

Veles Water Weekly Report

1. **WATERTALK**
TECHNICAL ANALYSIS BY JOSHUA BELL
2. **NQH2O INDEX VS H2O FUTURES PRICE PERFORMANCE**
3. **NQH2O INDEX HISTORY**
4. **NQH2O INDEX AND H2O FUTURES VOLATILITY ANALYSIS**
5. **CENTRAL VALLEY PRECIPITATION REPORT**
6. **RESERVOIR STORAGE**
7. **SNOWPACK WATER CONTENT**
8. **CALIFORNIA DROUGHT MONITOR**
9. **CLIMATE FORECAST**
10. **WESTERN WEATHER DISCUSSION**
11. **WATER NEWS**
 - I. CA WATER NEWS
 - II. US WATER NEWS
 - III. GLOBAL WATER NEWS

March 31st 2022

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

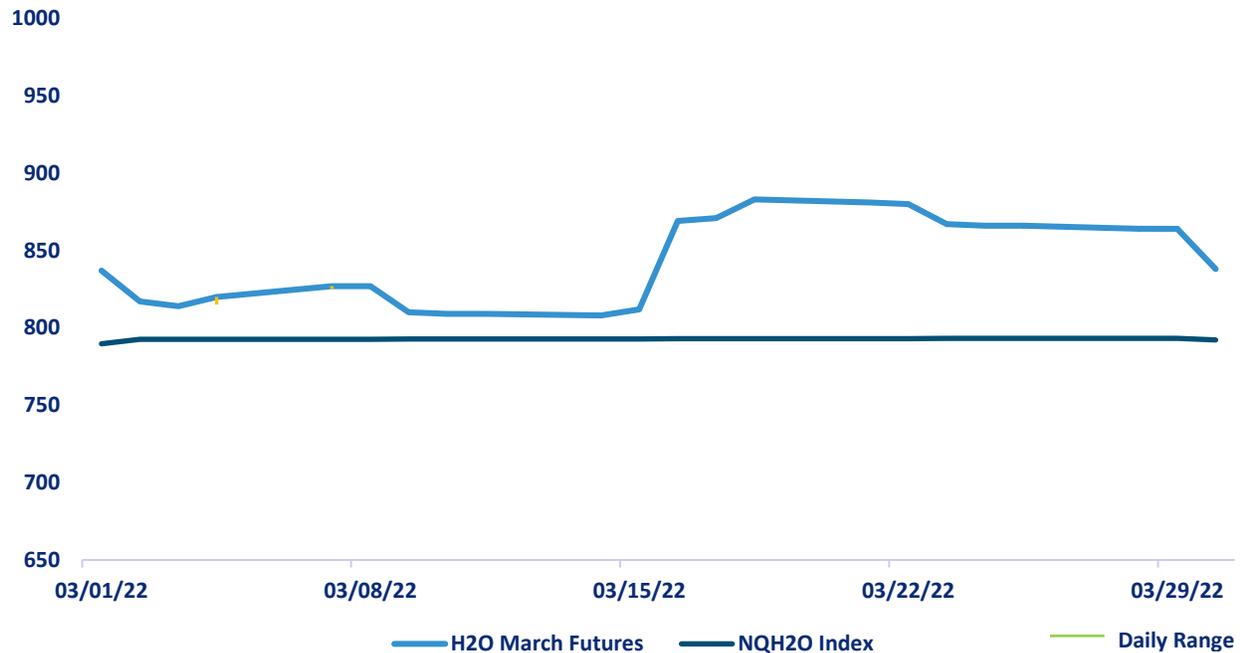
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/694309019>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

The new NQH2O index level of \$792.99 was published on the 30th of March, down \$0.03 or 0.22%. The Front Month or April Contract has been trading at a premium ranging from +\$45.01 to +\$72.80 to the index over the past week. We expect a further convergence of the futures and index prices with the most likely move being from the index upwards to catch the futures.

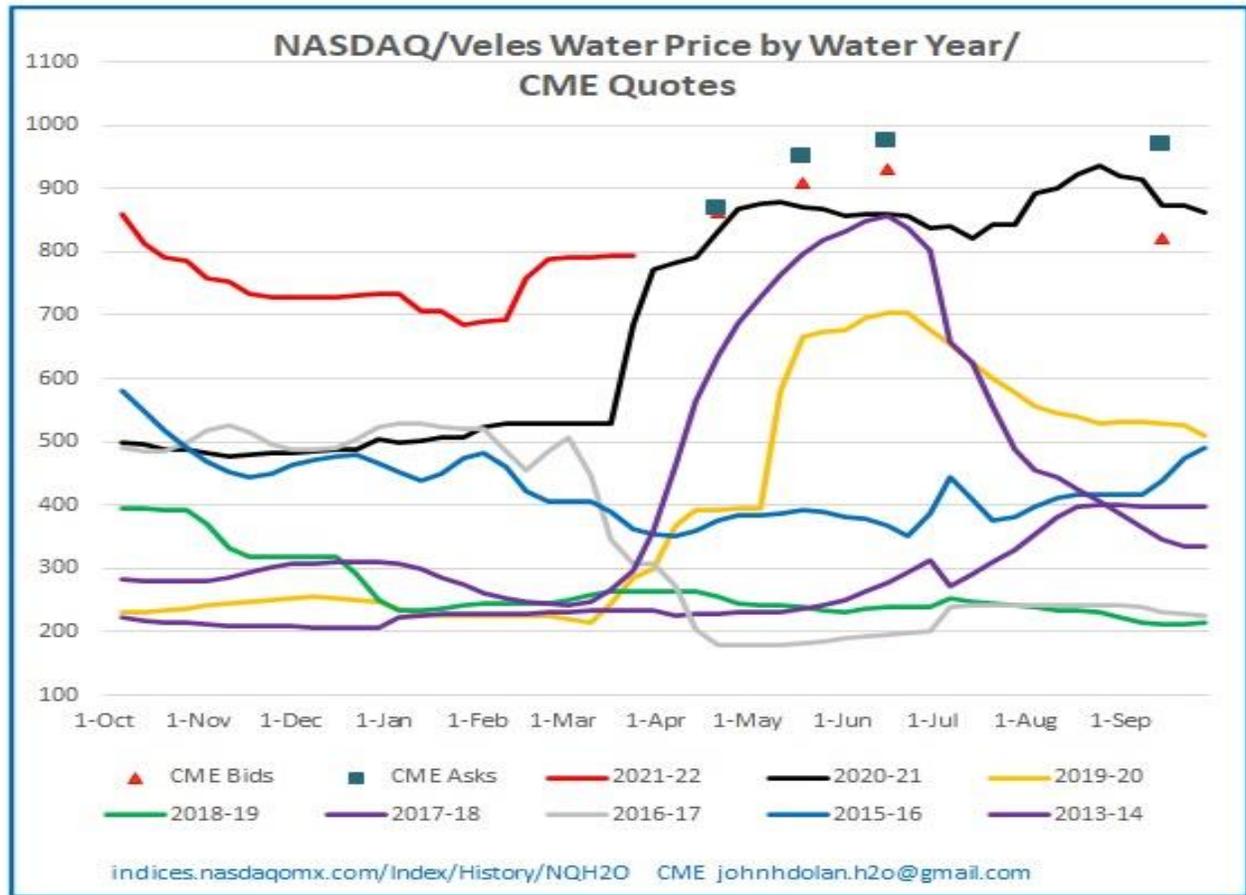
NQH2O is up 12.26% Year to Date.

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

April 22	830@839
May 22	890@910
June 22	900@940
Sept 22	820@890



NQH2O INDEX HISTORY



The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and the possibility of rain/snow. The restricted ability to “carry” water, much like one can do with financial contracts, gives this index the same type of seasonal pattern that one sees on some other commodities.

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

(John H Dolan, CME Market Maker)



H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the April daily future volatility high has been 2.13% on March 30th and a low of 0.08% on March 25th

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	21.68%	9.40%	0.06%	0.044%
H2O FUTURES	N/A	13.63%	9.05%	2.29%

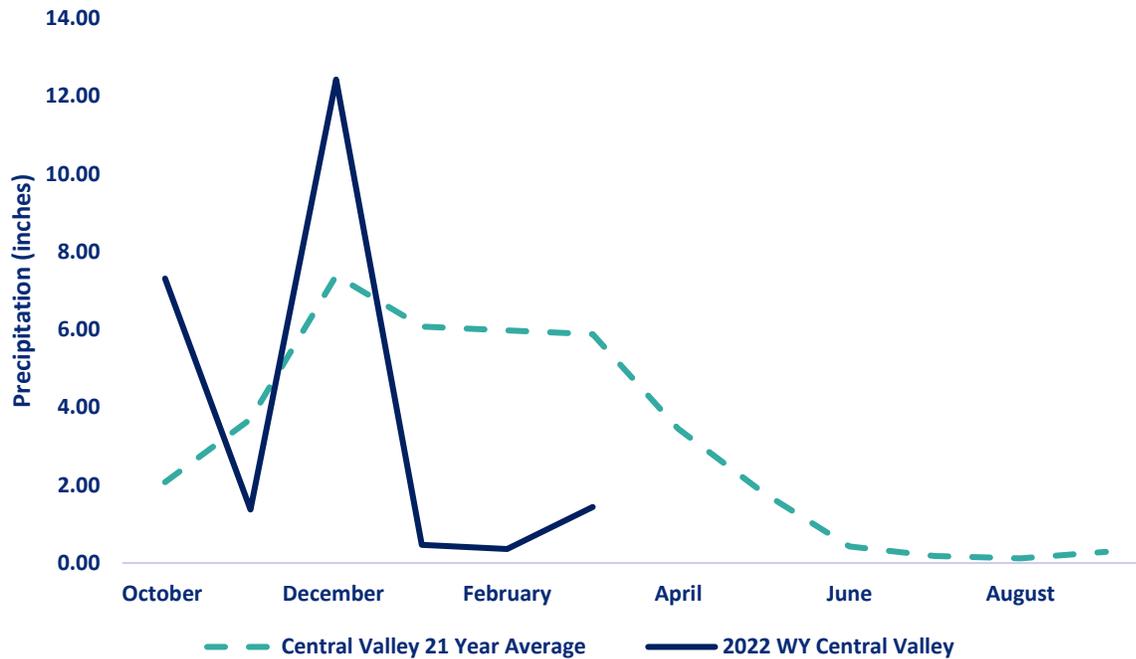
For the week ending on the March 30th the two-month futures volatility is at a premium of 4.23% to the index, down 0.02% from the previous week. The one-month futures volatility is at a premium of 8.99% to the index, up 0.28% from last week. The one-week futures volatility is at a premium of 2.24% to the index, down 0.03% from the previous week. We would expect convergence between the index and futures volatility, the most probable move is for the index volatility to increase. These are large differences in volatility possibly indicating a large underlying price move is imminent.

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



CENTRAL VALLEY PRECIPITATION REPORT

Central Valley Precipitation Index



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 30/03/2022

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2022 WYTD VS 2021 WYTD %	2022 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	1.66	0.62	28.47%	55	66
TULARE 6 STATION (6SI)	1.39	0.35	35.18%	41	63
NORTHERN SIERRA 8 STATION (8SI)	1.27	0.23	16.15%	51	76
CENTRAL VALLEY TOTAL	4.32	0.40	26.60%	49	68

RESERVOIR STORAGE

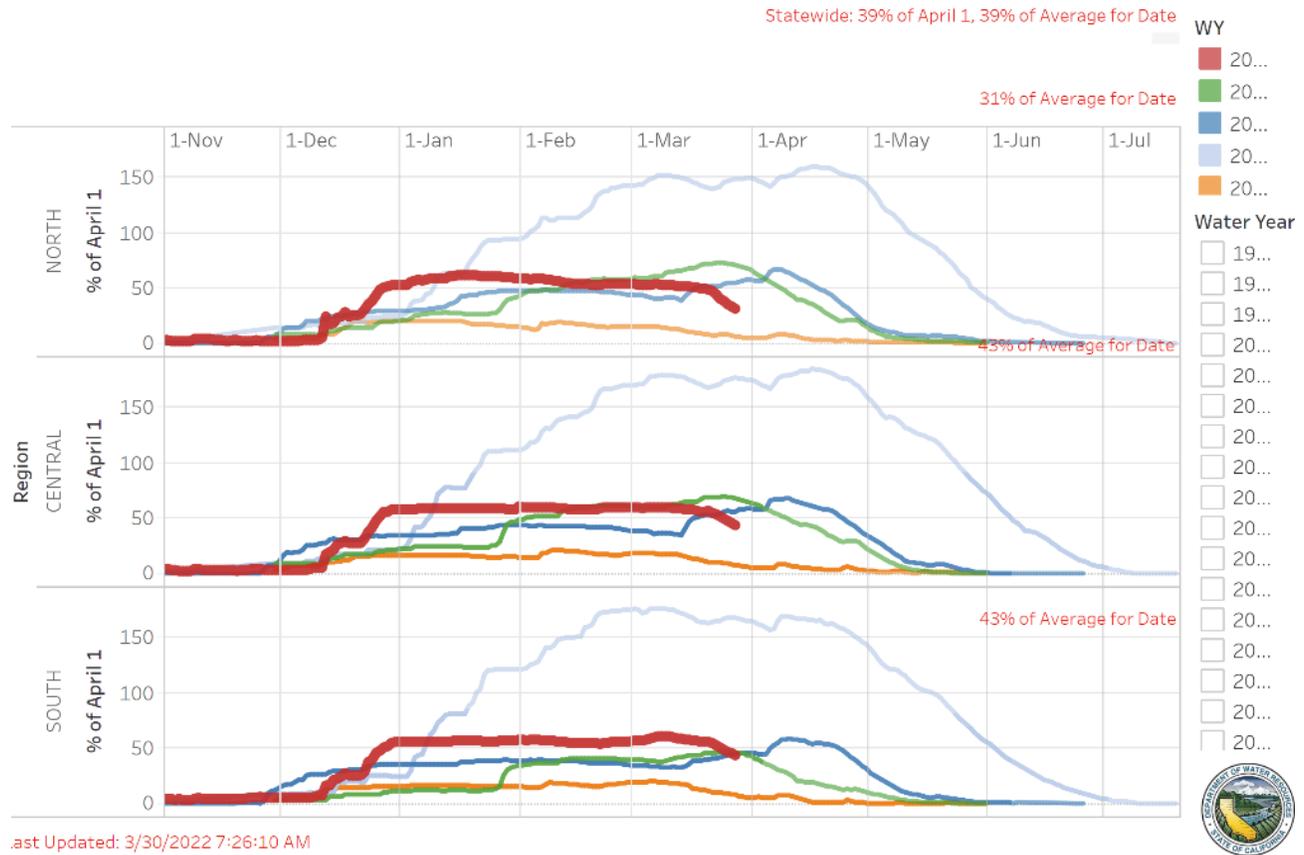
RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	807,588	33	53	45
SHASTA LAKE	1,729,990	38	52	48
LAKE OROVILLE	1,670,098	47	40	67
SAN LUIS RES	906,214	44	55	52

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



SNOWPACK WATER CONTENT

Snow Water Equivalent Dashboard



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	8.60	-4.40	70	31	31
CENTRAL SIERRA	12.70	-3.30	67	43	43
SOUTHERN SIERRA	10.80	-2.90	45	43	43
STATEWIDE	10.90	-3.60	63	39	39

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

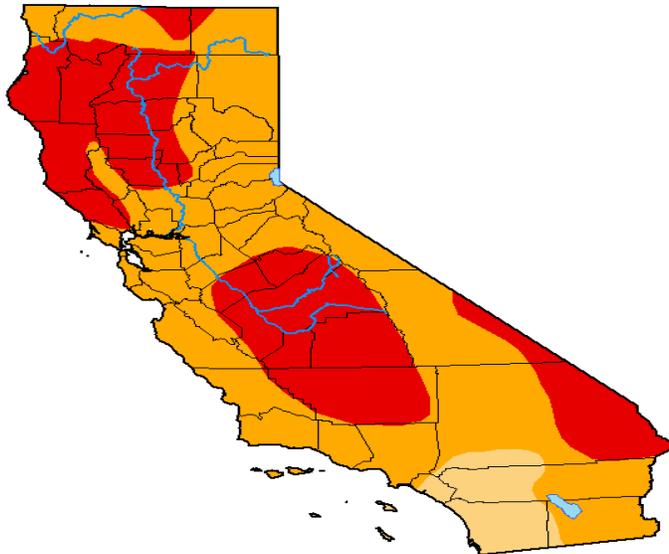
**** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.**



DROUGHT MONITOR

U.S. Drought Monitor California

March 22, 2022
(Released Thursday, Mar. 24, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	93.65	37.69	0.00
Last Week <small>03-15-2022</small>	0.00	100.00	100.00	93.23	35.22	0.00
3 Months Ago <small>12-21-2021</small>	0.00	100.00	100.00	92.44	79.44	23.11
Start of Calendar Year <small>01-04-2022</small>	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year <small>09-28-2021</small>	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago <small>03-23-2021</small>	0.70	99.30	90.66	64.02	31.76	5.36

Intensity:

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

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

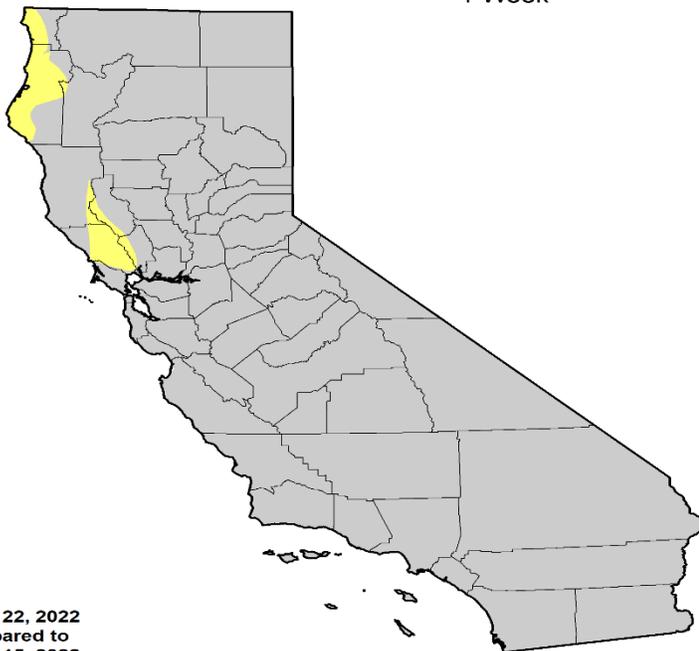
Author:

Adam Hartman
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

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



March 22, 2022
compared to
March 15, 2022

droughtmonitor.unl.edu



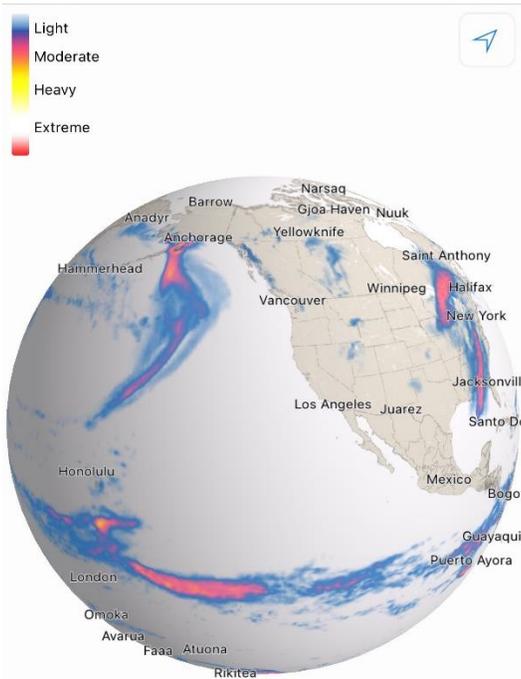
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been 2.47% Class 1 degradation in D3 extreme drought conditions.

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



CURRENT SATELLITE IMAGERY



Map Reference: Dark Sky

The current satellite picture is showing a frontal system in the Northwestern Pacific. This frontal system is expected to bring precipitation to the Northern US and Canada but very little if any to the Southern regions of California.

Once it has moved Eastwards it is expected to bring the possibility of some snow to the Rockies but very little to the Sierras.

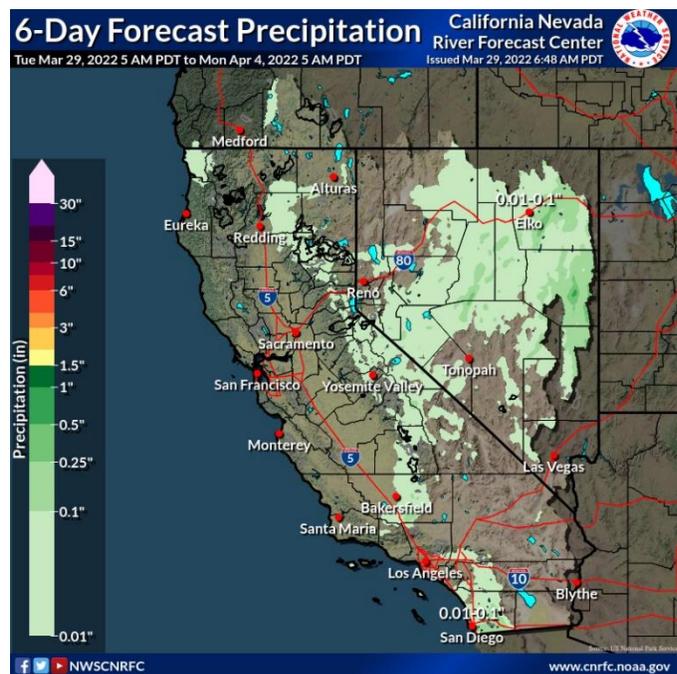
The satellite picture also shows a dry Western and Central US with small patches of cloud cover being remnants of the front that had just moved through the region. This area is still dominated by a high pressure system which will weaken in the West as the frontal system approaches.

The Eastern US has 2 weather systems, one predominantly in Eastern Canada stretching into the Northern US and a second one stretching from South of Jacksonville to New York.

There is no Monsoonal effect at this time of the year as the current weather systems dominate.

10 Day Outlook

No significant changes into next weekend as first a quick moving upper ridge slides across the region before flow becomes more flat and zonal. By Sunday...a weak s/wv trof will move onshore with some light precipitation possible over the upper Klamath River basin down across the higher terrain of northern CA along with eastern NV. Amounts will generally be light. Overall...temperatures will be 5- to 10-degF above normal for this time of year with some slight cooling along coastal locations as the s/wv trof approaches on Sunday.





WESTERN WEATHER DISCUSSION

Following a very wet December 2021 across parts of the West, a very dry pattern has persisted during much of 2022 so far, mainly from southern Oregon southward. Average basin snow water equivalent (SWE) values have continued to decline across the West and are now below-normal since the start of the water year (October 1, 2021). Despite the drying trend leading up to this week across many areas of the region, a stormy pattern brought above-normal precipitation to the windward (west-facing) slopes of Washington, with some additions to the snowpack. Snowpack gains were also evident across parts of the Northern Rockies. Given the small gains made over the past couple of weeks, targeted improvements were made across northern Oregon, northern Idaho, and western Montana. Additionally, sub-basin average SWE values are near and slightly above-normal for the water year, USGS average stream flows are running near and above-normal, and standardized precipitation evapotranspiration indices (SPEIs) are D0 to D1 equivalent (indicating abnormally dry to moderate drought conditions) for all periods going back 6 months. However, longer-term drought remains entrenched across much of the West, supported by NASA GRACE shallow groundwater remaining below the 5th percentile for many areas. Deterioration of drought was also observed in northwestern California, where 7-day precipitation was below-normal again this week. Widespread along the coastal ranges of northern California, USGS 28-day average stream flows are below the 5th percentile of the climatological distribution, with more having fallen into the bottom 1 percent of their respective distributions for the same period. Groundwater, soil moisture, and SWE are all below-normal and nearby reservoir levels are, on average, 50 percent of their historical averages as we begin transitioning into a drier time of year. Elsewhere in the Western Region, a low pressure system tracking eastward in the days leading up to March 22 produced enough precipitation and high elevation snowfall to stave off any further degradation this week. Some basins across the Four Corners region are even reporting near and above-normal seasonal snowpack following the event. However, more will be needed to curb long-term drought across these areas.

Reference:

Adam Hartman, NOAA/NWS/NCEP/CPC
Richard Heim, NOAA/NCEI



WATER NEWS

CALIFORNIA WATER NEWS

Newsom imposes new California water restrictions — leaves details to locals

As a dry summer looms, California Gov. Gavin Newsom ordered water suppliers across California to step up their local drought responses, but fell short of requiring water rationing or setting a statewide conservation target.

Despite pressure from experts urging a strong mandate, the order leaves the exact conservation measures up to the urban water providers and major water wholesalers that supply the vast majority of Californians. It does not affect agricultural water providers, or the small water systems that are especially vulnerable to drought.

Newsom also ordered state water regulators to consider banning irrigation of decorative lawns at businesses and other institutions.

California's water watchers said that the order wasn't enough.

"I would have liked to see a more directed statewide mandate that would have taken into consideration regional per capita water-use levels," said Newsha Ajami, chief strategy officer for research at Lawrence Berkeley National Laboratory. "However, I am glad to see he is initiating efforts to curb outdoor water use and banning non-functional turf."

Water systems, however, applauded Newsom for leaving water conservation up to local agencies.

"The Governor's Order today recognizes the diversity of California communities and their water supply conditions," Jennifer Pierre, general manager of the State Water Contractors association of public water agencies, said in a statement. "Ordering agencies to exercise their specific plans strikes that important balance of statewide needs and local action."

Under the order, which will require emergency regulations that are expected to take effect mid-June, local water suppliers must act as if their water supplies have dipped by at least 10 to 20%.

Each agency has spelled out what actions this degree of reduction — called a stage two water shortage — will trigger in their required Water Shortage Contingency Plans. This could include cutting the number of days when outdoor irrigation is permitted.

"That's what we're aiming towards: That everyone has a clear message of the need to conserve, but tailored locally based on the experiences of those suppliers," said Jared Blumenfeld, California's secretary for environmental protection.

Already, 41% of 385 water suppliers have reached or surpassed this level of shortage, administration officials said.



VELES WATER WEEKLY REPORT

That includes San Jose Water, which supplies thousands of customers in the heart of Silicon Valley. Under a stage two water shortage, it would cut irrigation to three days a week — but it's already reached stage three and cut customers back to two days of outdoor watering a week.

“Our current restrictions are already more restrictive than what the governor announced,” said Liann Walborsky, director of corporate communications for San Jose Water.

State officials tally 55 water providers — or about 14% of the water systems reporting their conservation efforts to the state — that have not yet activated their water shortage contingency plans.

Bottom of Form

Many are in Southern California, according to state data, including the Yorba Linda Water District in Orange County. Stepping up local conservation to the level Newsom called for will require increased customer outreach and education, expanded rebate programs, and a requirement for customers to promptly repair leaks. It does not include mandatory conservation measures.

“A mandate to conserve would need to come from the state. Then, (Yorba Linda Water District) would enact the level of the plan that matches the mandate,” said Alison Martin, the water district's public affairs manager — who noted it's currently raining in Yorba Linda.

Many residents, particularly in cities and towns, appear to be ignoring the state's pleas to take the drought seriously and cut back: In January, Californians used nearly 3% more water statewide compared to before the drought emergency was declared.

Overall, from July through January, Californians cut back by less than 7% statewide compared to 2020, according to state data.

Original Article: [CalMatters by Rachel Becker](#)

State Auditor needs to investigate water agency over inaccurate data

We need to talk about what happened to all the water that was lost.

We already know what happened to thousands of farmers: They went without.

We know what happened in cities up and down the state: They went dry.

We know what happened to salmon eggs and juveniles: More perished than usual.

In the 2021 water year, California water officials disastrously miscalculated the moisture content of the Sierra Nevada snowpack. Because the Department of Water Resources didn't know how much water was in the snow, or how much would be absorbed by the parched ground beneath, the department grossly overestimated how much would flow into reservoirs. That led the department to allow nearly 700,000 acre feet — some say much more — to flow to the ocean.

Even as dozens of climate scientists predicted drought, California wasted enough water to provide for at least 1.4 million households for a year. That's enough for everyone



VELES WATER WEEKLY REPORT

living in San Francisco, San Jose, Sacramento, Stockton, Fresno and Modesto combined. Those wasted flows did nothing to help salmon or to keep salt out of the Delta.

The water is long gone, so all we have left are questions.

That's why I have asked the State Auditor to investigate the Department of Water Resources' operations and management, including the accuracy of its data collection, predictive models, reservoir operations, pumping regimes and the roles of decision-makers.

That wasted water had value beyond what we could have done with it – grown crops, fortified reservoirs, saved a few thousand salmon. On emerging water “exchanges,” where investors bet on commodity price fluctuations, California water was selling for \$792.56 an acre foot in early March. That means the state flushed away some \$550 million. That's malfeasance.

We need answers first, then accountability, then solutions.

Bottom of Form

Question No. 1: Why was the state still using clearly unreliable measurements and operational procedures? Was it due to bureaucratic inertia or gross incompetence?

No. 2: No water agency other than the Department of Water Resources made such a colossal mistake in predicting runoff. Turlock Irrigation District was extremely close in its estimates on the Tuolumne River basin. The NOAA's California Nevada River Forecast Center – whose data many water districts incorporate into their calculations – was also extraordinarily close. If the state can't get it right, will it more closely collaborate with local water agencies who do?

No. 3: When will the state start to live up to its obligations? Contractually, California has agreed to do two important things: keep saltwater from rushing into the Sacramento-San Joaquin Delta from the San Francisco Bay and protect native fish species. Because the state has failed to create enough water storage, it routinely has too little water for either task. When it can't meet its obligations, the Department of Water Resources takes water allocated to others to backfill for the state's mistakes. This creates enormous friction, pitting dam-hating environmentalists against farmers, with the state in the middle.

No. 4: The most important question: Has the state learned anything from this disaster? Despite the Department of Water Resources' recent media blitz insisting it has adopted new methods of measuring snow, this February the state again appeared to be releasing far more water than it should have been. Despite predictions of continued drought, which have since come true, officials were releasing roughly three times the historic median from Lake Oroville. That wasted water helped neither fish nor farmers.

No. 5: Finally, are those responsible for past mistakes still making decisions?



VELES WATER WEEKLY REPORT

Deirdre Des Jardines of California Water Research began calling out the state's reliance on outdated procedures, models and data collection in 2009. This month, she told the water board that this reliance has resulted in "fatal errors."

This continued reliance on broken systems turns drought into catastrophe. Until we understand what has gone wrong with the agencies charged with managing California's water, we cannot understand how to fix the problems.

I hope my fellow legislators are also interested in finding the answers to my questions. We all should be.

Original Article: [CalMatters by Adam Gray](#)

As Western Drought Worsens, Governor Newsom Moves to Bolster Regional Conservation Efforts

Following the driest first three months of a year in the state's recorded history, Governor Gavin Newsom today took steps to drive water conservation at the local level, calling on local water suppliers to move to Level 2 of their Water Shortage Contingency Plans, which require locally-appropriate actions that will conserve water across all sectors, and directing the State Water Resources Control Board to consider a ban on the watering of decorative grass at businesses and institutions.

In an executive order signed today, the Governor ordered the State Water Resources Control Board (SWRCB) to evaluate the adoption of regulations banning irrigation of "non-functional" turf (or grass), such as decorative grass adjacent to large industrial and commercial buildings. The ban would not include residential lawns or grass used for recreation, such as school fields, sports fields and parks. The Department of Water Resources estimates this ban alone will result in potential water savings of several hundred thousand acre-feet. An acre-foot of water serves the needs of approximately three households for a year.

"While we have made historic investments to protect our communities, economy and ecosystems from the worsening drought across the West, it is clear we need to do more," said Governor Newsom. "Today, I am calling on local water agencies to implement more aggressive water conservation measures, including having the Water Board evaluate a ban on watering ornamental grass on commercial properties, which will drive water use savings at this critical time. Amid climate-driven extremes in weather, we must all continue to do our part and make water conservation a way of life."

A copy of the executive order can be found [here](#).

As the drought persists into a third year and conditions worsen amidst dry, hot weather, today's order called on the SWRCB to consider requiring urban water suppliers to activate, at a minimum, Level 2 of their customized Water Shortage Contingency Plans. These plans, required by state law, are developed by local water agencies to navigate drought and each plan is customized based on an agency's unique infrastructure and



VELES WATER WEEKLY REPORT

management. Triggering Level 2 of these plans involves implementing water conservation actions to prepare for a water shortage level of up to 20 percent. For example, in many communities, this would mean reducing the number of days that residents can water outdoors, among other measures.

To further conserve water and strengthen drought resiliency in this critically dry year, the Governor is encouraging suppliers, where appropriate, to consider going above and beyond the Level 2 of their water shortage contingency plans, activating more ambitious measures. The Governor has also ordered state agencies to submit funding proposals to support the state's short- and long-term drought response, including emergency assistance to communities and households facing drought-related water shortages, facilitating groundwater recharge and wastewater recycling, improvements in water use efficiency, protecting fish and wildlife, and minimizing drought-related economic disruption.

Today's executive order includes several other provisions that will protect all water users:

- Ensuring Vulnerable Communities Have Drinking Water
 - Cuts red tape so communities that need access to emergency hauled or bottled water can get it immediately
- Safeguarding Groundwater Supplies
 - Requires local permitting authorities to coordinate with Groundwater Sustainability Agencies to ensure new proposed wells do not compromise existing wells or infrastructure, as 85 percent of public water systems rely heavily on groundwater during drought
 - Streamlines permitting for groundwater recharge projects that help to refill aquifers when rains come
- Protecting Vulnerable Fish And Wildlife
 - Expedites state agency approvals for necessary actions to protect fish and wildlife where drought conditions threaten their health and survival
- Preventing Illegal Water Diversions
 - Directs the Water Board to expand site inspections in order to determine whether illegal diversions are occurring

The Governor's California Comeback Plan invests \$5.2 billion over three years to support the immediate drought response and build water resilience, including funding to secure and expand water supplies; bolster drought contingency planning and multi-benefit land repurposing projects; support drinking water and wastewater infrastructure, with a focus on small and disadvantaged communities; advance Sustainable Groundwater Management Act implementation to improve water supply security and quality; and support wildlife and habitat restoration efforts, among other nature-based solutions.

Earlier this month, Governor Newsom advanced an additional \$22.5 million to bolster the state's drought response. Of this funding, \$8.25 million will be used to increase



VELES WATER WEEKLY REPORT

educational and outreach efforts, including through the Save Our Water campaign, which is providing Californians with water-saving tips via social media and other digital advertising. The Governor's California Blueprint proposal includes \$750 million in additional drought funding, \$250 million of which was set aside as a drought reserve to be allocated in the spring, based on conditions and need.

Original Article: [Press Release Gov. Gavin Newsom](#)

State releases nearly \$30 million to Friant-Kern Canal repairs, holds back \$7 million

The Friant-Kern Canal has been in distress for several years thanks to severe drought and now requires millions of dollars in repairs.

According to a Friant Water Authority (FWA) press release the California Department of Water Resources (DWR) announced it will throw \$30 million dollars in funding to assist with repairs.

"Through this investment, we are furthering a partnership to restore California's major water conveyance systems to improve the resiliency of California's water supply during drought and flood conditions," said DWR Director Karla Nemeth. "The projects, when completed, will maximize the canal's capacity to move water efficiently through the system and improve California's ability to boost and store its water supply."

Specifically, DWR will release \$29.8 million from the already approved \$39.2 million in the 2021-2022 state budget. This money is going to aid phase 1 of the Friant-Kern Canal Middle Reach Capacity Correction Project that will rehabilitate 33 miles of the canal affected by subsidence. The canal has lost more than 60% of its conveyance capacity from subsidence caused from over pumping groundwater, making repairs even more urgent than before.

Alex Biering, communications director for the Friant Water Authority, explained that the state puts a hold on a small portion of the overall grant. The purpose of this is to essentially ensure that the project is running smoothly. In the case of the FWA, and the remaining \$9.4 million, \$7.4 million goes to a "hold back" while the remainder goes toward administrative costs.

"[The state] wants to make sure that we're all still pushing towards those goals of all ships rising together. So they are going to keep that and hold it back as an insurance policy until the project is done, or we get some further movement on the other sources of funding," Biering explained.

In January 2022, the FWA was able to break ground with the first phase of the project. The Friant-Kern Canal stretches over 100 miles, and supplies water to a million acres of farmland and more than 250,000 Californians. The rehabilitation of this project is no



VELES WATER WEEKLY REPORT

small task. The most impacted area is a damaging 33 miles causing the expected cost of phase 1 to be \$292 million.

Several different sources are going to be required to fully fund the project. Under the 2021-22 state budget there is a requirement that funds must come from the local, state and federal levels. Before the state will match any other funds, participants must show proof of funds allocated at the local and federal level.

“We have cobbled together this package of funding and financing that is coming from a lot of different places. There’s funding that is coming from a settlement with Eastern Tule Groundwater Sustainability Agency (GSA), there is financing and funding coming from the federal government, there is funding coming from the canal users directly and Friant contractors, but they don’t all arrive in a big chunk. Some of them are going to take a little longer,” Beiring explained.

DWR Deputy Director Executive Advisor Michael Sabbaghian explained that before the state will match any funds, participants must show proof of funds acquired at the local and federal level.

“Any future funding will be dependent on [Friant Water Authority’s] ability to secure non-State cost share from federal...and local sources. This requirement was applied to the 2021-22 State Budget Act for the first \$100 million as well,” Sabbaghian explained.

Regardless of the partial release of funds, FWA Chief Executive Officer Jason Phillips expressed his gratitude for this funding. He explained that this funding was a large reason why they were able to break ground in January.

“Our partners at the state of California have invested in the San Joaquin Valley’s future at a critical time, and we are grateful to the Newsom Administration and for DWR’s dedicated efforts to release these funds as quickly as possible in recognition of the urgent need to implement the project,” Phillips said.

These project funds are spread throughout areas such as planning, permitting, design and the actual construction of subsidence rehabilitation projects. The 2021-22 state budget also authorized an additional \$100 million for the 2022-23 fiscal year. Along with other requirements, each agency with a funded project will need to investigate the ever present risk of subsidence and analyze ways it can be prevented.

It seems virtually impossible to completely eliminate subsidence. Beiring explained that they will be implementing different ways to create resilience including moving some areas of the canal and working with local agencies to help monitor overpumping.

Original Article: [The Sun Gazette by Maddi Langton](#)



VELES WATER WEEKLY REPORT

Gov. Newsom outlines a peace agreement on California water. Will the fighting finally end?

Gov. Gavin Newsom's administration unveiled a \$2.6 billion environmental peace treaty on the Central Valley's overtaxed rivers Tuesday. The deal calls for farms and cities to surrender billions of gallons of water while contributing funds to help restore troubled fish habitats. Newsom's top aides called the 34-page memorandum of understanding a compromise measure that will leave more water in the rivers — but not as much as many environmentalists believe is needed to prop up ailing populations of salmon, steelhead and other fish. And some key water users, such as the city of San Francisco, haven't yet signed onto the plan. "We don't have to choose between healthy ecosystems or a healthy economy," Newsom said in a written statement. "We can choose a path that provides for both. This is a meaningful, hard-earned step in the right direction. This latest attempt to create a grand bargain among competing factions in California's water world comes as the state faces a third straight year of drought. Many farmers have already been told to expect minimal water supplies this year, and on Monday Newsom ordered urban water agencies to step up their conservation efforts. In a separate move Tuesday that underscores the severity of the drought, federal and state officials outlined a plan for releasing minimal amounts of water this year from Shasta Lake — the state's largest reservoir that's supposed to feed the Sacramento River with enough cold water to keep endangered winter-run Chinook salmon alive. Less than 3% of the population survived last year, when water releases from Shasta were more generous. "The system is in incredibly bad shape," said Jared Blumenfeld, secretary of the state Environmental Protection Agency. "No pretense here that this is a decision that will produce great outcomes." Against that dismal backdrop, state officials say a peace plan on the rivers is essential. "We have to end these water wars," Blumenfeld said. The so-called voluntary agreement released Tuesday is signed by some of California's biggest water users that pull water from the Central Valley's rivers. They include the agencies supplying water for Sacramento Valley's rice farmers, the city of Sacramento and its suburbs, most of urban Southern California and Westlands Water District, the largest farm-water agency in the San Joaquin Valley. "We actually have a critical mass of players — water users, federal agencies, state agencies — that are going to move forward," said Wade Crowfoot, Newsom's Natural Resources Secretary. "We're not waiting any longer." That said, several key players that pull water from the San Joaquin River and its tributaries are notably absent from the list of signatories released Tuesday. They include the city of San Francisco and water districts serving Turlock and Modesto and their surrounding farms. These water users have long objected to giving up water under Newsom's compromise plan, which originated in the final months of the governorship of his predecessor, Jerry Brown. Last fall, Newsom's administration sent these holdouts a warning: Without their cooperation, the State Water Resources Control Board would



VELES WATER WEEKLY REPORT

go ahead with a plan that would seize considerably more of their water than what's called for in the voluntary agreement. On Tuesday, top administration officials repeated that warning, saying the state water board would crack down on groups that refuse to leave more water in the rivers for fish. "We anticipate that," Blumenfeld said. "It's really important that we have a regime to make them provide (river) flows, because otherwise, if we didn't, it would put an undue burden, an unfair burden on the folks signing the (voluntary agreements)."

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

California's snowpack is 'roasting in the dry and sunny conditions'

California's winter snowpack is suffering after the state saw historically dry weather in January and February, and March is headed down the same track. An early spring heat wave this week brought record-breaking temperatures that accelerated snowmelt. On Friday, the snowpack — which historically has provided about a third of the state's water supply — stood at 46% of its average for this time of year.

The picture is bleak: Recent analysis of the snow in areas feeding into the state's key watersheds showed that "the snow has been roasting in the dry and sunny conditions for a while and is clearly melting," said David Rizzardo, chief of hydrology for California's Department of Water Resources.

Rizzardo said the finding came after aircraft with the Airborne Snow Observatory mission collected data on snowmelt in the Feather, Tuolumne and San Joaquin watersheds, finding shrinkage from early February to late March. "From these analyses, we also get an idea for the cold content of the snow, or how much energy it takes to melt the snow," he wrote in an email. "The lower the value, the less (solar) energy it takes to melt the snow."

Unless the mountains get cooler and cloudier weather, Rizzardo said the rate at which the snow is melting will only speed up.

Original Article: [SF Gate by Amy Graff](#)

California plan would pay farmers to grow less to save water

California would pay farmers not to plant thousands of acres of land as part of a \$2.9 billion plan announced Tuesday aimed at letting more water flow through the state's major rivers and streams to help restore the unique habitat in one of North America's largest estuaries.

The agreement, signed Tuesday between state and federal officials and some of California's biggest water agencies, would result in about 35,000 acres of rice fields left unused — or about 6% of the state's normal crop each year, according to the California Rice Commission.

The result, combined with other measures, would be up to an extra 824,000 acre feet (1 billion cubic meters) of water each year flowing through the Sacramento-San Joaquin



VELES WATER WEEKLY REPORT

River Delta. One acre foot of water is more than 325,000 gallons, which is usually enough to supply two average households for one year.

The money will come from the state and federal governments and the water agencies themselves, which for the first time have agreed to tax themselves to help pay farmers — who often have more senior water rights — not to plant some crops.

“We don’t have to choose between healthy ecosystems or a healthy economy, we can choose a path that provides for both,” Gov. Gavin Newsom said. “This is a meaningful, hard-earned step in the right direction.”

Some environmental groups disagreed. The extra water announced Tuesday would be about half of what state regulators in 2018 said was needed to fully protect the environment, according to Doug Obegi, a senior attorney for the Natural Resources Defense Council.

Original Article: [AP News by Adam Beam](#)

US WATER NEWS

Governor Little signs bill investing in water infrastructure

With the stroke of a pen, Governor Brad Little approved a nearly \$130 million budget for the Department of Water Resources.

“This is a culmination of years and years of both the department and the water board saying, ‘what do we need to do to address the critical water needs of the entire state?’” said Little during a signing ceremony at Murtaugh Lake.

Over \$100 million of the funding is from the American Rescue Plan Act, allowing for a one-time investment in projects that have, according to Jay Barlogi of the Twin Falls Canal Company, been put on the back burner.

“Oh, it’s huge, it’s just huge,” said Barlogi. “As the governor mentioned, agriculture is the economic engine that drives the state of Idaho. Of course, agriculture without water, is not very productive.”

For Governor Little, using federal dollars to invest in such a critical part of the state’s economy was a goal since ARPA funding was available.

“The commitment that the legislature and I made to the people of Idaho was that if we’re going to get this one-time money, and we put some general fund money into it



VELES WATER WEEKLY REPORT

too, quite a bit of general fund money, we were going to invest it in things that paid off for our children and grandchildren,” Little said.

Large portions of the budget will go to enlarging the Anderson Ranch Reservoir, construction of water delivery and treatment systems for the Mountain Home Air Force Base, and construction or enlargement of Milner Dam among others.

“It does a lot right here in the Magic Valley where we’ve got a real critical water structure that needs to be improved,” said Little.

With such a large investment coming from one-time spending opportunities, the pressure is on for funds to be well-spent, as proper use could have massive positive impacts for generations to come.

Original Article: [KMTV/KSVT by Zach Bruhl](#)

Southern Nevada water supply faces Colorado River restrictions

Southern Nevada will be getting at least 7 percent less water from the Colorado River, as the federal government restricts water allocations due to falling water supply. Scientists expect temperatures to continue to rise and water supply to decrease in the coming decades. Creative strategies and approaches will need to be applied to address the reduced supplies, three professors at the University of Nevada, Reno suggest in a series of blog posts about the Colorado River, the drought and its effects on Nevada. The professors study the climate and politics of water in Nevada and the drought impacts of the Colorado River.

Courtesy

Photo

Lake Mead water levels are rivaling the low water levels as seen here in the climate.gov photo taken in 2014

The Climate Prediction Center long-range outlook based on the U.S. Drought Monitor shows continued drought for the next three months in much of the West. It’s not looking good for the Colorado River, one of the main sources of water for Las Vegas, as the federal government has been forced to institute policies for the first time that limits the amount of water going to the partners in the Colorado River agreement.

Rising temps stress water supplies in Colorado River

The West will need a variety of strategies to sustain this important resource
Nevada State Climatologist and Associate Professor, Geography and Extension

Drought on the Colorado River has been in the news over the past year. In August, the U.S. Bureau of Reclamation’s water-level forecasts for January 2022 indicated that the water levels in Lake Mead, one of the system’s major reservoirs, would stay below 1,075 feet elevation. Because of how low water levels have fallen, a Tier 1 shortage was declared. This means that southern Nevada, which gets about 90 percent of its water from the Colorado, will have to make do with 7 percent less water.

But, steadily dropping river flows and reservoir levels are not exactly a surprise. Scientists have long warned that higher temperatures, especially if they coincide with a



VELES WATER WEEKLY REPORT

drought, could stress water supply in the Colorado Basin and force us to be more thoughtful and creative in how we use and manage water. The past year has underscored that message.

Scientists expect temperatures to rise in the coming decades. There is still some uncertainty about just how big a dip those higher temperatures will take out of the Colorado River, but as it warms, the overall amount of water available will drop and droughts will be worse than they would otherwise have been. To meet Nevada's current and new water demands, we will need innovation in water policy and management, new technology and conservation strategies, and the research to support those changes.

The impact of Colorado River water shortages on Nevada

Changes to water policy needed as time runs out

In August 2021, the Colorado River captured the attention of the nation. In a first-of-its-kind decision, the federal government declared a water shortage on the river, which provides 90 percent of southern Nevada's water supply. Mandatory water delivery cuts, known as "Tier 1" reductions, followed for Nevada and Arizona, as well as for Mexico. Paired with expectations of a drier climate, these cuts have catalyzed a conversation about how the region's water policies – and assumptions about future water availability – must be adapted.

Elizabeth Koebele's research team at the University of Nevada, Reno is leading efforts to better understand how collaborative water sharing processes used over the last 20 years in the Colorado River Basin may provide insight into the renegotiation process and the development of long-term solutions to one of the biggest problems facing Nevada and the Western U.S.

Large-scale water reuse investments target drought in the West

Investments such as \$1.2 trillion infrastructure law passed by Congress are key to the future

Most Nevadans are accustomed to having potable water on demand, regardless of season or drought. As drought threatens urban water supplies, there are two basic water management strategies: reduce demand and/or increase supplies. Reuse of highly treated municipal wastewater, known as reclaimed water or recycled water, is becoming a more common supply-side solution to water scarcity.

According to the USGS, each Nevadan, on average, uses about 197 gallons of potable water per day (compared to the national average of 82 gallons per day). Much of the water used indoors ends up as wastewater that is flushed down our toilets, sinks and showers. In Washoe and Clark Counties, reclaimed water is already used to irrigate parks, golf courses and other green space. In southern Nevada, any treated wastewater that is returned to Lake Mead earns "return flow credits" for the water authority, which means that for every gallon of treated wastewater that enters the reservoir, a gallon can be removed for later use. Additionally, researchers at the University of Nevada, Reno are currently collaborating with local agencies to explore the feasibility of a potable



VELES WATER WEEKLY REPORT

water reuse project. These are just two of the creative ways that reclaimed water can augment urban water supplies in Nevada.

Original Article: [Steph McAfee, Elizabeth Koebele, Assistant Professor of Political Science; and Max Robinson, Research Assistant and hydrogeology graduate student, Kerri Jean Ormerod, Associate Professor, Geography and Extension](#)

EPA awards \$104M to Ore., Wash., Alaska water projects

The U.S. Environmental Protection Agency (EPA) has recently announced \$104 million for drinking water and wastewater improvements in Oregon, Washington, and Alaska. The funds will be distributed between the states as follows: \$32 million for Oregon, \$52 million for Washington, and \$20 million for Alaska.

EPA has also provided a breakdown of how the funds will support water infrastructure across all three states:

\$32M to Oregon

EPA is awarding \$32 million to help fund Oregon's \$70 million plan for key drinking water projects and \$70 million plan to improve wastewater infrastructure.

In addition to this round of funding, Congress recently passed the Infrastructure Investment and Jobs Act /Bipartisan Infrastructure Law, which will inject another \$92 million into Oregon's two State Revolving Fund programs in 2022.

"Clean and safe water is a basic right, but at the same time something we can't take for granted" said EPA Region 10's Water Division Director Dan Opalski. "EPA is proud to invest along with our state partners in these projects that will benefit the health of Oregon's communities."

Some of the projects to be funded in the state's 2021-2022 drinking water plan include:

- \$20,000 for the Round Lake Mobile Home Park feasibility study. This project will identify solutions for water system improvements as well as evaluate the adequacy of long-term water supply for this water system.
- \$19,587 to the city of Gates to replace outdated monitoring equipment and alleviate drinking water quality concerns. Gates will also receive \$30,000 from Oregon's DWSRF Drinking Water Source Protection Fund (DWSPF). These funds will be used to install temporary monitoring equipment, collect samples, and then analyze and share the data to gain a better understanding of post fire impacts on sources of drinking water.
- \$100,000 to the Rhododendron Water Association for the purchase of a Riparian Management Area and conservation easement on privately owned timber land to protect the system's drinking water intake from clear-cut logging activity that could have created water quality issues.
- \$862,145 to Crescent Water Supply and Improvement District will be used for water master planning and well construction.



VELES WATER WEEKLY REPORT

- \$1,660,761 to Christmas Valley Domestic Water Supply District for distribution system improvements. The project will result in replacement of approximately three miles of distribution piping to help address water loss due to aging steel distribution pipe failure.

The state's list of wastewater projects to be funded include:

- \$30,056,061 to the city of Sweet Home to help the wastewater treatment plant achieve Clean Water Act compliance. The city of Sweet Home project affects a disadvantaged community.
- \$1,750,000 to the city of Bend to address city climate action goals through a collections system master plan update.
- \$2,000,000 to the Lone Pine Irrigation District for modernization of the of the irrigation system. The Lone Pine Irrigation District qualifies as a disadvantaged community.
- \$2,313,231 to the city of Madras to a wastewater collection expansion, allowing residences currently on septic to connect to the city sewer. The city of Madras qualifies as a disadvantaged community.

The sources of funding for Oregon's Drinking Water State Revolving Fund Intended Use Plan include a \$14.4 million grant from EPA, \$2.8 million in state matching funds, along with \$58 million in interest earnings and repayments from previous DWSRF loans.

Similarly, the sources of funding for Oregon's Clean Water State Revolving Fund Intended Use Plan include a \$17.9 million grant from EPA, \$3.6 million in state matching funds, along with \$52.5 million in interest earnings and repayments from previous CWSRF loans.

\$52M to Washington

EPA is awarding \$52 million to help fund Washington's \$22 million plan for key drinking water projects and \$253.5 million plan to improve wastewater infrastructure.

In addition to this round of funding, the Infrastructure Investment and Jobs Act /Bipartisan Infrastructure Law will inject another \$152 million into Washington's two State Revolving Fund programs in 2022.

Some of the projects to be funded in the state's 2021-2022 drinking water plan include:

- \$2,455,000 to the Kitsap Public Utility District #1 to fund the consolidation of the Bill Point water system and address aging infrastructure.
- \$2,012,546 to the city of Omak to install arsenic treatment at the Julia Maley Park Well. The treatment will also remove high levels of iron.
- \$5,050,000 to Skagit County Public Utility District #1 to help fund the Judy Reservoir to Mount Vernon Transmission Line, Phase II project. This project will replace the five-mile-long primary transmission main that is undersized and failing.
- \$1,234,500 to The Kiona West Heights Association to replace the community's only well. The project includes drilling a new well, constructing a new well house,



VELES WATER WEEKLY REPORT

and installing chlorination. The community qualifies for disadvantaged assistance, so half of the loan amount will be forgiven.

- The state's list of wastewater projects to be funded include:
- \$3,126,183 to City of Brewster for infrastructure within the collection system and at the wastewater treatment plant that are not operating with reliability. The community qualifies for disadvantaged assistance.
- \$1,024,090 to Chelan County Public Utilities District for improvements to the Dryden wastewater treatment facility. The improvements will benefit the Wenatchee river. The community qualifies for disadvantaged assistance.
- \$424,250 to the city of Harrington for modification of the city of Harrington wastewater plant. The modifications will eliminate leaks from treatment lagoons, prevent nearby water contamination, eliminate the odors from sludge, and reduce operation costs. The community qualifies for disadvantaged assistance.
- \$9,004,053 to the city of Stevenson Public Works for two projects. The first is upgrades and expansion of the wastewater treatment plant and pump stations. The second is an addition of approximately 900 linear feet of the collection system. The community qualifies for disadvantaged assistance.
- \$242,666 to Yakima County Public Services Department for Buena wastewater treatment facility improvements. The project will upgrade the wastewater treatment facility and provide hardware to improve facility monitoring and reliability. The community qualifies for disadvantaged assistance.

The sources of funding for projects on Washington's Drinking Water State Revolving Fund Intended Use Plan include a \$24.5 million grant from EPA (of which \$7.6 million will be used for non-project related activities), and \$4.9 million in state matching funds. Similarly, the sources of funding for Washington's Clean Water State Revolving Fund Intended Use Plan include a \$27.6 million grant from EPA, \$5.5 million in state matching funds, along with \$86.5 million in interest earnings and repayments from previous CWSRF loans.

\$20M to Alaska

EPA is awarding \$20 million to help fund Alaska's \$57.1 million plan for key drinking water projects and \$93.7 million plan to improve wastewater infrastructure.

In addition to this round of funding, Congress recently passed the Infrastructure Investment and Jobs Act /Bipartisan Infrastructure Law, which will inject another \$65 million into Alaska's two State Revolving Fund programs in 2022.

Some of the projects to be funded in the state's 2021-2022 drinking water plan include:

- \$509,167 to the city of Homer to extend the water distribution system to provide piped public water to 27 central business district zoned properties, all of which currently are served by hauled water from city watering points.
- \$1,600,00 to the Ketchikan Gateway Borough to design and construct a 100,000-gallon storage tank and booster pump station.



VELES WATER WEEKLY REPORT

- \$5,000,000 to the city of Nome to construct a building to support both the drinking water and sewer utilities.

The state's list of wastewater projects to be funded include:

- \$1,450,000 to the city of Fairbanks to construct a new 10-inch water main to the Wastewater Treatment Facility and replace the failing process water system within the facility.
- \$2,000,000 to the city of Cordova to remove 135 creosote pilings in the South Harbor and install a marine sewage pump station.
- \$3,900,000 to the Skagway Borough to extend sanitary sewer to an unserved area.
- \$5,600,00 to the city of Homer to extend piped wastewater service to unserved properties in five separate project areas.
- \$44,125 to the city of Dillingham to design utility upgrades to the waterfront area.
- The sources of funding for Alaska's Clean Water State Revolving Fund Intended Use Plan include a \$9.5 million grant from EPA, \$1.9 million in state matching funds, along with \$114.6 million in interest earnings and repayments from previous CWSRF loans.
- Similarly, the sources of funding for projects on Alaska's Drinking Water State Revolving Fund Intended Use Plan include a \$11 million grant from EPA (of which \$7.3 million will be used directly for project-related loans), and \$2.2 million in state matching funds. An additional \$87 million in interest earnings and repayments from previous DWSRF loans will also be available to fund project loans.

Original Article: [Water World](#)

Colorado hits a “hard pause” on water demand management as it waits for other states to catch up

Colorado is taking a “hard pause” on investigating the viability of demand management, a program that would allow the state to pay water users to temporarily and voluntarily conserve water and store what's saved in Lake Powell for future use.

“No more energy spent on this right now,” Colorado Water Conservation Board chair Jaclyn Brown said this week. “Until the facts change; until someone brings us new information.”

Demand management was a key component of the 2019 Drought Contingency Plans agreed upon by all seven states in the Colorado River Basin. The idea was that the Upper Basin states — Colorado, New Mexico, Utah and Wyoming — would each investigate the feasibility of paying water users to conserve water on a temporary and voluntary basis and then store the extra in Lake Powell in a special 500,000 acre-foot “account.” Then, if needed, that water could later be used by the Upper Basin states to meet delivery requirements specified in the Colorado River Compact.



VELES WATER WEEKLY REPORT

The CWCB, the agency tasked with protecting and managing the state's water resources, worked on Colorado's demand management investigation. Now, after years of work, Colorado is further along in the process than the other three states — and no program can be implemented without all four Upper Basin states on board. Brown said the fact that Colorado is ahead of the others is a big part of what led the board to take what she described as a “hard pause” on examining the concept.

“We have to let the other states catch up with their concerns and the issues they see,” she said.

In pausing its research, the CWCB decided at a meeting last week that it would instead focus on what can be done this year to help Colorado water users with the challenges presented by the dry conditions impacting the state. Brown said the board is excited to focus on what can be accomplished locally, without needing buy-in from neighbor states.

“What can we do as a state — recognizing that the trend is obviously leaning toward lower hydrology and drier climate — to prepare for this uncertain future that we're looking at?” Brown said. “What can we do right now?”

Each new forecast seems to point to a more challenging climate for Western water users. On March 17, the National Oceanic and Atmospheric Administration issued its spring outlook in which forecasters predicted prolonged drought to persist across the West, with below-average precipitation and above-average temperatures likely.

Nearly 60% of the continental U.S. is experiencing conditions ranging from minor to exceptional drought, according to NOAA. More than 82% of Colorado is experiencing some level of drought, with parts of southern Colorado in “extreme drought,” according to the latest map from the U.S. Drought Monitor. What's more, scientists who studied tree-ring data recently found that the past two decades are the driest on record going back 1,200 years, and that climate change has made the current megadrought more severe.

In addition to identifying demand management as a possible way for the Upper Basin states to bank water in Powell, the 2019 agreement also set 3,525 feet above sea level as an important “target elevation” for the Utah reservoir. That mark provides a buffer from the minimum level at which Glen Canyon Dam can generate power, 3,490 feet. More than 3 million customers use Glen Canyon Dam electricity and the federal government generates roughly \$150 million in revenue each year from selling that hydropower. Last week, Powell dipped below 3,525 feet for the first time since the lake was considered “full” in 1980.

With the other Upper Basin states catching up, CWCB director and Colorado River Commissioner Becky Mitchell said it was a good time to focus on Colorado. “I think it's critical that we wait and see what the other states are thinking,” Mitchell said. “We've got our thoughts and ideas and we have the capability of figuring it out, I think. But it



VELES WATER WEEKLY REPORT

seemed like an appropriate time to hit pause. Rather than sitting idle, we're looking at what we can do on the intrastate level."

Original Article: [The Colorado Sun by Chris Outcalt](#)

Nebraska wants to build a \$500 million canal over the border. Can Colorado stop it?

If Nebraska does indeed try to dig a \$500 million canal across its border and take water from the South Platte River on the Colorado side, it will have to be over the dead bodies in this town's cemetery.

Or perhaps under them.

At the very least, extremely close.

That includes the great-great-grandparents of Jay Goddard, whose big white Suburban is fishtailing around the edges of the cemetery and through the muddy remnants of the last canal Nebraska tried to dig in Colorado. Goddard, a fifth-generation farmer, points out century-old footprints of the canal Nebraska wants to revive. Goddard's ancestors likely got a kick out of watching 600 Nebraskans with shovels, struggling to sculpt the rolling hills into a waterway before they finally gave up and went home in 1894.

Nebraskans are Goddard's friends and neighbors, and employ his wife as a schoolteacher a few miles away in Big Springs. Nebraska may even have a legal right to buy up Julesburg land and send the bulldozers over, he admits.

But water is gold on the increasingly dry high plains. And a water war among friends is still a water war.

Nebraska's rich fields need water as much as Colorado does, Goddard said. But as a regional bank president, he sees prosperous Sedgwick County farmers expanding, developers buying land, and Fort Collins and Greeley to the west growing relentlessly. Colorado's 6 million people could be 12 million before the canal fight is settled.

"These guys were trying to do the same thing back in the 1890s. And here we are 100 years later," Goddard said, his arm sweeping across the cottonwoods lining the South Platte River through Julesburg and on to the Nebraska border a mile beyond. "We've got to figure out how to make it work for the next 100 years."

Eroded berms and meandering, overgrown ditches from Nebraska's 1890s canal effort are familiar marks on the landscape along 24 miles on the south flats of the South Platte River, from Ovid to Julesburg, and then east from the cemetery toward the state border 12 miles away.

Nebraska water officials say a healthy 7% of the supply in the agriculture-heavy state comes from the South Platte, before it joins its northern branch at North Platte. A 1923 compact settlement with Colorado guarantees Nebraska a flow of 120 cubic feet per second from April 1 to Oct. 15 where the South Platte leaves Colorado just northeast of Julesburg.



VELES WATER WEEKLY REPORT

For the other half of the year, the compact allows Nebraska 500 cubic feet per second, but only through a canal that would leave the South Platte near Ovid and crawl east. Absent a canal, Colorado from Oct. 16 through March can use South Platte water without worrying how much gets to Nebraska, though in recent years records show it has usually sent significant winter water to its neighbor.

But Nebraska leaders say they no longer trust Colorado to deliver the water without a Nebraska-dug canal. Gov. Pete Ricketts, flush with federal stimulus cash, suddenly announced in January he would seek legislative approval for reviving the canal, at a price of at least \$500 million.

The legislature is serious about appropriating the first \$50 million this year to start engineering studies and land purchases, said Nebraska state Sen. Dan Hughes, a Republican farmer whose district abuts Colorado.

Department of Natural Resources Executive Director Dan Gibbs said Ricketts gave Gov. Jared Polis a courtesy call the morning of his January news splash but offered no details. The media has heard more about Nebraska's current plan than the Colorado state engineer, said Kevin Rein, the Colorado state engineer.

Nebraska's Department of Natural Resources details what it calls accelerating plans by Colorado to divert more South Platte water before it gets to Nebraska's canal marker at Ovid, which would have a 1921 water right. Colorado interests with rights dated before 1921 could still take out their water regardless of the canal.

Ricketts, whose office declined comment to The Sun, wrote in an op-ed that Colorado's 2021 update to its South Platte plan includes potentially hundreds of projects and "threatens to choke off the flow of water into Nebraska."

The thing is, Nebraska's not paranoid if Colorado really is out to get them.

The Lower South Platte Water Conservancy District and Parker Water & Sanitation District, in fast-growing Douglas County, have teamed up for a new reservoir near Akron and pipeline plan that would indeed take more water from the river that is currently being sent downstream to Nebraska. Their PowerPoint presentation to the Colorado legislature and other interested parties includes a slide showing "Water Delivered to Nebraska in Excess of the Compact." In other words, perfectly good water for Colorado is there for the taking.

Colorado is a growth monster to the west. Nebraska needs to protect its rights, Hughes and others argue.

And this is not the first battle in a long cold war over water.

Original Article: [The Colorado Sun by Michael Booth](#)

Interior Department Invests \$100 Million in First Dam Safety Project Through President Biden's Bipartisan Infrastructure Law

The Department of the Interior announced today that the Bureau of Reclamation is providing project-specific funding of \$100 million for the modification of B.F. Sisk Dam



VELES WATER WEEKLY REPORT

in California. The funding, authorized by President Biden's Bipartisan Infrastructure Law, was highlighted in an addendum to the Bureau's initial spend plan for fiscal year 2022 funding allocations.

The Bipartisan Infrastructure Law provides \$500 million to Reclamation over the next five years to support critical dam safety projects, streamline construction management, maintain the operational capacity of Reclamation's dams and minimize risk to the downstream public. These investments underscore President Biden's commitment to developing longer-term measures to respond to climate change, mitigate drought and build climate resiliency.

"Investing in and enhancing dam safety is central to the Biden-Harris administration's all-of-government approach to addressing drought and confronting climate change impacts on communities and habitats," said Secretary Deb Haaland. "Crucial funding from President Biden's Bipartisan Infrastructure Law will further advance planned dam safety work at B.F. Sisk to reduce risk while preserving all the benefits that the dam and San Luis Reservoir currently provide. This is the first of many projects that will benefit from these historic infrastructure investments."

B.F. Sisk Dam, completed in 1967, impounds San Luis Reservoir, the nation's largest offstream reservoir, and provides supplemental irrigation water storage and municipal and industrial water for the Central Valley Project and California's State Water Project. In December 2019, Reclamation and the California Department of Water Resources announced a partnership to move forward on a \$1.1 billion seismic upgrade with the signing of a Record of Decision and Notice of Determination.

The dam safety project, Reclamation's largest project under the 1978 Safety of Dams Act, will add stability berms and other dam safety features to the existing 3.5-mile-long earthen dam. Increasing the dam height will reduce downstream public safety concerns by reducing the likelihood of overtopping if slumping were to occur during a seismic event. Exploratory blasting at B.F. Sisk occurred during 2020 in preparation for construction on the multi-year project to begin summer 2022.

"The Biden-Harris administration is focused on developing long-term resilience to drought and climate change," said Assistant Secretary for Water and Science Tanya Trujillo. "This investment in B.F. Sisk Dam, located south of the Sacramento-San Joaquin Delta, will build water supply security for California communities, farmers and ranchers and wildlife refuges, and help the system better adapt to a changing climate."

Construction is divided into three phases with a new contract for each phase. The award of the Phase I contract award is scheduled for FY 2022, using both Bipartisan Infrastructure Law Safety of Dams funding, as well as that provided in Reclamation's annual appropriations.

Original Article: [U.S Dept. Of the Interior](#)



Netherlands to join hands with India on global water pact

The Netherlands is keen to work closely with India, taking inputs from the Narendra Modi administration's 'access to drinking water for all programme (Jal Jeevan Mission) for a 'global water pact' to be discussed at the UN water conference next March, said Henk Ovink, Netherlands' special envoy for international water affairs.

Ovink said, in an interview at his office in The Hague, that Netherlands' partnership with India for climate change mitigation and adaptation would bring together innovative solutions developed in the Netherlands and India's experience in ensuring access to water, sanitation and hygiene to a large number of people, for implementation around the world.

"India and the Netherlands are amazing partners in demonstrating what works, showing the commitment behind what works and in the opportunity to scale that up and put that on the UN agenda as a 'global water pact,'" said Ovink. He said that all such initiatives from around the world such as India's Jal Jeevan Mission and the commitments of national governments would make up the global action agenda on water. He said the three-day UN conference starting 22 March 2023 would be one of action agenda, rather than just calling for action. The conference will be co-hosted by Tajikistan and the Netherlands.

India's Jal Jeevan Mission aims to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India. The scheme also entails measures such as water conservation and rain water harvesting. As per data available from the Jal Shakti ministry, nearly half of the 193 million Indian rural households to be covered under the scheme had access to tap drinking water as of 29 March.

"In partnership, we can see how we can scale innovative solutions across the world. This is at the heart of a lot of what we do together, said Ovink. He said that the Indian government's focus on water security is of critical importance in the context of the covid pandemic.

"We are coming after two years of the pandemic and we know how important is water for hygiene. We say 'wash your hands,' but if there is no water, there is no hand washing. Your government has a big focus on issues of water, sanitation and hygiene, which are of critical importance in the context of the pandemic," said Ovink.

Ovink said that India's efforts under the Jal Shakti Ministry showcases work that can be replicated in other parts of the world, for which partnership helps. "But we still know that billions of people around the world lack that access to water,"

India's water security programme is an inspiration and learning capacity that we can bring to other places around the world, he added.

Original Article: [Mint by Gireesh Chandra Prasad](#)



Record investment in infrastructure and regions to deliver a stronger economy

The Morrison-Joyce Government is investing record amounts in infrastructure and regional development projects through the 2022-23 Budget as part of our plan for a stronger future, to make our nation wealthier and stronger, create tens of thousands of jobs and drive economic growth.

With investments in new and existing infrastructure projects in every state and territory, the Government's rolling 10-year infrastructure investment pipeline will increase from \$110 billion to \$120 billion, a new record.

This includes an additional \$17.9 billion in new commitments to infrastructure projects through the 2022-23 Budget. These new commitments will support around 40,000 jobs over the lives of the projects, with around 120,000 jobs supported by projects underway as part of the Government's record infrastructure investment pipeline.

Building water infrastructure for a sustainable agricultural future

The Government will continue to deliver the water infrastructure needed to secure Australia's water future and provide the safe, reliable and affordable water industry, businesses and households need.

Since 2013, the Government has committed \$8.9 billion to the National Water Grid Fund, with more than 150 water infrastructure projects. Of the more than 70 construction projects, nine have now been delivered and a further 16 are under construction.

Through the Budget, our additional investment of \$6.9 billion through the National Water Grid Fund includes:

- \$5.4 billion for Hells Gates Dam, subject to the completion of the final stage of the business case and regulatory approvals;
- \$600 million for Paradise Dam Improvement; and
- Up to \$433 million for Dungowan Dam and Pipeline, subject to the finalisation of the business case and approval processes.

The Government has also locked in \$483 million to build Urannah Dam, pending demonstration of value for money and sufficient public benefit for investment.

Through the 2022-23 Budget, the Morrison-Joyce Government is building the infrastructure to make Australia as strong as possible, keeping commuters and freight moving safely and efficiently, and driving the economic growth of our nation.

Original Article: [Deputy Prime Minister Office for Infrastructure](#)



VELES WATER WEEKLY REPORT

Bill Gates and Blackrock are backing the start-up behind hydropanels that make water out of thin air

They're like solar panels, except instead of electricity, they produce water.

Source Global's hydropanels create water out of thin air and bring it where it's most needed. CEO Cody Friesen invented the panels in 2014 at Arizona State University's Ira A. Fulton Schools of Engineering, where he's on the faculty.

A year later, he turned the science into Source Global. The start-up's panels cost about \$2,000 a piece.

"We take sunlight and air and we can produce perfect drinking water essentially anywhere on the planet," Friesen said. "And so we take water that has historically been probably humanity's greatest challenge and turn it into a renewable resource that is perfect essentially everywhere."

Source's hydropanels take in water vapor from the air and pack it into a form that's about 10,000 times more concentrated than in the atmosphere. Using the warmth of the sun, the system converts the molecules into liquid water, which is collected in a reservoir inside the panel and then released as pure water.

By 2018, Friesen had installed an array of 40 hydropanels in Kenya, where members of the Samburu Girls Foundation faced daily danger on their journeys to find water. They now have their own water source.

"We can now make perfect water, at your home, at your school, in your community in a way that is really bringing it into the 21st century," said Friesen.

Source's hydropanels are installed in 52 countries in 450 separate projects. The company has raised \$150 million from investors including Bill Gates' Breakthrough Energy Ventures, BlackRock, Duke Energy and the Lightsmith Group.

This type of technology is desperately needed in places like India, where an estimated 800,000 villages don't have clean drinking water. Friesen cited World Health Organization, showing that by 2025 "half the world's population will be in water stressed areas."

There's a domestic need as well. In the U.S, there are 1.5 million miles of lead pipes still in the ground, and about 750 water main breaks a day, according to Friesen. The business opportunity, he said, is enormous.

Original Article: [CNBC by Diana Olick](#)

Water resource conservation promotes sustainable development in China's northern drylands

Water resource availability is the major limiting factor for sustainable development in drylands. The drylands of northern China contain only 19% of the country's total water resources but house one-third of the national population, and are therefore under considerable water stress. In particular, Inner Mongolia, which is a typical dryland province, plays an important role in maintaining ecological security in northern China.



VELES WATER WEEKLY REPORT

For the past few years, its anthropogenic water consumption has increased 4-fold, from 6.68 billion m³ in 1987 to 27.11 billion m³ in 2015; this increase has seriously threatened regional grasslands, which also rely on water resources to sustain ecological integrity. The conflict between ecological and social-economic systems and the actions that might relieve it has been long overlooked, thus, might lead to unexpected problems when adopting one-sided policies.

Climate change intensifies the conflicting water demands between people and the environment and highlights the importance of effective water resource management for achieving a balance between economic development and environmental protection. In 2008, Inner Mongolia proposed strict regulations on water exploitation and utilization aimed at achieving sustainable development. By adopting these regulations, Inner Mongolia's government aims to limit high water consumption and the expansion of polluting industries; by doing so, they aim to achieve industrial restructuring toward sustainable development. However, no systematic evaluation has been conducted to determine if and how such strict regulations on water conservation might alleviate the tension between environmental protection and economic development. Without this information, policy adjustment and the ability to achieve sustainable development are limited.

Now, a research group from University of Chinese Academy of Sciences studied the effectiveness and performance of these long-standing water conservation regulations. The results were published in *Frontiers of Environmental Science & Engineering*.

They found that the regulations drove industrial transformation, evidenced by the decreasing proportion of environmentally harmful industries such as coal and steel, and the increasing proportion of tertiary industries (especially tourism). Following industrial transformation, economic development decoupled from industrial water consumption and subsequently led to reduced negative environmental impacts.

Based on these results, adaptive strategies were developed for 12 cities by revealing and integrating their development pathways and relative status in achieving sustainable development. Integration and cooperation between cities were proposed, e.g., a water trade agreement between eastern Inner Mongolia (an economically underdeveloped region with relatively abundant water resources) and central Inner Mongolia (an economically developed region with high water stress). Such an agreement may enable the holistic achievement of sustainable development across regions. By integrating the findings of the research, a reproducible framework is established for water-management-based sustainable development strategies in drylands.

Stimulating the internal motivation of industrial transformation through the regulations of water resources could help achieve synergy between economic development and environmental protection, therefore, promoting sustainable development in drylands. Taken together, three suggestions are proposed for sustainable development in drylands: (1) restrict the water exploitation and regulate the



VELES WATER WEEKLY REPORT

water cost to reconcile the conflict between economy and environment; (2) promote novel technologies to increase the water use efficiency; (3) enhance regional cooperation achieve holistic development in a mutually beneficial way.

Original Article: [Phys.org by Higher Education press](#)

93% households in Delhi now have access to piped water supply:

Economic Survey

Around 93 per cent of households in Delhi now have access to piped water supply, and water production during the summer season is being maintained at 953 million gallons a day (MGD) consistently, according to the Delhi Economic Survey 2021-22. The survey report presented in the assembly on Friday by Deputy Chief Minister Manish Sisodia also said Delhi's water demand is set to increase to 1,505 MGD this year against the expected supply of 1,200 MGD.

Water is supplied to about 20 million population through the existing water supply network of 15,041-km-long pipelines and about 125 underground reservoirs (UGRs), it said.

"Besides, a total of 407 new water tankers with stainless steel containers fitted with GPS have been engaged in improving the water tanker supply delivery system in the city. Apart from these approx. 530 mild steel hired tankers (during peak summer), 250 newly purchased stainless steel tankers are being added to the existing fleet to supplement water supply in water deficit areas," the report said.

Original Article: [The India Economic Times](#)

Shifts in El Niño May Be Driving Climates Extremes in Both Hemispheres

The record-breaking heat wave last week in East Antarctica, the coldest region on Earth, saw temperatures surge as much as 85 degrees Fahrenheit above average, bringing readings near freezing and unexpected surface melting instead of the usual sub-zero conditions.

The heat wave adds to a quickly growing list of previously "unthinkable" climate events, and puts an exclamation point on an Austral summer that included brutal heat waves and record-high intensity wildfires in Argentina and Chile and flooding caused by record-setting rains in eastern Australia that killed more than 20 people and left thousands homeless.

Other "unthinkable" extremes hit the Northern Hemisphere in the months before that. A December wildfire in the Rocky Mountain foothills of Colorado completely changed how some forest and fire scientists see the fire risk in that area, and the Pacific Northwest heat wave that started in June 2021 was an extreme not forecast by climate models. As that heat wave ebbed in July, parts of several German towns were destroyed



VELES WATER WEEKLY REPORT

by flooding rainstorms that were intensified by global warming. And in recent days, temperatures surged to 50 degrees Fahrenheit in the Siberian Arctic near the North Pole and above the adjacent Arctic Ocean.

Scientists exploring possible connections between the remarkable series of extremes in both hemispheres say they are increasingly certain that the powerful El Niño-La Niña cycle in the Pacific Ocean is one of the key links. New research shows the cycle has shifted in a way that is likely to fuel extremes, including wild swings between heat and drought and flooding rains.

In the El Niño/Southern Oscillation (ENSO), huge masses of water surge eastward and westward every two to seven years along a vast region of the equatorial Pacific. One of the strongest El Niños on record in 2016 helped boost the average global temperature to a new record high that year.

It's Happening. Now

The most recent global science report from the Intergovernmental Panel on Climate Change projected that the global warming fingerprint on the El Niño-La Niña cycle would become apparent after about 2050. But the accelerating pace of record-breaking weather events shows that the destructive effects are already here, said Wenju Cai, director of the Center for Southern Hemisphere Oceans Research at the Commonwealth Scientific and Industrial Research Organisation in Australia.

Cai was a co-author on a key 2022 study showing that the western Pacific is warming more than the eastern Pacific and that the growing temperature contrast is driving complex changes to the El Niño cycle, but Cai said some key climate signals are emerging, including enhanced rainfall in the areas favored by the respective phases of the cycle. And along with the background global warming, each major El Niño peak since the 1950s has been stronger than the previous, pushing ocean surface temperatures to new highs in the east-central equatorial Pacific, where important climate measurements are made. "Anything that happens in the tropics affects both the northern and southern hemisphere," Cai said, adding that, as the El Niño/Southern Oscillation changes, the affected areas are expanding and the extremes are intensifying and lasting longer in both hemispheres.

How global warming changes the El Niño cycle is a "fundamental issue in climate science with critical societal ramifications" because the cycle is so important to driving climate extremes "within and outside the Pacific," Cai and his co-authors wrote in the study, published in January in *Nature Climate Change*.

There is not yet a discernible direct link between the current La Niña phase of the cycle and the recent heat wave in the Antarctic: Researchers have not even begun to explore a connection. But the southern polar extreme happened just days after scientists announced the finding that Antarctic sea ice had plummeted to the lowest extent on record, leaving miles of open ocean that's darker and warmer than a reflective ice shield. And recent research suggests that the El Niño cycle affects Antarctic ice shelves, with



VELES WATER WEEKLY REPORT

more melting from below in their floating sections, but also with increased snowfall on the surface that can thicken the ice.

Original Article: [Inside Climate News by Bob Berwyn](#)

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