Veles Water Weekly Report

November 24th 2022

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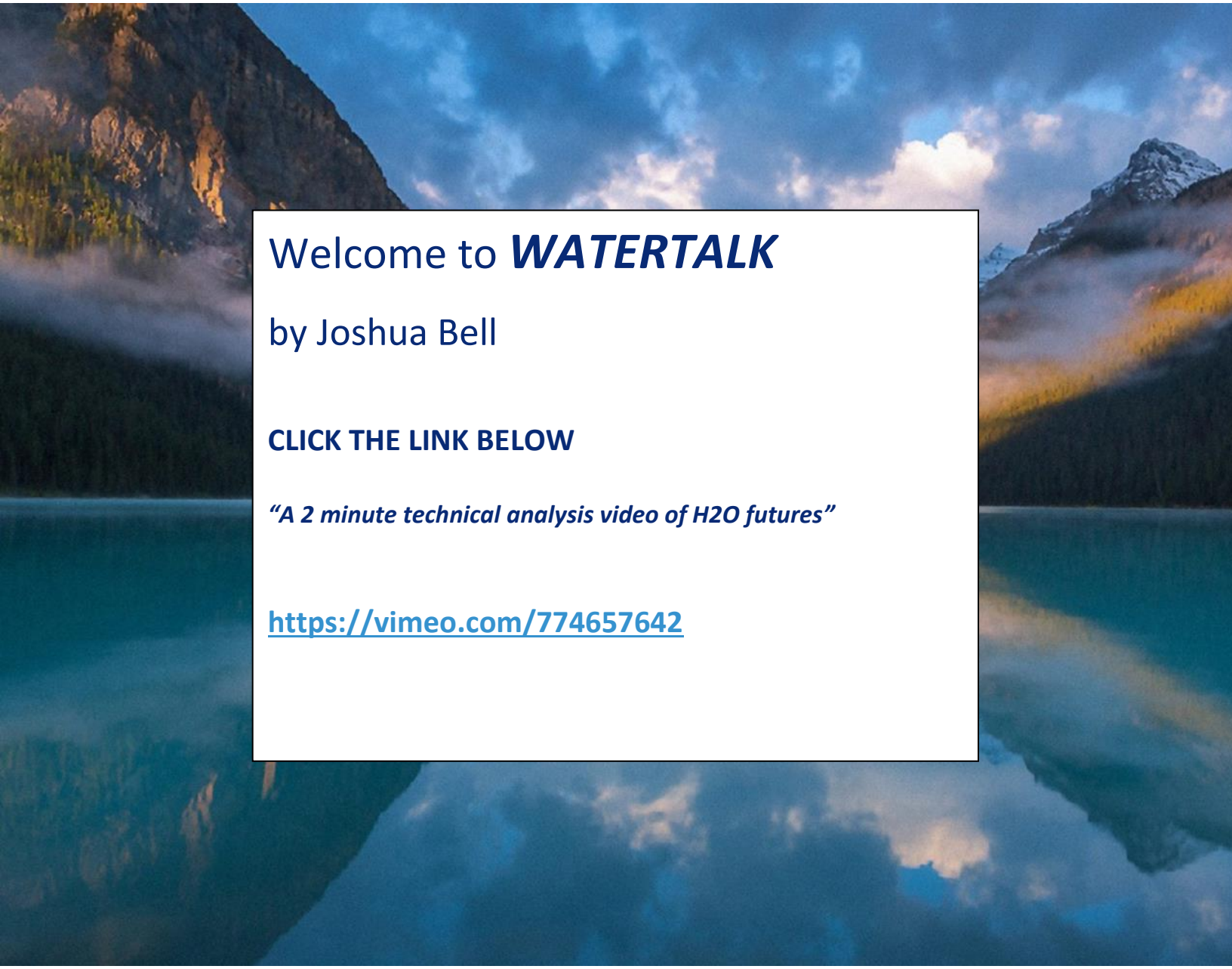
VelesWater

WATER FUTURES MARKET ANALYSIS



Welcome to ***WATERTALK***

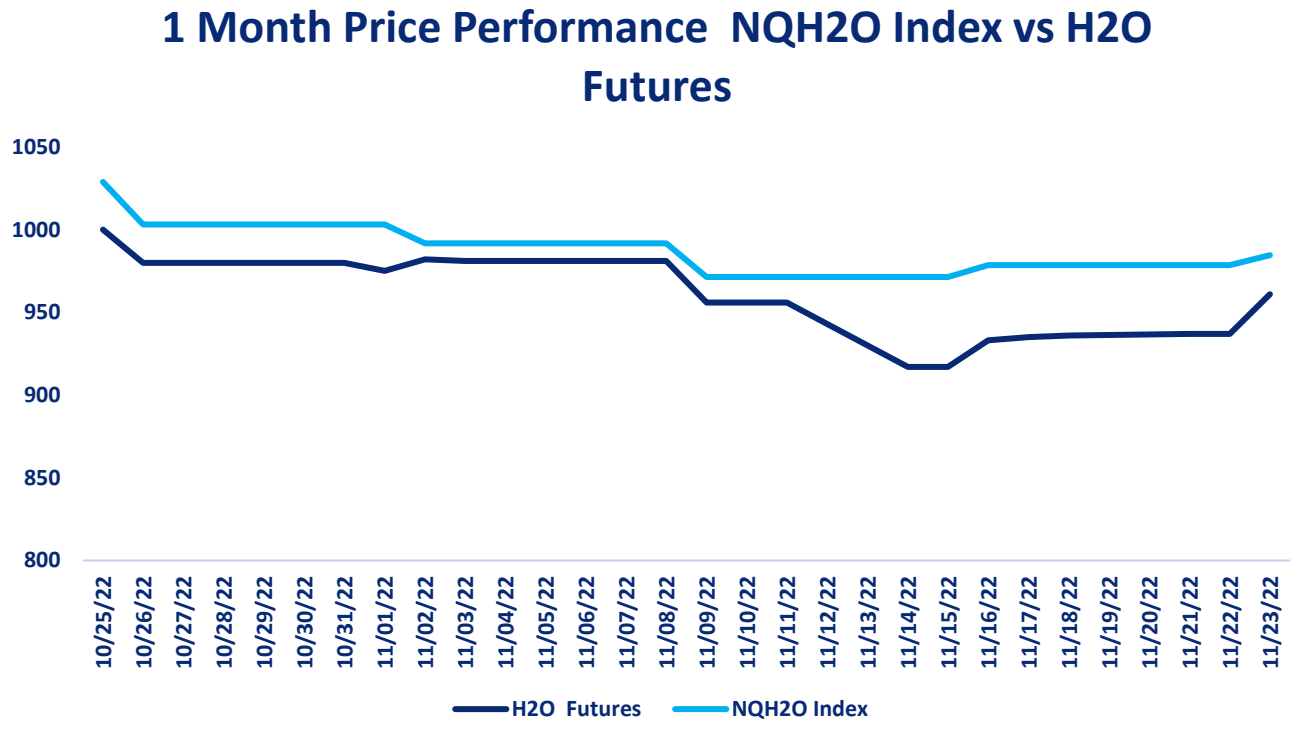
by Joshua Bell

CLICK THE LINK BELOW

"A 2 minute technical analysis video of H2O futures"

https://vimeo.com/774657642

NQH2O INDEX PRICE vs H2O FUTURES PRICE



Price Chart Based upon Daily Close

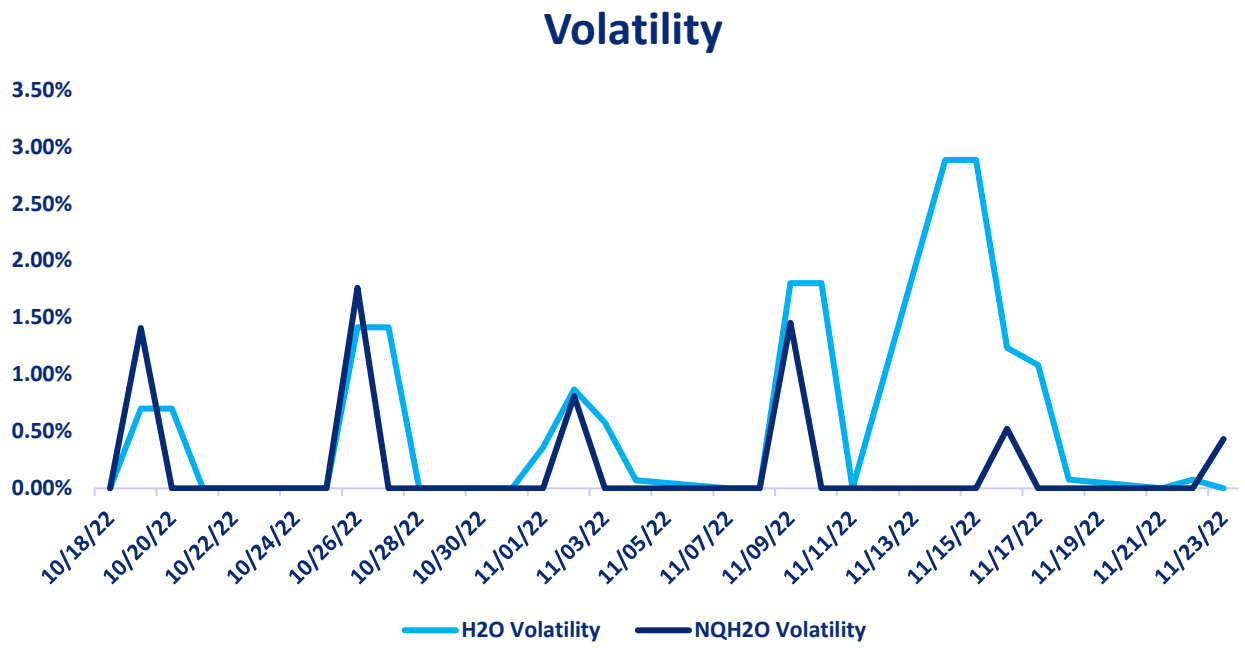
The new NQH2O index level of $984.54 was published on the 23rd November, up $6.00 or 0.61%. The December contract is considered the front month contract. The futures have been closing at a discount of $23.54 to $47.54 to the index.

NQH2O is up 34.15% Year to Date.

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

Dec 22	961@969
Jan 23	926@939
Mar 23	986@1019
Jun 23	1252@1260
Jun 24	1302@1480

H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS



DAILY VOLATILITY

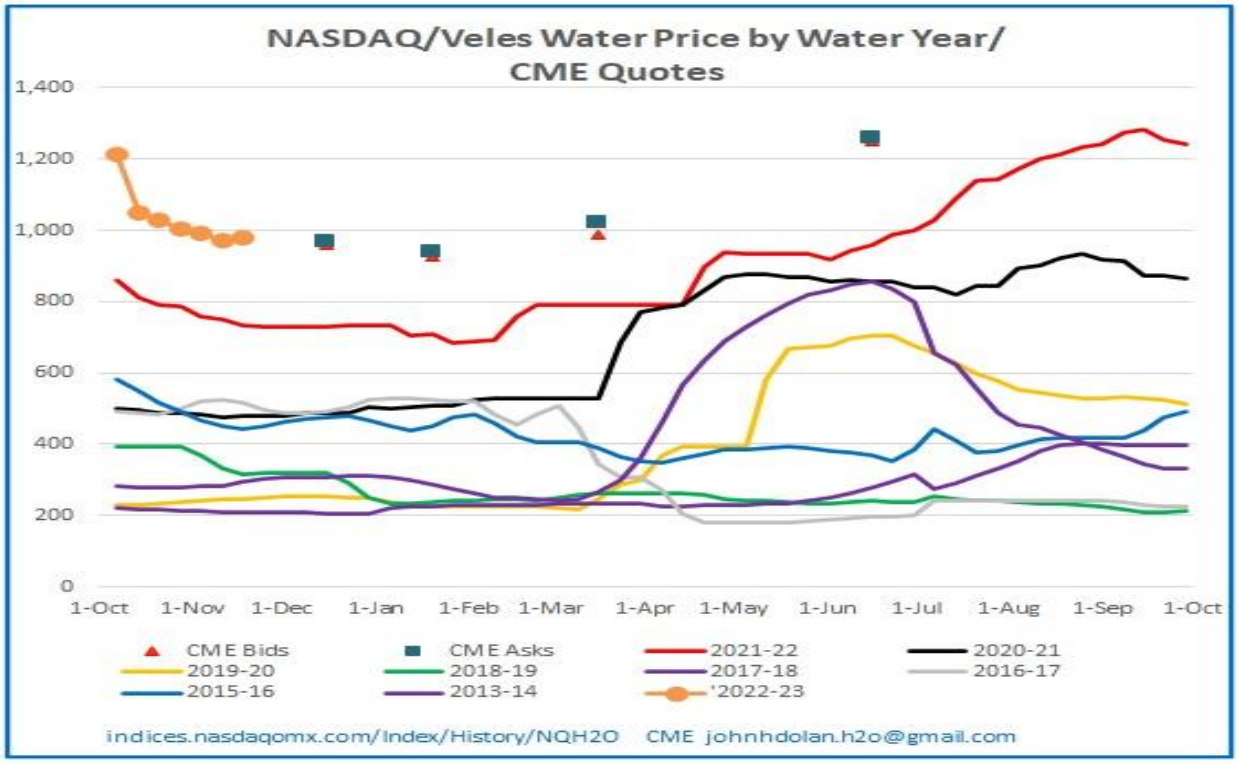
Over the last week the December contract daily future volatility high was on the November 17th 1.08% and a low of 0% on the 21st.

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	25.21%	11.47%	3.16%	0.13%
H2O FUTURES	N/A	13.94%	5.24%	0.20%

For the week ending on November 23rd, the two-month futures volatility is at a premium of 2.47% to the index, up 0.03% from the previous week. The one-month futures volatility is at a premium of 2.09% to the index, down 0.55% from last week. The one-week futures volatility is at a premium of 0.07% to the index, down 1.96% 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.*

NQH2O INDEX HISTORY



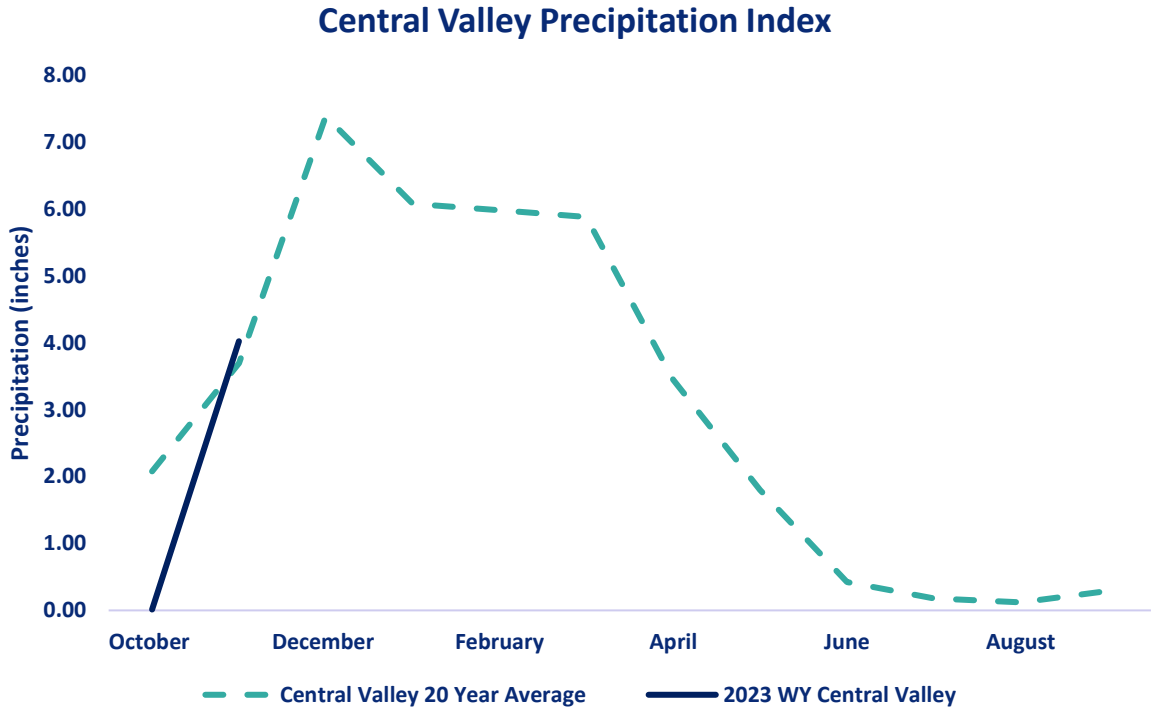
The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and 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 2021-2022 is highlighted in red. It shows the same seasonal climb, but at record-high values above each of the last eight years since February.
Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and prices may not fall seasonally as much as they have in prior dry years.

(John H Dolan, CME Market Maker)

VELES WATER WEEKLY REPORT

CENTRAL VALLEY PRECIPITATION REPORT



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 23/11/2022

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2023 WYTD VS 2022 WYTD %	2023 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	4.35	0.00	126.24	199	107
TULARE 6 STATION (6SI)	3.46	0.00	140.24	177	144
NORTHERN SIERRA 8 STATION (8SI)	4.26	0.00	82.40	294	80
CENTRAL VALLEY AVERAGE	4.02	0.00	108.91	223	110

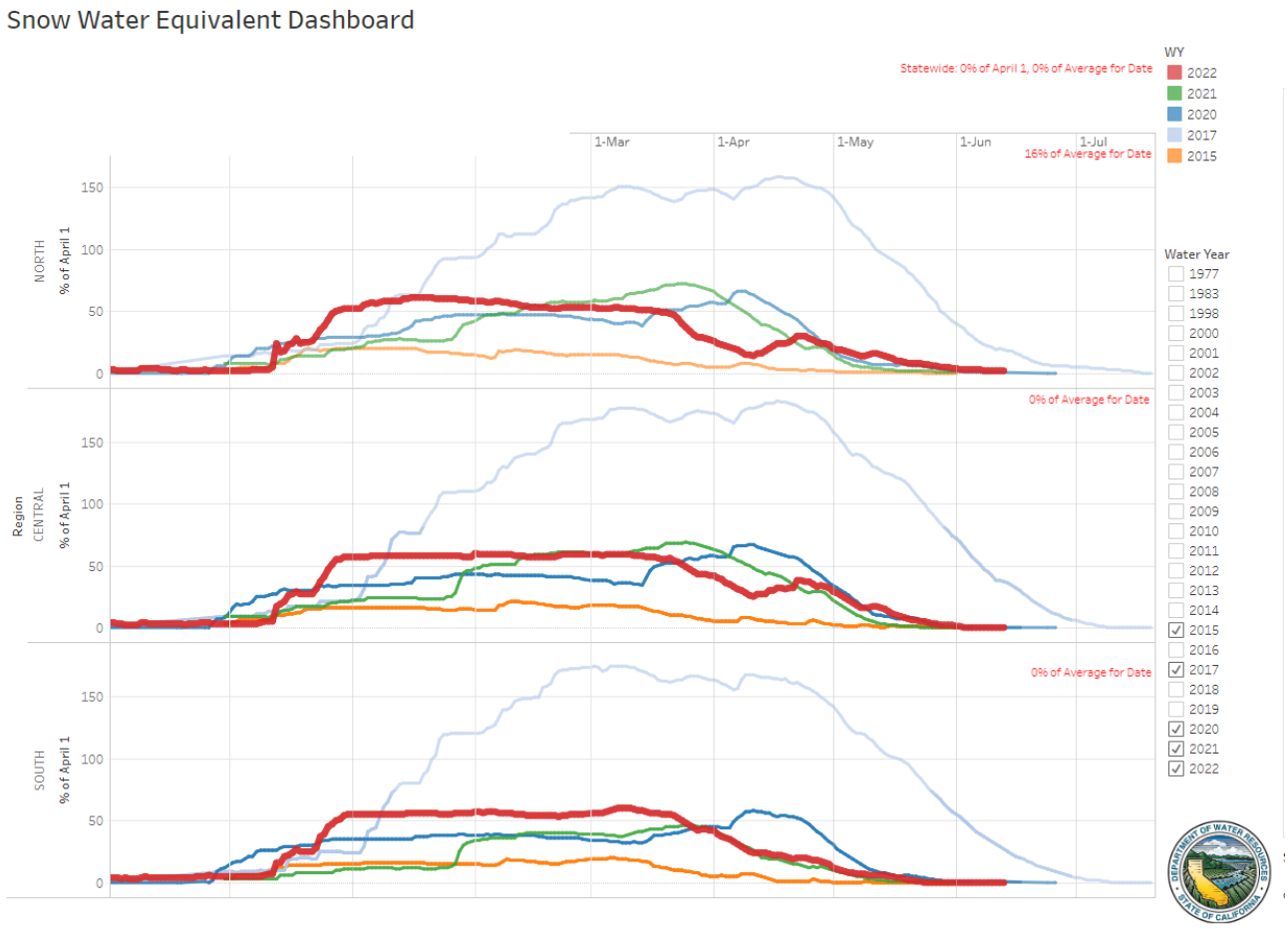
RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	530,235	22	29	38
SHASTA LAKE	1,339,911	31	24	57
LAKE OROVILLE	989,717	28	30	56
SAN LUIS RES	513,555	25	23	51

Reference: California Water Data Exchange

VELES WATER WEEKLY REPORT

SNOWPACK WATER CONTENT



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	0.4	0.00	0	16	2
CENTRAL SIERRA	0	0.00	0	0	0
SOUTHERN SIERRA	0	0.00	0	0	0
STATEWIDE	0.1	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.**

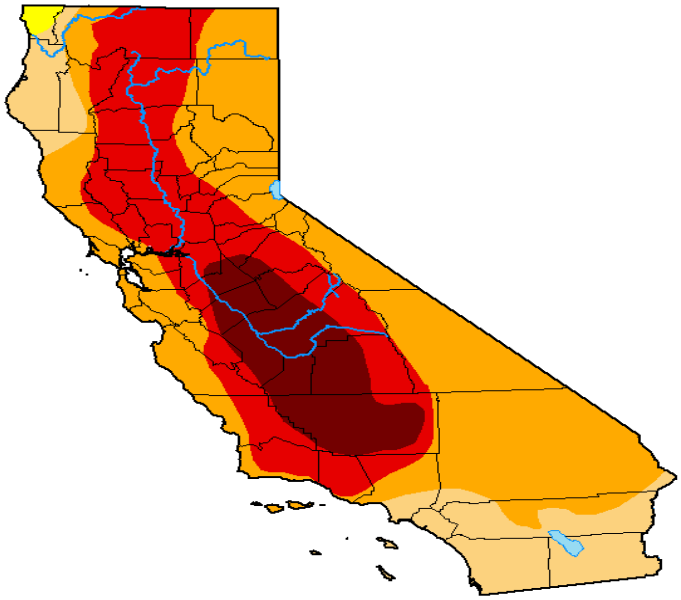
**** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.**

VELES WATER WEEKLY REPORT

DROUGHT MONITOR

U.S. Drought Monitor

California



November 22, 2022

(Released Wednesday, Nov. 23, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.48	84.97	40.92	12.73
Last Week *11-15-2022*	0.00	100.00	99.48	84.97	40.92	12.73
3 Months Ago *08-23-2022*	0.00	100.00	99.76	97.53	43.16	16.57
Start of Calendar Year *01-04-2022*	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year *09-27-2022*	0.00	100.00	99.76	94.01	40.91	16.57
One Year Ago *11-23-2021*	0.00	100.00	100.00	92.43	80.28	28.27

Intensity:

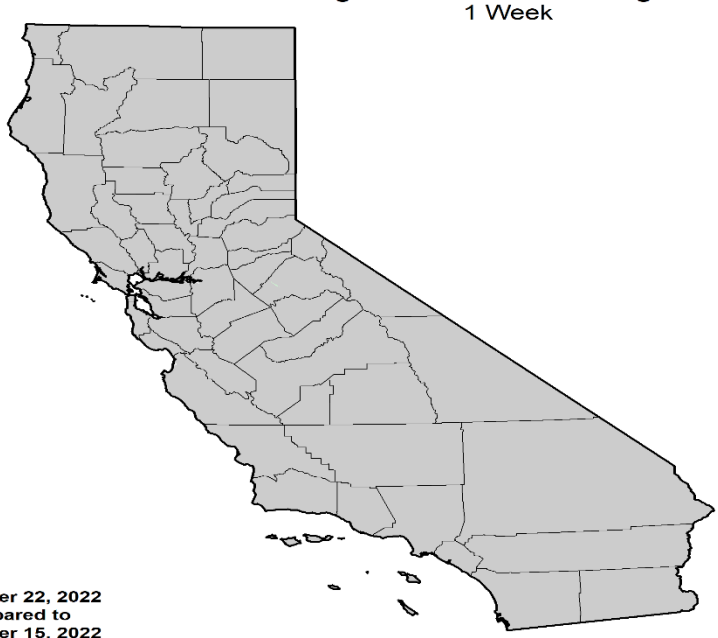
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

Author:
Brad Rippey
U.S. Department of Agriculture

droughtmonitor.unl.edu

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



November 22, 2022 compared to November 15, 2022

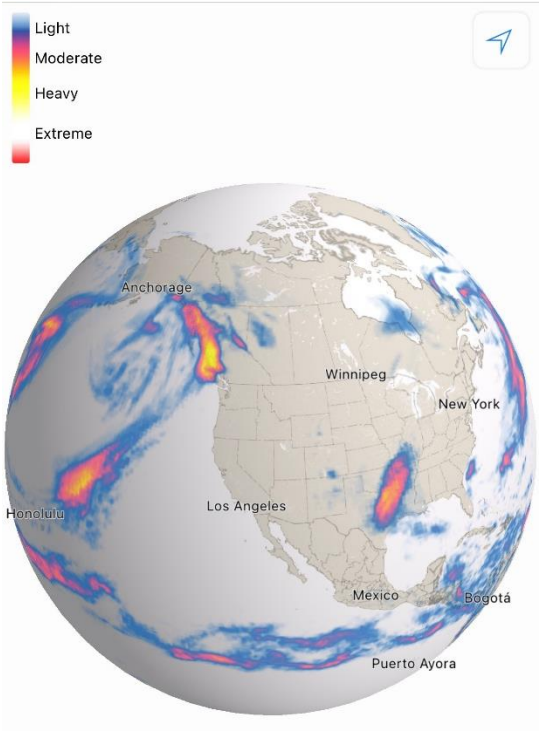
droughtmonitor.unl.edu

- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week the has been 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



Map: Dark Sky

The current satellite picture shows a mostly dry SW US.

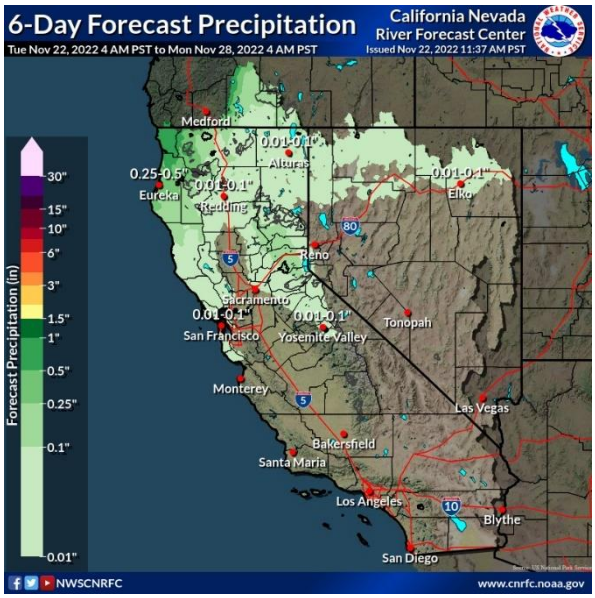
There has been significant moisture flow in from the Gulf of Mexico bringing a large patch of cloud cover and associated precipitation to Eastern Texas, growing and moving eastwards.

There is a frontal system hitting the Northwest coastline of Canada moving along the coastline which will bring precipitation to the Northwestern US over the next few days. At its best it may bring some precipitation to Northern California but the Southern region will most probably not be affected.

There is a further frontal system developing over the Northwestern Pacific which is typical of this time of year and may bring more frontal activity to the Northwestern regions in the next 2 weeks.

The hurricane season appears to have abated as there are no current threatening systems.There are no Monsoonal effects at present and these may only appear again at beginning of summer next year.

10 Day Outlook



Uncertainty remains in the forecast for Friday and Saturday in regards to a potential upper low bringing precipitation to the northern portion of the region. The 12z ECMWF still forms an upper low west of CA/OR Friday, however, in this run it reduces the low in size and shows the system losing most of its moisture before it reaches the CA coast Saturday morning. A good number of the 12z ensemble members are also dry, but a handful still show some precipitation (though not as much as the 00z det run). The GFS has also trended weaker on the trough for Friday/Saturday, but is still dry. Both the 06z and the 12z ECMWF mean 500mb height pattern do not show a closed low for

Friday/Saturday. Given this information, have elected to keep the forecast dry for that time period keeping consistent with this morning's package. Will keep an eye on the next few model runs and make adjustments should there be more consistency and convergence on a solution.

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

WESTERN WEATHER DISCUSSION

Like much of the rest of the country, the West experienced a full week of cold, dry weather, leading to minimal changes in the drought depiction. Fog, air stagnation, and low temperatures plagued the Northwest. Daily-record lows for November 17 included -16°F in Butte, Montana, and -3°F in Burns, Oregon. On November 18-19, Big Piney, Wyoming, collected consecutive daily-record lows of -15°F. Other Northwestern locations reporting a pair of daily-record lows on November 18-19 were Eugene, Oregon (21 and 18°F); Olympia, Washington (17 and 18°F); and Montana's Bozeman Airport (-14 and -16°F). On the 18th, lows plunged to -22°F in Butte, Montana, and -21°F at Lake Yellowstone, Wyoming. Early-season snowpack remained mostly favorable west of the Continental Divide, but a return to stormy weather will soon be needed to sustain the promising start to the water year that began on October 1.

Reference:

Brad Rippey, U.S. Department of Agriculture
Richard Heim, NOAA/NCEI

WATER NEWS

CALIFORNIA WATER NEWS

Question of water rights looms over controversial proposed new dam

A controversial proposed dam seems to have a new pathway forward. But how far will it get through California's byzantine world of water rights? Nobody seems to agree on an answer.

The Del Puerto Canyon Reservoir is a joint project between the Del Puerto Water District and the San Joaquin River Exchange Contractor Authority on the west side of the San Joaquin Valley.

A Stanislaus County Superior Court judge on Oct. 31 dismissed a host of environmental challenges against the project as well as all concerns brought by another group of irrigators, the Friant Water Supply Protection Association.

The judge did kick back Del Puerto's environmental impact report on one issue, a road relocation that he said had insufficient information.

Project managers rejoiced at the ruling. Fleshing out the road relocation is doable, managers said. And with the other major complaints dismissed, the project seemingly has a clearer path forward.

"We are considering our options and whether to appeal," said Alex Peltzer, attorney for the Friant Water Supply Protection Association. "Obviously we disagree with the ruling."

The Friant irrigators are concerned that the diversion and storage of federal Central Valley Project (CVP) water would allow the Exchange Contractors to hold on to water in wet years and still demand a full allocation from the federal government in dry years, which could impact the Friant supply.

They also contend the Del Puerto proponents need a new, or altered, water right to store some of the water they want to direct into the proposed reservoir.

The proposed reservoir would cover 800 acres and hold 82,000 acre feet of water. Some of the water would be captured from Del Puerto Creek but other supplies, up to 40,000 acre feet, would be diverted from the Delta-Mendota Canal from the Exchange Contractors' existing federal CVP allocation, according to court documents.

In the project's environmental impact review (EIR,) project managers muddled the question of whether they will need new water rights permits, said Peltzer.

The agencies would be taking delivery of the CVP water at the new dam instead of the locations that are specified in the Exchange Contractors original federal contracts. That requires a change in rights which would need to be permitted and the impacts of that change would need to be studied, said Peltzer.

That may be true in the eyes of the state, according to documents from the State Water Resources Control Board.

In a letter from the state Water Board's Division of Water Rights to the Bureau of Reclamation, the state wrote that the project will require multiple regulatory approvals from the board including, "approval of one or more change petitions to add a place of storage and points of rediversion to involved CVP water rights."

There is potentially a need for a new water right permit for the flow of Del Puerto Creek into the reservoir, said Chris White, executive director of the Exchange Contractors.

But when it comes to new CVP water rights, project managers seem to disagree with the state.

In response to comments on the project's EIR, project managers rejected the idea that any new water right approval will be needed for the CVP modifications.

"The Project Partners will not require a water right permit or other water right approval involving modification of Central Valley Project water rights," read the response to comments in the EIR.

"It's still early in the process for a water rights application," said Chris White, executive director of the Exchange Contractors.

In fact, the dam's proponents did apply for a water right permit for Del Puerto Creek in 2020. But the application was rejected by the state because the agencies did not pay the full fee of $553,919, according to letters sent by the state Water Board.

On the federal side, Bureau staff aren't sure about all the water rights issues either.

"I'm not clear on exactly what permits will be required," said Ernest Conant, regional director of the California-Great Basin region for the Bureau of Reclamation. "To the extent that the CVP water is being stored there, there may need to be a further permit for storage. And beyond that, I don't know."

The project proponents don't yet have approval from the Bureau to store and sell CVP water at the proposed reservoir, said Conant. The Bureau will need to put out an environmental impact statement first, which will be subject to public comment. After that process, the Bureau will make a decision on those approvals, said Conant.

The project has already secured $18 million in funding through the federal Water Infrastructure Improvements for the Nation Act (WIIN.) WIIN Act funding is decided annually and project managers are waiting to hear if the Bureau awards them more for the coming year.

"Frankly, that's plenty of money at this point to assist them, help them develop the project," said Conant. "As things move along, if and when there's a need for additional funds, I'm sure it will be considered."

That money hasn't actually made it to the project managers yet though. It's still tied up with the Bureau.

The Bureau is active in multiple water storage projects in California, including Del Puerto. The others are the new SITES Dam, and the expansions of Los Vaqueros Reservoir and San Luis Reservoir.

"Reclamation definitely has an interest in the project," said Conant. "The big picture story is that we need additional storage. We've got contractors here who are partnering with us and want to build additional storage. So that's something that we want to encourage and participate in potentially, but no final decisions have been made yet."

Original Article: SJV Water by Jesse Vad

NOAA winter outlook released: What it means for California

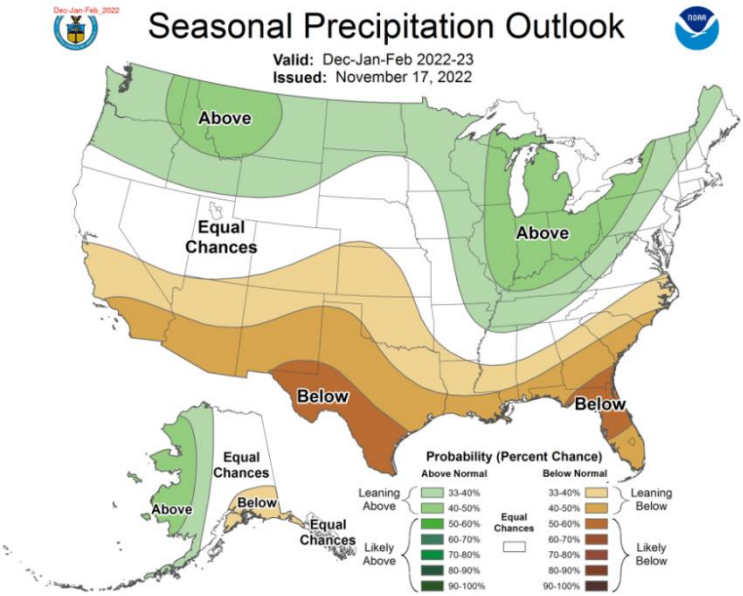
Most Californians don't expect to see anything like a white Christmas, but this year, even a damp Christmas is looking unlikely. An update to the Climate Prediction Center's official winter forecast shows a hot and dry season ahead for much of the Golden State.

The 90-day outlook was published Thursday morning by the Climate Prediction Center, part of the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service. It gives people a rough idea of what December, January and February will look like across the country.

The outlook shows the effects of La Niña still clearly visible. A La Niña climate pattern tends to divide the country in half, bringing a dry winter to the southern half and a wetter winter to the northern half.

You can see that pattern in the forecast map released Thursday (below): While the Pacific Northwest, Midwest and Northeast are forecast to see above-average precipitation, the southern half of the country is looking dry.

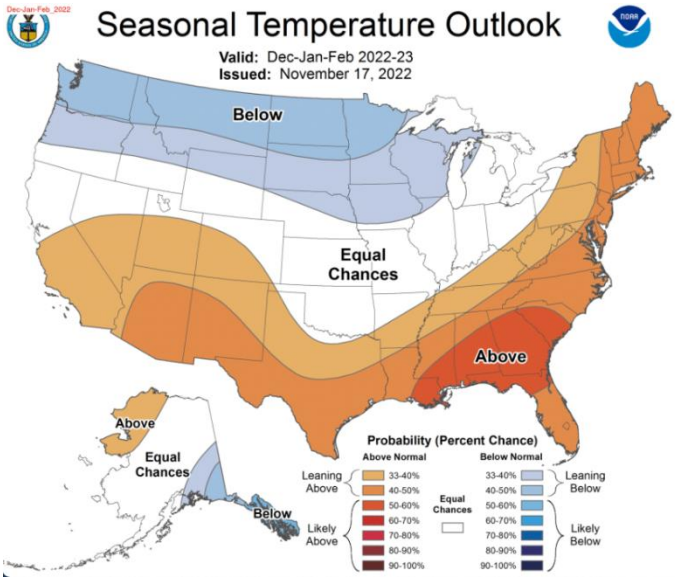
California is split into two, with the southern half forecast to be drier than usual. The northern half of the state is shown in white, meaning it has equal chances of a dry or wet winter.



The 90-day-outlook released Thursday shows winter weather predictions for December through February. (Credit: NOAA)

Southern California, from Santa Barbara down south, has the highest chance of a dry winter.

NOAA's temperature outlook doesn't look any bit more wintery for California. The majority of the state is highlighted in orange, indicating a likelihood for warmer-than-average weather from December through February.



The 90-day-outlook released Thursday shows winter weather predictions for December through February. (Credit: NOAA)

According to the U.S. Drought Monitor, 99.5% of California is in a drought. A warm and dry winter, as NOAA is predicting, would only aggravate those conditions.

California is especially reliant on winter rain to make a dent in the drought.

"Here in the Washington, D.C., area, it generally rains all year round," Mike Halpert, deputy director of the Climate Prediction Center, explained. "So if we have a couple of dry months, it's OK because we can make it up another time. When you're in California and the Southwest, 90% of the rain falls in that fairly short winter and spring season. So if you miss that, you're not going to make that up when you get into the summertime."

La Niña is favored to stick around all winter, with NOAA forecasters giving it a 76% chance of lasting through February. What happens in spring is less clear; meteorologists say there's about a 50-50 chance we shift into an ENSO-neutral pattern, which means we're neither seeing La Niña nor El Niño.

Original Article: KRON 4 by Alix Martichoux, Nexstar Media Wire

Biden Administration Gives PG&E $1.1 Billion to Keep Diablo Canyon Nuclear Plant Running

The federal government has conditionally awarded PG&E about $1.1 billion to keep Diablo Canyon nuclear power plant running past its original closure date in 2025.

The funding, announced Monday morning, comes from the U.S. Department of Energy's Civil Nuclear Credit Program — a $6 billion funding initiative to help keep struggling nuclear power plants operational.

"This is a critical step toward ensuring that our domestic nuclear fleet will continue providing reliable and affordable power to Americans as the nation's largest source of clean electricity," U.S. Secretary of Energy Jennifer M. Granholm said in a news release Monday.

"Nuclear energy will help us meet President Biden's climate goals, and with these historic investments in clean energy, we can protect these facilities and the communities they serve."

Diablo Canyon Power Plant was scheduled to close its two reactors in 2024 and 2025, but a recent push from the state and federal governments has reversed that course because the state has been unable to procure enough carbon-free electricity to replace the plant and meet its clean energy goals.

Diablo Canyon, located between Avila Beach and Morro Bay, can produce about 2,200 megawatts of baseload electricity, or 8.6% of the state's electricity supply, according to PG&E.

The federal funding will help PG&E with costs associated with relicensing the power plant.

The utility company had applied for the funding on Sept. 2, the same day Gov. Gavin Newsom signed Senate Bill 846 into law. That law authorized the California Department of Water Resources to loan PG&E the $1.4 billion and created a path forward to ensuring the nuclear power plant can continue to operate until 2030.

Top of Form

Bottom of Form

"This is another very positive step forward to extend the operating life of Diablo Canyon Power Plant to ensure electrical reliability for all Californians," PG&E Corp. CEO Patti Poppe said in a news release Monday.

"While there are key federal and state approvals remaining before us in this multi-year process, we remain focused on continuing to provide reliable, low-cost, carbon-free energy to the people of California, while safely operating one of the top performing plants in the country."

The final amount of money awarded to PG&E is subject to change based on actual costs, according to the utility company.

Should the U.S. Nuclear Regulatory Commission deny PG&E's relicensing application, the funding would be cut off.

PG&E recently sent a letter to the Nuclear Regulatory Commission asking whether the agency would prefer it submit an entirely new relicensing application, or if it could pick up from where it left off when it last applied in 2009.

That 2009 application was withdrawn in 2018 when the utility reached agreements with environmental groups to close the plant in 2025 and replace it with solar and other forms of renewable energy. The utility had wanted to extend the nuclear power plant's life to 2045.

"This investment creates a path forward for a limited-term extension of the Diablo Canyon Power Plant to support reliability statewide and provide an on ramp for more clean energy projects to come online," Newsom said in a Monday news release.

"I thank the Biden-Harris Administration for this critical support and the California Legislature for moving quickly to make this award possible. I look forward to our continued work together to build a clean, affordable and reliable energy future for our state."

Original Article: Noozhawk by Mackenzie Schuman/ San Luis Obispo Tribune

Southern California water agencies join providers in 6 states to reduce use

States that use water from the Colorado River have been unable to reach a realistic agreement on how to reduce consumption enough to keep the river a viable source — especially since the last drought has dropped reservoirs to record lows.

So agencies that provide water directly in six of those states have joined together in a Memorandum of Understanding, saying they will take the initiative to further reduce water use and find other ways to stop taking so much from the Colorado River, according to a recent press release. The Metropolitan Water District, which supplies imported water to most of Southern California, has signed the agreement, as has Long Beach Water and San Diego County.

Other municipalities and water districts can still join the agreement, but the MOU with 30 signatories has been sent to the federal Bureau of Reclamation, which has responsibility for water use on the Colorado.

Colorado River consumption is regulated by contracts among seven states, Mexico and a coalition of American Indian tribes.

But that agreement over-allocated the amount of water available even before the mega-drought, which has stretched for two decades. This summer, water levels on Lake Powell and Lake Mead hit historic lows, with predictions that they will be so low next year they will no longer be able to produce hydro-electric power.

Earlier this month, the U.S. Department of the Interior (under which the Bureau of Reclamation falls) issued a letter to the Colorado River Compact members saying it would impose restrictions if they didn't reach an agreement to reduce consumption. There have been some concessions, including MWD agreeing to reduce its reliance on Colorado River water. But the California drought also has reduced supplies from northern California, prompting MWD to declare a water emergency this summer, with mandatory restrictions on the cities it supplies.

But rather than wait for the states to come to agreement, or for the federal government to impose restrictions, local agencies in six states have committed to local action.

The MOU promises, among other things, to increase emphasis on eliminating "non-functional turf" — grass lawns — with a goal of reducing grass by 30%. It also promises more water reuse and recycling programs, and implementing water efficiency strategies by sharing best practices.

"Forging a sustainable future for the Colorado River will take a commitment from all of us to use less water. More than two dozen water agencies from cities across the

Southwest have made this commitment on behalf of the millions of people they serve," Adel Hagekhalil, Metropolitan Water District of Southern California general manager, said in the Wednesday, Nov. 16, press release. "This MOU is a key step towards bringing the River into balance, and powerful proof that working together, we can build solutions."

MWD has long provided incentives to reduce residential lawns. And this year, the agency banned decorative turf at industrial and commercial centers. It also sets rates based on consumption levels to encourage conservation and punish high water use. Those rates are typically passed on to customers.

Long Beach, one of only a handful of MOU signatories from Los Angeles County — Burbank and Santa Monica are the others — has promoted a "Lawn to Garden" turf removal program for more than a decade, with various levels of rebates to homeowners when they tear out lawns and replace them with drought-tolerant plants. Currently, the city will pay $3 a square foot to those who remove their front lawns and $2 for back yards, with some restrictions.

Chris Garner, Long Beach Water Department's general manager, said that in the last two months, the city has reduced water usage by 17% compared to the same period in 2020. The city has maintained multiple water efficiency programs since the early 2000s.

"Saving water is the Long Beach way of life, and we've achieved significant water savings over the past several decades," Garner wrote in a letter to the U.S. Bureau of Reclamation regarding the agreement. "Today, the Long Beach community uses 33 percent less water than it did in 2000.

"Long Beach Water continues to promote conservation through community outreach, direct install appliance initiatives, and incentive and rebate programs," he added. "In addition, our department is investing in projects and strategies to reduce water demand, enhance access to local groundwater, and increase our use of recycled water."

Cities and regional water providers from California, Arizona, Colorado, Nevada, New Mexico and Utah have joined in the agreement (Wyoming is the seventh state in the compact). Under the MOU, the agencies agree to implement new conservation and water efficiency efforts, but there are no specific targets or penalties for non-compliance.

"As a longstanding regional leader in conservation, Long Beach Water joins with other water agencies to affirm and stress the importance of the Colorado River as an essential water supply for millions of Americans," Gloria Cordero, president of the Long Beach Board of Water Commissioners, said in a statement. "Our residents and businesses have consistently heeded the call to save water and, as an agency, we continue to invest in our effective conservation programs and in enhancing our local water supply to reduce our demand on the Colorado River and help preserve this precious, drought-stricken resource."

In its fiscal year 2023 budget, the Long Beach Water Department emphasized increasing ground water usage to reduce the amount of imported water. There are six wells under construction now — some new, others getting refurbished — and six more in the planning phase, according to Lauren Gold Howland, Long Beach Water Department spokesperson.

Original Article: Press Telegram by Harry Saltzgaver

Southern California serving hot Santa Ana winds for Thanksgiving

Southern California residents considering deep-frying or grilling a Thanksgiving turkey outdoors might want to think twice this holiday season.

Thanksgiving Day is shaping up to be the warmest and breeziest day of the week, with another in a series of Santa Ana winds expected to usher in wildfire concerns in Southern California.

Santa Anas, easterly winds that develop because of high pressure over the Great Basin, such as the Nevada and Utah area, typically come in from the northeast and pass over the mountain slopes into the Los Angeles area, according to the National Weather Service.

Winds could reach 30 to 50 mph Thursday, with the strongest gusts in the mountains and foothill areas, such as the Santa Clarita Valley, the Porter Ranch area and down to the Malibu coast, according to the National Weather Service. By Friday, the winds are expected to subside to around 25 to 45 mph.

The winds on Thanksgiving will mark the the third Santa Ana event in a week after gusts toppled semi-trucks, damaged electrical equipment and ignited a blaze in a Fontana pallet yard last week.

“It might be similar to the previous one we had,” forecaster Rich Thompson of the weather service said. “But nothing too bad.”

Thursday is also expected to be the warmest day of the week due to high pressure building overhead, Thompson said. Temperatures could top into the lower to mid-80s, with relative humidity values near the 10% range, possibly even lower in some areas.

The warmer weather, coupled with lower humidity levels, could increase the wildfire risk in the region.

“Be careful with ignition sources, and if you live in a fire-prone area, just be prepared in case something develops,” Thompson said. “Any fire that starts will have the potential to spread very quickly.”

Thompson also recommended being careful while driving any high-profile vehicles that could be toppled by the winds.

Over the weekend, temperatures are expected to cool down into the mid-60s to lower 70s. There is also a chance for light rain Monday and Tuesday, but Thompson said the weather models were still too far out to determine timing and potential rainfall amounts

"It's not looking like a monstrous rain event or anything like that," he added.

Original Article: The LA Times by Summer Lin

State water agency wades into lawsuit to maintain its authority over groundwater plans

A lawsuit over groundwater plans in the northern end of the San Joaquin Valley is being closely watched as it could have implications for how the state's groundwater mandate moves forward, according to a recent briefing on the issue at the Kern Groundwater Authority.

At the Nov. 16 meeting, authority attorney Valerie Kincaid explained that the lawsuit, filed in 2020, seeks to have a court invalidate six groundwater plans in the Delta-Mendota Subbasin, which runs along the western edge of the valley from west of Fresno north to west of Modesto.

The Department of Water Resources filed an amicus brief in the suit, which was bought by the California Sportfishing Protection Alliance, Kincaid explained. An amicus, or friend of the court brief, can be filed by a group that has a strong interest in a case.

"In that amicus, DWR said: 'We don't think that the court has the authority to review the substance of a plan for compliance with SGMA, that in fact is the job of DWR,'" Kincaid said.

DWR claimed that the Legislature did not intend for the courts to decide the validity of the plans.

Kincaid noted DWR had not addressed whether the court could intervene after DWR had decided whether a groundwater plan was adequate.

Groundwater plans are required under the state's Sustainable Groundwater Management Act (SGMA) and were initially filed with DWR in 2020. Most were found incomplete and were resubmitted in July 2022 for re-evaluation, which is ongoing.

It's unclear how the process would move forward if groups can have courts intervene before plans are fully evaluated by the state.

Groundwater sustainability plans are highly technical studies that must consider a number of variables in order to achieve SGMA's goal of bringing overpumped aquifers into balance by 2040. That generally means more water shouldn't be pumped out than goes back in.

But groundwater plans must also avoid certain "undesirable" results including: chronic lowering of groundwater tables; water quality degradation; land subsidence (sinking);

reduced groundwater storage; depletion of interconnected surface water (river water being sucked into a groundwater deficit, for example); and seawater intrusion.

California Sportfishing's suit claims the six groundwater plans covering the Delta-Mendota Subbasin aren't likely to achieve their sustainability goals.

The parties in the suit have so far not responded to the amicus brief, which DWR filed on October 27.

The court will ultimately decide whether it has the authority to assess groundwater sustainability plans, as well as whether the Delta-Mendota Subbasin's plans should be invalidated.

Original Article: SJV Water by Rose Horowitch

US WATER NEWS

As the Colorado River is stretched thin by drought, can the 100-year-old rules that divide it still work?

Cowboy Michael Klaren heaved hay bales onto his wagon, climbed aboard and urged his two workhorses to drag it across a meadow, the ground spongy with the meltwater from a snowstorm.

Wet boots had raised his spirits on this March morning, as had two wet cow dogs he called Woodrow and Gus. The meadow was off to a more promising head start on spring than he had come to expect after years of drought.

If left to run off in rivulets or percolate through the pasture, the moisture from the Colorado River's prodigious Wyoming headwaters would collect in the nearby New Fork, join the Green River, and ultimately surge across three state lines before swelling the Colorado in southeastern Utah and buoying the Southwest's depleted reservoirs.

But first, Klaren would wring some of it out for his next hay crop.

"Personally, I think the water that falls in Wyoming is Wyoming's until it gets to Utah," he said. "When it falls here, it's our water."

If it were that simple, Klaren and his mountain town would have little to fear. But 100 years ago, Wyoming signed onto a deal to divide the water that flows through the

Colorado River basin among seven states. It's based on a formula — one likely based on mistaken beliefs about the river itself — that did not award extra credit for living in the mountains where the snow piles up.

Instead, the states signed a compact allocating the water where it would readily be put to work. It meant the more populated states of California, Colorado and Arizona would get the biggest shares. And it meant in lean years, water users in places like Pinedale might go without, watching as runoff from the jagged Wind River Range flowed past the mountain ranches to farmers and cities far downstream.

Over time the government built massive dams near Las Vegas and Page to store the water for those big downstream users: a Yuma lettuce field, an Imperial Valley melon patch, the Phoenix suburbs, all stretching toward a desert horizon far from the river's channel.

But more than two decades into a punishing drought that climate scientists say will likely intensify with more warming, the system can no longer supply everything that some 40 million people in a warming and drying region desire from it, or that grocers nationwide sell from its verdant fields. Since 2000, water demand and evaporation have exceeded the river's flow, on average, by roughly 15%.

The federal and state governments that share the water are now urgently seeking conservation to save the river. Their negotiations could produce either a new system of sharing the pain of cutbacks or an impasse that ends in lawsuits as states and water users try to hang onto water promised them in a different time.

Farmers like Klaren are among the most at risk, in part because they use the most water. Agriculture, not big cities, consumes as much as 80% of the river's flow in any given year. Shutting down the canal that feeds Phoenix and Tucson wouldn't stabilize the reservoirs, Arizona's water resources director said early in November. The government could cut off municipal deliveries across the basin and still face shortages if farms don't adapt to the shrinking flows of a warming climate

Interstate negotiations have proceeded haltingly this year in an emergency effort to conserve billions of gallons needed to keep America's biggest dammed reservoirs — lakes Mead and Powell — from emptying. The U.S. Interior Department has also begun a process for determining how to operate the dams and preserve the river beginning in four years, when current rules expire.

Despite his wish to use local water as he and his neighbors see fit, Klaren knows that a worsening shortage endangers the life he chose in 1989. That's when, just three years removed from high school, he leased this place and started grazing cattle on it.

But Klaren would save fretting for another day. His son and future daughter-in-law worked in the next field, feeding and assisting cows and calves.

"You guys cannot imagine how cool it is for me to see my son doing this," he said.

His graying horseshoe mustache curled into a smile, deepening the sun-creased crow's feet around his eyes. He snapped the reins.

He had no complaints, so long as the water holds out.

The devastating combination of a warming climate and sustained overuse has long bent the Colorado River, but now stands ready to break it. If neither the demand nor the weather relents, it's possible the river could finally stop flowing past Hoover Dam by the end of President Joe Biden's term.

Farms with senior water rights on paper would not be able to claim their due from a dry riverbed. Phoenix, while backstopped with other in-state sources such as the Salt River, would have to stop pouring Colorado River water into its aquifer for future demands, and start pumping what is already there. Small ranch towns like Pinedale and even major farm service centers like Yuma would lose jobs and population as they are forced to reduce production.

A hundred years since seven states agreed to split up the Colorado River Basin's bounty with a federally chartered compact, persistent drought and overuse have laid bare the flaws in the "Law of the River," a set of laws, settlements and treaties that parcel out the water. The rules assumed a river flow that has only rarely existed since, and only in increasingly rare wet years. The states and Mexico now use more than the river supplies, and are drawing down their storage from years past.

Plunging reservoirs behind Hoover and Glen Canyon dams imposed austerity on central Arizona farmers this year and will spread still more pain in 2023. Without action to save massive amounts of water, a worst-case weather scenario could drop Lake Mead so low that it no longer releases any water toward the sprawling farm empires and cities of Arizona, Southern California and Mexico.

"We really are in a crisis," Central Arizona Project General Manager Ted Cooke said. If everyone takes what they're currently taking from the river over the next two years, he said, Lake Mead's surface will sit just above the point where it can still flow through Hoover Dam. California and Arizona would be on the precipice of losing their massive supplies from the river.

The U.S. Department of the Interior and its water managers, the Bureau of Reclamation, established dam-operating guidelines in 2007 that were meant to prevent such a calamity. They hitched certain cutbacks to various water levels in Lake Mead, and led to Arizona's first mandated cutbacks this year. Their updated guidelines for 2026 and beyond will likely prescribe deeper cuts.

The Interior Department declined to make officials available for interviews about if and how the new guidelines might address or alter allocations among the states. In public settings over the last year, Interior and Reclamation officials have said only that they intend to build on the existing compact, as they have done with various water-saving agreements over the years.

Many experts say the time has come for the federal government to shake up the system it created when it built the dams to grow the West. That scheme awarded half to an Upper Colorado Basin in the mountains and sagebrush plains, and half to the Lower

Basin in the desert Southwest and coastal Southern California. Some, heeding climate scientists' projections of still lower levels, say the government will have to limit the states to percentages of the Colorado's year-to-year flow rather than the firm allocations they've always had on paper.

Having never used all the water that they were promised in the 1922 Colorado River Compact, the Upper Basin states now find there's no more to go around. The only way Wyoming, Colorado, Utah and New Mexico could grow into their full allocation in the current climate would be to force Arizona, Nevada, California and Mexico to give back more of the water they're already using.

Bruce Babbitt is among those who expect the U.S. will have to change the rules if drought continues to suppress river flows and reservoir levels over the next couple of years. The former Arizona governor and U.S. Interior secretary said the river will soon decline to the point where it's impossible for the Upper Basin to meets its fixed yearly commitments to the Lower Basin without "progressively shutting down current Upper Basin uses. That is an ethical and political impossibility.

"At that point," Babbit said, "the equitable solution will be to share reductions proportionately among all users in both Upper and Lower basins."

Original Article: AZ Central by Brandon Loomis

US approves largest dam removal in history to save endangered salmon: Four dams on California-Oregon border to be decommissioned on Klamath River, which fish use to reach spawning grounds

A US agency seeking to restore habitat for endangered fish gave final approval on Thursday to decommission four dams straddling the California-Oregon border, the largest dam removal undertaking in US history.

Dam removal is expected to improve the health of the Klamath River, the route that Chinook salmon and endangered coho salmon take from the Pacific Ocean to their upstream spawning grounds, and from where the young fish return to the sea.

The US Federal Energy Regulatory Commission issued an order surrendering the dam licenses and approving removal of the dams.

The project has long been a goal of several Native tribes whose ancestors have lived off the salmon for centuries but whose way of life was disrupted by European settlement and the demand for rural electrification in the 20th century.

"The Klamath salmon are coming home," Joseph James, chairman of the Yurok tribe, said in a statement. "The people have earned this victory and with it, we carry on our sacred duty to the fish that have sustained our people since the beginning of time."

Climate change and drought have also stressed the salmon habitat; the river has become too warm and too full of parasites for many fish to survive.

The dams on federal land, which at full capacity provide enough electricity for 70,000 homes, will be surrendered by the power utility PacifiCorp, a unit of Warren Buffett's Berkshire Hathaway.

Faced with costly new regulations that included building fish screens and ladders, the company instead entered an agreement with the tribes and the US government to decommission the dams.

PacifiCorp is contributing $200m toward dam removal, paid for by a surcharge on its customers in Oregon and California, said Bob Gravely, a company spokesperson, and California voters approved a bond measure for the state to provide an additional $250m.

Original Article: The Guardian

Texas AG vows to protect interstate Rio Grande Compact over Biden objection

After years of dispute and finally reaching an historic agreement over the use of water from the Rio Grande River, the states of Texas, New Mexico and Colorado are requesting a special master, and eventually the U.S. Supreme Court, to approve their settlement terms in light of a recent objection raised by the Biden administration. Texas Attorney General Ken Paxton says he will fight on their behalf after the states finally resolved a dispute over an 84-year-old compact that Texas sued over in 2013. The Rio Grande Compact, which Texas, New Mexico and Colorado entered into in 1938 and was approved by Congress, was devised to equitably apportion the waters of the Rio Grande River among the three states through which it flows. The Texas legislature also ratified the agreement, which became part of the Texas Water Code. The river is a vital water source for the three U.S. states and four Mexican states, flowing through arid, semi-arid and desert terrain. Due to the massive agricultural reliance on water from the river, only 20% of the river's water is estimated to reach the Gulf of Mexico.

The Rio Grande River flows along the southern boundaries of 13 Texas border counties. At the center of the dispute is the region between Elephant Butte Dam in Truth or Consequences, New Mexico, and Hudspeth County, Texas. The dam confines the Elephant Butte Reservoir, which New Mexicans use primarily for agriculture, as well as recreation and hydroelectricity. Hudspeth County is the second-most west located Texas county, located directly east of El Paso County, which borders New Mexico.

In 2013, Texas sued over the compact in Texas v. New Mexico and Colorado. Texas alleged New Mexico was unfairly syphoning water from the river before it reached Texas. New Mexico counterclaimed, alleging Texas violated the compact.

After years of dispute, the Rio Grande Compact Commission, a body of commissioners from each state, reached an agreement in a special meeting held on Nov. 10. Each state's

commissioner signed a resolution stating they'd considered a consent decree in a closed executive session and found it "to be consistent with the Compact and fair to all Compacting states."

The consent decree, they said, "provides for the collection, correlation, and presentation of factual data necessary for the administration of the Compact's apportionment of water among New Mexico and Texas below Elephant Butte Reservoir."

The commission also recommended to the attorneys general of Texas, New Mexico and Colorado "that they approve the Consent Decree for administration of the Compact as a resolution of the current dispute among the States regarding the apportionment of water below Elephant Butte Reservoir."

However, the Biden administration recently announced it objected to the terms of the agreement. As a result, Texas, New Mexico and Colorado requested the special master, and ultimately the Supreme Court, to approve their agreement over the administration's objection.

Of the development, Paxton said, "I've continued to fight to ensure our state has the legal access to the Rio Grande River that we're owed, and that we can responsibly use the river's resources to limit the damage of droughts and help Texas farmers."

He added that the agreement "helps protect the resources of all the states involved" and encouraged the federal government "to reconsider its objection" to it.

The nearly 1,900-mile-long Rio Grande River originates in the San Juan Mountains of Colorado at 12,000 feet above sea level. It flows south through New Mexico into El Paso, Texas, where it becomes the international boundary between Texas and Mexico. After the 1848 Treaty of Guadalupe Hidalgo was signed, ending the Mexican American war, the river became the international border, which is now "ground zero" for Texas border security efforts. Paxton has also filed numerous lawsuits against the Biden administration for failing to secure the border as millions of people from over 150 countries have walked across the river to illegally enter Texas.

In Texas, the river stretches from the farthest west in El Paso, southeast along Texas' 1,254-mile-border with Mexico, ending in the Gulf of Mexico.
Original Article: Highland County Press by Bethany Blankley

VELES WATER WEEKLY REPORT

Microsoft, Meta and Others Face Rising Drought Risk to Their Data Centers

"Drought conditions are worsening in the U.S.," reports CNBC, "and that is having an outsized impact on the real estate that houses the internet."Water is the cheapest and most common method used to cool the centers. In just one day, the average data center could use 300,000 gallons of water to cool itself — the same water consumption as 100,000 homes, according to researchers at Virginia Tech who also estimated that one in five data centers draws water from stressed watersheds mostly in the west. "There is, without a doubt, risk if you're dependent on water," said Kyle Myers, vice president of environmental health, safety & sustainability at CyrusOne, which owns and operates over 40 data centers in North America, Europe, and South America. "These data centers are set up to operate 20 years, so what is it going to look like in 2040 here, right...?"

Realizing the water risk in New Mexico, Meta, formerly known as Facebook, ran a pilot program on its Los Lunas data center to reduce relative humidity from 20% to 13%, lowering water consumption. It has since implemented this in all of its center. But Meta's overall water consumption is still rising steadily, with one fifth of that water last year coming from areas deemed to have "water stress," according to its website. It does actively restore water and set a goal last year to restore more water than it consumes by 2030, starting in the west.

Microsoft has also set a goal to be "water positive" by 2030. The good news is we've been investing for years in ongoing innovation in this space so that fundamentally we can recycle almost all of the water we use in our data centers," said Brad Smith, president of Microsoft. "In places where it rains, like the Pacific Northwest where we're headquartered in Seattle, we collect rain from the roof. In places where it doesn't rain like Arizona, we develop condensation techniques."
Original Article: Slash Dot

This Utah official applauds Nevada's water conservation measures, but cautions against direct comparisons

Golf course "water budgets." Pool size limits. A ban on nonfunctional turf. Full-time water wasting investigators. The Southern Nevada Water Authority is hard core in its water-conservation measures compared to Utah.
But to be fair, the comparison isn't really apples to apples.
"Southern Nevada Water Authority is a water conservation leader. We appreciate the path they have charted and look to their advice and collaboration as we implement more aggressive conservation measures in the state of Utah," said Kim Wells, communications director for the Utah Department of Natural Resources.

But, Wells notes, it's difficult to compare the conservation measures of a comparatively compact regional water authority like the Southern Nevada Water Authority against that of a state with 470 separate water agencies scattered in several unique climates, all within a state that's more than 600 times the size of Las Vegas.

Also, Utah has one thing over Nevada and the rest of the U.S. The Utah Legislature this year OK'd the first statewide grass removal rebate program in the country and funded it with $5 million.

Plus, Utah water suppliers, which used to rely entirely on voluntary reductions in water use, are increasingly implementing mandatory water conservation measures, turning off water completely for repeat violators and working with local governments to limit grass in new development.

The water districts may not be outlawing nonfunctional turf like the Southern Nevada Water Authority — they actually don't have the statutory authority that the Nevada authority does — but limiting grass to a water efficiency standard of no more than 35% of landscaping is gaining a toehold in Utah.

"Historically there hasn't been a lot of interest for new-development mandates," said Jonathan Parry, assistant general manager for the Weber Basin Water Conservancy District.

But of the district's approximately 45 municipalities within its service area, 17 so far have adopted some form of limits on using grass in landscaping for new construction. "Some are more aggressive than others but all have at a minimum moved the bar on turf utilization," Parry said.

Jordan Valley Water Conservancy District is also seeing success in working with its municipalities to impose limits on grass for new developments. "High-growth areas such as Herriman, Bluffdale, South Jordan, West Jordan, Kearns and to a lesser extent West Valley City have all adopted water efficiency standards that will be applied to new construction," said Cynthia Bee, Jordan Valley's outreach coordinator.

Original Article: Deseret News by Wendy Ogata

GLOBAL WATER NEWS

Finance costs water down Severn Trent's profits

In a year where water utilities faced much higher scrutiny of their dumping of sewage, worry over supply during a very hot summer and a generally tougher operating environment, Severn Trent (SVT) has made it out largely in good health so far.

The utility, which covers an area stretching from the Cotswolds to Lincolnshire, did see a hit from higher financing costs, which were up £66mn on last year. It took on £400mn in new debt in the six-month period as well. The impact on adjusted earnings per share was significant – these fell by almost half to 29.9p.

At the same time, net labour costs actually came down, while power costs jumped 75 per cent to £96mn. This was mitigated by using sewage sludge and food waste to generate electricity. Severn Trent also owns other renewable energy assets.

As a consumer-facing operation, inflation will be folded into bills, and regulator Ofwat last week confirmed its decision to allow Severn Trent to add £102mn to bills next year as a marker of good performance. Southern Water and Thames Water had to hand back a combined £80mn for "missed targets on water treatment works compliance, pollution incidents and internal sewer flooding across 2021-22".

This penalty means good stewardship is positive for shareholders, too – Severn Trent wants to reduce its "combined sewer overflow activations" to 20 a year by 2025. The utility did not give a number on this for the half year, but said the low rainfall meant "activation levels were particularly low for the first half of the year".

Original Article: Investors Chronicle by Alex Hamer

Miniature water purification technology ensures safe water for the Armed Forces, at anytime, anyplace

Scotland-based Novus received DASA funding to develop their high speed, low energy water distillation unit that can purify water from practically any source, such as sea water, swamps, wells, floods, rivers, and even waste water.

Novus' technology utilises innovative high temperature evaporation techniques to evaporate water vapour leaving containments behind, resulting in medical grade water, suitable for drinking, field surgery and wound cleansing.

The purification device is also small, at around the size of two jerry cans, has low power requirements and has no removable parts that need to be maintained or replaced, such as carbon filters or reverse osmosis membranes.

The technology will not only reduce the logistical challenges of transporting bottled water, it will also reduce the risk of waterborne disease affecting mission success and ensure constant clean water supply.

Novus started developing the water distillation technology in 2018. They were at an early stage of development and had successfully tested the technology at The University of Edinburgh, but they had a long way to go towards a final product.

Novus began their journey with DASA after a meeting with Dr Debra Carr, Innovation Partner for Scotland, who encouraged them to submit their idea to the DASA's Open Call for Innovation. Their proposal was successful and Novus received funding to miniaturise the technology for a military case use.

At the end of the project, Novus demonstrated the water purification technology as part of a DASA hosted Demonstration Day in 2021. The virtual event was attended by senior military personnel in the Army and Royal Marines, who witnessed the innovation in action and were impressed by its capabilities to fulfil the challenge of miniaturising water purification capability, to ensure the self-sufficiency of military operations and to meet humanitarian challenges.

Original Article: Gov.uk

United Utilities interim profit rises on net finance income

United Utilities Group PLC on Wednesday reported strong profit growth in the six months to September 30, on the back of a swing to a net finance income from a net finance expense.

The Warrington, England-based water works company posted a pretax profit of GBP426.3 million, compared to GBP212.7 million a year before.

However, this mostly reflects a GBP255 million decrease in reported net finance expense, including fair value movements. It reported a GBP136 million net finance income, compared to a GBP119 million net finance expense a year prior.

Revenue edged down 1.4% to GBP919.3 million from GBP932.3 million.

The water works increased its interim dividend by 4.6% to 15.17 pence, up from 14.50p.

Looking ahead, United Utilities expects annual revenue to be around 1% lower than a year before. "While the current challenging macro environment is impacting financial performance, the economic performance of our business remains robust, supported by our strong balance sheet, effective hedging policies and tight cost control," United Utilities said.

Original Article: Morning Star by Tom Budszus

Dry Weather In Southern Eu Raises Concerns For Winter Crops, Mars Says

Winter crops in most of Europe were off to a good start, helped by historically warm weather and sufficient moisture, but a lack of rain is prompting concern in the southern region, the European Union's crop monitor MARS said on Monday.

Crop conditions for next year's harvest are being closely watched at a time when grain and oilseed global supplies are being disrupted by the war in Ukraine and after summer crops like maize already endured historic drought in the EU last season.

"In most regions, the exceptional warm temperatures, combined with adequate topsoil moisture conditions, favoured emergence and early establishment of winter crops, and allowed late sown crops to catch up in development," MARS said in a monthly report.

The period under review in the report, between Oct. 1 and mid-November, was the warmest on MARS' records going back 31 years.

Negative effects from warmer-than-usual temperatures, including low frost tolerance and increased pest and disease pressure, were not yet alarming, it said.

However it warned that dry weather in large parts of southern Europe, including southern Spain and central and northern Italy, eastern Romania and Bulgaria, was raising concerns for winter crops.

The situation was most serious in southeastern Bulgaria, where little rain had fallen since August, and substantial areas might have to be resown with other crops in spring, it said.

Some rainfall deficits were also observed in southern France, north-eastern Germany, eastern Poland, Lithuania, Slovenia and Croatia but so far without substantial impacts on winter cereals, it said.

For rapeseed, sown earlier than wheat and barley, MARS said the warm October had favoured crops' development in the main producing countries. It added, however, that considerable pest pressure had been reported during the review period.

The seasonal outlook up to the end of February was for likely warmer-than-usual conditions in Central and Eastern Europe and highly likely warmer-than-usual conditions in Scandinavia and northern European Russia, it also said.

Original Article: Successful Farming/ Thomson Reuters by Sybille de la Hamaide

The US$2.5 trillion blue economy investment opportunity

The ocean or the global “blue economy” contributes US$2.5 trillion ($3.8 trillion) a year in economic output – equivalent to world’s seventh-largest economy by GDP – and is expected to expand at twice the rate of the mainstream economy, reaching US$3 trillion a year by 2030.

The ocean covers three quarters of the Earth’s surface, providing food, energy, transport and recreation as well as hosting a major portion of the planet’s biodiversity. It plays a vital role in regulating the water and carbon cycles, absorbing around 25 per cent of carbon dioxide, while producing half the oxygen we breathe.

The largest ocean economy sectors include offshore oil and gas, maritime and coastal tourism, maritime equipment and ports. The largest employers are industrial capture fisheries with over one-third of the total, and maritime and coastal tourism with almost one-quarter. Strong growth is expected this decade in marine aquaculture, offshore wind, fish processing, and shipbuilding and repair. In 2030, the ocean economy is anticipated to be responsible for 40 million full-time equivalent jobs.

Highlights include aquaculture which produces half of the world's seafood. Fisheries and aquaculture provide direct or indirect employment to 10-12 per cent of the world's population, with more than 90 per cent of those employed located in developing countries. Some 90 per cent of international trade is delivered through over 50,000 merchant ships and 98 per cent of international telecommunications, carried on more than 1.2 million kilometres of submarine cables

Human impact

However, human use of ocean space and resources is affecting ocean health and sustainability. Often, the effects of sea-based activities are also accompanied by much more significant land-based sources of impacts, such as municipal wastes, agricultural runoff and plastics.

Some of the major challenges facing our oceans include climate change with warmer oceans, rising seas levels, bigger seas and cyclonic activity and moving fisheries. Ocean pollution is another challenge from plastics, and microplastics, waste run off and ocean dumping as well as noise pollution from shipping. Overfishing and illegal, unregulated and unreported fishing is another key issue with some 80 per cent of fisheries at risk of being overfished.

The shipping industry produces approximately three per cent of global greenhouse gases, and this continues to rise with growing economic activity. Traditionally cheaper bunker fuels are used on ships, but rules via the International Maritime Organisation are tightening.

Much of modern slavery takes place on ships and ports across the world, but in particular in developing countries and regions where regulation, monitoring and controls are often weaker. The overuse and coastal development, pollution, climate change is contributing to significant biodiversity loss in oceans as witnessed in the Great Barrier Reef. Solutions to many of these issues are starting to be addressed by global bodies and leading companies.

Investment opportunities

For such a significant component of the planet and the global economy and with the impacts and threats to its future, the ocean is under-invested. Of the 17 UN Sustainable Development Goals, SDG14 on the conservation and sustainable use of the ocean attracts only 3.5 percent of global investment.

Achieving a balance between "blue growth", jobs, and a healthy marine environment will largely be based on addressing the opportunities and challenges faced by the diverse and extensive, existing ocean activities. Existing kinds of ocean uses are expanding in intensity, duration, and geography. New ocean uses will be coming into effect in the next few years and decades including offshore renewable energy, decarbonisation, carbon dioxide sequestration and marine genetic resources use.

This creates a compelling investment case for finance and innovation by impact entrepreneurs and investors. One area that could hold great potential for improving

ocean sustainability is technology. While emerging areas such as renewable energy are technologically advanced, there is a lot of potential in areas such as fisheries, aquaculture, shipping and tourism.

The investments are available across asset classes, from start-up equity and debt all the way to global listed equities and bonds. Investors also range from global asset owners and their asset managers to the angel investors in oceans start-ups. There are now numerous ocean incubators and accelerator popping up across the globe, some in developing countries, and many in Europe and the US.

The European Investment Bank and many other foreign direct investors are supporting blue economy investment, with noted high activity in Norway, Spain and Portugal. To further develop the blue economy early-stage investments, a combination of different types of sustainable finance are being used, including philanthropic grants, investor supporting capital, impact investment, loans and blue bond issuances.

The World Ocean Council's Ocean Investment Platform is a global initiative that links ocean industries, innovators, and investors to accelerate investment in ocean sustainable development. This includes the Ocean Investor Roundtable, which brings together the growing number of funds dedicated to investing in ocean sustainable development opportunities. There is also the Global Blue Economy Innovation Initiatives Network which connects the around 100 ocean-sustainability related accelerators, incubators, challenge competitions and startup hubs.

Original Article: Investment Magazine by Michael van Niekerk

Calls for States to Boycott the Federal Government's Water Rights Intervention

Australia's food production and security will be "at risk" if the New South Wales (NSW) and Victorian state governments do not withdraw from the contentious Murray Darling Basin Plan, one community representative has warned.

Jan Beer, a representative from the Upper Murray River Catchment Association in Victoria, told The Epoch Times that the implications of the federal government's water buyback scheme would be far-reaching if pursued.

Under the scheme, the federal government buys water rights from irrigators using the Murray-Darling Basin for environmental reasons—an area considered to be "Australia's Food Bowl."

"It will affect our ability to export food. And particularly food producers in Victoria and New South Wales have already given up large amounts of water for the environment," Beer told The Epoch Times during a phone call on Nov. 11.

"If they buy back that water or they take that further water out of the consumptive pool, then food production and food security will be greatly affected because the irrigators get the very last of what's left in the consumptive bucket of water."

The NSW state government has responded to federal government moves saying it would oppose "non-strategic buybacks" due to the socioeconomic impacts

"When it comes to managing water my view is healthy rivers, healthy farms, and healthy communities, not one or the other," said NSW Minister for Lands and Water Kevin Anderson in a statement on Nov. 16.

The Water Rights Tug-of-War

Water buyback schemes are a controversial part of the 2012 Murray Darling Basin Plan and involve the federal government "buying back" water entitlements from farmers to reduce the amount of the resource being taken from the system, in turn, allowing the government to meet certain water-saving targets.

Environmentalists have tended to champion buybacks because it keeps more water in the system, while farmers and industry have resisted—the Murray-Darling Basin Plan is designed to balance the interests of both.

Yet the state governments, the current federal opposition, and national farming groups such as the National Farmers Federation and the National Irrigators Council, have staunchly opposed the move.

Both the federal Coalition and Labor governments have undertaken water buybacks since 2008.

In 2008, then-water minister Penny Wong announced a $50 million scheme to buy water from irrigators, considered a "downpayment on the future of the Murray River" and a "first" in the nation's history, reported the Australian Broadcasting Corporation (ABC).

However, there were community concerns over job losses. Later in 2015, direct negotiations between the relevant federal departments and irrigators were held.

More recently, there are concerns that Labor will continue to up its commitment to the scheme after its recent budget allocated an undisclosed amount of funding—not revealed due to "commercial sensitivities"—for meeting "water-saving targets" for the Murray-Darling Basin.

Beer warned the price of water to farmers would skyrocket if the federal government entered the market.

Original Article: The Epoch Times by Henry Jom

From water-deficient to 'water surplus' state, how Gujarat saw change under Modi's leadership

Prior to 2001, Gujarat had a severe drinking water deficit. In order to provide drinking water, governments were compelled to spend billions of rupees on road tankers and in certain cases, special water trains. The State even had "water riots" because of severe water shortages that were made worse by insufficient management of water resources. Additionally, due to the water crisis, residents of Gujarat's drought-prone Saurashtra and Kutch migrated to Central and South areas. This human migration was usually

followed by the movement of cow herds, and it led to the displacement of hundreds of thousands of people on economic, social, and cultural levels.

Gujarat saw 12 major droughts between 1980 and 2001, according to statistics from the India Meteorological Department from 2015.

The average depth of the groundwater between 1975 and 1980 in the districts of Gujarat and Kutch was 30 metres. By 2001–2002, it had dropped to 150–250 m. The groundwater level was dropping at a pace of 3-5 metres per year. The Saurashtra region, in particular Kutch, was on the brink of turning into a desert in around two decades if the situation was not quickly addressed.

State of affairs in Gujarat when Narendra Modi became CM in 2001

The story of how Gujarat transformed into national model for managing water resources began in 2001, when Narendra Modi became Chief Minister.

From his expertise as a social worker, Modi understood that the age-old issue in Gujarat could not be resolved by conventional approaches. It was necessary to implement a scientific strategy that made use of modern technology, astute planning, and assured delivery in a staggered manner.

Shortly after taking office, Modi instructed his team to improve existing canal systems rather than just rely on Narmada water, and he insisted on participatory management of drinking water and agriculture.

He broke the administrative stranglehold on projects while including NGOs and water beneficiaries from the start.

Most critically, Modi allocated money to build the infrastructure needed to distribute water.

Birth of BISAG

The Gujarat government created the state-level Bhaskaracharya Institute for Space Applications and Geoinformatics (BISAG) to aid in the supply of services and solutions for the deployment of map-based GeoSpatial Information Systems. The BISAG, a specialised institute that used satellite remote-sensing technologies and GIS-based maps to aid expedite the Gujarat infrastructure development model, was founded in 2003 as a result of the scientific attitude, with an emphasis on the use of technology. When the concept was mastered, it was applied to the water issue.

Micro-level check dams

Check dams are a traditional way of replenishing groundwater, particularly in dry locations. Gujarat had about 6,000 such check dams when Modi became CM in 2002.

One of the many reasons why this incredibly effective method of conserving and using water wasn’t expanded was a lack of understanding about where to build the dams to be more effective, as well as local political priorities. Space technology based on BISAG arrived to help.

Due to this, the total number of check dams increased from just under 6,000 to over 100,000 in only a few years, reaching 166,062 by mid-2016 with a storage capacity of more than 28,408 million cubic feet (mcf). Check dams were put in place, which greatly boosted the water supply.

Macro-level projects

At the macro level, three significant initiatives transformed the landscape of Gujarat, particularly in the Saurashtra, Kutch, and North Gujarat areas. Satellite-based planning and execution were also used in the deployment of these three major initiatives.

The Narmada Main Canal

The Narmada canal is the world's longest irrigation canal, reaching 458 kilometres in length and transporting 40,000 cusecs of water. The system of branch canals, sub-canals, and distributaries, moreover, is what has made the Narmada canal such a transformational undertaking. PM Modi launched the Kutch branch canal from this Narmada Main canal, which helps provide water to the most distant parts.

The Sujalam Sufalam Yojana

The main goal of this initiative is to irrigate the areas of North Gujarat. Due to the deepening of lakes, check-dams, rivers, and reservoirs, which started in 2018 after a weak monsoon, the state's water storage capacity has increased by 23,000 lakh cubic feet to date. It is a 332 km canal network that aids in bringing floodwaters from the Narmada and other rivers to the parched area of North Gujarat and supplies irrigation to around 2.2 million hectares of arable land.

The SAUNI Yojana (Saurashtra Narmada Avtaran Irrigation Yojana), which means literally "reincarnation of the Narmada River in the region," was thus introduced. In order to transmit the extra Narmada waters to more than 115 main reservoirs and irrigate more than 1 million acres of land, a 1,126-km network of four-link pipes was designed and constructed.

Administrative and Governance reforms

The organisational structure of water resource management was also altered by Narendra Modi, who replaced the umbrella organisation with functional divisions.

The Gujarat Water Supply and Sewerage Board retained responsibility for constructing and regulating water supply and sewerage systems.

In order to give village-level institutions the competence to manage and maintain their own water supply infrastructure, the Water and Sanitation Management Organization (WASMO) was founded.

Sardar Sarovar Nigam Limited was created as an independent organisation responsible for completing the project. To transport Narmada waters, Gujarat Water Infrastructure Limited was charged with developing bulk water pipe networks.

Gujarat has been designated a 'Har Ghar Jal' state, which indicates that all homes in the state now have access to fresh tap water. As part of the 'Jal Jeevan Mission,' the project

has been completed in phases throughout the years. According to state officials, all 91,73,378 houses in the state now have access to tap water.

Gujarat under Narendra Modi's leadership has come a long way from transforming itself from water deficit to a water surplus state and also with a tap water connection in every household.

Original Article: News Room Post by Himanshu Jain

The Ethiopian scientist on the search for water on the moon

Ethiopian-American Nasa research engineer Berhanu Bulcha is aiming to find a solution to the problem of locating water on the moon, to help humans set up a permanent base there.

Without water there can be no life.

Whether humans are on the Earth or elsewhere in the universe, that axiom remains the same.

Nasa's Artemis 1 rocket was finally launched this week - the start of an ambitious space exploration programme that is designed to take humans back to the moon and beyond.

Addressing the issue of how to get hold of water beyond Earth is crucial. The lunar base being planned would be impossible without the precious liquid and Dr Berhanu is leading a team working on how it could be found on our planet's only natural satellite.

Water can be transported from Earth but this is expensive and highly inefficient. Significantly lunar water could also be used to make rocket fuel, allowing the moon to be a platform for further space travel, which would bypass the need for the huge rockets required to overcome our planet's gravitational pull.

'Million-dollar question'

Dr Berhanu and his team are developing a prototype light-weight compact spectrometer that could definitively identify where water reserves are on the moon.

"It's the million-dollar question," he tells the BBC by phone from one of Nasa's offices in the US.

Since getting to graduate school at the University of Virginia 12 years ago, Dr Berhanu has been focussing on developing space instruments that would solve problems for Nasa - and arguably the search for water is the biggest problem of all.

The presence of some water on the moon has already been confirmed. But the issue with most methods of detection is that they cannot tell the difference between water, which is made up of hydrogen and oxygen, and hydroxyl, another hydrogen-containing compound.

Nasa expects human habitats on Moon this decade

The tiny laser device is part of a spectrometer that will allow for the detection of small molecules of water

The device assisted by the laser that Dr Berhanu is working on emits particles of light at a frequency specific to water, which can be used to pinpoint its presence.

His team is developing what are called quantum cascade lasers to reach this frequency that has been hard to achieve in the past, Nasa's news service reports.
Dr Berhanu describes it as a novel technological development that will enable astronauts to use a hand-held device to find both the location and volume of water - something which has not been achieved before.
The tiny instrument could also be deployed on a remotely operated rover. Reducing the size and weight of any objects designed to go on a lunar mission is crucial as space is at a premium.

Nasa says going back to the Moon is part of a stepping stone to learn how to get to Mars
Based at Nasa's Goddard Space Flight Center in Maryland, Dr Berhanu recently received $2.5m (£2.1m) to continue working on the prototype. It might take another two years to finish but Dr Berhanu says he is optimistic that it can be done and it will work.
There is no doubting his determination and tenacity - and he sees these as defining characteristics for himself.
The 38-year-old grew up in the Ethiopian capital, Addis Ababa, but moved to the US after high school to study physics and engineering at Virginia Commonwealth University.
He had to be self-reliant.
"When I came to the US I did not have a support network, I was supporting myself. I was really isolated from the culture I grew up in and immersed into a new culture. The first thing you think of is to work hard and succeed in education," he says, reflecting on his early years in his adopted country.
"There was the passion to know more, and the curiosity to know more about what the universe looked like and how big it is"", Source: Dr Berhanu Bulcha, Source description: Nasa research engineer, Image: Berhanu Bulcha
He admits it was a risky step to leave Ethiopia but the opportunities to work with cutting-edge technologies and on exciting research projects were hard to resist.
The inspiration to look out at the cosmos and wonder what was there, however, came from closer to home.
He had a religious Christian upbringing and says that his early introduction to the Bible led him to start asking questions about the universe and how things came about.
For some a strict adherence to the scripture could close off the exploration of different ideas but for Dr Berhanu it led him to look beyond himself.
"I was so fascinated about how things were created… [there was] the passion to know more, and the curiosity to know more about what the universe looked like and how big it is," he says.
That willingness to ask questions and look for the answers has led a young boy growing up in Addis Ababa to possibly help solve one of the key barriers to further space exploration.

For him, there is no doubt that hard work as well as finding the right mentors were key to his success.

But he says "the first thing is to have a dream, have a plan and work towards your dream… definitely there will be challenges but don't stop, just continue to work".

Original Article: Yahoo News by Damien Zane/BBC

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