Veles Water Weekly Report

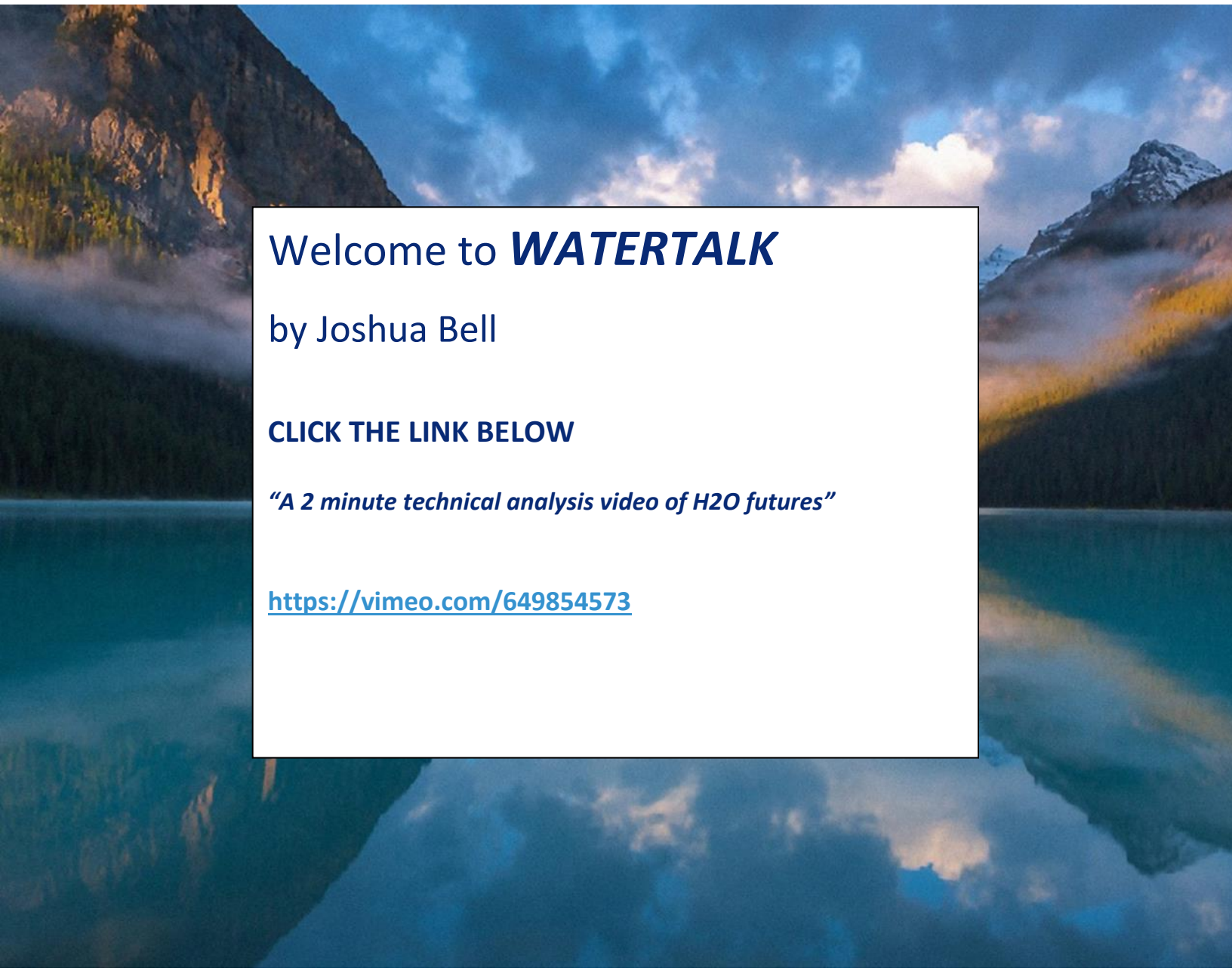
November 25th 2021

Authors:
Lance Coogan - *CEO*
Joshua Bell - *Research Analyst*

research@veleswater.com
+44 20 7754 0342

VelesWater

WATER FUTURES MARKET ANALYSIS



Welcome to ***WATERTALK***

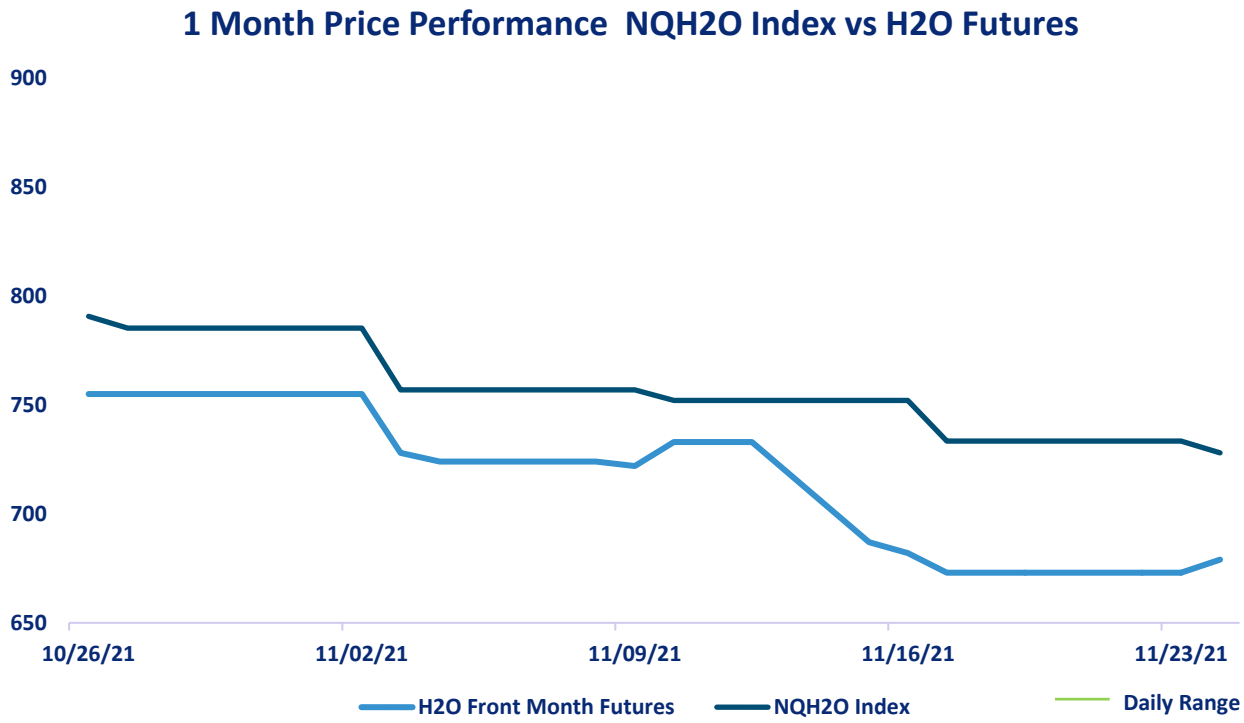
by Joshua Bell

CLICK THE LINK BELOW

"A 2 minute technical analysis video of H2O futures"

https://vimeo.com/649854573

NQH2O INDEX PRICE vs H2O FUTURES PRICE

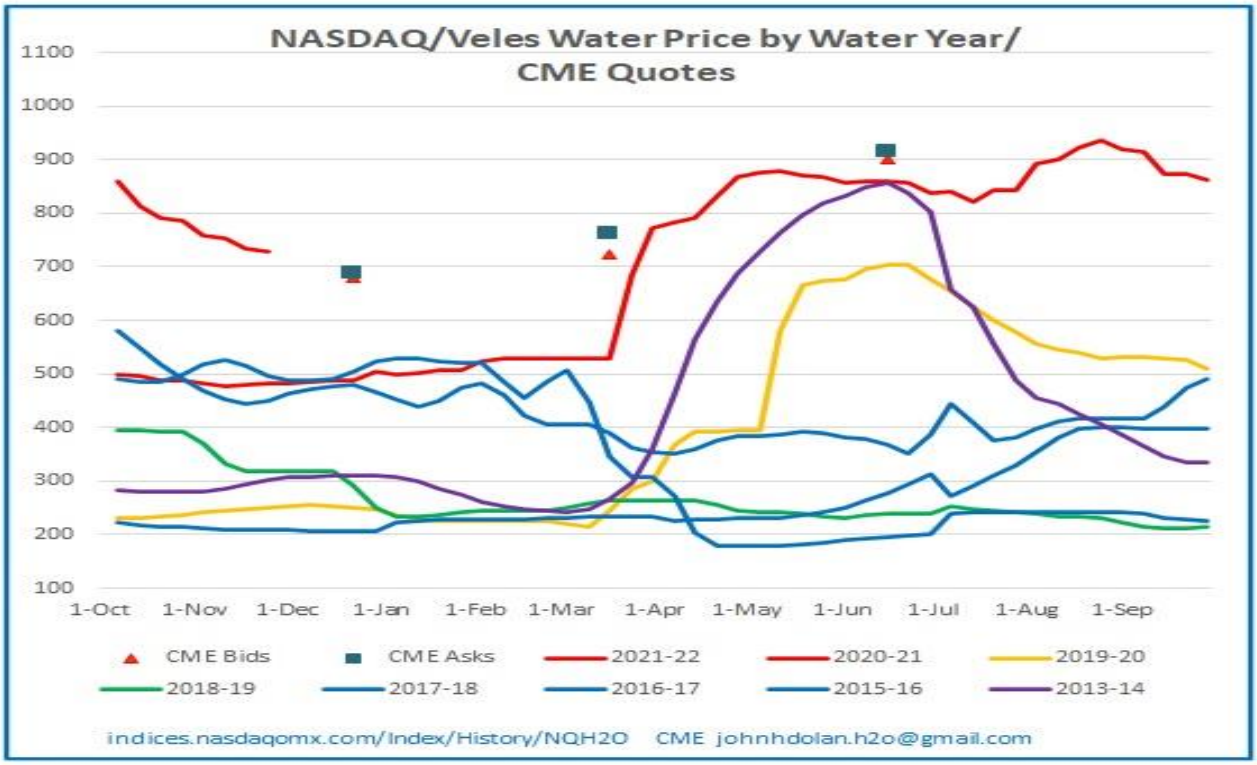


Price Chart Based upon Daily Close

The new NQH2O index level of $728 was published on November 24th, down $5.42 or 0.74%. The futures have been closing at a discount to the index of $49-60.42 over the past week.
NQH2O is up 45.65% YTD.

Below are the bid offer prices on different expiries being quoted in the market.
December 679@687
March 22 724@762
June 22 900@915

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.

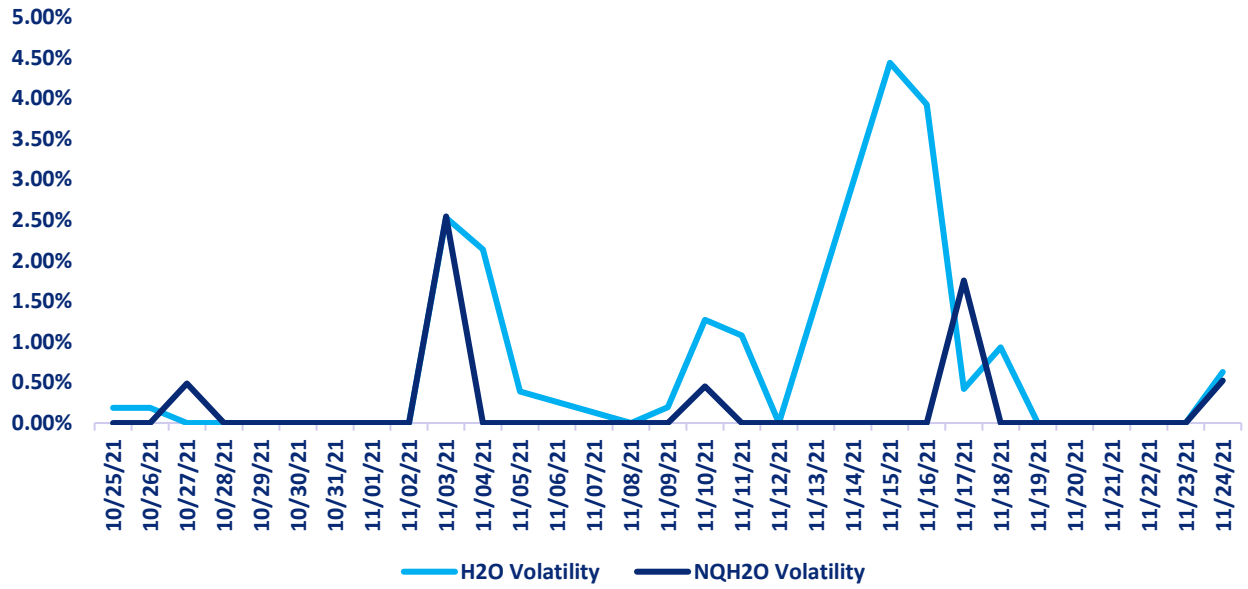
The graph for 2021 is highlighted in red. It shows the same seasonal climb, but at record-high values above each of the last eight years since February.
Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and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

(**Reference: John H Dolan, CME Market Maker**)

VELES WATER WEEKLY REPORT

H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the December future volatility high has been 0.93% on November 18th with lows of 0% on November 18th-22nd .

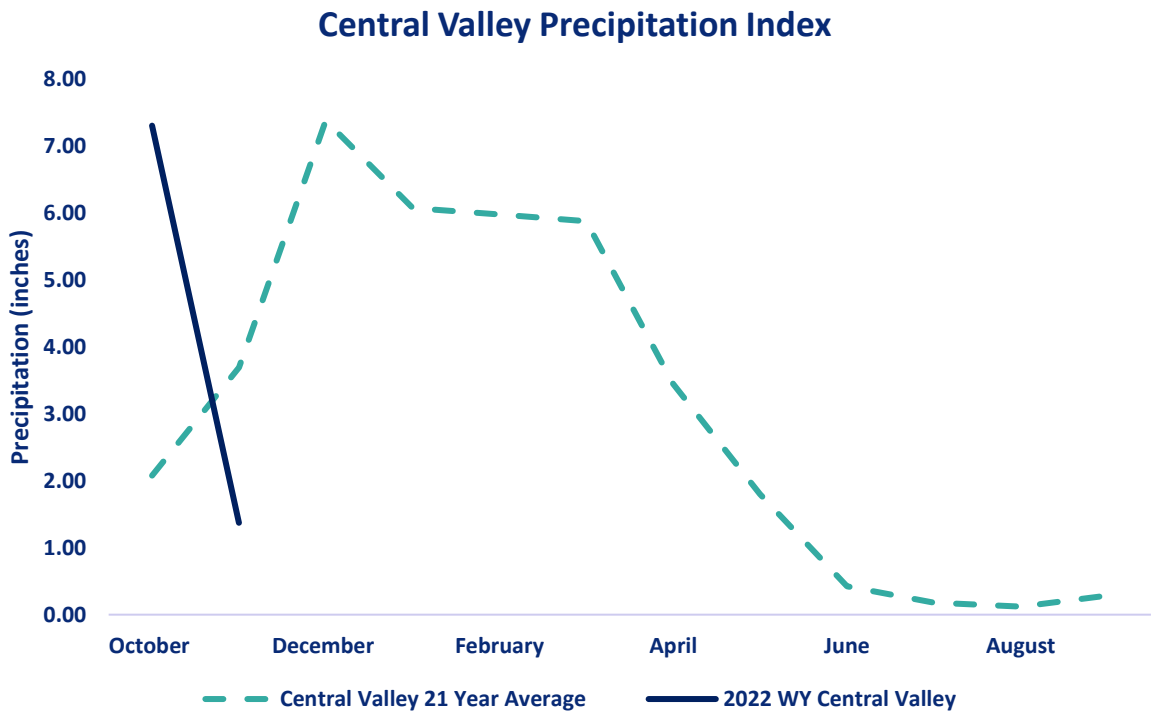
ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	34.75%	4.84%	2.52%	1.745%
H2O FUTURES	N/A	10.37%	7.44%	1.58%

For the week ending on the November 24th the two-month futures volatility is at a premium of 5.53% to the index, up 0.52% from the previous week. The one-month futures volatility is at a premium of 4.92 to the index, up 0.13% from last week. The one-week futures volatility is at a discount of 0.16% to the index, a reversal of 3.29% from the previous week. These futures premiums in volatility are indicating the futures are anticipating greater moves in the index.

*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.*

VELES WATER WEEKLY REPORT

CENTRAL VALLEY PRECIPITATION REPORT



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 17/11/2021

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)	0.86	0.00	24.96%	204	159
TULARE 6 STATION (6SI)	0.21	0.00	8.51%	212	91
NORTHERN SIERRA 8 STATION (8SI)	3.05	0.18	58.99%	489	235
CENTRAL VALLEY TOTAL	4.12	0.18	30.82%	302	162

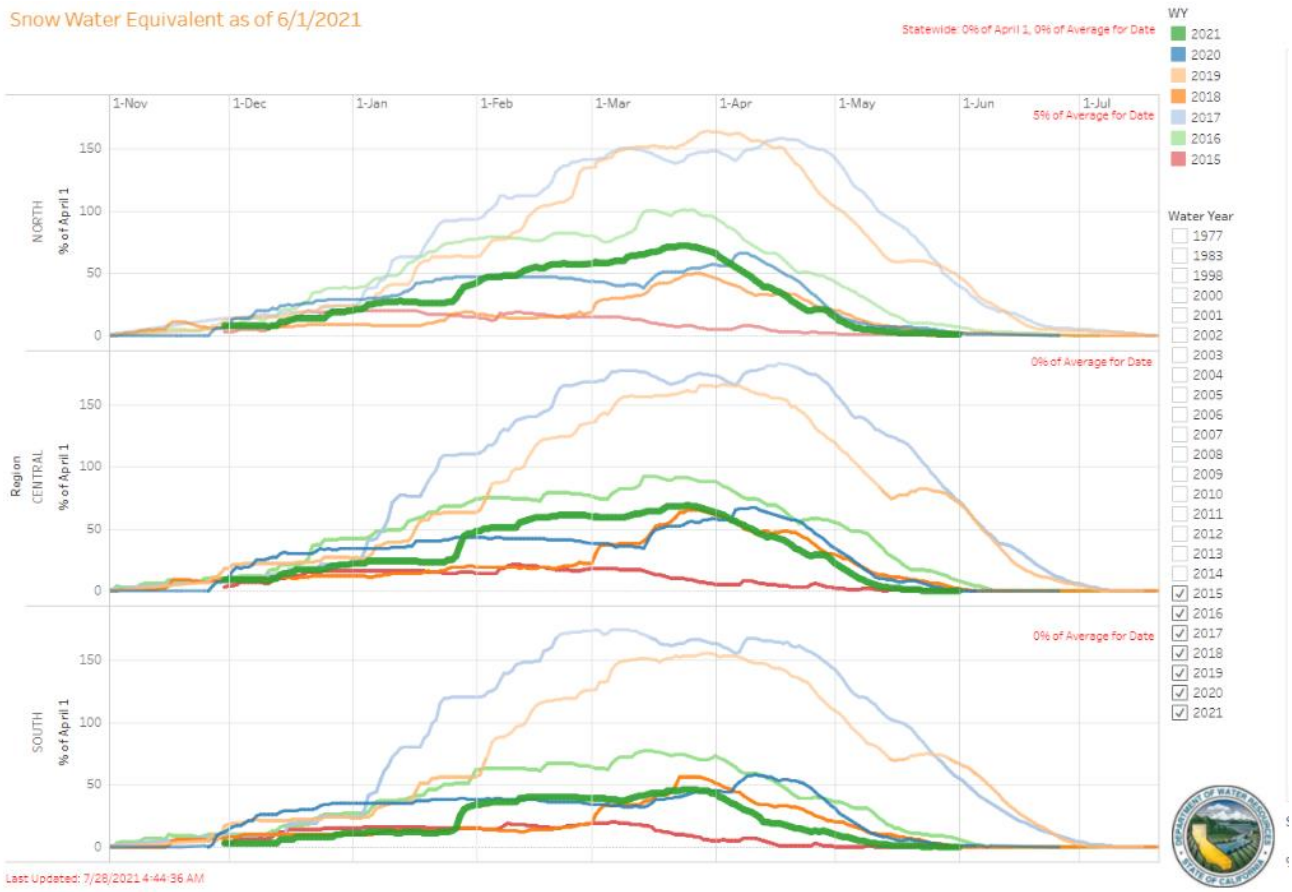
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	707,840	29	52	50
SHASTA LAKE	1,114,559	24	45	45
LAKE OROVILLE	1,046,641	30	38	59
SAN LUIS RES	471,190	23	46	46

Reference: California Water Data Exchange

VELES WATER WEEKLY REPORT

SNOWPACK WATER CONTENT

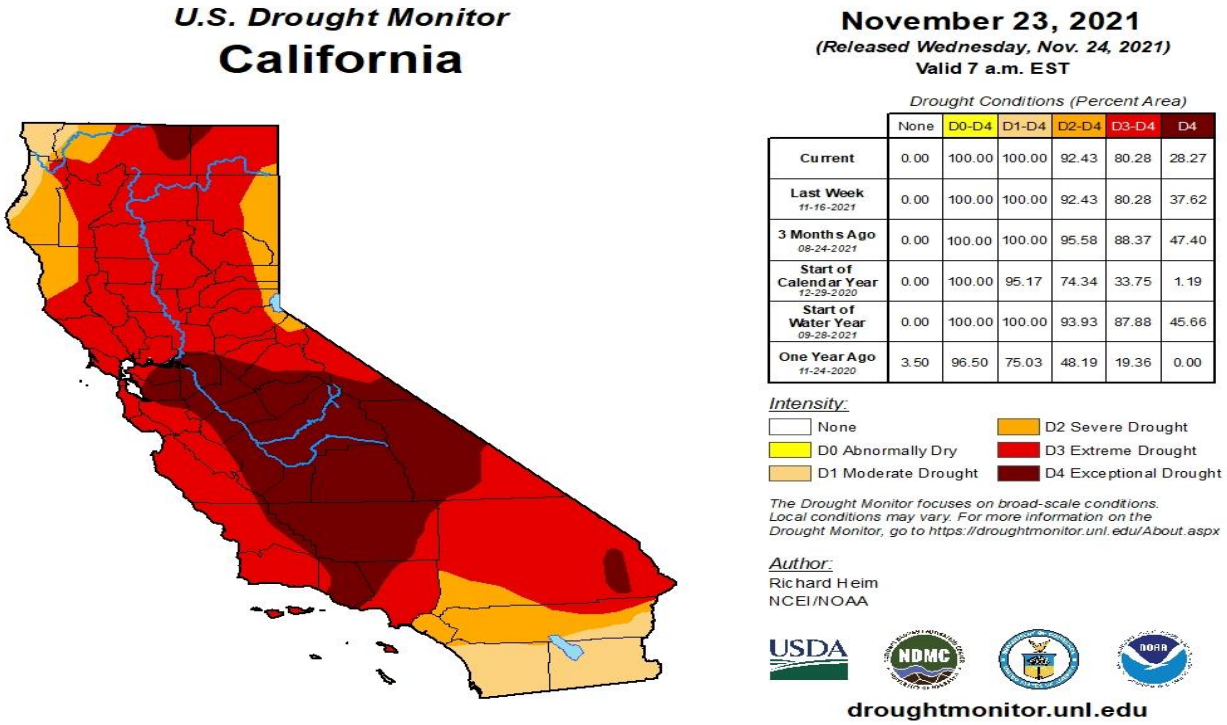


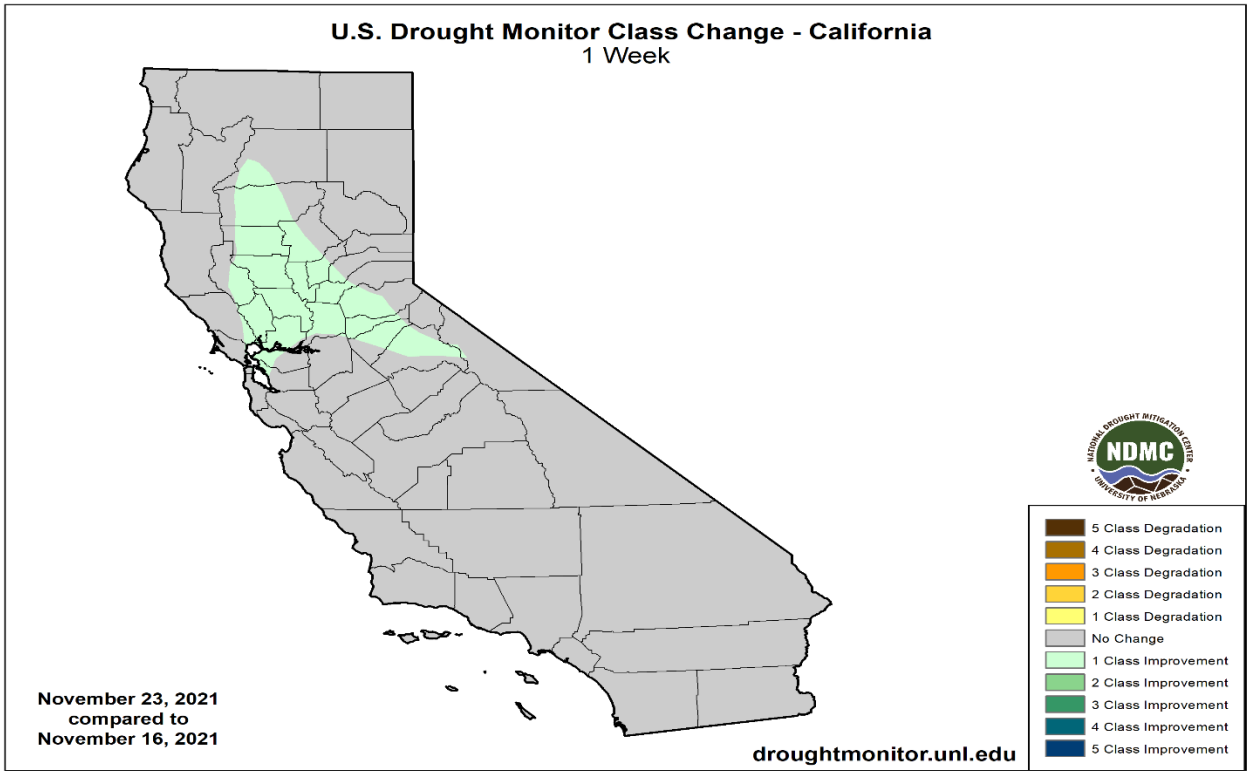
REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE %	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	0	0.00%	0	0	0
CENTRAL SIERRA	0	0.00%	0	0	0
SOUTHERN SIERRA	0	0.00%	0	0	0
STATEWIDE	0	0.00%	0	0	0

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

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

DROUGHT MONITOR

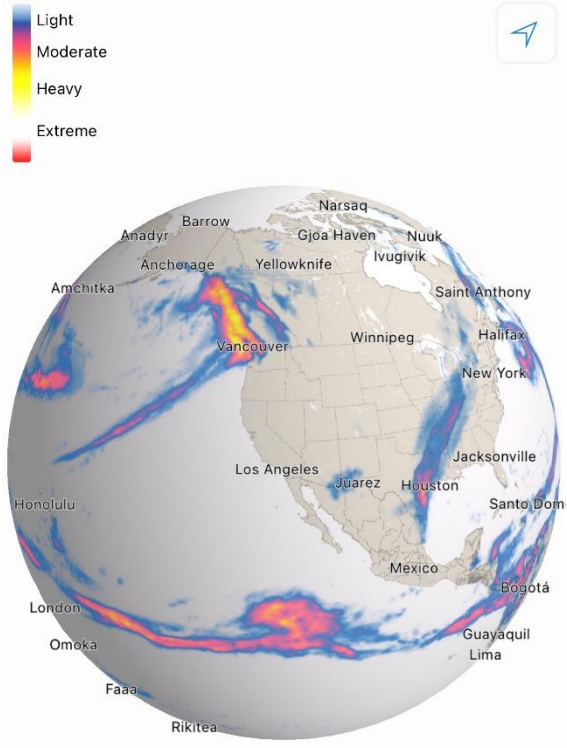




The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been a class 1 improvement in (D4) drought conditions in Northern CA by 9.35%.

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



Ref. Dark Sky

The current satellite picture shows continued frontal and low pressure systems off the coast of Canada and the NW US. There are signs of further frontal activity brewing over the NW Pacific.

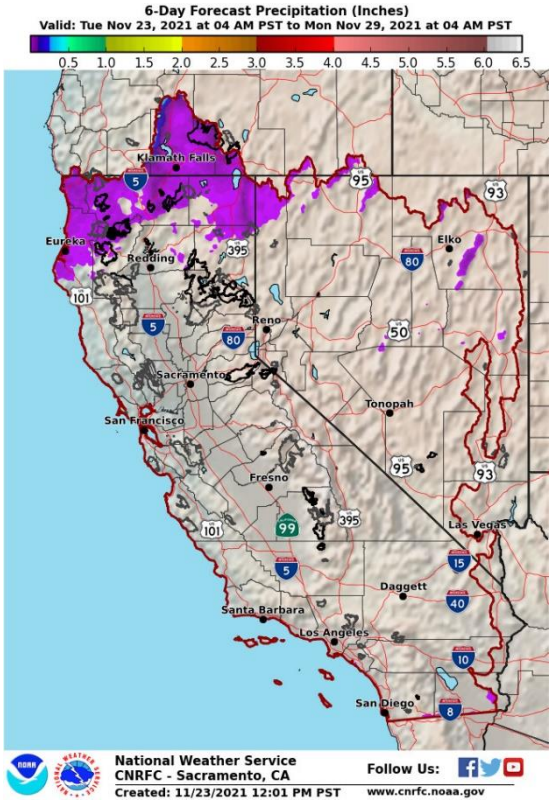
This activity will bring further precipitation to the Northwestern US just reaching reaching Northern California. The second frontal system behind the present one may bring precipitation further south in California later in the week.
The high pressure system is still evident over the SW hence limiting precipitation in this region.
There is some slight moisture inflow from the South into Southern Arizona and New Mexico but not strong enough to be considered a Monsoonal effect.

Monsoonal effects are not prevalent on this satellite picture at present as it appears this moisture inflow from the South may have ceased for the year. Our long-term models are still showing the potential for greater precipitation to reach the SW and Western US this winter.

10 Day Outlook

Generally dry conditions are expected through the weekend period with a blocking pattern in place. Most guidance keeps showers north of the area for Fri as a front dissipates over the Pac NW. WPC and a couple of EC/CMC ensemble members show light amounts near the far southern edge of CA Fri night or early Sat, but the vast majority of guidance is dry, and elected to keep CNRFC QPF dry as well.

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



WESTERN WEATHER DISCUSSION

Half an inch to locally 2 inches of precipitation fell along coastal areas of Oregon and Washington, with half an inch over eastern Washington to northern Idaho. Less than half an inch occurred further south to northern portions of California and the Great Basin. Areas further south received no precipitation this week. Dry soils, high evapotranspiration, and severely dry SPI and SPEI values prompted expansion of D4 in northern Montana. According to November 21st statistics from the U.S. Department of Agriculture, 99% of Montana's topsoil moisture was short or very short (dry to very dry) and 42% of the winter wheat crop and 99% of the pasture and rangeland were in poor to very poor condition. D1-D3 expanded in eastern New Mexico. Even though California and Nevada were mostly dry this week, the impacts from the atmospheric river event and frontal rains of October continued to be felt. With moist soils, wet SPI and SPEI indicators for the last 1 to 6 months, and slightly improved reservoir levels and snowpack, a reassessment of conditions resulted in the pullback of D4 in the Sacramento River Valley in California, and a pullback of D2 and D3 in northern Nevada. D3 was also pulled back slightly in southwest Montana and adjacent Idaho.

Reference:

Richard Heim, NOAA/NCEI

Richard Tinker, NOAA/NWS/NCEP/CPC

WATER NEWS

CALIFORNIA WATER NEWS

State calls on local agencies to protect groundwater

For the first time in California history, local agencies and groundwater users are required to form groundwater sustainability agencies and develop and implement plans to guide how they will achieve groundwater basin sustainability goals over the next 20 years.

As part of this process, agencies overseeing management of high- and medium-priority groundwater basins have until Jan. 31, 2022, to submit groundwater sustainability plans to the state to be reviewed by the California Department of Water Resources, the agency tasked with evaluating and assessing the plans.

Last week, the agency released its second round of assessments of plans developed by local agencies required to bring groundwater basins into sustainability for the future. The actions are mandated under the 2014 Sustainable Groundwater Management Act, or SGMA.

The first round of assessments for critically overdrafted basins happened in June.

"In light of the historic and variable climate conditions we are experiencing, these decisions reinforce that managing our water resources in an adaptive and inclusive way is how groundwater sustainability will be achieved," said DWR Director Karla Nemeth. "We appreciate and support the role of local leaders in shaping how their communities manage the change that comes from creating sustainable groundwater supplies."

DWR approved plans for the Oxnard Subbasin and the Pleasant Valley Basin in Ventura County and the North and South Yuba subbasins in Yuba County. In doing so, it recommended corrective actions for groundwater sustainability agencies to address in their next updated plan due in January 2025. The GSAs for these basins will continue implementing plans to achieve groundwater sustainability.

DWR has notified agencies in the Eastern San Joaquin Subbasin in San Joaquin County, the Chowchilla and Merced subbasins in Merced and Madera counties, and the Westside Subbasin in Fresno County that their plans lack details and need to address deficiencies to be approved. Before making a final determination, DWR is requesting a consultation meeting with the GSAs to discuss actions and time necessary to improve the plans.

"The Department of Water Resources is working very collaboratively with all groundwater sustainability agencies to help them address any deficiencies," said Danny Merkley, California Farm Bureau director of water resources.

The four basins must address effects of chronic lowering of groundwater levels and land subsidence conditions on groundwater users. The GSAs will need to further analyze drinking water impacts, including development of projects and actions. Additionally, they will be required to thoroughly understand and avoid or minimize subsidence impacts on flood control and water conveyance infrastructure, as intended by the law, according to DWR.

SGMA lays out a process for continuous improvement, and plans will be updated as new information becomes available and conditions change. DWR will review annual reports and assess each plan every five years.

Paul Gosselin, DWR deputy director of sustainable groundwater management, is scheduled to lead a breakout session on Dec. 6, during the 103rd California Farm Bureau Annual Meeting in Garden Grove, Merkley said.

Original Article: AgAlert by Christine Souza

CA Voter Support For Water Infrastructure Bill May Hang On The Weather

Signature-gathering has begun to place an initiative on the 2022 ballot that would force the legislature to fund more water storage in California. But even supporters admit, the success of the measure may depend on the weather.

With many reservoirs in the state drying up and no guarantee of a wet winter, some Central Valley farmers and Southern California water districts are pushing an initiative called the 'Water Infrastructure Funding Act of 2022.' If passed by the voters, it would require the state to spend two percent of the general fund on projects that would expand water supplies.

"That would be $3-to $4 billion per year to fund water supply projects. And we don't choose specific projects, but we define categories that are eligible for funding," said Edward Ring, a co-organizer and spokesperson for the campaign known as More Water Now.

The effort to qualify the state-wide measure has just begun and many Bay Area water agencies aren't even aware of it yet. But Steve Sheldon, president of the Orange County Water District said when it comes to water projects, there has been a lot of political foot-dragging going on.

"In 2014, Californians passed Prop 1, which was supposed to fund water storage. Nothing has been constructed from that proposition," he said.

That includes the raising of the dam and expansion of Los Vaqueros Reservoir in Contra Costa County. It was approved for Prop 1 funds four year ago but still hasn't gotten the money. Ring thinks the legislature must be forced to act and said he feels confident the measure will pass if voters are motivated by yet another dry winter.

"A lot of this depends on the weather," he said, "but voters, as it is right now, very much support spending money on water infrastructure, by 70-80 percent, depending on the polls you look at."

But some environmental groups are lining up in opposition. They don't trust provisions in the measure that would speed up the environmental review process. Monday on the streets of Walnut Creek, Thomas Kalker sided with those who think the state should focus on more conservation.

"Spending more money is not necessarily the right approach. It's about how much we use, how we treat our existing water source," he said. "Instead of creating more, we need to use less. And what we have— use it wisely."

But Trevor Nicol couldn't remember a time when California wasn't in a drought situation. He said it's clear the state needs more water.

Original Article: CBS SF Bay Area by John Ramos

California drought unlikely to end this winter

Don't hold your breath for California's drought ending with this winter's rains. Instead, you'd do well to hold your shower time to a minimum.

There's less than a 40% chance of water supplies getting back to normal after this winter, with a slightly better than 50% chance that the state's drought will worsen, according to forecasters at a Monday, Nov. 22, drought webinar hosted by the National Integrated Drought Information Center. The center is led by NOAA, the National Oceanic and Atmospheric Administration.

The record atmospheric river storms that pelted Northern California in late October helped a bit, but water levels at major reservoirs remain far below normal and La Nina conditions increase the likelihood of Southern California having a drier, warmer winter than is usual.

"The drought has been built over years. And autumn storms do not necessarily mean the rest of the winter will be wet," said Amanda Sheffield, the region's coordinator for the drought center.

All of California continues to experience moderate to exceptional drought, with 80% of the state at the two highest levels of "extreme" and "exceptional" drought. Southern California is marginally better off, with much of the greater Los Angeles area considered under a "severe" drought and San Diego labelled as having a "moderate" drought.

But while Southern California ranks a bit better than the rest of the state, it failed to get much direct benefit from October's atmospheric river — aside from a dampening of brush to temporarily lower the risk of wildfire.

"We're still relatively dry here and warmer than normal," Sheffield said.

That's expected to continue at least through December, thanks in part to La Nina, a weather pattern that typically includes warmer oceans, less precipitation in Southern California and more precipitation in Northern California.

While La Nina is expected to continue through the early winter and increase the chance of a warmer, drier Southern California, that forecast becomes less certain after the beginning of the year.

Original Article: The Orange County Register by Martin Wisckol

Where Is The Water Going?

Farmers in the heart of California's agricultural belt – Kings County – sense something is awry with their water supplies. In this intensively farmed, perennially dry county, water is leaving at a concerning rate.

"We've all seen it," said walnut farmer Steve Walker. "We haven't sat down and put dye in the water to watch where it actually goes. But everybody talks about it, and we're all concerned."

As far as Walker knows, no agency, city or county board is trying to figure out what's really happening.

"There's so many canals and ways it can move; it's hard to track," he said. But this much he knows — certain groundwater wells in the county are running practically year round, even in wet years.

"So, it's going somewhere," Walker said. "And that's the biggest issue. Because once it's pumped out, we aren't getting it back."

Now, in the grip of yet another devastating drought, Kings County farmers like Walker want to know: Where is the water going?

For the portions that can be tracked through state and other water district records, the water is mostly flowing south to Kern County, much of it from Kings County's two largest and most powerful farming operations — J.G. Boswell Company and Sandridge Partners. Exactly how much is moving and who is benefitting from it are more murky questions, as water – especially river and groundwater – in California is notoriously hard to track. What is clear is that over the past 12 years, Boswell and Sandridge have moved a combined 239,000 acre feet of State Water Project water out of Kings County — all with approval from the state's Department of Water Resources (DWR).

Some of that state contracted water appears to have been used in multi-million dollar deals by Boswell, based on the few records that could be tracked, and some has gone to Sandridge's own fields in other counties, according to the company's owner.

The end result, though, is less water staying in Kings County. And the consequences of this could be far reaching. Less surface water forces growers to pay for deeper wells or additional water supplies — particularly expensive during one of the worst droughts in recent state history.

Some farmers can't afford to do either, making the difficult decision to get out of agriculture all together. "Independent farmers are selling out," said Kings County farmer Robert Smith, who grows walnuts, almonds, corn and cotton on about 1,000 acres. "I'm a small guy over here and the big-time guys, well I thought they were big at 10,000 acres, even they're selling out."

Smith, Walker and others fear that if large amounts of water continue to move out of Kings — with little to no oversight from the state — most smaller farmers will be driven out of a part of California they have called home for generations.

"It just doesn't look very good for us right now," Smith said.

Original Article: Circle of Blue by Lois Henry

Castaic Dam project to ease quake concerns nears completion

Seismic work at Castaic Dam's tower access bridge in Los Angeles County has reached a milestone, wrapping up a project on three bridge piers as its owner — the California

Department of Water Resources — works on reducing risk of quake damage at its water facilities.

"With the completion of the reinforced wrapping to all of the bridge's piers, we have improved the strength and flexibility of each pier to allow for controlled movements of the bridge during a major earthquake," said Jason Brabec, Castaic Dam Modernization Program Manager in a statement. "This work bolsters DWR's ability to safely and reliably release water."

The 500-foot-long bridge provides access for operations and maintenance crews to the structure that allows releasing water from Castaic Lake.

The bridge was built in 1974 and later retrofitted in 1998 following the Northridge Earthquake.

In 2017, California safety regulators rated Castaic Dam as "fair," noting it was vulnerable to earthquakes. The following year, the Department of Water Resources, which owns the dam, launched the modernization program.

Crews will continue working on the bridge's structure which supports the deck and connects to the piers, officials said.

Original Article: Los Angeles Daily News by Olga Grigoryants

Four valley groundwater plans fail to meet state standards

The Central Valley's four groundwater projects, including those for Westlands, Chochila, Merced and Eastern San Joaquin Subbasin, protect water quality, prevent drinking wells from drying out, and land that has already subsided. It doesn't show how to stop it, according to the Department of Water Resources, because it will sink further.

In short, these plans received a "D" in the initial DWR rating of the Central Valley Groundwater Program. Within the first two weeks of December, DWR will publish an assessment of approximately 36 remaining groundwater projects covering the valley from Madera County to Kern County.

The groundwater agency's manager was unable to answer questions about a particular issue because it had not been evaluated by DWR before it was released Thursday morning. Some planning managers said they only received a call from DWR warning about the upcoming assessment the day before.

The DWR says it wants to see responses from groundwater agencies that show clear action to reduce harm to well owners in the country and reduce the impact of land subsidence.

"We are not willing to accept plans to implement the plan," said Paul Gosselin, Deputy Director of the California Department of Water Resources for Sustainable Groundwater Management. "We are looking for very specific and measurable changes to address these flaws."

The groundwater program is the result of the state's Sustainable Groundwater Management Act passed in 2014, requiring the balance of the uplift aquifer by 2040.

In eastern San Joaquin, including Stockton, Lodi, Manteca, Oakdale, Lathrop, and other communities throughout San Joaquin County, DWR has more information and projects to reduce chronic drops in groundwater levels, and Requested more data to accurately monitor the subsidence.

In a DWR letter on the Westside Subbasin overseen by the Westlands waters, the plan did not have sufficient information on subsidence, chronic groundwater level drops, and water quality issues. According to the letter, the problem of low groundwater levels, endangering national and regional wells throughout the San Joaquin Valley, was particularly lacking. The plan contained “almost or no” specific information to support sustainable management of groundwater level decline, the letter read.

The Westlands Water District couldn’t comment immediately, but a spokesperson wrote in an email that staff would continue to work with DWR to ensure that the plan complies with state requirements. ..

The main problems DWR found in the Chochila waters are how the Groundwater Agency monitors and corrects drinking wells in the country if the groundwater level drops too low, justifying continued land subsidence in parts of the groundwater. Includes how and why the Groundwater Agency did not discover. The pumping of groundwater had some impact on rivers in the region, such as the Chowchilla, Ashslau, Berendaslau and San Joaquin rivers.

According to a 2020 report from the University of California, Davis Regional Change Center, more than 80% of the wells in the country are expected to be dry under the current groundwater plans for the Merced and Chowchilla subbasins.

The groundwater agency responsible for these plans has a quick turnaround to fix issues flagged by the DWR before issuing the legally mandated assessment in January 2022. Even snuffs.

A groundwater project covering the other four subbasins of Sacramento and Ventura counties was stamped for approval by DWR on Thursday. They included the North and South Yuba Groundwater Projects, as well as the Oxnard and Pleasant Valley projects.

DWR Gosselin said that even those approved plans received some amendments and other requirements.

“We see this as the beginning of a continuous improvement process,” he said. “We are not going to approve the plan and leave and leave it alone.”

Original Article: California News Times

There's a Chance Groundwater in California's Central Valley Will Not Recover From Past and Potential Droughts

According to recent research published in the interdisciplinary AGU journal Water Resources Research, which focuses on hydrology and water resources, central valley's groundwater could possibly become exhausted as a result of excessive pumping of water during and after droughts.

After the state's previous two droughts, groundwater recovery has been poor, with less than a third of the groundwater recovered from the drought that lasted from 2012 to 2016, according to Phys.org.

Drought years are followed by years of above-average precipitation, and researchers discovered that it might take six to eight years to recover overdrafted water. This happens when more groundwater is pumped out than can be replenished by all sources of precipitation and irrigation, including runoff.

Due to California's increasingly hot and dry environment, the best-case scenario of six to eight consecutive rainy years seems unlikely. Over a 20-year period after a drought, there is less than a 20% likelihood of complete overdraft recovery.

There are around 6.5 million people in the central valley, which generates nearly a quarter of the country's food. Unrestricted extraction of the groundwater during and after droughts might soon force this natural resource beyond repair. Recovery durations may be cut in half with modest caps on groundwater pumping.

This is really dangerous, Stanford hydrologist Sarfaraz Alam, the study's principal author, warned. He continued, people in the area get their drinking water from a variety of wells. These wells will eventually run empty because of the downward trend in [groundwater] levels, leaving the community without access to water.

Original Article: Nature World News by Precious Smith

Now it's San Francisco's turn to ask residents, suburban customers to cut water use

San Francisco's robust water supply, long unruffled by the severe dry spell now in its second year, has finally begun to feel the pinch of drought, and city water managers are recognizing it may be time to cut back.

Officials at the San Francisco Public Utilities Commission plan to ask city residents and businesses to reduce water use by 5%, compared to two years ago, and ask the more than two dozen communities that buy water from the city to reduce water use nearly 14%. The goal is a cumulative 10% savings.

While the reductions won't be enforced — and don't carry penalties — SFPUC officials expect to get enough buy-in from customers to meet their target and help sustain the water supply in the city's reservoirs in and around Yosemite National Park.

The planned cutbacks are part of a water shortage emergency that the SFPUC's governing board is looking to declare at its meeting Tuesday. The declaration not only calls for water reductions but would enact a surcharge of up to 5% on water bills for city customers to offset the loss of revenue from decreased water sales. The surcharge is scheduled to begin April 1.

The emergency declaration would also allow the SFPUC to potentially sidestep state restrictions on water draws, enacted during the drought. San Francisco has faced orders from the State Water Resources Control Board to stop taking water from the Tuolumne River to fill its reservoirs. With a water shortage emergency, the city can apply for a

"health and safety" exemption to the order and draw at least a limited amount of water from the river.

Original Article: San Francisco Chronicle by Kurtis Alexander

California Spent Decades Trying To Keep Central Valley Floods At Bay. Now It Looks To Welcome Them Back

Land and waterway managers labored hard over the course of a century to control California's unruly rivers by building dams and levees to slow and contain their water. Now, farmers, environmentalists and agencies are undoing some of that work as part of an accelerating campaign to restore the state's major floodplains.

At the Dos Rios Ranch Preserve near Modesto, crews with the statewide conservation nonprofit River Partners have set back levees along eight miles of the San Joaquin and Tuolumne rivers to invite seasonal flooding. Beside the Sacramento River, at Hamilton City north of Sacramento, a levee setback and habitat restoration project is opening up 1,361 acres to periodic inundation. The crown jewel in the state's push for restored floodplains might be the ongoing projects within the Yolo Bypass near Sacramento. Here, advocates – including local farmers and fish biologists – hope to adjust key levees along the vast bypass so that Sacramento River water can more routinely inundate more than 20,000 acres of historic floodplain and, through a related project, expand that floodplain by 900 acres.

These are just a few of dozens of projects that together could add tens of thousands of acres to the Central Valley's existing floodplain acreage. The hope, shared by stakeholders who have traditionally fought over water and land, is to rebuild habitat for fish, birds and other wildlife while simultaneously providing benefits, like improved flood protection and groundwater recharge, for towns and farms.

These ideas began coalescing into a field of science all its own in the 1990s and some projects lifted off the ground. Still, because of permitting delays and the complex logistics of remodeling the landscape, progress has remained sluggish.

That could change, though. In the past several years, both policy support and funding for this kind of multi-benefit floodplain restoration has gained momentum. Leaders and lawmakers have taken action to remove regulatory and bureaucratic hurdles, while state policy guides for addressing climate change and flood risk in the Central Valley have incorporated "green infrastructure" into their planning. Priming these efforts for takeoff is the recently approved state budget, which includes tens of millions of dollars for floodplain projects that offer distinct benefits to different stakeholder groups.

"The concept of multiple benefits has made floodplain restoration very appealing," said Jeffrey Mount, a watershed expert and senior fellow with the Public Policy Institute of California. "Basically, everyone's on board."

"The concept of multiple benefits has made floodplain restoration very appealing." Jeffrey Mount, senior fellow with the Public Policy Institute of California.

VELES WATER WEEKLY REPORT

The rapid decline of the Delta ecosystem, including its fish populations, has coaxed stakeholders to the negotiating table. So has the calamitous fallout of climate change, which is hitting home and fueling a sense of urgency around landscape adaptation measures. Drought now gripping California is forcing new approaches to distributing surface water and managing the use of groundwater. On the wetter side of climate change, Oroville Dam came close to bursting in the state's last very wet year, 2017, and last month's torrential atmospheric river was a reminder that disastrous floods are sure to come. Nature-based solutions, according to officials in numerous offices, will be essential in absorbing the deluges.

"The way to do it is move back the levees and make the rivers bigger," said Tim Ramirez, a board member with the Central Valley Flood Protection Board, a state agency that oversees the valley's flood risk reduction system.

Original Article: Water Education Foundation/ Western Water by Alastair Bland

RCSD eyes eminent domain process to obtain water rights

The Rosamond Community Services District Board of Directors, on Thursday, agreed to begin eminent domain proceedings to obtain water rights from agricultural land owned by the Calandri family on Rosamond's west side.

The Board unanimously approved a Resolution of Necessity, which declared it in the public interest to acquire the property for the water rights.

Ed Lear, a litigation attorney representing the Calandri family, said they will challenge the action as a violation of the water basin adjudication.

The District is facing shortages in its future water supplies, as it is limited in the amount of groundwater it may use to serve its customers, a result of a 2015 court settlement that established groundwater pumping limits across the Valley.

Because the amount allowed as part of this adjudication is less than what RCSD customers have historically used, District officials have been seeking additional, permanent water supplies.

The court settlement has a five-year ramp-down period to allow water providers to gradually reduce the amount of groundwater they use until they meet the allocation in 2023. At that time, RCSD will be reduced to pumping 404 acre-feet of water annually, down from the more than 2,000 acre-feet the district used annually prior to the settlement.

An acre-foot is 325,851 gallons, or approximately the amount of water a typical Antelope Valley household historically used in one year, before recent droughts reduced usage.

"Our other efforts to obtain water have come up empty and RCSD needs to act now. We can act at the last minute," General Manager Steve Perez said.

The eminent domain proceedings seek to obtain 1,776 acre-feet of groundwater rights allocated to nine parcels, roughly between Gaskell Road and Willow Avenue and 60th and 70th Streets West.

The parcels are owned by John A. Calandri of Calandri Water Company; John A. Calandri and Shannon C. Calandri as cotrustees of The John and Shannon Calandri 1992 Trust; and Katherine Calandri Nelson, trustee of The Katherine J. Calandri Nelson 2008 Trust, according to the Resolution.

These parcels are close to an RCSD well and the existing water distribution system, Perez said.

Original Article: The Antelope Valley Press by Allison Gatlin

Rush is on to drought-proof California's archaic water system

Caught in one of the driest two-year stretches in state history and with long-range weather forecasts coming up mostly empty, the key players battling California's drought have plenty to be concerned about.

Whether it's plunging reservoir levels, crumbling canals, empty wells or salmon die-offs, the water woes that have plagued the state for decades have returned forcefully during the pandemic.

Droughts come and go routinely in the Golden State, including the last which stretched from 2012 to 2016, but long-term solutions rarely seem to follow. Once the atmospheric rivers finally return to mercifully fill up Shasta Lake and Lake Oroville, the thirst for change evaporates. Politicians turn their attention elsewhere, funding streams go dry and blueprints are tabled.

But one thing is glaringly different this time around: California's coffers are overflowing, creating an opportunity for the nation's most populous state to renovate and prep its outdated water systems for climate change.

"Now, we're lucky, we have money all of a sudden in the state of California," said Celeste Cantu, chair of the San Diego Regional Water Quality Control Board. "We have the ability to really address a 21st century challenge."

Vanishing snowpack

Last winter wasn't exceedingly dry across the main watersheds in the northern part of the state where most of the rain and snow falls, but what followed in the spring shocked the federal and state agencies that jointly manage most of California's water supply.

Heading into the spring, California's snowpack was an estimated 60%-70% of average — not great, but not enough to cause alarm. In a typical year that amount of snow in the Sierra Nevada would have slowly melted in the spring and at least partially replenished the state's critical reservoirs.

But scorching temperatures in April and May dissolved the snowpack at an incredible rate, rendering 100 years of data on snowmelt useless. Instead of reaching streams and riverbeds, the precious runoff soaked into the dry mountain soils or evaporated. By June 1, the statewide snowpack was completely gone.

The very disastrous scenario scientists warned would become more common with climate change came to fruition as only 20% of the snowpack was captured. The meager runoff and scheduled water deliveries to farmers dropped reservoir levels to record

lows, causing Governor Gavin Newsom to declare a statewide drought emergency as the state plunged into the summer.

With global temperatures continuing to rise, what happened this past spring in Northern California will almost certainly occur more frequently. Officials are now publicly sounding the alarm that California's water system simply can't keep up.

"We got pretty smoked," admitted Karla Nemeth, director of the California Department of Water Resources.

In the pipeline

Nemeth is one of the many people striving to advance Newsom's grand vision for California's water future. She and an assortment of water managers, farmers and environmentalists discussed infrastructure and policy changes this week during a Public Policy Institute of California forum.

While the state's so-called "Water Resilience Portfolio" contains over a hundred ideas, including big-ticket items like new dams and tunnels, Nemeth said a variety of improvements are already underway.

Original Article: Courthouse News by Nick Cahill

CA DWR passes Groundwater Sustainability Plan for Fox Canyon GMA

The California Department of Water Resources (DWR) has approved the Fox Canyon Groundwater Management Agency Groundwater Sustainability Plans, covering Oxnard and Pleasant Valley Basins—its two critically over-drafted basins.

The California Department of Water Resources released its second round of assessments of Groundwater Sustainability Plans (GSPs) developed by local agencies to meet the Sustainable Groundwater Management Act requirements.

After four years of development including extensive stakeholder input at dozens of public meetings, technical advisory group meetings, and two public comment periods, the Fox Canyon Groundwater Management Agency (FCGMA) adopted the GSPs in 2019. Plans include comprehensive technical information about the basins including the hydrogeology of the groundwater aquifers, numerical modeling of future groundwater conditions, and potential projects to increase the water supply and sustainable yield of the basins. The GSPs provide the framework for sustainably managing the basins by 2040, as required by the Sustainable Groundwater Management Act.

"The DWR's approvals for these two basins highlight the nearly 40 years of Fox Canyon Groundwater Management Agency's leadership and technical rigor behind protection of this vital resource," said Fox Canyon Groundwater Management Agency Executive Director Jeff Pratt. "We were very proud to have been the first to submit Board adopted GSPs to DWR, and now overjoyed that they are approved. With the drought, careful management of this valuable resource is key."

Original Articles: Patch by Keri Setnicka, Community Contributor

VELES WATER WEEKLY REPORT

Calif. releases updated groundwater report

With a severe drought and an increased reliance on groundwater basins, Calif.'s Department of Water Resources (DWR) released the final version of its California's Groundwater – Update 2020 report. The report, also known as Bulletin 118, contains critical information about the condition and use of the state's groundwater, which is especially important as California faces the real-time impacts of climate change and drought.

"Groundwater plays a central role in sustaining our state's ecosystems, businesses, agriculture and people, with some Californians relying solely on groundwater for drinking water," said DWR Director Karla Nemeth. "The updated California's Groundwater provides key information for the state and locals to better understand and manage groundwater as we adapt to variations in climate and navigate a historic drought."

This version of the groundwater report provides a comprehensive look at statewide groundwater conditions and activities, including implementation of the Sustainable Groundwater Management Act (SGMA) and the framework it provides to share information as locals work to improve groundwater management. It also focuses on emerging topics such as water markets and the impacts of climate change on groundwater and summarizes groundwater information for each of the state's 10 hydrologic regions.

The report contains a Highlights overview section in English and Spanish, 10 Hydrologic Regional Summaries and a detailed Statewide Report, which features current knowledge of groundwater resources including information on the location, characteristics, use, management status and conditions of the state's groundwater. The bulletin also presents findings and recommendations that support the future management and protection of groundwater.

This information also supports statewide actions being implemented as part of the state's 2020 Water Resilience Portfolio.

New this year, DWR has developed a companion web-based dashboard, called California's Groundwater Live, that leverages the California Natural Resources Agency's Open Data Platform to improve the timeliness of statewide groundwater information and make it easily accessible for water managers and the public. California's Groundwater Live is a dynamic platform with real-time data that will help generate greater awareness and improved understanding of groundwater to support more informed decisions.

Original Article: Water World

US WATER NEWS

How a Federal Drought Relief Program Left Southern Oregon Parched—and Contributed to the Ongoing Groundwater Crisis in the West

This April, Micah Goettl, an emergency coordinator for the Oregon Department of Human Services (ODHS), began to hear reports of residential wells failing in Klamath County.

At first, this wasn't a complete surprise. The region was experiencing extreme drought. Many farmers in the area were tapping into groundwater reserves after their preferred water sources, Upper Klamath Lake and the Klamath River, had been cordoned off to protect endangered species. Wells have occasionally gone dry in previous years, Goettl said. It happens every now and then, when groundwater falls to a level lower than pumps can reach.

Quickly, however, it became apparent that this year's water woes were more severe than usual, and widespread: As of last Friday, more than 280 homes in Klamath County have seen their wells go dry. For the first time ever this summer, the state was asked to step in and coordinate an emergency response.

Even finding a temporary solution was an uphill battle: Early on, ODHS found itself competing with its counterpart agencies in California—also facing waves of domestic well failures this year—to buy water tanks, which can be hooked up to homes as a backup water source. Eventually, an Oregon-based manufacturer set up a dedicated assembly line to produce tanks for residents waiting to resume their lives. In the months since, private water suppliers have been making regular deliveries to Klamath County to keep them full.

For some residents, there's not much to do right now but hope that the upcoming winter's rain and snow will help groundwater levels recover. Another option is to deepen their wells, allowing them to tap into lower groundwater levels. However, not only is this process costly, but demand for well repair services is so high right now that waiting lists are reportedly as much as a year long. In October, ODHS announced that it would extend emergency water deliveries through April of 2022 due to poor groundwater recovery. One Klamath County resident cried when she heard the news, Goettl said: "She's on a fixed income, elderly, and was not certain how she was going to be able to continue paying for water once this stopped."

This year's emergency took both residents and officials by surprise, but perhaps it shouldn't have. That's because the region's ongoing groundwater woes are at least two decades in the making, exacerbated in part by the very federal programs meant to conserve water in the area, The Counter has found. Our analysis looked at drought responses within the upper Klamath Basin—an 8,000-square-mile ecological region that encompasses most of Klamath County and parts of northern California—and drew from

interviews from dozens of sources, including scientists, agricultural groups, tribal representatives, conservation experts, and government officials.

In 2001, the Bureau of Reclamation (USBR), a federal agency that manages the agricultural water supply within the basin, began paying farmers to pump large amounts of groundwater out of the aquifers below. The idea was supposed to temporarily help producers access underground reserves whenever there was a run on surface water, referring to lakes, rivers, and other above-ground sources. Surface water has historically been the primary water source for many farmers in the region. However, as droughts persisted year after year, the pay-to-pump program gradually became the norm rather than an exception. Since 2001, such programs have now been activated in more years than not—even as the agency's own scientists warned that water was getting pulled out of the earth faster than it could be replenished.

Original Article: The Circle of Blue by Jessica Fu, The Counter

The Supreme Court's Decision on the Mississippi-Tennessee Aquifer Conflict Will Change U.S. Water Wars

On Monday, the U.S. Supreme Court unanimously rejected Mississippi's claim that Tennessee was stealing its groundwater in a decision that legal experts say could have major implications for future battles over water amid the worsening climate crisis.

If the Supreme Court had sided with Mississippi, it would have "created chaos in the long-established world of interstate water allocation," says Christine Ann Klein, a professor at the University of Florida Levin College of Law who specializes in water law. "[The ruling] is a very big deal."

The term "groundwater" refers to freshwater that's stored beneath the earth's surface. Groundwater makes up about 50% of municipal, domestic and agricultural water supply, per the U.S. Environmental Protection Agency (EPA). (The term "surface water," on the other hand, refers to any body of fresh water that's above ground.)

Monday's case stretches back to 2014, when Mississippi sued Tennessee for allegedly stealing its groundwater by allowing a Memphis water utility company to pump from the Middle Claiborne Aquifer, which sits below the Mississippi-Tennessee border. Mississippi argued that it had owned that water since it entered the United States in 1817, and sought $615 million in damages from Tennessee.

The Supreme Court disagreed. Instead, the high court ruled that the legal doctrine of "equitable apportionment"—which has long been used to determine what states get control of interstate surface water—also applies to groundwater. Both Mississippi and Tennessee can use the Middle Claiborne Aquifer. But if they want an official decree dictating how they have to share it, they'll need to go through an "equitable apportionment" process, in which they must go before a court and argue their case. That court will then divide up the water as it sees fit.

In other words, the high court ruled that "states have to share," writes Robin Craig, a professor at the University of Southern California Gould School of Law who specializes in water law. "They can't claim all the water for themselves."
Original Article: Time by Madeleine Carlisle

Company abandons appeal to export Iowa groundwater

A northeast Iowa company that initially sought to export billions of gallons of groundwater to parched western states each year but scaled back the quantity after pushback has abandoned the request to state regulators altogether.

The Pattison Sand Co. proposal was repeatedly rejected by the Iowa Department of Natural Resources — most recently in May 2020 because the Clayton County company didn't demonstrate "beneficial use" of the water as required by state law — and an appeal hearing had been set for early next month.

But the appeal was dismissed at Pattison's request, according to a motion it filed on Sept. 22. An administrative law judge dismissed the case the next day, records show.

Pattison, through its attorney, declined to provide a reason for the dismissal. It's unclear whether the company might again seek permission to export water from its wells near the Mississippi River.

The first-of-its kind proposal to withdraw and export water from the Jordan Aquifer — which lies beneath nearly all of Iowa and parts of neighboring states — drew criticism from state lawmakers, the state geologist and conservation groups.

"We opposed it from the beginning because we felt that the Jordan Aquifer was at risk," said Wallace Taylor, an attorney and the conservation chair of the Sierra Club's Iowa Chapter, which sought to intervene in the appeal. "The Jordan Aquifer has been losing more water than is put back into it for some time now, and to take millions of gallons as Pattison proposed to do would have been disastrous."

The estimated effects on the aquifer were not well established; the DNR noted in a May 2020 letter to the company that there were concerns about the proposal that weren't fully investigated because the company was unable to meet the "beneficial use" requirement.

Taylor applauded the appeal's dismissal but wondered whether the issue might resurface.

"With these boondoggles these companies have, they never actually totally go away," he said. "Companies are always looking for some other way they can do it. I would not turn my back on it yet."

Pattison's primary business is mining sand that is used in oil and gas fracking.
Original Article: Iowa Capital Dispatch by Jared Strong

Water projects could get biggest slice of state's $1 billion COVID relief pie

The state of South Dakota still has nearly $1 billion of federal coronavirus relief money, and some state officials want to spend most of it on water projects.

"Benefits of water and wastewater funding are quality drinking water and necessary sewer services, which result in the health and welfare of out citizenry," said Hunter Roberts, secretary of the the Department of Agriculture and Natural Resources. "It protects the environment and our natural resources, and it can be an economic driver for our economy, certainly."

Roberts spoke at a recent hearing where a legislative committee reviewed the federal funding and heard spending proposals.

The money was awarded in March when Congress passed the American Rescue Plan Act and gave South Dakota $974.5 million.

Roberts' department wants to spend $710 million, he told the COVID Relief Liaison Committee last week.

The money would go to drinking water, wastewater, and sewer and storm-related projects to help prepare for workforce housing.

The funds can only go to government entities and nonprofits.

Roberts said DANR has received about 250 eligible applications worth more than $3.2 billion.

"We were shocked to see the volume that we got in applications. We knew there were some big projects but didn't realize how many small bread-and-butter projects there were out there that people were interested in," he said.

Aberdeen and the surrounding area have outdated infrastructure and not enough water to accommodate growth, according to City Manager Joe Gaa.

He said drought is causing Elm Creek to dry up, so the city would like to build a pipeline from the Missouri River. The project would cost between $271 million and $334 million.

Original Article: South Dekota Public Broadcasting by Arielle Zionts

Future of groundwater pumping in Texas unsustainable

The future of water looks murky in the Lone Star State.

Groundwater levels are declining in Texas, according to two reports published last week by Texas State University and the Environmental Defense Fund. Seven of 20 aquifer systems analyzed in the state are being overpumped, and that number could double by 2070, which would leave only six aquifers sustainable for future groundwater use in the state.

Unsustainable pumping of aquifers can lead to wells drying up, less groundwater storage and the degradation of rivers and springs that depend on aquifers for their ecosystems.

“We’re heading in the wrong direction,” said Vanessa Puig-Williams, director of the Environmental Defense Fund’s Texas Water Program. “In Texas, none of us want to see our aquifers be depleted or be unavailable as a water source in the future. And unfortunately, we’ve made a decision to allow our aquifers to be pumped beyond what is sustainable.”

Groundwater conservation districts, which manage local aquifers, are not practicing sustainability to the degree that they should, Puig-Williams said, with many districts

pumping more than they can withstand in the long term. And while some districts — such as the Clearwater Underground Conservation District, the Barton Springs District and the Edwards Aquifer Conservation District — have good management practices employed to maintain spring flow, groundwater in Texas is greatly connected, meaning one aquifer's supply can impact another.

On ExpressNews.com: Drought conditions have eased in San Antonio — but the relief is likely just temporary

For the Edwards Aquifer, groundwater is protected by the Endangered Species Act — limiting the amount of water pumped in order to protect creatures such as the blind salamander and the San Marcos Gambusia. Currently, the Edwards Aquifer is being pumped sustainably and will continue to be in 2070, according to the Texas State University report.

But the Edwards is connected with the Trinity Aquifer, which stretches north from San Antonio through the Texas Hill Country.

"Most of the Edwards Aquifer's recharge comes from rivers across the recharge zone that leak into the aquifer, and then most of that water flowing through those rivers is a source for the Hill Country," said Robert Mace, a professor at Texas State University and executive director of the Meadows Center for Water and the Environment. "But there's water that also flows underground from the Trinity aquifer into the Edwards, so if there's less water in the Trinity, there's going to be less water flowing into the Edwards."

While the Trinity Aquifer as a whole is projected to be managed sustainably in the future, the Trinity within the Hill Country is not, Mace said. The Trinity's groundwater levels are projected to decline by 30 feet by 2070.

If that occurs, there will be less water for pumping in San Antonio, and the city would need to impose drought restrictions more frequently to ensure the Comal and the San Marcos rivers keep flowing.

Original Article: San Antonio Express News by Elena Bruess

Distilleries Are Innovating to Save Water in Drought-Stricken Areas

Water sustainability was not top of mind for Al Laws when he was starting Laws Whiskey House in Denver. That quickly changed after he watched a constant stream of cold tap water run over his still's condenser and then flow straight down the drain.

"I thought, 'This has got to stop,'" Laws says. "We need to have investment so we don't do that anymore. We want to track every gallon from its input to its output."

Water is the key to distilling—and distilling traditionally uses a lot of water for fermentation, proofing, and especially cooling. The group of alcohol industry leaders in the Beverage Industry Environmental Roundtable (BIER) found that, on average, distilleries use about 37 liters of water to produce one liter of spirit—around 10 times the amounts used for beer (3.5 liters of water) and wine (four liters of water).

Diverting the water used to cool a still's condenser into a closed-loop system is the first way that Laws moved toward water sustainability. He's far from alone. Cooling is the

biggest water use culprit in distilling, though it's also one area with an established fix—closed-loop systems that recycle and re-cool the water instead of draining it can be found around the world. That same BIER report outlined that this can bring water use down to about 11 liters of water for every liter of liquor produced.

That's a sizable amount of water, especially in the dry West where climate change is exacerbating a severe drought. Reservoirs are running low, annual rainfall is lower on average, and extended hot conditions dry up the moisture that does fall.

This impacts every facet of life, including distilling. Today, distillers across the country are rethinking their approach to water management, from how much water goes in, to the quality of the wastewater coming out.

"The big question with water is who gets what, and if you have a big population in one location, does that mean they can take water from other locations, which is what we're doing now," says Ryan Friesen, the head distiller at Blinking Owl Distillery in Santa Ana, California, and the vice president of the California Artisanal Distillers Guild. "Is it sustainable? Not as long as California stays in a 100-year drought for more than 10 years in a row. So we have to get better at controlling the water we do use."

Blinking Owl is in a rare position in California. Orange County, where the distillery is located, has one of the largest groundwater reclamation systems in the world. This allows Blinking Owl to rely on its local municipal system to provide a sustainable option. Friesen notes that water conservation is a problem that'll require both municipal and industry solutions. On the distillery side, Blinking Owl uses a 10,000-gallon closed-loop cooling system.

"There's always a cost though, and the cost for us is the electricity to do the cooling," says Friesen. "But at least the electricity you can get from sustainable resources when available."

Original Article: Seven Fifty Daily by Nickolaus Hines

The false choice between agriculture and clean water

In a state as abundant in water as Wisconsin, it's easy to take for granted the rich groundwater resources running below our feet. Our Great Lakes contain 20 percent of the world's fresh surface water, and there is more than enough water available for drinking, recreation, wildlife, and business. However, growing concerns over the public health and ecological impacts of agricultural and industrial pollutants in our water mean we must reevaluate how we manage water resources in Wisconsin.

Unfortunately, the Wisconsin Department of Natural Resources (DNR) recently announced it is abandoning efforts to develop regulations that would reduce nitrate pollution in drinking water, claiming "the statutory process and associated firm timelines established by the Legislature for rule-making do not allow adequate time for the department to complete this proposed rule."

In 2020, Wisconsin Farmers Union (WFU) participated in a series of NR-151 Technical Advisory Committee (TAC) meetings to address the issue in a way that took agricultural, environmental, and public health concerns into consideration.

Although certainly not the sole factor, we must acknowledge that agricultural runoff is a contributor to water pollution in this state. Many farmers are aware of this fact and are actively working to address it through improved conservation practices and collaborative educational efforts, such as farmer-led watershed councils. WFU recognizes a need to safeguard our resources against bad actors Wisconsin has over 1,500 impaired waterways, and many private wells in Wisconsin do not meet safe drinking water standards due to excess bacteria or nitrates. Excess nutrients in surface water cause toxic algae blooms, which threaten humans and wildlife and destroy the tourism and recreation industries.

Original Article: Wisconsin State Farmer by Nick Levendofsky

With cutbacks imminent, Arizona and other states scramble to save Colorado River water

The Colorado River's worsening water supply outlook has led Arizona, California and Nevada to commit at least $100 million over the next two years to reduce consumption dramatically and keep more water in Lake Mead.

It’s not as though no one saw a crisis coming before now, with a warming climate and decades-long drought continuing to exacerbate the region’s overuse problem. But when the U.S. Bureau of Reclamation formally declared a shortage in August that will necessitate cuts to certain Arizona farmers and others beginning this winter, three states with a long history of bickering over the river teamed up.

The plan fell into place rapidly and calls for the states to collectively hold back 500,000 acre-feet of water in Lake Mead every year for five years — almost matching the amount that Arizona already must forfeit to the shortage declaration. Funding has been identified to compensate water users who agree to cut back in the first two years.

The federal government, Mexico, various tribes and all seven states that use the Colorado will continue to negotiate new guidelines for operating the river’s dams, aiming to complete a plan by 2026, but the states believe they must act now to stop the shrinking reservoir levels from triggering further cuts under the existing rules.

“We need to plan on a more conservative basis,” Arizona Department of Water Resources Director Tom Buschatzke said. “The projections are all heading in a direction where we should assume declining levels of Lake Mead are our future without additional actions.”

When Buschatzke saw the worsening conditions after poor meltwater runoff from the Rocky Mountains last spring, he asked for and got $10 million from the governor’s budget for drought mitigation.

Once Reclamation officials in August projected the reservoir would start next year below elevation 1,075 feet, the trigger for a restrictive shortage declaration, he asked for and

got another $30 million. That money came from the pot of federal pandemic recovery funds in the American Rescue Plan Act and will pay for farm efficiency upgrades or temporary field fallowing from willing farmers.

In all, the states are committing $100 million to such efforts over the next two years. They are likely to apply for more money from the federal government, Buschatzke said.

The infrastructure package that President Biden signed this week includes $300 million for drought mitigation on the Colorado River, with $250 million of it for the river's lower basin, which includes Arizona, California and Nevada.

Original Article: AZ Central by Brandon Loomis

Utah farmers try to adapt to drought in a changing climate

Climate change is making droughts more frequent and intense. This summer, the southwestern U.S. had the worst drought on record, according to the National Oceanic and Atmospheric Administration.

That has limited Utah farmers' ability to grow crops. So, in the past two years, a growing number of farmers have signed up for a state program that helps fund projects to increase their water use efficiency, KUER-FM reports.

Trent Brown is one of them. One early October morning, he was standing on a wide expanse of land with cows grazing nearby. Brown is a long time rancher and farmer in Beaver County. He's also the county assessor since farming doesn't pay all the bills.

It's a family tradition: His father and grandfather were ranchers and farmers and worked government jobs too. Brown said juggling both is a lot of work.

"So not not too many vacations or things like that, but you have to love it for sure," he said. "It's hard to explain. It kind of gets in your blood."

The drought this summer was hard on Brown. He finished the switch from growing alfalfa to grass five years ago to save water, but it wasn't enough to overcome this summer's drought. Brown said he only produced about a quarter of what he usually does.

"We always try to be a little bit aware of it and try to prepare for it," he said. "But these last couple of years and this year, especially, it's been far worse than even anything we were probably prepared for. So we're trying to look even farther outside the box and into the future."

Brown stood next to a ditch that brings water from the nearby Manderfield Reservoir to him and other farmers in the valley. He used a grant from the state's Water Optimization Program to replace the cement in the ditch earlier this year.

"The concrete ditch was put in in the '60s, and it was just falling apart, failing," he said. "We were losing a lot of water. We figure probably 20%. (Conserving water is) important all the time, but especially (with) this drought we're in and the way it looks like that we're going to continue."

Utah established the Water Optimization Program in 2020. It got $3 million in state funding that year and another $3 million in 2021.

During the latest round, the program got 81 applications totaling $10.6 million — more than triple the money they had to spend, according to the program's director Jay Olsen.

"That shows you what the need is and the increased interest that we've had in the water optimization program at the department, especially with drought conditions that we've had," Olsen said. "There's just a need to save water."

Olsen said that can be hard for farmers to do without some help.

"Farmers are very strapped for cash," he said. "They have a lot of assets, but they have a real tough cash flow."

Original Article: Beaumont Enterprise by Sonja Hutson and Lexi Peery

Aquifers are not forever

Are aquifers stable? Some people, and apparently some of those who manage groundwater, assume that aquifers are a relatively constant environment. They are not. In South Dakota the authority to manage state groundwater, in non-Indian Country, is given to state government and its appointed state boards. The state has oversight over the use of, quality of and available quantities of groundwaters. State government is the trustee of public waters.

Since 1978 the state has had statutory authority as a 'gatekeeper of groundwater'. Under the gatekeeper law a permit or license to withdraw groundwater may not be given to a private or business applicant unless the terms of the gatekeeper statute have first been met. An applicant must show it is probable the quantity of water to be withdrawn annually from the source will not exceed the quantity of the average estimated annual recharge of water to the aquifer.

The state has publicly said, "State law requires a balance of SDCL 46-1-4 requiring water to be put to the fullest extent it is capable with SDCL 46-6-3.1, which provides that over the long-term we do not withdraw more than is recharged so the resource is maintained into perpetuity." The state's position on water use is incorrect.

It is the responsibility of a water permit applicant to satisfy the terms of the gatekeeper law. The law is not a balancing test with other rules or statutes. The law says: You can mine minerals but you cannot mine water. Recharge is the natural replenishment of aquifers. Recharge has importance where groundwater is taken for commercial, agricultural, or human use. Recharge of an aquifer is a process in opposition to the withdrawal of water from the same aquifer. The gatekeeper statute requires a quantification analysis based on the "water withdrawn annually" as against the "average estimated annual recharge." If aquifers were stable, forever, and constant the state's gatekeeper statute would be unnecessary.

Government's encouragement of large users of water held in trust by the state as water management should not be validated without the proper application of the state's gatekeeper law. A predisposition to welcome large users is not unique however to South Dakota. Kansas in recent years has had water availability problems, yet the state

encouraged the relocation of dairy operations to the state. It is reported that former Kansas Governor Sam Brownback on later learning the extent of water problems said he felt like a “cattle rustler” by recruiting dairies to the state.

In 2012 a circuit court in South Dakota handled an appeal from a decision of the Water Management Board which had approved a large dairy operation water use permit. No study or modeling of the aquifer’s waters was presented by the applicant or by the state DENR (now DANR) to support the application. The parties relied on data from observation wells. This data is known as a hydrograph. The court ruled that this evidence was inadequate to support a large future draw of water from the aquifer. The court stated, “The court finds it perplexing that the board chose to analyze observation well data, almost exclusively, to satisfy the requirement set out in [the gatekeeper statute].” The court ruled that the test was, “whether it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source, as required by [the gatekeeper statute]. The court holds that simply looking at two hydrographs that contain three decades' worth of observations and comparing the beginning observation with the last observation does not approach the requirements of [the gatekeeper statute].”

To address this challenge, in May of 2018 I recommended that a water permit applicant, who will use large quantities of water, provide an aquifer recharge study as a required part of the application process. Rest assured; no action has been taken on my recommendation. It has been business as usual.

In 2020 the state Water Management Board granted a permit for a large livestock production facility and reviewed two aquifers for consideration. No studies or modeling were done. The permit was granted to the applicant for one of the two possible aquifers apparently because the actual location of one of the aquifers was unclear. Concerning the first aquifer, no studies had been done to estimate the recharge rate for the aquifer, although based on observation wells the state determined that recharge is greater than discharge. For the second aquifer there were no estimates for the entirety of the recharge to the aquifer. And the state indicated that without a reliable recharge rate, there is no way to compare the recharge and discharge rates directly. On this second aquifer the nearest observation well to the project site showed a decline in water head pressure over an 18-year period. This did not present a problem. The state suggested the decline in hydraulic head is likely due to uncontrolled flowing wells and not well withdrawals for beneficial use. An uncontrolled or free flowing well is an artesian well either without a mechanism for controlling discharge or a well that is allowed to flow continuously at the land surface and includes wells that only flow internally below land surface through corroded or leaky casings. Curiously, the permit was granted for one of the two aquifers to be determined by the applicant “but not for both.”

While some aquifers have an ebb and flow, I question whether an aquifer, if lower than it should be, will recharge in a natural and timely fashion like that of an aquifer maintaining a normal amount of water. I don’t have an answer to the question, but the

state has given us an answer. The state's gatekeeper statute provides a commonsense standard for aquifer management. The late USD Professor John Davidson said, "South Dakota's approach is both bold and conservative; bold because it sets the State apart from its western cousins, and conservative because it places preservation of groundwater ahead of short-term exploitation."
Original Article: Rapid City Journal by David Ganje

Water rights: Google deal

"Oregon city OKs Google data centers amid secrecy, water worries" [Nov. 9, Business] states the company "acquired the locale's rights to 3.9 million gallons of water per day." Four million gallons — a day. And not just any water like that in the Columbia River but water "that has gone through the city's water treatment plant." The Dalles City Council signed off unanimously on this, even though Wasco County, where The Dalles is located, "is suffering extreme and exceptional drought." Good thing water isn't nearly as important in sustaining life as data centers forming the "cloud."
Speaking of clouds, "How much water the data centers would use … remains confidential." Nothing like a massive deal done in secret to make "some residents uneasy," especially when Google "is fighting a public records request for the information."
But worry not: "Three studies related to the proposal were paid for by Google." And thus the cloud descendeth so none may see The Dalles googled out of its water.
Original Article: The Seattle Times by Letters Editor

Biden administration restores clean-water safeguards halted in Trump era

The Biden administration took action Thursday to restore federal protections for hundreds of thousands of small streams, wetlands and other waterways, undoing a Trump-era rule that was considered one of that administration's hallmark environmental rollbacks.
At issue is a regulation sometimes referred to as "waters of the United States," or WOTUS, that defines the types of waterways qualifying for federal protection under the Clean Water Act. The regulation has long been a point of contention among environmental groups, farmers, homebuilders, lawmakers and the courts.
The announcement by the Environmental Protection Agency and the Army reinstates a rule in place before 2015 while the Biden administration arrives at its own, which is expected to be next year.
The administration had said in June that it planned to repeal the Trump-era water rule and issue new regulations defining which waterways are federally protected under the Clean Water Act. In August, a federal judge in Arizona threw out the Trump water rule and restored a 1986 standard. It was broader in scope than the Trump rule but narrower than what was established by the Obama administration, which brought federal protections to nearly 60% of the nation's waterways.

The Trump-era rule was long sought by builders, oil and gas developers, farmers and others who complained about the federal overreach of Obama administration restrictions that they said stretched into gullies, creeks and ravines on farmland and other private property. They have frequently argued that broad federal protections for waterways make it difficult to do their work.

The agency's action Thursday formalizes steps it already has been taking since the court order.

Environmental groups and public health advocates say a strong federal rule is crucial to protect countless small streams, wetlands and other waterways that are vulnerable to pollution from development, industry and farms. The Trump-era rule resulted in an estimated 25% reduction in the number of streams and wetlands that are afforded federal protection, officials said.

Groups including the National Association of Home Builders and the American Farm Bureau Federation argued that the court should not have removed the Trump rule without deciding on the merits of legal challenges. The judge's ruling in August "casts uncertainty over farmers and ranchers across the country and threatens the progress they've made to responsibly manage water and natural resources," the farm bureau said at the time.

Original Article: Fox 7 by Suman Naishadham and Matthew Daly

Is Cloud Seeding the Solution to NM's Water Woes?

After years of dry winters and disappointing snowpacks, New Mexico is considering cloud seeding as a solution to the state's water woes. Cloud seeding has already been common practice in Colorado, where the state's ski resorts contribute to the $1.5 million programs every year to increase their snowpack. New Mexico's ski resorts have struggled with maintaining lucrative snowpacks in the wake of a severe drought. The state's low snowpacks have also reverberated to water stress on farmers in the water-scarce southern portion of the state. Although the idea of inducing increased precipitation sounds like a no-brainer, the process has drawn criticism from environmental groups who fear the sustainability and consequences of inducing rainfall using inorganic compounds.

Western Weather Consultants of Durango, Colorado submitted the proposal to the New Mexico Interstate Stream Commission. The operation will begin by December 13 if nothing goes awry during a public hearing on Monday—and if the proposal is approved NMISC.

The controversy around the proposed solution to the state's water woes lies in the inorganic compounds that are released into the atmosphere. A mixture consisting of silver iodide is released into the atmosphere either with planes or drones or, in the proposed project, through a ground-based device that will allow the particles to rise to a targeted cloud. Once the solution is released, it resembles the structure of ice, which

water molecules cluster around and increases the chances of a cloud releasing its moisture.

The practice of cloud seeding is nothing new. The U.S. military began climate experiments just after WWII throughout the 1950s to explore potential military applications of artificially altering the weather. Since then countries around the world have used the methods to relieve drought-stricken regions. Eight U.S. states are already using cloud seeding to boost their snowpacks as summers become hotter and drier. The benefits of clouding seeding are still considered ambiguous at best, as there has been no direct evidence that artificial efforts to induce clouds to release their moisture are reliable.

Northern New Mexico is the latest region to consider the controversial practice to relieve their water woes. The area under the proposal is the Eastern Sangre De Cristo Mountains, including Taos and Santa Fe as its most southern boundary. A mixture including the silver iodide will be released from devices, called cloud-seeding nuclei generators, which would distribute the mixture from remote locations across the region. The area would target New Mexico's ski resorts, including Taos, Angel Fire, Red River, Sipapu and Ski Santa Fe.

Original Article: The Paper/ ABQ News by Justin Schatz

GLOBAL WATER NEWS

Israel, Jordan to partner in water-for-energy deal, Israeli ministry says

Israel and Jordan have reached a preliminary agreement to partner in a water-for-energy deal, Israel's Energy Ministry said on Monday, in the first such deal between the two countries.

The countries signed a memorandum of understanding for Jordan to produce a total of 600 megwatts of renewable energy for Israel, and Israel to desalinate 200 million cubic metres of water for Jordan.

It was not decided over how long the agreement would be carried out. The deal was signed in Dubai.

"All residents of the Middle East will benefit from this memorandum of understanding, not just Jordan and Israel. This is a message to the world on how countries can act together to fight the climate crisis," said Israel' Energy Minister Karine Elharrar.

Original Article: Reuters/ Nasdaq by Ari Rabinovitch

VELES WATER WEEKLY REPORT

Saudi National Water Company signs two contracts worth $154m

Saudi PIF-owned National Water Company (NWC) announced on Sunday the signing of two contracts at SR579 million ($154 million) to manage the operation of water treatment services in the Central and Eastern clusters.

The first SR358 million contract was signed with Saudi Al-Khorayef Alliance and French Veolia to provide operation and maintenance for the Riyadh region.

The other SR221 million contract was signed with the Saudi Miahona Alliance, the French group Saur and the Philippine company Manila Water for the operation and maintenance of the Eastern Cluster.

"One of the most important foundations of Saudi Arabia's Vision 2030 is the well-being of citizens and the quality of services provided, which gave rise to the National Water Strategy 2030," NWC's CEO, Mohammed bin Ahmed Al-Mowkely, said.

"Based on this, the NWC strategy has been adopted and detailed plans have been developed to improve water services in the Kingdom with the participation of the private sector," he added.

Al-Mowkely said that the company is currently working on awarding management contracts for the remaining clusters, namely western, southern and northern ones, which will be completed by the end of December 2021.

Original Article: Arab News

Trade rule set to come into play

The interim rule for water traded from the Goulburn system to the Murray system will see trade capped at December 15.

The Victorian Government introduced the rule for 2021-22 so the inter-valley trade account is run down by the end of the season, which is critical to support the following year's trade for water users.

Goulburn-Murray Water's water resource manager Mark Bailey said when the summer-autumn cap came into effect, further trade opportunity would become available only through back-trade and not as river operators delivered more water to the Murray.

"The interim trade rule also prevents allocation trade from the Goulburn to the Murray and interstate before December 15 when the IVT account balance reaches 190 gigalitres," he said.

Dr Bailey said changes to the trade rule would not affect who could participate in the water market, impact reliability of current water entitlements or change opportunities to carry over water.

"The interim trade rule will affect when buyers and sellers can trade between the Murray and Goulburn water markets," he said.

"Water users with tagged accounts have been stopped from using Goulburn water in the Murray system — except Broken Creek users and users with grandfathered tagged accounts — when allocation trade is closed."

DELWP has also released the Operating Plan for Delivery of Water from the Goulburn IVT Account 2021-22.

The operating plan increases transparency around the year's default delivery pattern for water from the Goulburn IVT account in an average year and the seasonal conditions for varying delivery from this default.

Original Article: Country News

Alegria claims quarter million dollars for promised water rights

Minister of Public Housing, Spatial Planning, Environment and Infrastructure VROMI Egbert Doran failed to comply with the judgment of the Court of First Instance on September 4, 2020. As a result, Country St. Maarten is forced to pay 480,000 Netherlands Antillean guilders (US $267,000) in penalties.

Country St. Maarten was ordered to execute the settlement agreement with Alegria Real Estate NV within 48 hours of service of the judgment for the granting of an area of 13,525 square metres of water rights in long lease. The bailiff handed over the verdict on Wednesday, September 9. The government then had two days to accommodate Alegria.

Due to negligence on the minister's part, the sanction came into force on September 12, 2020, imposing a penalty payment of NAf. 10,000 on the government for each subsequent day.

The government, represented by Minister Doran, was served for the second time on March 3, 2021. *The Daily Herald* has the bailiff's warrant which states that the advanced sum of NAf. 480,000 represents penalties forfeited from September 12 to October 30, 2020.

At the request of Alegria Real Estate NV, the bailiff served country St. Maarten again on September 1, 2021. The sum of NAf. 480,000 in penalties and still unpaid legal costs, was increased by NAf. 721.50 for the bailiff.

This newspaper has tried in vain to find out whether Minister Doran has paid the bill. Doran, Alegria, lawyers and bailiff do not want to confirm or deny that the NAf. 480,000 has been transferred.

The judge had ordered that in case of non-compliance, country St. Maarten or the VROMI Ministry would have to pay daily penalties of NAf. 10,000, up to a maximum of NAf. 1 million. Whether that limit has meanwhile been reached is not known.

Alegria Boutique Hotel filed an injunction on August 12, 2020, regarding the issue of water rights which dates back more than three years. The VROMI minister informed Alegria on May 31, 2018, that he had received a request for the issuance of long-lease rights for an area of approximately 13,525 square metres of water for the development of the hotel in providing "additional service" to tourists and "resident clients."

In the letter, the minister stated that the Department of Domain Affairs was in the process of drafting an advice and the resort was informed that the minister "in principle"

had no objection to the issuance of long lease, adding that “the only construction to be allowed in the area in question is a breakwater and a sea aquarium.”
Original Article: The Daily Herald

Protests over water shortages erupt in Iran, as river dries up

Protests in the Iranian city of Isfahan erupted yesterday due to a severe shortage of water, as the region continues to suffer from a year of low rainfall and drought.

Thousands of farmers and others who supported them took to the streets in Isfahan in central Iran yesterday, expressing their dissatisfaction at the water shortages and urging the government to solve the crisis. They shouted "let Isfahan breathe again, revive Zayandeh Rud," referring to the dried river which supplies their crops with water.

In response to the protests, Iran's energy minister Ali Akbar Mehrabian apologised for the shortages. "I apologise to all of our dear farmers, and I feel ashamed for not being able to provide the water needed for their crops. With God's help, I hope we can overcome these shortcomings in the next few months," he told state TV.

The water shortages and the drying of the river come at a time when the region is suffering from a similar shortage, as rainfall has been low and temperatures have increased to make it one of the hottest and driest years recorded.

The protests yesterday also comes after major street protests broke out in July this year over water shortages in the south-western province of Khuzestan, in which a number of protestors were shot by the police.

Neighbouring Iraq and Syria have also been expressed concern over the shortage of water this year, with Baghdad having requested Damascus in August for an increase its supply of water.

The drying up of the Zayandeh Rud river has not only been caused by drought, however, but also by the government's diversion of water from the river to supply other areas and with a pipeline supplying water to Yazd province also having been damaged. Those incidences have contributed to the farms being left dry and the famers' livelihoods being threatened.

Earlier this month, a major reservoir in Syria also dried up completely, and was similarly due to a combination of climatic and structural causes.

Original Article: Middle Eastern Monitor

Water scarcity cost Iraq two million tons of wheat in 2021: Minister

The Iraqi Ministry of Agriculture has warned of a crisis in wheat production caused by water scarcity, with production deficit reaching two million tons this year.

Muhammad Al-Khafaji pointed out that the water problem and the scarcity of funds reduced the agricultural plan by 50 percent, according to the Iraqi News Agency (INA).

"Diyala, a province in eastern Iraq, was left out of the agricultural plan by 90 percent due to the problem of water scarcity, Diyala is in real danger, and migration may occur due to water scarcity, " he said.

Original Article: Arab News