAFER).

These principles aim to increase coordination and engagement with non-government organizations, Tribes, water agencies, groundwater sustainability agencies, and other local entities to ensure that the state's resources and actions support state and local needs.

“Ultimately, sustainable groundwater basins will help Californians manage through drought — especially those dependent on domestic wells. But we're simply not there yet. These principles will help state agencies, local governments and communities address very real domestic well outages that are starting to occur,” said DWR Director Karla Nemeth. “A big thank you to the members of the public who shared their insights with DWR. We are ready to implement.”

“We are in a severe drought that, with declining groundwater levels, threatens drinking water wells and makes harmful contaminants become more concentrated in certain areas,” said Joaquin Esquivel, chair of the State Water Board. “Articulating clear principles and strategies to manage groundwater, while protecting drinking water, improves the drought resilience of our rural and often disadvantaged communities, who are most burdened and impacted by deteriorating conditions.”

Original Article: [Water World](#)

A frenzy of well drilling by California farmers leaves taps running dry

Vicki McDowell woke up on a Saturday morning in May, thinking about what she would make her son for breakfast. He was visiting from Hayward, and she wanted to whip up something special. Biscuits and gravy. Fried potatoes. Eggs.

She walked to the kitchen sink to wash her hands. Turned on the faucet. Nothing happened. Worried, she tried the bathroom sink. Still nothing. She flushed the toilet. It gurgled.

The 70-year-old called her landlord. He called a well driller. The news was grim. The well that pumped water to the small, cream-colored house she rents on an olive ranch had gone dry. Seven months have passed. It's still dry.

“I've never lived in the country,” said McDowell, who moved here to the outskirts of the Tulare County seat three years ago. “I thought, that's an easy fix. It wasn't.”



VELES WATER WEEKLY REPORT

In the verdant San Joaquin Valley, one of the nation's most productive farming regions, domestic wells like McDowell's are drying up at an alarming pace as a frenzy of new well construction and heavy agricultural pumping sends the underground water supply to new lows during one of the most severe droughts on record.

During California's last extreme drought, which stretched from 2012 through 2016, lawmakers scrambled to protect the state's dwindling groundwater. The resulting law, however, was limited by politics and compromise. It set up a framework to manage groundwater, but so far has done little to safeguard the precious resource.

The Los Angeles Times analyzed state groundwater data from the hard-hit San Joaquin Valley and found that 2021 is on track to see the most agricultural wells drilled since the last drought ended.

The Times analysis found that more than 6,200 agriculture wells have been drilled in the valley since the flawed Sustainable Groundwater Management Act, known as SGMA, was passed in 2014.

The Times sifted through more than 1 million Well Completion Reports from the state Department of Water Resources. These reports were used to analyze patterns in well drilling — including dates, locations and depths — to understand how the agriculture industry's access to groundwater has increased over time. Another source was the department's periodic groundwater level measurements data, a collection of more than 2 million records from thousands of wells across the state, to track the impact of drilling and pumping on the water supply.

The sobering results show a region in which agriculture has vastly outgrown its water supply. In Tulare County, where agriculture is the top industry and brought in more than \$7 billion in 2020, hundreds of families have been left without running water. The most harm has been felt by low-income residents and small farmers. Continued heavy pumping and unchecked agricultural well drilling have left the future water supply in question.

Original Article: [The LA Times by Maria L. La Ganga, Gabrielle LaMarr LeMee and Ian James](#)

CA Department of Water Resources warns 27 GSAs over risks to well users

On December 9 the Department of Water Resources (DWR) took another important step toward protecting drinking water supplies by issuing correspondence letters to 27 Groundwater Sustainability Agencies (GSAs), warning GSAs that these plans will be deemed incomplete when final assessments are issued at the end of January.

These GSAs span across the San Joaquin Valley, including Kern Groundwater Authority, Kern River, Buena Vista Water Storage District, Olcese Water District, Henry Miller Water District, Tri-County Water Authority, Lower Tule River Irrigation District, Alpaugh, Delano-Earlimart Irrigation District, Eastern Tule, Pixley Irrigation District, Tulare Lake, Mid Kaweah, Greater Kaweah, East Kaweah, James, Central Kings, North Fork Kings, South Kings, McMullin Area, Kings River East and North Kings.



VELES WATER WEEKLY REPORT

DWR cited previously issued consultation letters that identified a lack of information and required justification of sustainability goals that would jeopardize the water supplies of thousands of Californians.

Over 30 million Californians rely on groundwater and over-pumping is impacting and will continue to impact drinking water needs. The Sustainable Groundwater Management Act (SGMA) of 2014 establishes “significant groundwater-level declines” and “water-quality degradation” as two of the six undesirable results that GSPs must avoid.

The letters released by DWR cover basins deemed to be in a “state of critical overdraft” meaning that groundwater levels have been dropping for decades. In these basins, tens of thousands of residents reliant on shallow wells — domestic well owners and residents of small communities — are at risk of losing their water supply if overdraft continues at its current rates. SGMA was intended to reverse that continuing decline.

“More than 10,000 San Joaquin Valley residents lost their water supplies in the last drought, and nearly 1,000 wells have gone dry in 2021,” said Justine Massey, Policy Manager & Attorney of Community Water Center. “Domestic well owners and small communities should no longer be forced to bear the brunt of unsustainable groundwater management.”

“The Department of Water Resources has taken an important step towards protecting the water supplies of those who rely on groundwater in California,” says Jennifer Clary, California Director for Clean Water Action. “Although there is more work to be done to ensure GSPs are adequately addressing all user needs in their basin, this sends a clear signal that the status quo of overlooking domestic well users is no longer accepted.”

While applauding the prioritization of domestic water user needs in GSP review by DWR, advocates also emphasized that more needs to be done to ensure these plans are protective of the Human Right to Water.

“Now is the time for GSAs to prioritize protecting all groundwater users in their basin,” says Michael Claiborne, directing attorney for Leadership Counsel for Justice and Accountability, “first by addressing the revisions directed by DWR, then by listening to what communities have been asking for since SGMA was established: immediate reductions in groundwater pumping to end overdraft and protect access to drinking water, and well mitigation plans to address water quantity and quality issues for those dependent on this critical resource.”

Original Article: [Our Valley Voice by Kelsey Hinton](#)

California advances big new reservoir project amid drought

Amid a severe drought, California regulators on Wednesday advanced what could be the state’s first major new water storage project in years despite warnings it would hasten the extinction of an endangered salmon species while disrupting the cultural traditions of some native tribes.

The plan is to build a new lake in Northern California that, when full, could hold enough water to supply 3 million households for one year. Supporters need about \$4 billion to



VELES WATER WEEKLY REPORT

build it. Wednesday's vote by the California Water Commission means the lake — named Sites Reservoir — is eligible for about \$800 million in taxpayer money, or about 20% of the project's price tag.

The vote is a major milestone for the reservoir, one of seven water storage projects now eligible to receive public money from a 2014 voter-approved bond. But environmental groups complained it was too early for regulators to say the project was feasible, especially since it hasn't completed multiple environmental reviews required by state and federal law.

They argue the project would pull even more water from the state's rivers, which are already so depleted that fish hatcheries must send fish downstream by truck to give them a chance to survive.

"Simply put, we have to stop permitting projects and financing projects that worsen this condition," said Barry Nelson, a policy consultant with the Golden State Salmon Association.

But the climate-change-fueled drought gripping the Western United States is so severe that many of California's 1,500 reservoirs are at historic lows. Things are so bad that, earlier this month, state officials told water agencies they wouldn't get any water from the reservoirs heading into the new year.

"The Sites Reservoir project is not going to solve all of our problems," said Jerry Brown, executive director of the Sites Reservoir Authority, and who is not related to the former California governor with the same name. "If we do absolutely nothing, I can guarantee you things will get worse."

California's reservoirs are a crucial source of drinking water for the state's nearly 40 million residents, help maintain necessary flows in rivers for fish, and irrigate California's robust agricultural industry that grows a third of the country's vegetables and two-thirds of its fruits and nuts.

Severe droughts have strained the state's supply and renewed calls for more ways to capture and store water from the state's major rivers and streams instead of letting it flow to the ocean.

But just because California builds a new reservoir does not mean the state will have enough water to fill it. Most major reservoirs are connected to rivers and rely on gravity to fill them with water from snowmelt in the mountains. The Sites Reservoir would not connect to any river. Instead, the project must pump water from the nearby Sacramento River.

The idea is to only take water from the river when it has extra to give, such as during large storms like the one that set a single-day record for rain in Sacramento in October. But some tribal groups say that doesn't make sense because all water in the rivers has a significant purpose.

"The rivers are barely surviving. They can barely sustain life as it is," said Margo Robbins, a member of the Yurok Tribe, which relies on salmon for food and ceremonial needs. "I



VELES WATER WEEKLY REPORT

would hope that you would take into consideration the huge detriment that this will be to the salmon and native people.”

California Water Commission chair Teresa Alvarado stressed Wednesday’s vote was not a final decision to fund the project. And Brown, executive director of the Sites Authority, noted the project has changed multiple times based on public comments.

“I think our history shows that we do listen,” he said. “We are open to others’ input and we will take that into consideration and carefully review what is put before us to ensure that what we ultimately decide on is something that’s good for all of California.”

Original Article: [KTLA by Associated Press](#)

Despite California groundwater law, aquifers keep dropping in a ‘race to the bottom’

It emerged during one of the worst droughts in California history, when rampant agricultural pumping was causing groundwater levels to plummet and hundreds of Central Valley wells were going dry.

Signed by then-Gov. Jerry Brown, the Sustainable Groundwater Management Act was intended to address overpumping, halt chronic water-level declines and bring long-depleted aquifers into balance.

More than seven years later, however, those goals are still a long way off. The law, known as SGMA, prioritized water management decisions at the local level and laid out a timeline of implementation that spanned more than two decades. Even in farming areas with the most severe problems of groundwater overdraft, the local agencies charged with combating the declines have until 2040 to achieve their sustainability goals.

In the meantime, a frenzy of well drilling has continued on large farms across the San Joaquin Valley. Growers have been pumping heavily during the drought, and groundwater levels have continued to drop. As a result, shallower wells supplying nearly a thousand family homes have gone dry this year. Families with dry taps have been left relying on plastic tanks and trucks that roll through the valley hauling water.

Some of the architects of the legislation now acknowledge it contained flaws.

“Looking back on it, probably the timeline was too long,” said former state Sen. Fran Pavley, a Democrat who helped draft the 2014 law. “But who knew there would be another severe drought so quickly? And that people wouldn’t self-manage how much water they were taking out, knowing the impacts.”

Pavley said she has also been disappointed to see how some local agencies seem to be waiting rather than embracing steps toward sustainability.

“They’re going to wait to the end. And a lot of average people, whether they’re families or small family farmers, are going to get hurt,” Pavley said. “And the state of California is left shipping water to homeowners who can’t compete in the race to the bottom.”

Given the contentiousness of California water politics, the law needed to include compromises, Pavley and others said. One compromise was putting local agencies in



VELES WATER WEEKLY REPORT

charge instead of adopting a top-down system of state regulation. Another was granting the new groundwater sustainability agencies 20 years to reach their goals.

SGMA wasn't meant to bring about an instant change, said Felicia Marcus, a visiting fellow at Stanford University and former chair of the state water board. It was intended to be "a long-term reach to assure that people's kids and grandkids would be able to farm," she said, and to prepare for the worsening strains that climate change is putting on water resources.

Original Article: [The LA Times by Ian James](#)

Kern County Water Agency declares water supply emergency

On Wednesday, the Kern County Water Agency has declared a water supply emergency due to the shortage of water supplies for Kern County. This is after an announcement by the California Department of Water Resources declaring that water supply allocation is zero percent.

The announcement is unprecedented since the previous lowest allocation was five percent in 2010 and 2014. This means that the Agency will receive no SWP water in 2022, which is the third consecutive year of dry weather, leaving the county at an all-time low. Kern River's water supplies are also the second driest on record leaving the smallest carryover balances in Isabella Reservoir since its existence.

"This declaration should make all aware that these are extraordinary times for Kern County. Given these dry conditions, coordination and cooperation among local, State, and federal agencies will be required to maximize and optimize California's very limited water resources." Said Royce Fast, Agency Board of Directors (Board) President.

During this shortage, Kern County farmers are expected to rely on groundwater basin to make up the shortage.

The Agency Member Units will be forced to continue recovering water from the approximately 1.6 million acre-feet currently stored in the Kern Fan banking projects and to pay the costs to recover these groundwater supplies in addition to the \$155 million paid for SWP water not received in 2022.

Original Article: [23 ABC by Muska Olumi](#)

More Than \$350 Million Available for Groundwater Sustainability Projects

Over \$350 million is being made available from the California Department of Water Resources (DWR) to support groundwater sustainability. DWR has released Final Guidelines and Proposal Solicitation Package for the Sustainable Groundwater Management Grant Program. The funding support will be made available for the planning and implementation of efforts to assist in compliance with the Sustainable Groundwater Management Act (SGMA).

"Through these investments, we will continue collaborating with our regional groundwater agencies to promote projects that provide multiple benefits while also



VELES WATER WEEKLY REPORT

improving groundwater supply and quality,” DWR Deputy Director of Integrated Watershed Management, Kris Tjernell [said in a press release](#).

DWR will be providing funding to support the groundwater sustainability projects through at least two rounds of solicitations. More than \$150 million will be provided to regional groundwater sustainability agencies during the first round of the process. Eligible projects for the grant funding include updates to existing groundwater sustainability plans, groundwater recharge projects, and other projects that support water supply reliability. Additional projects that are eligible for grant funding include those that prevent or clean up contaminated groundwater supplies that serve as a source of drinking water. Announcements for the first round of awards are expected to be released sometime in the Spring of 2022.

In the Fall of 2022, the second solicitation period is expected to open. More than \$200 million will be made available for planning and projects in medium and high-priority groundwater basins. Funding for the grants will come from the voter-approved Proposition 68, any future budget allocations, and any remaining funds from the first round. Funds that remain after the second round will be distributed through future funding solicitations.

Other grant programs available to help address issues of water include the Urban and Multibenefit Drought Relief Grant Program, which is currently accepting applications. Round 2 of the Proposition 1 Integrated Regional Water Management Grant Solicitation is also expected to open sometime in early 2022.

Original Article: [Ag Net West by Brian German](#)

California's major reservoirs are still far drier than average

The just-passed atmospheric river gave California a lot of precious, badly needed water. But how well did our all-important reservoir systems do? For California, water storage, above and underground are the key to California's economic fate.

As of midnight Monday, California's major reservoirs keep getting more water from the weekend's storm as the runoff finds its way into them.

"The major reservoirs are still very, very low," said hydrologist and climatologist Dr. Peter Gleick, founder of the Pacific Institute.

"We need several more big storms, really quite a few, frankly before those big reservoirs get to where they ought to be today," said Gleick.

The state's five biggest reservoirs tell the tale.

Shasta, the state's largest is only 25% full. But that's less than half of its normal volume this time of year. Lake Oroville: 31% full. Trinity: 29% full; less than half of normal. New Melones: 37% full. San Luis: 24% full, not even half of normal.

"The really big water demands in California, the Central Valley Farms, the big cities along the coast and in southern California, depend on the big reservoirs," said Gleick.

Lake Sonoma, managed by the Sonoma County Water Agency, is the Bay region's largest reservoir. It serves 600,000 residences and businesses in the North Bay.



VELES WATER WEEKLY REPORT

In 2019, on this day, it was 87% full will much of the rainy season to go. In 2020, as the drought set in, it was at 66% full. This time, this year, just 50% full, including the most recent rains.

"This is the second atmospheric river we've had and we're going to need a lot more of these storms before we're out of this drought. After two years of drought, it's going to take a lot of rain to fill up our reservoirs again." said Sonoma Water spokesman Barry Dugan.

Right now, most Marin County reservoirs look to be in better shape as we can see here at Stafford Lake and Nicasio Reservoir. But that's because they are relatively small, in constant need of replenishment. So, whether it's big or small reservoir, the worry is this. "Sometimes we can have an incredibly dry January and February and that's what we're worried about. We're still not out of the woods yet," said Dr. Gleick.

So, for now, the atmospheric rivers bought us a little time, but very little.

Original Article: [Fox 2 KTVU by Tom Vacar](#)

US WATER NEWS

Ag interests fear water anti-speculation over-reach

If there's an antidote to the threat of water speculation in Colorado, state legislators have a ways to go to come up with a means to do it that will satisfy most agriculturalists, based on a panel held during the Colorado Ag Water Summit.

For now, any proposed legislation that involves the risk of intrusive government intervention or the potential to devalue a multigenerational private property asset puts many in the farming and ranching community on edge.

In a mutually respectful but sometimes tense discussion, a wide-ranging panel described the sale of water rights as existing along a spectrum ranging from an unfettered marketplace modeled on Wall Street to something more akin to a public trust.

Discussed at some length was a 160-page report compiled by a 19-member working group that led to a few early proposals that made most panelists and audience members uneasy.

Joe Bernal, a Mesa County farmer and one of only two landowners on the working group, felt the dialogue had been constructive and informative but ended without a clear path forward and with more research and input needed.

As a farmer, he felt outnumbered, he said. And he was disappointed the group failed to reach a clear consensus on what water speculation actually is.

"I didn't ever feel comfortable we had that well-defined," he said.



VELES WATER WEEKLY REPORT

The final paragraph of the report urged legislators not to act on any of the concepts discussed due to the drawbacks identified and a lack of consensus among the group.

“I don’t see how we can sort out the good and bad (from this report) without hurting a lot of good people,” Bernal said.

James Eklund was less charitable. He summarized the process as legislators asking the group to “throw a bunch of spaghetti at the wall,” then — after none of the spaghetti stuck — moving forward anyway with draft legislation he described as “an embarrassment to the state.”

An early draft bill would grant the state water engineer the ability to investigate complaints of investment water speculation and fine purchasers up to \$10,000 if they determine speculation is occurring, along with capping the percentage of ag water rights a single owner can hold in a district, requiring sworn affidavits of a purchaser’s intent and potentially other fines and restrictions.

“The topic boils down, to me, to one of control,” asserted Eklund, a fifth-generation Coloradan who owns agricultural water rights as part of a family-run farming operation. Eklund is also a former government bureaucrat who now runs a private firm that represents private equity groups and asset managers.

One area where most everyone agreed was on the concept of tying water rights to beneficial use as one of the state’s proudest achievements.

Beneficial use implies water is a shared asset of the state that can’t be purchased merely to hold or to hoard; it has to be deployed in a way that maximizes its value for all.

From there, however, opinions quickly splintered in different directions.

Eklund characterized the current situation as a supply-and-demand problem with an existing system in place to solve it.

Original Article: [La Junta Tribune Democrat by Candace Krebs](#)

Leasing Colorado River water to Queen Creek would be a step in the right direction

A small proposal that would nevertheless move water policy considerably in the right direction is pending before the federal Bureau of Reclamation.

An investment company, Greenstone, purchased some farm land along the Colorado River. It proposes to sell the Colorado River water rights associated with the land to the town of Queen Creek, which would use the Central Arizona Project distribution system to transport it. It would be enough water to support an estimated 6,000 households.

The Arizona Department of Water Resources has approved the transaction, but it awaits a decision by the bureau.

Some locals object to the transaction. One argument is that selling water for a profit is per se offensive.

However, setting a market price for the water itself is precisely what makes this a small but considerable step in the right direction.

It's time to put a market value on water



VELES WATER WEEKLY REPORT

If Arizona's water situation is considered holistically, taking into account all sources and uses, the anticipated reductions in the state's CAP allocation don't look so daunting.

However, who, where and for what purpose water can be used is subject to a web of legal restrictions.

Moreover, there is a shortage of anything only in relationship to a particular price for that thing. Arizona's ability to adjust to a declining supply of Colorado River water is made more difficult because, for the most part, there is no price put on water itself. It is treated as a free good.

In markets, prices reflect not only the current cost of production but anticipated future scarcity as well. Overwhelming, however, what end customers pay for water reflects the cost of extraction and delivery only. The price doesn't reflect the anticipated future scarcity of the water itself.

Original Article: [AZ Central by Robert Robb](#)

Looming water cuts call for solutions

Lake Mead is shrinking. Last seen full in 1983, a 157 foot "bathtub ring" of salty white mineral deposits is the visible record of a slowly unfolding crisis. For the first time ever, federal officials have declared an emergency water shortage for the Colorado River. Nevada's water cuts will take effect on January 1, 2022. Extended droughts, extreme temperatures, and chronic overuse of the Colorado river basin require our attention. It's a wakeup call to change the country's reckless relationship with desert water. Policymakers, farmers, and 40 million residents who depend on the Colorado River must find ways to use less.

A common thread throughout history is the persistent belief that nature can be conquered. Such hubris has emboldened those in power to harness and exploit great Western rivers. Unsustainable water diversions along the Colorado River began in the late 1800s to irrigate crops hundreds of miles away. In an effort to "reclaim" the river, federal and state officials established the Colorado River Compact of 1922. It was an unusually wet year, and water was over-allocated from the onset. The compact divided the river between seven states, and Mexico was added later. The West has been overdrawing on the mighty river ever since.

The first tier of federal emergency cuts affect Nevada, Arizona and Mexico. Allocated just 2 percent of the river's water, Nevada will reduce its supply by 7 percent, a meager 0.14 percent savings for the Colorado River. Arizona, with 17 percent of river water rights, faces reductions of 18 percent. Mexico receives 9 percent, and its cuts will be 5 percent. Together, these reductions amount to less than 4 percent savings in our critical mitigation efforts.

Conservation policies often target cities where costs are widely distributed. Nevada's urban areas represent 90 percent of the state's population, but consume less than 20 percent of the water.



VELES WATER WEEKLY REPORT

People blame casinos, suburban lakes, and their neighbors' pools and lawns for wasting water. However, Las Vegas recycles all water used indoors, and it is among the most water efficient cities in the West. Outdoors, where water can't be reused, the Southern Nevada Water Authority incentivizes homeowners to convert their lawns to low water desert landscapes with drip irrigation. Nevada policymakers, in response to anticipated water shortages, passed a new law prohibiting water-intensive decorative turf within medians, along roads, and in business parks.

Original Article: [The Nevada Independent by Linda Stout](#)

Controversial Lake Elsinore hydroelectric project blocked by federal government

The Federal Energy Regulatory Commission has blocked a controversial \$2 billion hydroelectric plant near the Lake Elsinore shoreline after the developer failed to provide requested environmental studies and a construction plan, among other things.

Vista-based Nevada Hydro Co. has proposed building a 200-foot-high dam above the lake and a 500-megawatt, underground power plant with turbines on 845 acres of U.S. Forest Service. Water would be pumped from the lake to a man-made reservoir when demand for electricity is low, with water flowing back to the lake when demand is high. The project has been named the Lake Elsinore Advanced Pumped Storage Project, or LEAPS.

The city of Lake Elsinore, Riverside County, the Pechanga Band of Luiseno Indians, environmentalists and local residents oppose the project.

In a letter dated Dec. 9, FERC's director of hydropower licensing, Vince Yearick, informed Nevada Hydro's president that the commission was dismissing its project application because Nevada Hydro failed to provide the Forest Service with recreation, groundwater, seismic, and geotechnical studies, as well as a construction plan.

"The Forest Service states that while it has held multiple meetings with Nevada Hydro to seek resolution and completion of the required studies, Nevada Hydro has informed the Forest Service that it does not intend to perform the studies and provide the remaining information prior to the Commission's issuance of any license for the project," Yearick said in the letter.

On Dec. 13, the commission rejected Nevada Hydro's Dec. 10 request for a preliminary permit that would give the company up to four years to conduct a project feasibility study. Nevada Hydro, however, could request a rehearing on the matter within 30 days, said FERC spokeswoman Celeste Miller.

It was unclear what Nevada Hydro's plans are moving forward. Company representatives, including President Rexford Wait, declined to comment.

Nevada Hydro has also proposed installing 32 miles of transmission lines and 170 high-voltage steel towers that would carry electricity from Lake Elsinore to the unincorporated communities of La Cresta, Tenaja, Lakeland Village and Temescal Valley, and then connect to power lines owned by Southern California Edison and San Diego Gas and Electric.



VELES WATER WEEKLY REPORT

Nevada Hydro, founded in 1997, said the project would give the region a reliable energy source and support 600 construction jobs and 20 to 30 permanent jobs. According to its website, LEAPS was designed to respond to the growing need for reliable renewable electricity and to help meet California's ambitious emissions reduction programs.

Original Article: [The Press Enterprise by Joe Nelson](#)

Water managers grapple with a smaller Colorado River as the climate changes

For years, scientists have warned that climate change would have significant ramifications for the Colorado River. But it took two back-to-back dry years and dramatic declines in Lake Mead to drive home the point: The Southwest needs to plan for a world where water scarcity is the reality.

What that planning process looks like — and exactly how it takes shape — was a primary topic of conversation at an annual Colorado River conference in Las Vegas over the past week. At Caesars Palace, water managers listened to speeches, milled about the hallways and convened closed-door side meetings. Their focus: how to move forward, what kind of future the region should prepare for, and how to overcome serious political challenges.

“The really bad conditions that we are seeing right now, the dramatic drops in the reservoirs, are forcing conversations that are extremely uncomfortable, but really important and useful,” said John Fleck, a University of New Mexico researcher and author of two books on the river.

In many ways, the Colorado River Water Users Association Conference is a microcosm of the global challenges and negotiations to reconcile science and policy in grappling with a changing climate, which has already left a major imprint on how water cycles through the environment.

Each year, the conference brings together water users from across the Colorado River Basin, which includes about 40 million people from seven Western states, more than two dozen tribes and the country of Mexico. The river, the region's environmental lifeblood, is diverted for cities, farmers and industry, all sectors that send representatives to negotiate at the conference.

The watershed's size and scope, even in years where there is far more water in the reservoirs, means the stakes for negotiations are always high. Those stakes are especially high now, with the river's two largest reservoirs — Lake Mead and Lake Powell — at 32 percent of capacity.

Everyone at the conference has different interests and the representatives who attend must grapple with politics at home, leaving them with less negotiating power than it might appear. Moreover, the river's governance is diffuse and decentralized, with different nodes at different parts of the basin. This fact has, in the past, shut certain water users out of the discussions.



VELES WATER WEEKLY REPORT

In 2007, the last time the states negotiated guidelines for managing the basin's reservoirs, tribal nations were not included, despite having rights to about one-fifth of the river. As states start to renegotiate those guidelines and work through the process of planning for a drier future, tribal leaders have stressed the importance of inclusion.

"You've heard it so many times," said Maria Dadger, executive director of the Inter-Tribal Council of Arizona. "Historically, tribes have not been a part of the negotiations around the management of the Colorado River. And let's just say that's past history, because that is no longer the case."

But even as many water managers see the need to plan for less, some are seeking to develop more. Today, nearly a century after states signed the Colorado River Compact, one of the river's primary governing documents, there are proposals to divert more water from the river, including a pipeline that would move water from Lake Powell to the fast-growing area of southwest Utah.

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

'What we need is multiple solutions' to solve water crisis

A major conference on Colorado River water issues last week in Las Vegas revealed signs of progress in protecting the West's dwindling water supply, notably a new agreement between Nevada, Arizona and California that will ease the burden on Lake Mead.

But the gathering of water officials, conservationists, tribal leaders, state and local officials and others also pointed out the depth of the developing crisis, with even the headlining multistate pact raising questions about whether it was a Band-Aid over a gouging wound, and pointed to the complexities involved in a long-term solution.

Experts across the board, from scientists to water commissioners to government officials, are brainstorming the many possible solutions, from small ones such as cutting down on water-sucking landscape to larger ones like completely removing dams and decommissioning the lakes.

"It's going to take ingenuity, money and cooperation to find those projects throughout the basin, regardless of how big or small they are," said Colby Pellegrino, deputy general manager of water resources at the Southern Nevada Water Authority (SNWA).

The snow that falls onto the Rocky Mountains during the winter melts in the spring, trickling downhill as a stream before accumulating into a river, which meanders for hundreds of miles, stopping at Lake Powell in Utah and Arizona before continuing downstream to Lake Mead where it is stored in the Colorado River Basin.

The water is distributed to seven states through the Colorado River Compact, an agreement signed in 1922 that lays out how much river water each state gets.

But with climate change and water shortages, that water is drying up. The lakes made to store water were at 95% capacity in 2000. Since then, Lake Mead, which supplies water to 25 million people, is at its lowest levels ever at only 35% capacity, and experts project Lake Powell levels will continue to drop as well, below 3,940 feet.



VELES WATER WEEKLY REPORT

Leaders say they made some progress at the Colorado River Water Users Association conference at Caesars Palace, including [signing the memorandum of understanding](#) known as the “500+ Plan” that will save 500,000 acre-feet of water in Lake Mead in 2022 and 2023 and includes plans for further conservation going into 2026. Through a \$200 million partnership between the U.S. Department of Interior, Arizona, Nevada and California, communities that cut down on their water and implement water-saving technologies can get paid.

SNWA has been successful in prohibiting the installation of nonfunctional turf and new golf courses. It is also working on stopping “evaporative cooling” technologies that represent the largest consumptive water use next to irrigation, and limiting the sizes of swimming pools to no more than 3,000 square feet, Pelligrino said. Pools lose more than 145,000 gallons of water a year through evaporation.

The U.S. and Mexico also entered into an agreement at the conference, establishing a binational contingency plan that goes over how Mexico and the U.S., which holds 1,500,000 acre-feet of water for Mexico, will work together to conserve water and find solutions.

“This is a small direction, but I think it’s symbolic of the need for collaboration and partnership. We can’t do it alone,” said Adel Hagekhalil, general manager of the Metropolitan Water District of Southern California, at the conference Thursday. “What we need is multiple solutions, not one single solution.”

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

Tucson receives federal grant to develop green jobs and infrastructure plan

The federal government announced this week that Tucson is one of 60 finalists for a grant through the Build Back Better Challenge. The money will fund a plan to create jobs while promoting sustainable agriculture, preserving water and developing clean energy. Each finalist will get \$500,000 to develop proposed projects. Mayor Regina Romero said the money will support work that is already happening in Tucson and the surrounding region.

“There are two big issues that, actually, I've been pushing on as the mayor, which is climate resiliency, and equity, and seeing climate change with an eye to equity,” Romero said.

The city worked with a coalition of nonprofits, universities and other organizations to write the proposal for phase one. They say the money will enable them to map out programs that phase two will fund.

“The next space of innovation for agriculture in our state is incredible, especially in an area of our country that has been in drought for the last decade,” Romero said.

And, she said to get the phase-two money, the coalition will need to prove “we can actually create those green jobs that will use less water and will keep our economy running and growing.”



VELES WATER WEEKLY REPORT

The Greater Yuma Development Corp, the University of Arizona, Startup Tucson and the Santa Cruz Valley Heritage Alliance have all contributed to the proposal.

Original Article: [Arizona Public Media by Megan Myscofski](#)

Parched West Receives \$200 Million to Refill Largest Reservoir in US

Amid an ongoing drought, stakeholders will team up to refill Lake Mead, and the effort will not be cheap.

Since 1983, Lake Mead has been disappearing. In summer 2021, it hit the lowest level in its 86-year history. When it emptied to just 35.17% capacity in June, alarm bells went off. As the United States' largest reservoir, Lake Mead supplies water to the Lower Colorado River Basin states: Arizona, California, and Nevada (including Las Vegas).

Now, the Bureau of Reclamation and other interest groups have stepped up to refill it via new conservation protocols. On Wednesday, state water agencies in Arizona, California, and Nevada announced a \$200 million investment in Colorado River conservation projects.

The 500+ Plan aims to add 500,000 acre-feet of water to the lake during 2022 and 2023. (An acre-foot is the amount of water required to cover one acre of land to a depth of one foot.)

The measure would keep the faucets running in 1.5 million households for a year, and increase the reservoir's water level by 16 feet. The project exists as a collaboration between the Bureau of Reclamation, the Department of the Interior, and several water conservation and state entities.

"Two decades of drought on the Colorado River is taking a toll across the Basin and on Lake Mead," U.S. Bureau of Reclamation Commissioner Camille Calimlim Touton said in a statement. "By working together we've staved off these historic low levels for years, thanks to collaboration and conservation in the Lower Basin. But we need even more action, and we need it now."

According to the agreement, the Arizona Department of Water Resources will commit up to \$40 million to the initiative. Central Arizona Project, the Southern Nevada Water Authority, and the Metropolitan Water District of Southern California will each contribute up to \$20 million. The federal government has pledged to match the grand total, which brings the project's maximum funding to \$200 million.

The plan also implicates funding available via the Infrastructure Investment and Jobs Act (or "Bipartisan Infrastructure Bill"). The recently ratified bill, the partners noted, includes an \$8.3 billion investment in water infrastructure. Stated goals include minimizing the impacts of drought and creating a long-term plan for water conservation and economic growth.

The case to put Lake Mead near the top of the list looks fair. At maximum capacity, the lake is the largest reservoir in the United States by volume, containing 28.5 million acre-feet of water. Currently, it holds just over 9 million acre-feet.

Original Article: [Gear Junkie by Sam Anderson](#)



GLOBAL WATER NEWS

Willis designs, places parametric climate cover for Belize

Willis Towers Watson PLC said Monday it has designed and placed a parametric cover to support the government of Belize's debt-restructuring for marine conservation.

Underwritten by Munich Re, the coverage enabled Belize to refinance its sovereign debt under The Nature Conservancy's Blue Bonds for Conservation program, Willis said.

The Nature Conservancy's \$364 million transaction with Belize was structured and financed by Credit Suisse, while political risk insurance was provided by the U.S. International Development Finance Corp.

The catastrophe wrapper around the 20-year sovereign debt restructure covers Belize's loan repayments after hurricane events. Climate shocks have previously triggered credit rating downgrades and disrupted economic development.

Belize repurchased an international bond with the capital arranged by the Nature Conservancy, enabling it to restructure approximately \$553 million of external commercial debt.

The parametric insurance covers the first 31 months of the bond term and was marketed and placed by Willis Towers Watson's alternative risk transfer team.

Original Article: [Business Insurance by Claire Wilkinson](#)

Researchers find First Nations' water rights are decreasing

Griffith University researchers have found that 12 months on from Australia's first study of Indigenous water rights holdings in the Murray Darling Basin, holdings have reduced by 24 megalitres/year.

This is a result of the sale of a license of moderate size, and it leaves Aboriginal organisations in control of just 0.17 per cent of the total water in the Basin, whilst groundwater remained unchanged in regards to First Nations control at 0.027 per cent as no new licenses were acquired in the last year.

Griffith University's Professor Sue Jackson said the updated research raised "serious questions about the inequitable effect of water markets" believing that the results show "how vulnerable First Nations' water holdings are to permanent loss in the country's most valuable water market".

According to Dr Lana Hartwig, this decreasing control comes despite "a commitment by all Australian Governments under the Closing the Gap policy to set a target to increase First Nations water holdings," and is likely a result of Indigenous organisations feeling pressured to sell their "water rights to cover the costs of operating their organisations". This recent decline follows the trend of the last decade where in a separate study, the same team of academics found a 17 per cent loss in First Nations' water rights between 2009 and 2018.



VELES WATER WEEKLY REPORT

Professor Jackson called for urgent action of the causes of the issue, stating that governments need to “act on commitments to improve access to water for First Nations under national water policy, state water policy and law, as well as Closing the Gap”.

Such action Professor Jackson believes needs to be “a comprehensive approach to water rights”.

“The Federal Government should follow through on its 2018 commitment of \$40 million to buy water for Aboriginal people in the Murray Darling Basin,” she said.

This commitment has seen “a long delay”.

The Professor further suggested reform to the fees State and Territory governments “charge Aboriginal organisations for water licences”.

Original Article: [National Indigenous Times by Aaron Bloch](#)

How an upland watershed got its groundwater back

The world of water management is replete with stories about traditional systems that break down, such as the one we reported in November from Karnataka, South India. Age-old, decentralized approaches to managing water and watersheds do fall apart, leaving farmers high and dry. However, a remarkable study published in the Journal of Hydrology documents just how rapidly farmers can reap the benefits when an old system is restored and enhanced.

Researchers at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and their collaborators selected for a five-year study two degraded watersheds in the hilly, semi-arid region of Bundelkhand, which is divided between Madhya Pradesh and Uttar Pradesh in central India. Farmers in the region – a third to half of whom subsist below the poverty line – live in villages that traditionally have an earthen rainwater harvesting tank called a haveli. These havelis act as reservoirs during the monsoon (June to September), and after draining they are used for crop cultivation during the post-monsoon (October to February). By facilitating groundwater recharge the system ensures water security for households, livestock and agriculture. Farmers maintained their havelis together for hundreds of years, but many of the structures have collapsed along with the rural institutions that created them. When the monsoon comes now, rainwater quickly flows downhill. Rainfall is becoming more and more variable every year, with climate change cutting some rainy seasons down to a fraction. Yet even after a good monsoon, more than 80% of open wells soon run dry.

From this rather sobering baseline analysis, the story gets much better. The researchers targeted one of the two watersheds for rejuvenation, first restoring a defunct haveli to service and upgrading its earthen wall with a concrete core for improved storage and longevity. This was just the beginning of a five-year watershed monitoring, adaptive management and resilience-building scheme. The plan extended to other low-cost rainwater harvesting structures – check dams along drainage lines, and systems of contouring and bunds in farmers' fields – along with tree planting and crop management



VELES WATER WEEKLY REPORT

demonstration. The second watershed, similar in all other respects, served as an experimental control.

Watershed management is nothing new in India, where more than \$14 billion has been invested since 1990 to solve the connected problems of land degradation, water scarcity and unproductive agriculture. Public programs have even made a push to repair and maintain havelis in the last two decades, although the impact was short-lived due to frequent breach. The shortfall has also been in monitoring and understanding the impact of such efforts – on hydrology, water balance, upstream–downstream trade-offs, land use and livelihoods. Where most watershed planning has been based on assumptions about these factors, the new study looked at five years of substantial evidence.

The team collected hydrological data through carefully placed runoff gauging stations, and through water level measurements taken monthly at all 388 dug wells in the intervention watershed. The results couldn't have been clearer. The rainwater harvesting structures, which added up to 100,000 cubic meters of new storage capacity, significantly enhanced groundwater recharge by reducing surface runoff from an average 250mm a year to 150mm a year. The difference was very noticeable to every member of the community: well water levels stood 2–5 meters higher than in the control watershed.

The trend of extreme variability in monsoon seasons, linked to global climate change, was very evident in the five years of research, and this variability led to some of the most important findings. One was on upstream–downstream trade-offs. The data from Bundelkhand showed that the interventions did affect water availability downstream, but only in intermediate rainfall years; there was no loss downstream in very dry years, when runoff is minimal anyway, or in very wet years, when havelis release ample excess water.

The real difference the structures made was to the recharge of shallow groundwater aquifers. Following the interventions, a single recharge in a wet year could sustain groundwater supplies through two subsequent years of low rainfall – meaning that most dry years would not become drought years for farmers. Within the study period, 2015 was an exceptionally dry year, with just 404mm of rain. At the end of the monsoon, 30% of dug wells in the control watershed were already dry, whereas only 6% of the wells in the intervention watershed had run out of water.

Original Article: [CGIAR Research Program on Water, Land and Ecosystems by Kaushal K. Garg and Paul Farah Cox](#)



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