BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD OF DIRECTORS MEETING

May 11, 2023

Correspondence and media coverage of interest between April 11, 2023 and May 9, 2023

Correspondence

From: Los Vaqueros Reservoir Expansion Project
To: CCWD Board
Date: April 28, 2023
Subject: Monthly Report

From: Peter Drekmeier, Policy Director, Tuolumne River Trust
To: President Newsha Ajami and Commissioners of the SFPUC
Date: April 17, 2023
Subject: Salmon Count data Sources

From: Peter Drekmeier, Policy Director, Tuolumne River Trust
To: President Newsha Ajami and Commissioners of the SFPUC
Date: April 10, 2023
Subject: Item 6: Rescinding the Water Shortage Emergency

Press Release

From: East Bay Municipal Utilities District
Date: May 2, 2023
Press Release: EBMUD celebrates 100 years of safe, reliable water

From: East Bay Municipal Utilities District
Date: April 25, 2023
Press Release: EBMUD further eases drought restrictions and focuses on long-term conservation

From: San Francisco Public Utilities Commission
Date: April 11, 2023
Press Release: San Francisco Public Utilities Commission Votes to End Local Drought Declaration

Media Coverage

Water Supply Conditions:

Date: May 4, 2023
Source: California Courthouse News Service
Article: California snowpack reaches historic 240% of normal

Date: May 4, 2023
Source: San Francisco Chronicle
Article: Climate whiplash: Satellite images show dramatic swings of California's snowpack

Date: May 2, 2023
Source: USA Today
Article: Water levels are going up in the West's massive reservoirs. Has the water crisis been averted?

Water Supply Conditions, cont'd.:

Date: May 2, 2023
Source: San Francisco Examiner
Article: California snowpack melting slower than expected as summer approaches

Date: May 2, 2023
Source: Newswise
Article: Forced water-use cuts made California more waterwise

Date: May 2, 2023
Source: CapRadio
Article: California's snowpack is double the average for May, survey finds

Date: April 28, 2023
Source: Desert Review
Article: Abundant snowfall in Rockies cause for extra water to Lake Mead

Date: April 26, 2023
Source: San Jose Mercury
Article: Peak snowpack: PG&E measures 211 inches of snow in final Lassen Peak survey

Water Supply Management:

Date: May 9, 2023
Source: Union Democrat
Article: SF Officials reflect on Hetch Hetchy water system's 'multigenerational legacy' in Tuolumne County

Date: May 9, 2023
Source: Mercury News
Article: Massive snowpack's summer bonus: Clean, cheap electricity for California

Date: April 25, 2023
Source: Patch
Article: Zone 7 Water Agency Ends Drought Emergency & Mandatory Conservation

Water Quality:

Date: May 3, 2023
Source: WaterWorld
Article: California Water Board releases Drinking Water Needs Assessment

LOS VAQUEROS RESERVOIR EXPANSION PROJECT

APRIL 28, 2023

UPCOMING ACTIVITIES

May 2 at noon – Finance workgroup on Service Agreements

May 9 at 3:30 p.m. – JPA Open House at ACWA spring conference

May 10 at 3 p.m. – GM meeting at ACWA spring conference

May 18 at 10 a.m. – JPA O&E Committee Meeting

May 19 at 10:00 a.m. – JPA Board Meeting at Zone 7 Water Agency

May 20 at 10:00 a.m. – Los Vaqueros Reservoir 25th Anniversary Event

May 25 at 1 p.m. – JPA Finance Committee Meeting

June 14 at 9:30 a.m. – JPA Board Meeting Budget Adoption & MPA No. 5 Execution

UPCOMING JPA MEMBER BOARD COORDINATION

May 9 at 9 a.m. – EBMUD Planning Committee Meeting

May 12 at noon – Valley Water Storage Committee

ADDITIONAL PROJECT INFO

https://www.ccwater.com/lvstudies

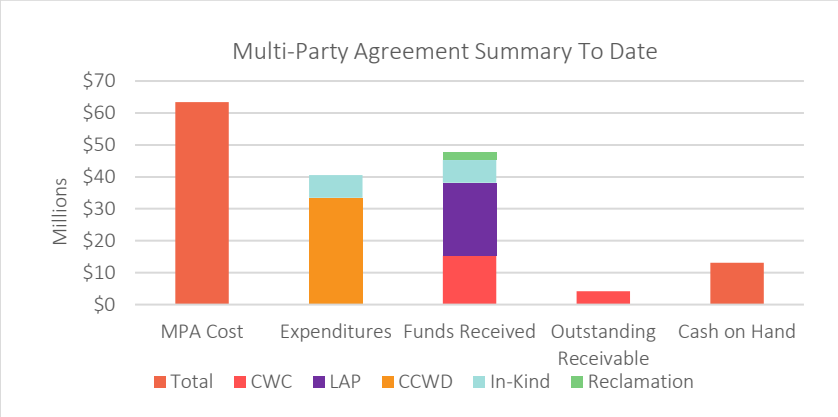
www.losvaquerosjpa.com

MONTHLY REPORT

FUNDING

Amendment No. 5 to the Multi-party Cost Share Agreement is currently being reviewed by JPA members. The cost share for each JPA Member agency, excluding Grassland Water District, will depend on member feedback and is currently approximated to be $1.2 million per agency. Amendment No. 5 to the Multi-party Cost Share Agreement will cover all of the revenue and expenditures in FY24 of the JPA. The JPA is set to adopt the FY24 budget on June 14.

The following chart provides an overview of the Multi-party Agreement (MPA) expenditures at CCWD through March 2023. The funds received, outstanding receivable, and cash on hand are shown through mid-March 2023.



JPA BOARD OF DIRECTORS MEETINGS

On April 12th the JPA Board of Directors met in-person at Zone 7 Water Agency. The JPA unanimously approved appointment of an auditor for FY22, contracting with Cal Mutuals JPRIMA for insurance, and an amendment to the Khadam Consulting contract. The Draft FY24 Budget and Federal Relations Report were also reviewed for discussion. The next monthly JPA Board Meeting has been scheduled for May 19 at Zone 7 Water Agency in Livermore and the meeting agenda packet will be distributed to JPA Directors and Alternate Directors on Monday May 8 and posted to the JPA website on Tuesday May 9.

PERMITTING

U.S. Fish and Wildlife Service (USFWS) supervisory staff are reviewing the draft Biological Opinion for terrestrial species. USFWS Migratory Bird Program issued the 'take permit' under the Bald and Golden Eagle Protection Act on March 28, 2023.

California Department of Fish and Wildlife (CDFW) continues work on the Incidental Take Permit for terrestrial species and Lake and Streambed Alteration Agreement. Meetings have been ongoing with CDFW to finalize modeling for the aquatic Incidental Take Permit application. Central Valley Regional Water Quality Control Board (CVRWQCB) issued its Section 401 permit on June 30, 2022. The U.S. Army Corps of Engineers (USACE) continues work on the Section 404 permit and associated Decision Document. Draft water rights change petitions have been prepared and submitted to staff at the State Water Resources Control Board for preliminary review.

DESIGN & ENGINEERING

CCWD's ongoing Capital Project Management efforts include developing the Risk Management Plan and updating risk assessments for the dam expansion, Pumping Plant No. 1 and the Transfer-Bethany Pipeline (TBPL). CCWD is also reviewing the market-place evaluation of potential Project Management Information System vendors, which will be used by a selection committee consisting of CCWD and JPA Member staff representatives to identify a short-list of vendors to submit additional information and to provide a vendor demonstration.

CCWD updating the schedule and the total program cost estimate. The schedule will reflect the status and timing of critical path activities and will reflect the latest updates on estimated construction timing. The updated schedule and program costs will support plan of finance.

Coordination with the Department of Water Resources (DWR) continues on the TBPL Turn-In to the California Aqueduct. Updates to the design to reflect the latest input from DWR and updated topographic information are underway and anticipated to be submitted to DWR in June. CCWD has sent requests for permission to enter private parcels along the TBPL alignment to perform geotechnical investigations and environmental surveys.

CCWD authorized an amendment to AECOM's contract to complete additional analyses and design updates in response to comments and questions from the California Division of Safety of Dams, to update the cost estimate, to collect additional field information, and to continue with dam expansion implementation planning.

Tuolumne River Trust

OFFICES
San Francisco

Modesto

Sonora

Mailing Address
P.O. Box 3727
Sonora, CA 95370

Phone
(415) 882-7252

Website
www.tuolumne.org

BOARD MEMBERS
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Harrison "Hap" Dunning, Vice Chair
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Brad Wurtz

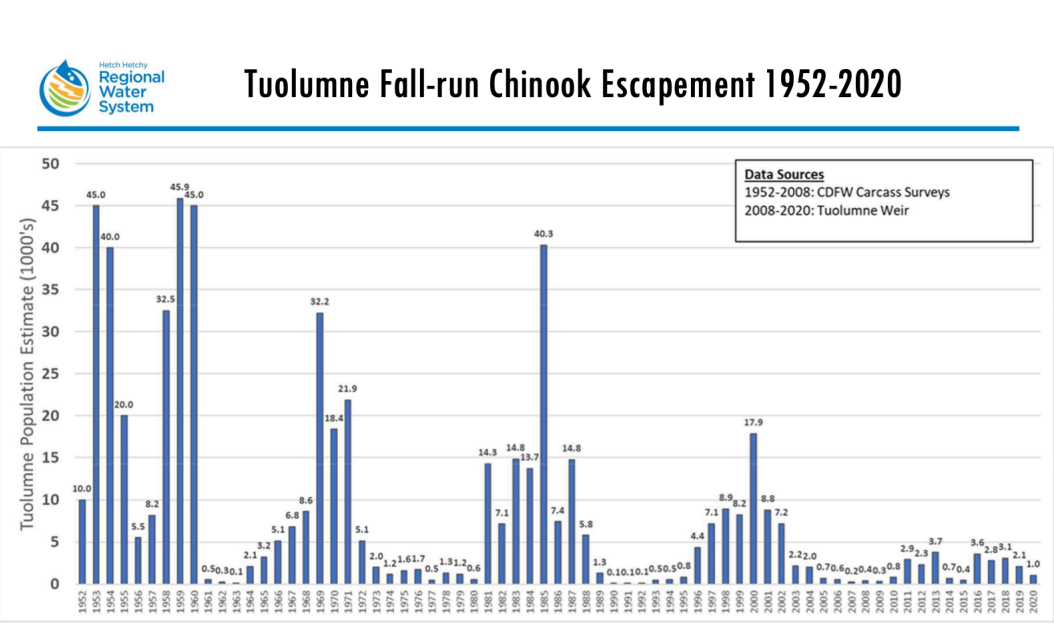
April 17, 2023

President Newsha Ajami and Commissioners
SFPUC
525 Golden Gate Ave.
San Francisco, CA 94102
Via Email

Re: Salmon Count Data Sources

Dear President Ajami and Commissioners:

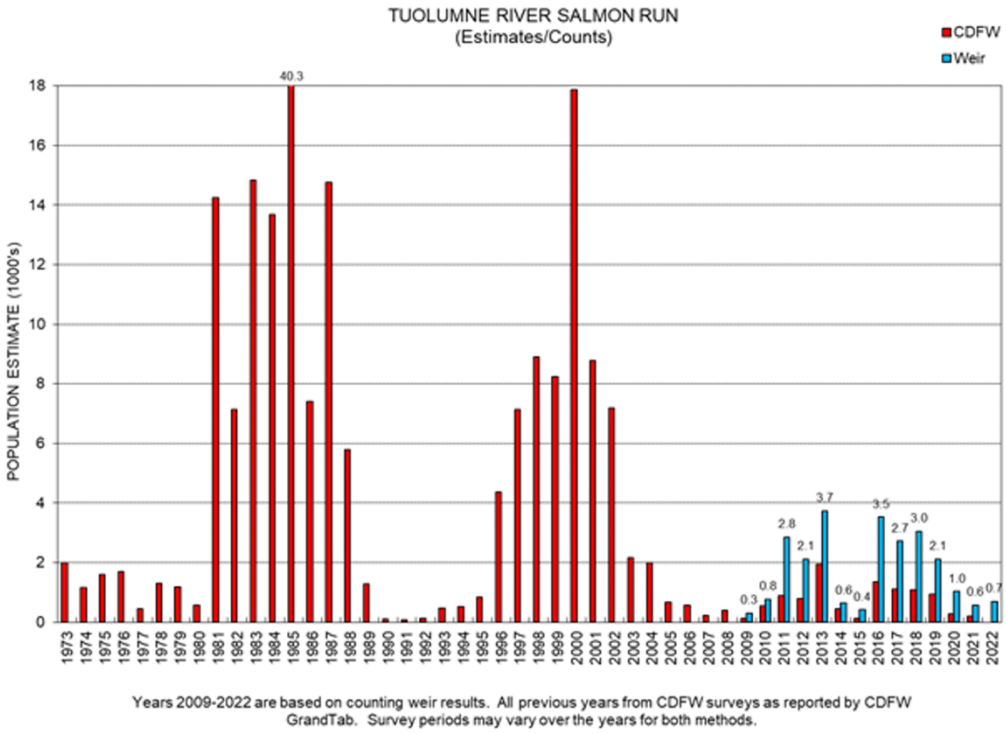
The following salmon count graph was presented by staff to the Commission twice, first at a workshop on the scientific basis for the proposed Tuolumne River Voluntary Agreement on February 5, 2021, and later during an update on Tuolumne River fall-run Chinook salmon on November 8, 2022



TRT pointed out that the data sources used for the graph were changed in 2009, shifting from historic CDFW carcass surveys to FishBio weir counts. We informed the Commission that the weir counts were on average 2.5 times higher than the carcass surveys, so the graph did not compare apples to apples. Whether intentional or not, this made recent salmon counts appear higher than they should have been had a consistent source been used.

SFPUC staff never corrected the graph. However, upon request consultants for the Irrigation Districts, who had been using a similar graph, agreed to update their graph to show both CDFW carcass surveys and FishBio weir counts.

You will see that from 2009 to the present, weir counts (blue bar) averaged 2.5 times higher than carcass surveys (red bar).



Moving forward, please direct staff to use a consistent salmon count data source, which should be the CDFW carcass surveys upon which the State and Federal salmon doubling goal is based.

Thank you.

Sincerely,

Peter Drekmeier

Peter Drekmeier
Policy Director

Cc: BAWSCA Board of Directors
SFPUC Citizens Advisory Committee

Tuolumne River Trust

OFFICES
San Francisco

Modesto

Sonora

Mailing Address
P.O. Box 3727
Sonora, CA 95370

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April 10, 2023

President Newsha Ajami and Commissioners
SFPUC
525 Golden Gate Ave.
San Francisco, CA 94102
Via Email

Re: Item 6: Rescinding the Water Shortage Emergency

Dear President Ajami and Commissioners:

Item 6 on tomorrow's agenda provides an opportunity to reevaluate overly-conservative SFPUC policies. During the recent three-year drought, the SFPUC never had less than four years-worth of water in storage, yet the public was led to believe we were experiencing a water shortage emergency. San Francisco ratepayers were forced to pay a drought surcharge.

Up through your October 26, 2021 meeting, water supply reports were titled "Water Supply Conditions Update." Beginning on November 9, reports were renamed "Drought Conditions Update." On November 23, your agenda packet did not include a water supply update, marking the only time in 2021 a report was not included at regular SFPUC meeting. Suspiciously, that was the meeting when you declared a "Water Shortage Emergency."

At your November 9, 2021 meeting, the report showed Total System Storage as of November 1 at 1,053 thousand acre feet (TAF). On December 6, Total System Storage was 1,033 TAF. Water demand has been under 200 mgd for the past eight years (182 mgd last year). 200 mgd equals 224 TAF per year.

At the time you declared the Water Shortage Emergency, the SFPUC had more than 4-and-a-half years-worth of water in storage.

The low point in Total System Storage during the three year drought was 932 TAF on December 5, 2022. The SFPUC never had less than four years-worth of water in storage.

According to the current Water Supply Conditions Update, the SFPUC needed 621 TAF this year to fill its reservoirs on the Tuolumne River. The SFPUC already has been entitled to 1,008 TAF, and the snowpack contains more than 2 million acre feet of water.

The current report also shows that in 2017 (a year similar to this) the SFPUC was entitled to 3.3 million acre feet of water from the Tuolumne. That was enough water to last more than 14 years at 200 mgd demand.

Keep in mind that in an average year, the SFPUC is entitled to 744 TAF from the Tuolumne. This is why last year, despite it being dry, the SFPUC captured a years-worth of water from its watersheds.

Please take this opportunity to revisit other SFPUC policies that needlessly harm the environment and ratepayers.

Staff is now preparing an Alternative Water Supply Plan. Figures used to represent "Water Supply Needs," which will help determine how much expensive alternative water supplies might be developed, have been manipulated, as pointed out in previous correspondence.

Furthermore, by making two common sense changes to the Design Drought, with a stroke of the pen you can reduce Water Supply Needs dramatically. We ask that you request an item be included on your next agenda to explore removing a year from the Design Drought and to evaluate the impact of using SFPUC Finance Bureau sales projections on Water Supply Needs.

Thank you for your consideration.

Sincerely,

Peter Drekmeier

Peter Drekmeier
Policy Director

Cc: BAWSCA Board of Directors

Oakland, May 2, 2023

EBMUD celebrates 100 years of safe, reliable water

Events this month will celebrate the role of water in supporting the East Bay's public health, economy and environment.

OAKLAND - In May, the East Bay Municipal Utility District (EBMUD) completes 100 years of proud service providing clean, safe, reliable water to families, cities and businesses across Alameda and Contra Costa counties. At the turn of a century of service, EBMUD's investment in infrastructure and new technologies prepares us and the region to meet the challenges ahead, from climate change to seismic risks, and more.

To celebrate our 100th birthday and thank our 1.4 million customers for their ongoing support, this month EBMUD will host events and unique collaborations to highlight our commitments to the diverse communities we serve, to the infrastructure we maintain, and to the sustainability of our work. EBMUD will continue to share the history of the water system and the people who built it with the future release of special projects.

"As part of this historic moment, EBMUD recognizes our dedicated staff and those whose foresight, sacrifice and tremendous efforts created a system that we have used nonstop for 100 years," said General Manager Clifford Chan. "We must also take this time to thank our customers who support our work to protect public health and safeguard our natural resources. Please join our celebration."

Events: May 21- 23, 2023

Sunday, May 21 – EBMUD 100th Birthday Party and Community Fair: Join EBMUD from 11 a.m. to 4 p.m. for a community fair at Lake Temescal in Oakland, one of the East Bay's original water sources. The fair is free admission with free shuttle service from Rockridge and MacArthur BART stations, and will feature entertainment, a kids zone, a beer and wine garden to benefit EBMUD's Water Lifeline, and more. Media advisory to come.
Monday, May 22 - Time Capsule Burial: EBMUD invites dignitaries, special guests, and the press to the corner of 21st and Adeline streets in Oakland, the location of EBMUD's original headquarters, for a time capsule ceremony. Media advisory to come.
Tuesday, May 23 – Board of Directors meeting: Join EBMUD staff and officials on the first day of EBMUD's second century of service for a commemorative meeting of the governing board. Media advisory to come.

Collaborations: Drake's Brewing Co., Oaklandish

Drake's Brewing Co. – Water Wings East Bay Lager is a limited-release beer highlighting our shared commitment to water quality, sustainability, and community. A portion of the proceeds will support Water Lifeline. The beer will be available at select retailers. Press release to come.

Oaklandish – Exclusive centennial T-shirts will raise funds for Water Lifeline. Available while supplies last. Press release to come.

Special projects: Film, flipbook, lobby

Centennial film – A film chronicling EBMUD's story featuring interviews, historical and modern-day footage of water operations, and priorities for the future. Coming July 2023.
Centennial flipbook – A digital presentation of EBMUD's timeline, from establishment in 1923 to today. Coming July 2023.
Lobby – A reimagination of the public lobby of EBMUD's Administration Building, 375 11th Street, Oakland, will invite visitors to explore the world of water. Coming December 2023.

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The East Bay Municipal Utility District has a proud history of providing high-quality drinking water for 1.4 million customers in Alameda and Contra Costa counties. EBMUD's wastewater system serves 740,000 customers and helps protect the ecosystem of San Francisco Bay. EBMUD is a not-for-profit public agency established in 1923.

Contact
Nelsy Rodriguez
Public Information Representative
510-287-0150

Oakland, April 25, 2023

EBMUD further eases drought restrictions and focuses on long-term conservation

Move from Stage 1 to Stage 0 follows the scaling back of drought restrictions in March

OAKLAND - Following a unanimous 7-0 vote by its Board of Directors, the East Bay Municipal Utility District (EBMUD) has moved to a stage 0, further easing drought restrictions, while continuing to urge customers to conserve water.

The April 25, 2023 Board action ends the water shortage emergency that began in April 2021, and suspends a District-wide voluntary 10 percent water use reduction. Drought restrictions issued by Gov. Gavin Newsom in a March executive order remain in place. They include no irrigation within 48 hours of rainfall, no irrigation of ornamental turf on non-residential sites, no irrigation runoff, no spraying sidewalks and driveways, and only allowing hoses with shut-off nozzles when washing vehicles.

All changes went into immediate effect on April 25.

The easing of the nearly three-year drought follows an impressive effort by EBMUD's 1.4 million customers to conserve water. Customers saved a collective 32,000 acre-feet, or 10 billion gallons of water. EBMUD thanks its customers and urges them to embrace a water-conservation culture.

"With the heavy rainfall and snow we experienced this winter, we see how quickly conditions can change from exceptionally dry to extraordinarily wet," Board President Andy Katz said. "EBMUD's customers can play an active and important role in preparing for inevitable future droughts by making water conservation a part of their daily lives."

EBMUD customers can continue to save water by finding and fixing leaks indoors and out; using a flowmeter that can help catch leaks early; creating water-wise landscaping; replacing inefficient household appliances and plumbing fixtures with budget-friendly efficient models, and following state guidelines to curb water waste. More information can be found at ebmud.com/waterconservation.

The shift to Stage 0 reflects the change in EBMUD's water supply after a series of unprecedented winter storms filled the District's reservoirs. EBMUD projects its water system will be full by the end of the water year on September 30. EBMUD's system is currently 76% full with room for snowmelt from this winter's record-breaking Sierra snowpack.

In March, EBMUD suspended penalties for excessive water use, ended the 8 percent drought surcharge, and downgraded from a Stage 2 to Stage 1 drought after a rollback of state drought restrictions. The prolonged drought cost the District $21 million, including the purchase of 54,000 acre-feet of supplemental water supply for customers.

With EBMUD marking its 100th anniversary this May, the utility has weathered numerous droughts and drought-busting winters. Formed in 1923 to address concerns about the scarcity of water in the East Bay, EBMUD remains committed to its mission to provide safe, clean water while planning and innovating for the future.

“We are pleased with this winter’s plentiful rain and snow that allows us to move past the drought. But we recognize that drought is cyclical in California and climate change is intensifying this phenomenon,” said General Manager Clifford Chan. “As we look ahead, EBMUD will continue to upgrade and invest in our infrastructure, develop partnerships, and use state-of-the-art technology to ensure that East Bay residents have a reliable supply of water in response to a changing climate.”

###

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Contact
EBMUD Public Affairs
510-287-0138

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

FOR IMMEDIATE RELEASE
April 11, 2023

SFPUC Contact:
Joseph Sweiss
(628) 231-9861
jsweiss@sfwater.org

SAN FRANCISCO PUBLIC UTILITIES COMMISSION VOTES TO END LOCAL DROUGHT DECLARATION

Today's vote repeals the City's drought surcharge adopted in 2021 in response to exceptionally dry weather conditions across the state.

SAN FRANCISCO — The San Francisco Public Utilities Commission (SFPUC) today voted unanimously to rescind the Water Shortage Emergency Declaration due to systemwide hydrologic conditions and high water storage levels in SFPUC reservoirs. The Commission also lifted the drought surcharge, effective May 1, 2023.

"Recent storms have made this year one of the wettest on record, and snowpack has reached historic levels," said Dennis Herrera, SFPUC General Manager. "This follows three of the driest years in recorded history. While these storms may have ended the latest drought for much of California, climate change is resulting in weather whiplash. Rapid shifts between extreme weather mean long-term vulnerabilities for our water supply. Over the next 10 years, the SFPUC is investing billions in capital improvement programs to ensure reliable delivery of clean drinking water, systemwide climate change adaptation, and ratepayer affordability."

Adopted in November 2021, the SFPUC's water shortage emergency instituted a temporary drought surcharge for retail water and wastewater customers of up to 5% on part of their bill, effective April 1, 2022. With today's vote to rescind the emergency declaration, the temporary drought surcharge will end as well.

The SFPUC's 11% systemwide voluntary water use reduction remains in effect (5% from San Francisco customers and 16% from wholesale agencies). This is because the State Water Board's regulations require urban water agencies remain in in Level 2 drought response.

Restrictions against certain wasteful uses of water are permanent in San Francisco. For more information, visit the SFPUC's Wasteful Water Use FAQ here.

For more information on today's Commission meeting, visit the SFPUC's 2023 Commission Meeting agenda and minutes here.

About the San Francisco Public Utilities Commission

The San Francisco Public Utilities Commission is a department of the City and County of San Francisco. It delivers drinking water to 2.7 million people in the Bay Area, collects and treats wastewater for the City and County of San Francisco, and meets over 70 percent of the electricity demand in San Francisco. Our mission is to provide our customers with high-quality, efficient and reliable water, power, and sewer services in a manner that values environmental and community interests and sustains the resources entrusted to our care. Learn more at www.sfpuc.org.

California snowpack reaches historic 240% of normal

The Golden State's massive snowpack will begin melting in May, causing widespread flooding concerns particularly in the Central Valley.

California Courthouse News Service | May 4, 2023 | Natalie Hanson

Sean de Guzman handles a snow depth survey at Phillips Station in the Sierra Nevada Mountains. (Ken James / California Department of Water Resources)

SACRAMENTO, Calif. (CN) — Despite a recent bout of warm weather, California's snowpack still stands at 241% of average for May, prompting experts to double down on warnings about spring flooding.

The California Department of Water Resources conducted a fifth snow survey of the season Monday at Phillips Station near Lake Tahoe. The survey recorded a snow water equivalent of 30 inches, which is 241% of average for this location. Readings from 130 snow sensors placed throughout the state indicate the snowpack's snow water equivalent is 49.2 inches, or 254% of average, officials reported.

Recent winter storms brought the abundant snow and caused flooding in many counties including the central San Joaquin Valley. Experts warned a period of unusual heat in April could cause flooding risks in such vulnerable areas, but the snowpack has melted more slowly than average, or about 12 inches.

The state reported that average snowpacks have only measured above 200% in April during the winter seasons in 1952, 1969 and 1983.

“While providing a significant boost to California’s water supplies, this year’s massive snowpack is posing continued flood risks in the San Joaquin Valley,” said department director Karla Nemeth. “The snowpack will not disappear in one week or one month but will lead to sustained high flows across the San Joaquin and Tulare basins over the next several months and this data will help us inform water managers and ultimately help protect communities in these regions.”

Sean de Guzman, the state’s Snow Surveys and Water Supply Forecasting Unit manager, said technology is being used to forecast snowmelt and runoff.

“Survey results from our partners in the California Cooperative Snow Surveys Program and other data, including data from Airborne Snow Observatory flights, allow us to incorporate these data into our models to provide the most accurate snowmelt runoff forecasts possible right now to inform water supply, flood control and planning,” he said.

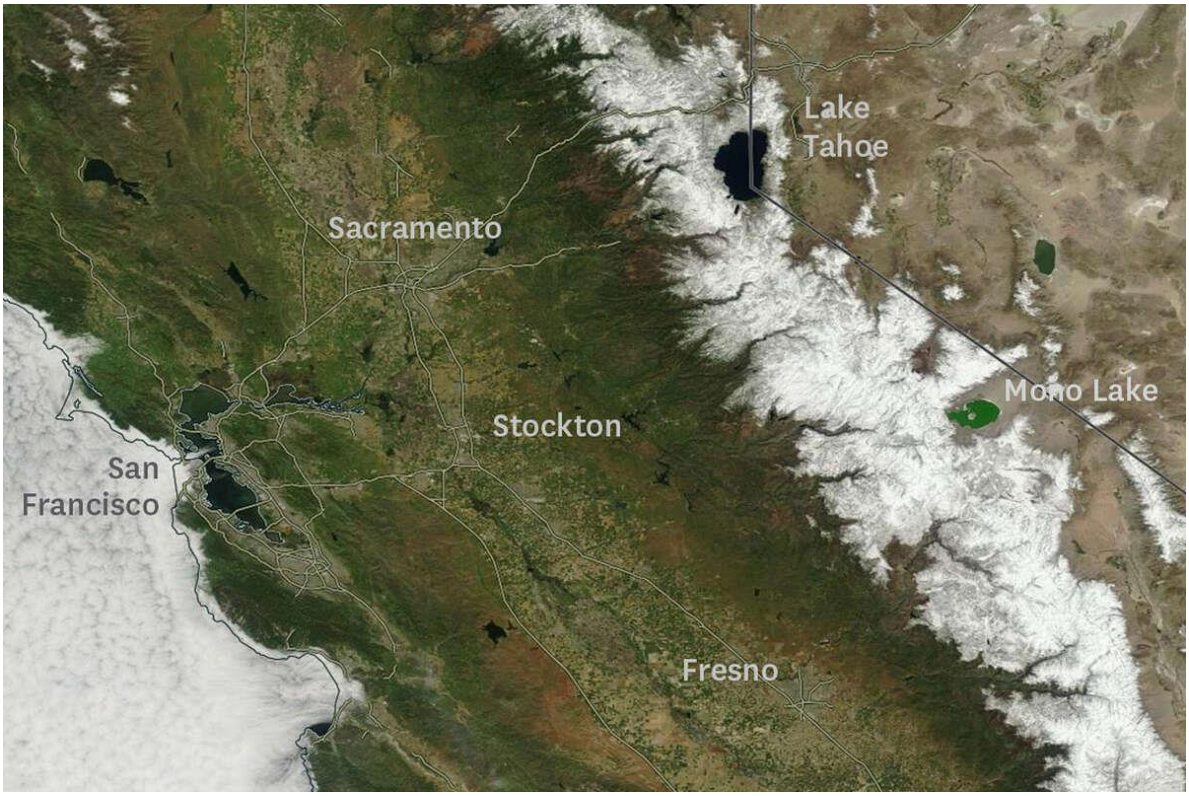
Due to the effects of climate change on California’s snowpack, since 2021 snowpack averages have been calculated using a timeframe of 1991 through 2020 to better reflect current climate conditions.

The banner winter spelled good news for drought-weary California: the U.S. Drought Monitor indicates most of the state is currently completely out of drought, with only areas in the southeastern desert regions and near the Oregon border measuring as abnormally dry or in moderate drought. The state has said the drought tracker does not account for snowmelt outcomes or how rainfall received over the winter will affect groundwater basins.

In April, the state announced that for the first time since 2006 it will allocate 100% of requested water from the State Water Project, which delivers to 29 public water agencies serving 27 million Californians and 750,000 acres of farmland. The state says it is also maximizing the water that can be diverted toward recharging groundwater basins for future use.

# # #

‘Climate whiplash’: Satellite images show dramatic swings of California’s snowpack
San Francisco Chronicle | May 4, 2023 | Jack Lee



An image captured by NASA’s Terra satellite shows the Sierra Nevada snowpack on April 27.

NASA Worldview
Twelve months ago, California was entering year three of an extended drought. On the heels of the driest January-April period in 128 years, the state’s two largest reservoirs were down to critically low levels, and a skimpy snowpack meant little additional water was on the way.

“We were in dire straits,” said Jeffrey Mount, a senior fellow with the Public Policy Institute of California Water Policy Center.

This year has been a complete turnaround.

More weather: Maps show how California’s snowfall compares with past winters
Storms drenched California for months and piled on epic amounts of snow in the Sierra Nevada. The state’s May 1 snowpack clocked in at 254% of average for the date.

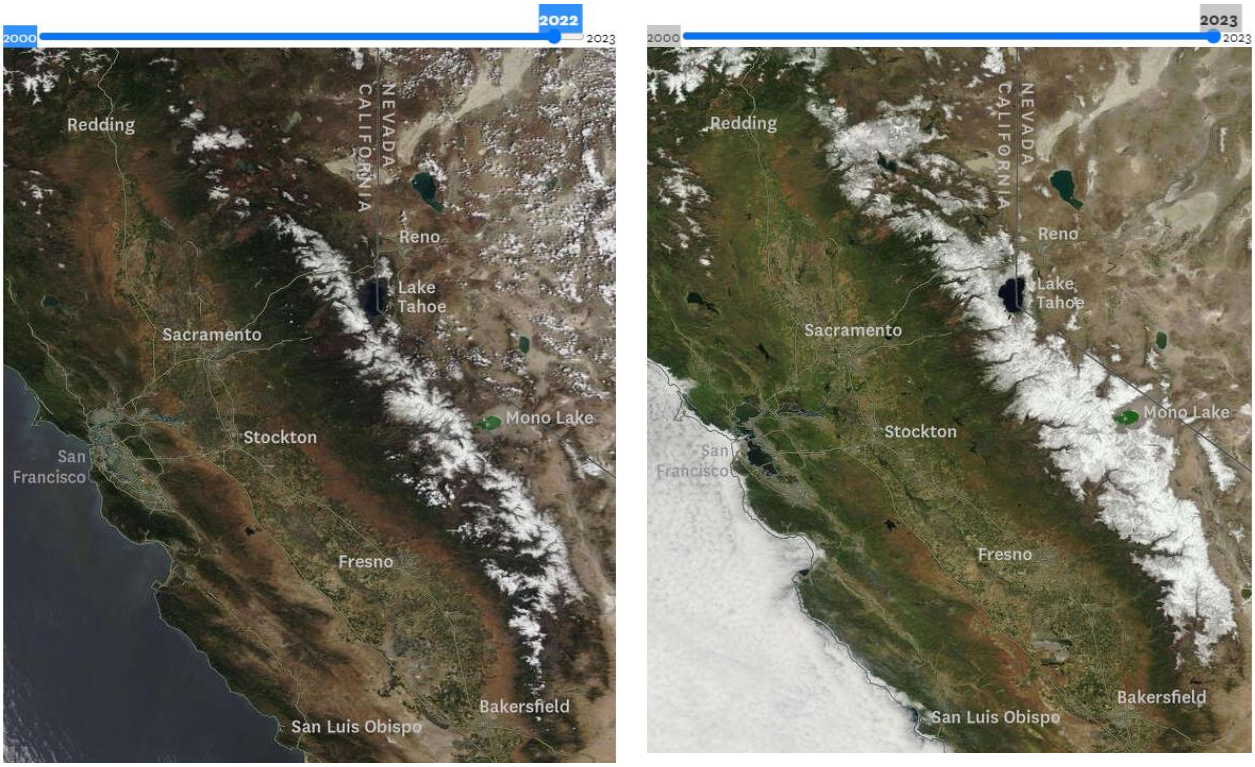
California regularly sees variability in Sierra snow from season to season, or a “snowpack whiplash.”

“If you look at the long-term year-by-year trend in snowpack overall in California, we’re still getting the big years, but we’re also getting a lot more really bad years,” said Daniel Swain, a climate scientist at UCLA and the Nature Conservancy, in an online presentation. “The variability of that snowpack definitely has increased in recent years.”

Scientists anticipate that hydroclimate variability will continue to rise in the future.

“As the climate warms, climate whiplash events or these back-to-back wet and dry extremes are expected to become more likely across the state, which poses challenges for water management,” said Laurie Huning, an assistant professor of civil engineering and construction engineering management at California State University Long Beach, by email.

Sky-high view
Satellite images show how much California’s snowpack, in white, varied from 2000 to 2023.



The images came from NASA’s Terra satellite, which has taken measurements of Earth’s atmosphere, lands and oceans since 2000. Images were selected around May 1, with shifts of a few days if needed, due to cloud cover. The marine layer is also visible off the coast in some images.

This year, the peaks of the Sierra are a swath of white, reflecting all the snow in recent months. The jet stream steered atmospheric rivers toward the West Coast, providing ample moisture for storms that barreled through the state all winter.

Big multi-day storm events, like the ones that drenched the state this winter, account for upward of 80% of the variability in California’s precipitation, said Benjamin Hatchett, an Earth systems scientist at the Western Regional Climate Center and the Desert Research Institute.

“If we get more of them, we have a really wet year,” Hatchett said. “If we get too few of them, we have a very dry year.”

Scientists predict that future storms will pack a bigger punch, as a warmer atmosphere holds more water, resulting in even bigger extremes.

Rain versus snow

Whether storms produce rain or snow involves additional factors, including where a storm makes landfall. This year many storms were oriented toward Central and Southern California, where high peaks of the Sierra Nevada can lift storms to chilly environments and shift precipitation from rain to snow.

Another factor is storm temperature. This year, storms that made landfall in Northern California were very cold, resulting in ample snowfall.

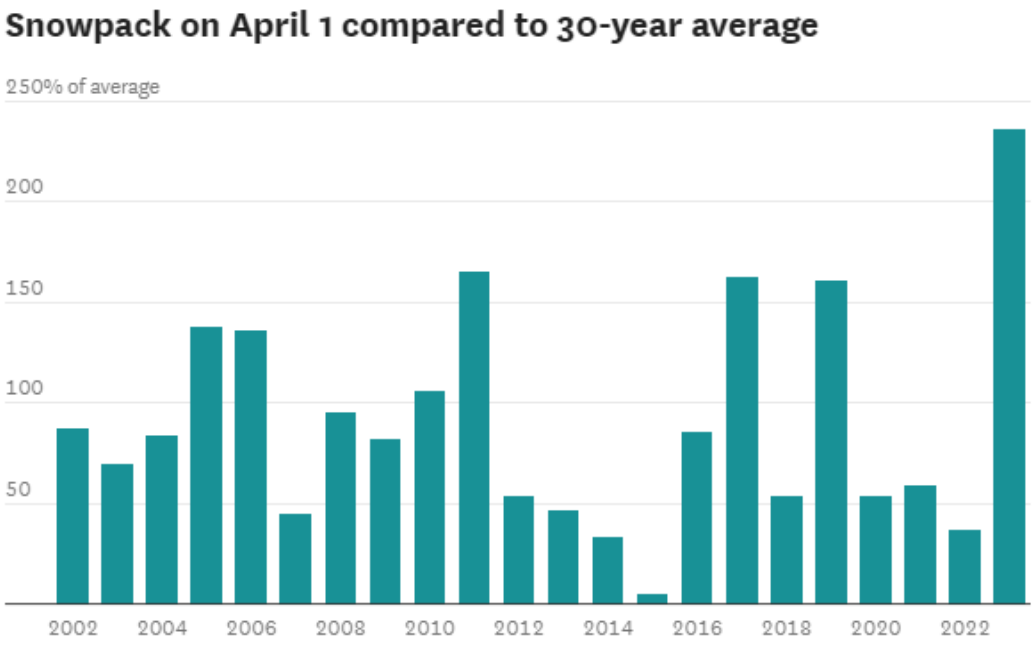
But it was a different picture in 2017.

Though it was one of the wettest water years on record for California — with devastating consequences in places like Lake Oroville — there was less snow than the current water year, tracked as of Oct. 1.

“We had warmer storms and those storms were hitting Northern California a bit harder, and it was warmer there (because) the mountains are lower,” Hatchett said.

Future snowpack

Scientists and water experts also track snowpack by water content rather than area covered. Officials traditionally use April 1 to report peak California snowpack.



Values reflect snow water equivalent of the April 1 statewide snowpack, as a percentage of a 30-year average.

Chart: Jack Lee / The Chronicle • Source: California Department of Water Resources

Like the satellite images, these measurements illustrate California's "snowpack whiplash." This year the snowpack came in at 236% of average. Last year's was a scant 37%.

But that still tops the all-time low of 5%, seen in 2015 — a very dry and warm year, Hatchett said. He and other scientists describe these conditions as a snow drought, which occurs when there's little precipitation, like in 2015, or when it's so warm that precipitation comes down as rain rather than snow.

Greenhouse gas emissions, and a resulting rise in global temperatures, could make snow droughts more frequent.

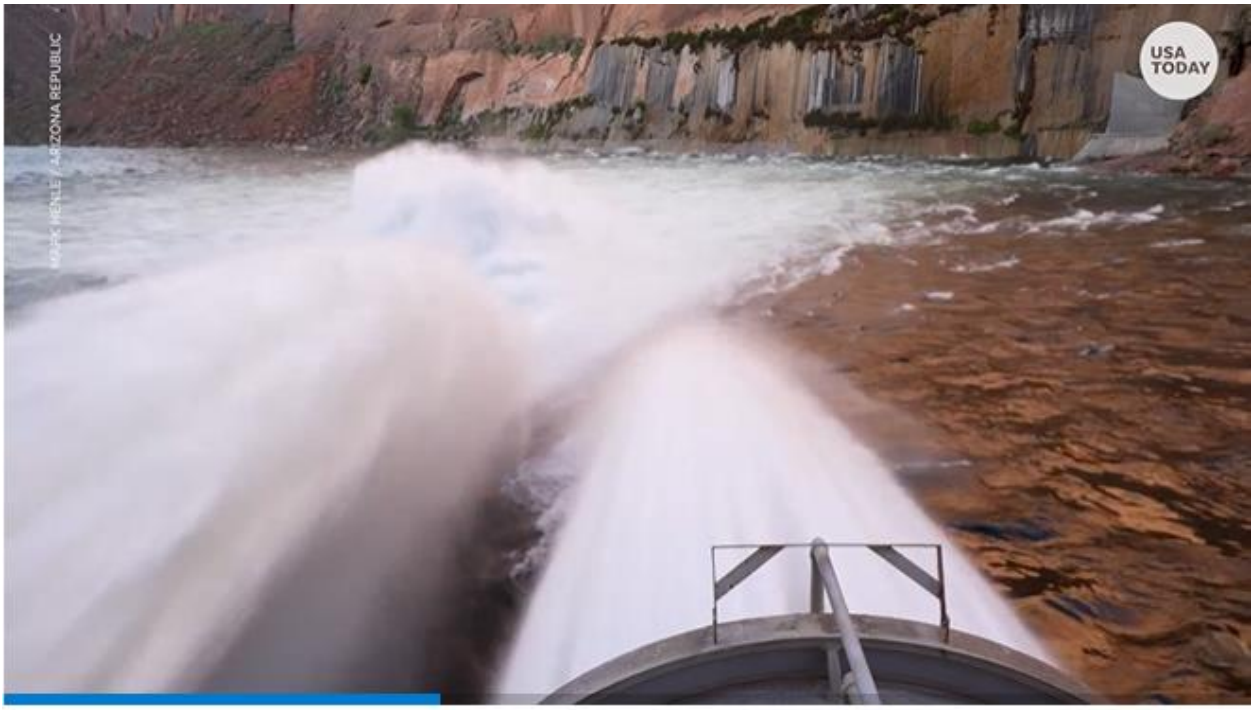
"Climate models tend to project an increase in the number of back-to-back years of low to no snow conditions in the future across California," Huning said.

By the end of the century, snow could become increasingly sparse, or disappear entirely, scientists say.

"It's just going to be too warm to snow," Hatchett said. "That's kind of where we're headed."

# # #

Water levels are going up in the West's massive reservoirs. Has the water crisis been averted?
USA Today | May 2, 2023 | Trevor Hughes



Glen River Dam experiment hopes to improve drought conditions on the Colorado River

Officials are releasing a flood experiment from Lake Powell to refill low water levels in Lake Mead and the Colorado River following severe drought. *Claire Hardwick, USA TODAY*

Historic snowfall across the Rocky Mountains is helping recharge some of the country's biggest reservoirs and provide – briefly – some much-needed breathing room for the oversubscribed Colorado River.

Forecasts say the melting snow flowing into Lake Powell via the Colorado River and its tributaries could hit 177% of average this year, a major boost at a time when lake levels had hit historic lows. The levels are now headed up and will likely peak sometime in June, raising the surface by 50 feet.

But experts say the boost won't solve or even significantly delay the West's water crisis that has drained the massive Lake Powell and Lake Mead reservoirs – Lake Powell will probably only be about 40% full this fall, far below what it once held.

"This buys a year," longtime Colorado River expert Brad Udall said. "It doesn't remotely come close to solving the long-term problems."

Meanwhile, at Lake Powell this week, authorities released billions of gallons of water downstream through the Grand Canyon as part of an attempt to rebuild beaches and create new fish habitats. It's a long-planned experiment that might have been halted if water levels in the reservoir had kept dropping.

What does the Colorado River snowpack look like?

The Upper Colorado Basin's snowpack stands at almost 160% above normal, meaning there's a significant amount of water that will melt and flow downstream into the river. Some of that water will be lost through evaporation or absorption into the dry soils, however.

Colorado's snowpack is well above average, and Utah had its snowiest winter on record.

“This winter’s snowpack is promising and provides us the opportunity to help replenish Lakes Mead and Powell in the near-term – but the reality is that drought conditions in the Colorado River Basin have been more than two decades in the making,” said Bureau of Reclamation Commissioner Camille Calimlim Touton in a statement.

Water managers hope to refill some of their smaller reservoirs in Colorado and Wyoming, which they have been draining in previous years to prop up Powell and Mead and prevent them from dropping below the levels necessary to produce hydroelectricity.

But overall, Colorado River flows have declined about 20% compared to historic flows, even with this year's record-breaking snowfall.

The Glen Canyon Dam, which impounds the Colorado River to create Lake Powell, was originally designed to be 16 feet higher, making it the same height at the Hoover Dam on Lake Meade in Nevada. Engineers shortened the dam, lowering the reservoir's height, to protect Rainbow Bridge, North America's largest natural rock bridge, which is about 50 miles north of the dam. *Trevor Hughes, USA TODAY*

What are the projections for Lake Powell and Lake Mead levels?

Authorities predict that Lake Powell will end 2023 at 3,573 above sea level, which is a clear improvement over the past several years. Last year it ended the year at 3,524 feet. Lake Mead ended 2022 at around 1,044 feet, and authorities predict it will end this year at about 1,068 feet.

Lake Powell's official full level is 3,700 feet, and it topped out at 3,708 feet in 1983. That same year Mead hit 100% full at 1,225 feet. At their lowest, Powell was just 23% full, while Mead dropped to 28%.

Because the reservoirs are shaped like martini glasses, they hold significantly more water when they're closer to full. Combined, they are today only about 26% full.

Experts don't expect them to ever be full again, however – the ongoing question is how to manage what water they do have for the benefit of as many Americans as possible. Federal officials have rejected suggestions that they remove either the Glen Canyon or Hoover Dam and consolidate the water into just one reservoir.

Projections suggest Lake Powell's level on Oct. 1 – the official start to what's known as the water year – will be nearly 50 feet higher than it was a year ago. Lake Mead could be around 22 feet higher than it was last Oct. 1, although still about 160 feet below full.

What's the long-term outlook for the Colorado River?

Udall, who studies the river at Colorado State University's Colorado Water Center, said this winter's snow is likely an aberration, and that long-term trends show the West is getting drier due to climate change. He said the only real solution is to use less water.

Big snow years are happening half as often as they used to, while dry years are happening 2.5 times as often, he said.

"There's two important components to get to a better place," he said. "The first is wishing for high flow years and the other is cutting demand. And we only control one of them."

Federal officials are developing a plan that would force the seven states and Native American tribes using Colorado River water to use less of it. The exact details are being worked out but could lead to significant cuts in both California and Arizona, which depend heavily on the river to irrigate crops from alfalfa to almonds, along with many of the vegetables Americans eat, especially in the winter.

# # #

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California snowpack melting slower than expected as summer approaches
San Francisco Examiner | May 2, 2023 | Natalia Gurevich

Right, Sean de Guzman, Manager of the California Department of Water Resources Snow Surveys and Water Supply Forecasting Unit, and Anthony Burdock, Department of Water Resources Engineers in the Snow Surveys and Water Supply Forecasting Unit, weigh the aluminum survey pole during the final snow survey of the 2023 season at Phillips Station in the Sierra Nevada Mountains. Photo taken May 1, 2023. Ken James / California Department of Water Resources

With record snowfall this winter, many communities in California are awaiting the melt with bated breath over the inevitable deluge.

But some may be able to breathe a sigh of relief – at least, for now.

According to the Department of Water Resources' latest report on Monday, the snowpack is melting at a slower rate than expected due to cooler temperatures over the last month.

As of Monday, 59 inches of snow and 30 inches of snow water were recorded, or 241% of the May 1st average. Statewide, the survey found that the average snow water level in the snowpack is a little more than 49 inches which is 254% of the typical average on May 1st.

Three years ago, on May 1st there was only 1.5 inches of snow and half an inch of snow water measured.

While the month started on the warmer side, cooler weather and increased cloud cover have led to slower melting. Only around 12 inches of the snowpack has melted during April.

Still, the massive quantity of snow topping the Sierras poses a risk to communities likely to experience flooding, like the San Joaquin Valley. Just last week, most of Yosemite Valley temporarily closed anticipating flooding.

“The snowpack will not disappear in one week or one month but will lead to sustained high flows across the San Joaquin and Tulare Basins over the next several months, and this data will help us inform water managers and ultimately help protect communities in these regions,” said Karla Nemeth, the director of the Department of Water Resources in Monday’s press release.

The Tulare Basin used to be a massive lake more than one hundred years ago, but was depleted by farmers and the former lakebed is now mostly farmland.

This year record rainfall has returned Tulare to its former glory, flooding the farmland and devastating the agricultural operations in the area.

There have only been a few years in the past where the averages were over 200% – 1952, 1969, and 1983 – according to the recent DWR report.

“No matter how you look at the data, only a handful of years in the historical record compare to this year’s results,” said Sean de Guzman, manager of DWR’s Snow Surveys and Water Supply Forecasting Unit, in Monday’s release.

This year, while temperatures remain relatively cool, flood concerns are rising as summer approaches, especially in communities that have already experienced severe floods in this winter’s massive rainfall.

This includes Pajaro and communities in Sacramento, Tulare, and Merced counties. In the meantime, DWR officials have been connecting with locals to manage water diversion to help reduce flooding impacts.

This week brings yet another smattering of rain to parts of the Bay Area, although nothing compared to the atmospheric rivers throughout the winter season, and temperatures will likely remain cool the rest of the week.

# # #

Forced water-use cuts made California more waterwise
State mandate in 2015 and 2016 resulted in ongoing water efficiencies
Newswise | May 2, 2023 | University of California, Riverside

A study by the University of California, Riverside, found that after California ended mandatory water-use cuts in 2015 and 2016, urban water use increased somewhat, but the state remained more water-conscious overall. This means that even though people started using more water again, they were still mindful of water conservation and continued to save water in the long run.

The University of California, Riverside study was published in the Water Resources Research journal on Tuesday, April 25th. The study found that by 2019, water use in California was still lower than it was in 2013. This was mostly due to changes in water use by larger water users.

When then-Governor Jerry Brown imposed a water-reduction mandate in 2015, it also encouraged Californians to develop better water-saving habits, like watering their lawns and gardens during cooler morning hours when less water evaporates. The researchers analyzed about 500 million records of hourly water use data to reach their conclusions.

Most of the permanent water savings came from higher-end water users, who get a greater return from investments in water efficiency.

According to Mehdi Nemati, the lead author of the study and an assistant professor of water resources economics at UCR's School of Public Policy, wealthier people with larger properties tend to use more water. However, the study found that these individuals adopted technology and changed their water usage habits, resulting in a smaller rebound in water usage compared to those with lower water usage.

During the water-cut mandate period, lower-end water users with less income and smaller yards tended to let their lawns go brown. When the mandate was lifted, these users started watering their lawns again, which led to a 13-15% increase in water use compared to the mandate period. However, even though the mandate was lifted, water use in 2019 was still lower than in 2013.

This study gives us more information about what happened after California's governor, Jerry Brown, told water providers to reduce the amount of water used by people living in cities by 25% in 2015. The study found that the mandate helped to reduce overall water use in the state, especially among larger water users who tended to be wealthier and had bigger properties. Even after the mandate was lifted, people continued to use less water than before.

The UCR researchers focused on granular data from a water utility in Northern California that serves about 70,000 people and were able to extrapolate the trends to the entire state with data from an ongoing statewide study, Nemati said.

The Northern California utility had to decrease its water deliveries by 32% as part of the mandate. To achieve this, the utility offered incentives such as rebates for residents and businesses to replace grass lawns with drought-resistant landscapes, upgrade irrigation systems, and install water-efficient toilets and washing machines, among other measures to save water.

Significantly, the utility also banned watering between the hours of 10 a.m. and 10 p.m., when higher temperatures outdoors increase the loss of irrigation water from evaporation.

According to Nemati, people followed the best practices of watering their lawns and gardens during cooler morning hours even after the water mandate was lifted. This was revealed as one of the findings from the hourly water usage data.

Nemati cautioned that it would be more difficult in the future to achieve water-use reductions because so many higher-end water users have already invested in water efficiency.

“It is useful for the water agencies to know that we already got rid of most of our low-hanging fruit,” he said.

The study, called "Residential Water Conservation and the Rebound Effect: A Temporal Decomposition," was written by Mehdi Nemati, Dat Tran, and Kurt Schwabe from the University of California, Riverside’s School of Public Policy.

# # #

California's snowpack is double the average for May, survey finds
CapRadio | May 2, 2023 | Manola Secaira

Sean de Guzman with the California DWR walks with a tape measure to determine the next sample location during a snow survey at Phillips Station in the Sierra Nevada Mountains on May 1, 2023. Fred Greaves / California Department of Water Resources

During the final statewide snow survey of the year, researchers at Phillips Station near Lake Tahoe recorded a snow depth of nearly five feet. That's 241% of the May 1 average for this area. Statewide, the snow water equivalent is at 254% of average for this date. That measurement indicates how much water the snowpack contains, which is helpful to know when assessing the state's water resources.

It's not every year that the California Department of Water Resources conducts a fifth snow survey. David Rizzardo, manager of the department's hydrology section, said it depends on whether there's any snow to measure — and for the last couple years, that hasn't been the case.

The last time there was a measurable amount of snow in May at Phillips Station was 2020. That year, researchers measured only one and a half inches of snow.

“These forecasts are vitally important to establishing the final numbers for… our water supply index,” Rizzardo said of April and May surveys. “And that sets the water year type for the Sacramento and San Joaquin Valley.”

Even though late-April temperatures spiked, officials say that statewide snowpack melted at a slower rate than average. That’s largely thanks to lower-than-usual temperatures in early April, coupled with cloud cover. Rizzardo called this a “mixed blessing.”

“It would be nice to get a little bit more melt, just to trim a little bit off the top, so we don't have to cram all that melt into May and June and July,” he said.

He said warmer days often mean more demand for irrigation in areas like the San Joaquin Valley, which means snowmelt could be directed towards something beneficial. But at the same, he said it’s important that it doesn’t all melt now.

“It was very hot last week, above normal temperatures, so that accelerated the melt,” he said. “Had we been talking a week ago, the concern might have been, well, is this above normal [temperature] going to continue because we really don't want to see it accelerate too fast either.”

In a statement, state water department director Karla Nemeth said this year’s massive snowpack continues to pose a flood risk for communities in the San Joaquin Valley. She said snowmelt will lead to sustained high flows in both the San Joaquin River and Tulare Basins.

Overall, it’s a tricky balance. Rizzardo said officials will be keeping an eye on the rate of snowmelt as the state heads into the summer, ensuring that flooding induced by it is mitigated whenever possible.

Some parts of California — especially those in Southern California that depend on resources from the Colorado River Watershed — are still suffering the more acute impacts of drought. But overall, Rizzardo said the state has had a good winter of precipitation. For now, he said he’s hoping that the snow continues to melt at a rate the state can handle.

“Mother Nature's in control,” he said. “And how is that weather going to change and what extremes might we still see – that's really going to dictate how this runoff occurs and whether it's happening at a pace that's manageable.”

# # #

Abundant snowfall in Rockies cause for extra water to Lake Mead
Desert Review | April 28, 2023 | Staff Reporter

CALIFORNIA — The Bureau of Reclamation released its April 24-Month Study late April, which includes an increase to downstream flows from Lake Powell to Lake Mead of up to 9.5 million acre-feet (maf) this water year, Oct. 1, 2022 through Sept. 30, 2023.

Lake Powell's Glen Canyon Dam's annual release volume for water year 2023 was initially set at 7.0 maf, based on the August 2022 24-Month Study, and is now projected to increase to up to 9.5 maf because of high snowpack this winter and projected runoff in the Colorado River Basin this spring, according to the report. The actual annual release volume from Glen Canyon Dam is adjusted each month throughout the water year and is determined based on the observed inflow to Lake Powell and the storage levels of Lake Powell and Lake Mead.

While this water year's projections are above average, the Colorado River Basin is experiencing severe drought conditions and system reservoirs remain at historically low levels, the report said. In response to this historic drought, Reclamation recently released a draft Supplemental Environmental Impact Statement to potentially revise the current interim operating guidelines for the near-term operation of Glen Canyon and Hoover Dams.

“This winter’s snowpack is promising and provides us the opportunity to help replenish Lakes Mead and Powell in the near-term — but the reality is that drought conditions in the Colorado River Basin have been more than two decades in the making,” said Commissioner Camille Calimlim Touton in the report. “Despite this year’s welcomed snow, the Colorado River system remains at risk from the ongoing impacts of the climate crisis. We will continue to pursue a collaborative, consensus-based approach to conserve water, increase the efficiency of water use, and protect the system’s reservoirs from falling to critically low elevations that would threaten water deliveries and power production.”

Lake Powell is currently operating in the Lower Elevation Balancing Tier, and Reclamation is required to “balance the contents” of Lake Mead and Lake Powell, as outlined in the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines).

The April through July unregulated inflow forecast for Lake Powell is 11.3 maf (177% of average) — an increase of 3.3 maf from March, which was 125% of average. Reclamation’s April 24- Month Study projects Lake Powell’s elevation at 3,576.50 feet at the end of the water year (Sept. 30, 2023). This is approximately 40 feet higher and 2.74 maf of additional storage than projected in the August 2022 Most Probable 24-Month Study, which was used to set the annual operations for Lake Powell and Lake Mead.

For the past several years, Reclamation has had to take drought response operations, including modifying monthly releases from Glen Canyon Dam, to keep water in Lake Powell and help prevent it from dropping to critically low elevations.

Reclamation has already increased the monthly release volume for April from Glen Canyon Dam from 552,000 acre-feet to 910,000 acre-feet to be better positioned to release up to 9.5 maf by the end of the water year (Sept. 30, 2023). Monthly releases for May through September will also be adjusted as needed, the report said.

Based on the April 24-Month Study, Lake Mead’s elevation is also projected to improve in calendar year 2023, with a projected end of calendar year elevation of 1,068.05 feet — approximately 33 feet higher than the March 24-Month Study. With this improvement in Lake Mead’s elevation, a mid-year review of Lake Mead operations is not expected in 2023.

While improved hydrology and projected forecasts have provided an opportunity to recover upstream reservoir storage and use the higher runoff to take positive action in the Grand Canyon, the Colorado River system remains at risk, with Lake Powell and Lake Mead at a combined storage capacity of just 26%.

# # #

Peak snowpack: PG&E measures 211 inches of snow in final Lassen Peak survey
San Jose Mercury | April 26, 2023 | Michael Weber

PG&E Hydrographer Duncan Drummond, left, and Dan Stephens holds steady a tube containing a sample of snowpack as Lassen Peak is seen in the background Tuesday, April 25, 2023 at Lassen Volcanic National Park in California. (Michael Weber/Enterprise-Record)

CHESTER — The final snowpack survey of the year took a bit more effort for the PG&E team at Lassen Volcanic National Park.

In the dense, late April snow, PG&E hydrographers drilled through 211 inches of snowpack Tuesday to reach the gravel parking lot of the Lassen Peak trailhead — by jumping on their equipment like a pogo stick.

“At many other sites we can core many samples by hand. At this site, we have to jump on the sampler to use our full body weight to get it down,” said PG&E Hydrographer Dan Stephens. “We’ve already broken gear this morning.”

Stephens said Lassen Peak represents 3% of the Feather River watershed, and one of the stations measured 211 inches of snow, equivalent to 118 inches of water.

Spokesman Paul Moreno said PG&E is one of many agencies conducting snowpack surveys throughout the state from February through May. The Department of Water Resources will collect data through May 3 and the final report will be published later in the month, he said.

“This has been done since the 1930s, this physical measurement. And they continue to do it so they have a consistent yardstick, so to speak,” said Moreno.

Stephens said samples are taken from 10 stations at Lassen Peak and is averaged out for a final number to report to the California Cooperative Snow Survey.

Aside from measuring snowpack for municipal water uses, PG&E will calculate how much hydroelectric power will be generated from water traveling through its power plants along the Feather River.

Moreno said water from Lassen Peak will have passed seven hydroelectric powerhouses before reaching Lake Oroville.

“This is one of several sites that we measure each month during this time of year. This is actually the start about as high up you can get off the north fork watershed,” he said.

Stephens said core samples at Lassen Peak are showing less snow than areas farther south.

“What we’ve seen is a year similar to 2017, 2019 — big banner year. I can’t say its record amounts in this area. Farther south we’ve had a really good year; that’s going to be a great year for hydroproduction,” Stephens said.

After samples are taken throughout the Feather River watershed, PG&E will calculate a forecast of how much hydroelectric power will be available.

Moreno said hydroelectric in a typical year will produce about 15% of PG&E’s power portfolio.

“With a wet year like this, we expect that number to increase, but we’re not going to have the numbers crunched until sometime in May,” Moreno said.

Hydroelectric power generation this year is expected to last into early fall. Moreno said hydroelectric power can be used to fill gaps in power production to meet power needs for residents through the summer.

“In drier years, we will actually hold water back in our reservoirs … that way we’ll have water available to meet the peak demands of summer. For this year, it means much more hydropower pretty much all the time.”

# # #

SF officials reflect on Hetch Hetchy water system's 'multigenerational legacy' in Tuolumne County

Union Democrat | May 9, 2023 | Guy McCarthy

San Francisco officials including Mayor London Breed; San Francisco Public Utilities Commission general manager Dennis Herrera; and Newsha Ajami, the public Utilities Commission president unveil a plaque Tuesday commemorating the centennial of O'Shaughnessy Dam, the keystone of the Hetch Hetchy Water and Power system that serves about 3,500 Groveland Community Services Distrct customers and 2.6 million people in the Bay Area, including all of San Francisco and San Mateo counties, and portions of Alameda and Santa Clara counties.

Snow showers and wintry weather came to Hetch Hetchy Reservoir in Yosemite National Park on May 2 during a visit by San Francisco officials to celebrate the centennial of O'Shaughnessy Dam, the keystone of the Hetch Hetchy Water and Power system.

The reservoir serves about 3,500 Groveland Community Services District customers and 2.6 million people in the Bay Area.

Hetch Hetchy Water and Power managers, other agency managers, and a historian for the San Francisco Public Utilities Commission described impacts of the system in Tuolumne County as a multigenerational legacy that will continue into the future.

“When you think about a hundred years ago, and how this was established, and how everything came together with the federal park service and other federal authorities putting together the Ryker Act, creating the opportunity for something of this magnitude,” San Francisco Mayor London Breed told The Union Democrat before ceremonial remarks and unveiling of a plaque marking the occasion.

“Can you imagine what people were thinking back then when they decided this is the location and this is where we’re going to create a reservoir, and the gravity that goes into it allowing it to occur naturally? It’s pretty amazing,” Breed said. “What it took — local, state, and federal government — it’s pretty awesome to be here and to see it.”

Since 1914, when work first began on the Hetch Hetchy project, Hetch Hetchy and the City and County of San Francisco have been one of the leading economic engines in Tuolumne County, said Steve Ritchie, the SFPUC’s assistant general manager for water.

“We are one of the largest employers in Tuolumne County,” Ritchie said. “We employ roughly 300 people on the Hetch Hetchy Water and Power system up here and in Moccasin. And the men and women who work up here on the Hetch Hetchy Water and Power system, they are all locals. They’re people who live here. They’re neighbors. They’re partners. We work with the county a lot on all kinds of different things. We’re doing a lot of work with Columbia College now with training programs. We really think being a part of the community is important.”

Ritchie said he manages about a thousand people total on the commission’s water enterprise, with about 300 people dedicated to running the Hetch Hetchy system in Tuolumne County. He said he loves the people of Tuolumne County, and he loves the landscape.

“Having water that’s generated running off of granite into this really ideal place for a dam, a very efficient dam site,” Ritchie said. “It’s really great here. And the view is spectacular here. We partner a lot with Yosemite National Park. They’re a big piece of what we do here. But also, folks with the county. Last time I heard, I think we were the seventh largest employer in Tuolumne County. We really value Tuolumne County as the provider of the men and women who work here.”

Dennis Herrera, general manager of the SFPUC, thanked the leadership and staff of Yosemite National Park and the National Park Service for their partnership with Hetch Hetchy to protect natural resources, specifically the natural ecosystem of the Tuolumne River and its watershed for current and future generations.

Michael O’Shaughnessy, great-great-great nephew of the San Francisco city engineer Michael M. O’Shaughnessy who oversaw design and construction of the Hetch Hetchy project, came to the dam that bears his family’s name on May 2 with his wife, Sinead O’Shaughnessy. They are residents of San Francisco, and Cork and Tipperary counties in Ireland.

“It’s just amazing up here,” Michael O’Shaughnessy said.

“It’s so beautiful here, and to think that this can exist in this beauty, is amazing,” Sinead O’Shaughnessy said. “To think that someone had the foresight a hundred years ago, that we need to develop this but not at the cost of this beauty. To have it here and to have where you can hike out to the falls, and you can be part of nature, that’s pretty amazing. Especially for people who aren’t from this county, to be able to come up here and appreciate it.”

Gustav Larsson, board chair for the Bay Area Water Supply and Conservation Agency, represents 26 cities that purchase water wholesale from San Francisco — two-thirds of the water the Hetch Hetchy system produces — focusing on policy and protecting water supply. He visits Tuolumne County often enough to appreciate what it means to San Francisco and the Bay Area.

“Tuolumne County is tremendously important to the Bay Area,” Larsson said. “A lot of people don’t realize the connection. Because our water supply comes from here, we are absolutely reliant on the Tuolumne County area, and it’s important for us to be supporting this area because we’re all connected.”

Tim Ramirez, manager of the SFPUC’s Natural Resources and Lands Management Division, estimates his division employs about a dozen scientists — hydrologists, foresters, biologists, and environmental planners — deployed in watershed protection at Hetch Hetchy. They work with partner scientists employed by Yosemite National Park and the Forest Service, and most of them live in Sonora and other parts of Tuolumne County, Ramirez said.

Herrera acknowledged building a dam and reservoir in a national park was controversial more than 100 years ago.

The Center for Legislative Archives recounts that between 1908 and 1913, Congress debated whether to make the Tuolumne River watershed available, or to preserve a wilderness. The growing city of San Francisco wanted a dam in Hetch Hetchy Valley to provide a steady water supply.

Hetch Hetchy Valley in Yosemite National Park was protected by the federal government, leaving it up to Congress to decide the valley’s fate. National opinion was divided between giving San Francisco the right to dam the valley, and preserving the valley from development.

The heart of the debate boiled down to conflict between conservationists, who believed the environment should be used in a conscientious manner to benefit society, and preservationists, who believed that nature should be protected, saved from human interference.

Siding with conservationists, San Francisco citizens argued the reservoir was necessary for the health of their city.

On the other side, preservationists, led by John Muir, argued Congress should protect Hetch Hetchy Valley from destruction. Muir and his allies believed nature should be enjoyed for its beauty, not merely used for its resources.

Individuals and organizations across the nation submitted petitions to Congress. The petitions helped mark the birth of environmental activism as citizens weighed in, expressing multiple opinions about uses of national park land and the relationship between local interests and national values.

In the end, Congress passed legislation allowing creation of a dam in Hetch Hetchy Valley. President Woodrow Wilson signed the bill into law in December 1913. Preservationists lost the battle, but the damming of Hetch Hetchy Valley raised public awareness about the importance of preserving nature, and helped justify the creation of the National Park Service in 1916.

John Gray, the retired Tuolumne County supervisor for District 4, used to represent the sprawling area that includes Hetch Hetchy Reservoir, more than half of Yosemite National Park, Groveland, Pine Mountain Lake, Big Oak Flat, Moccasin, Chinese Camp, Don Pedro Reservoir, Standard, East Sonora, The Junction and Curtis Creek Ranch. He wasn't at the May 2 ceremony at O'Shaughnessy Dam, but he knows a lot about the connections between Hetch Hetchy and Tuolumne County.

Gray is 74 now, and his father worked for Hetch Hetchy starting in 1924 at age 14 as a water boy and then as a brakeman on the Hetch Hetchy Railroad.

Hetch Hetchy projects over the decades served as catalysts, including high points and low points, in the Groveland and south Tuolumne County economies, affecting generations of boom-bust workers and some who stayed and became Tuolumne County residents, Gray told The Union Democrat two years ago in February 2021.

"At first they kept that railroad alive because they knew they would have to raise the dam," Gray said. His father moved eventually up from brakeman to equipment operator, and part of his duties included chauffeuring dignitaries in modified buses on the Hetch Hetchy Railroad tracks.

Gray said the railroad remained active until World War II, then Hetch Hetchy Water and Power had workers tear it up, and the scrap iron was used in the war effort.

"My father and my uncle had a contract to remove railroad ties in the 1950s," Gray said. "My father, he worked for the Hetch Hetchy system for 27 years and he died at age 50. Many miners and ranchers worked for Hetch Hetchy. My great-uncles worked for them, and my grandfather drove wagons to make freight deliveries."

The history and economic fortunes of southern Tuolumne County along Highway 120 — the ebbs and flows, the highs and lows, the peaks and valleys — reflected what was going on with Hetch Hetchy Water and Power over the course of a century, Gray said.

Work continued in the 1950s with construction of Cherry Dam, to catch more water for Hetch Hetchy at Cherry Reservoir, which impounds Cherry Creek on the edge of what is today designated as the Emigrant Wilderness. Lots of Hetch Hetchy workers were miners who came from out-of-state, Gray said. Some families stayed here in Tuolumne County.

“From the very beginning of the dam process, after the Ryker Act was approved, it was due to the support of the local congressman up here, and the people up here, elected officials, business owners, and just regular people who wanted to bring jobs up here,” Mike Housh, the SFPUC archivist since 2012, said while at O’Shaughnessy Dam.

“From 1914 through 1938, thousands of people in Tuolumne County were employed directly in building, inspecting, and expanding this dam. We have many families, that the grandparents worked, the parents worked, and their kids worked, and the great-grandchildren are still working here today on the Hetch Hetchy system. That’s a legacy.”

Breed said her favorite thing about Tuolumne County is the physical setting.

“It’s the natural beauty of the area,” Breed said. “Look at this. This looks like something from a movie. The clouds with the waterfalls. And the trees and the calmness of the water. It’s just, all of it, it’s beautiful.”

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Contact Guy McCarthy at gmccarthy@uniondemocrat.net or (209) 770-0405. Follow him on Twitter at @GuyMcCarthy.

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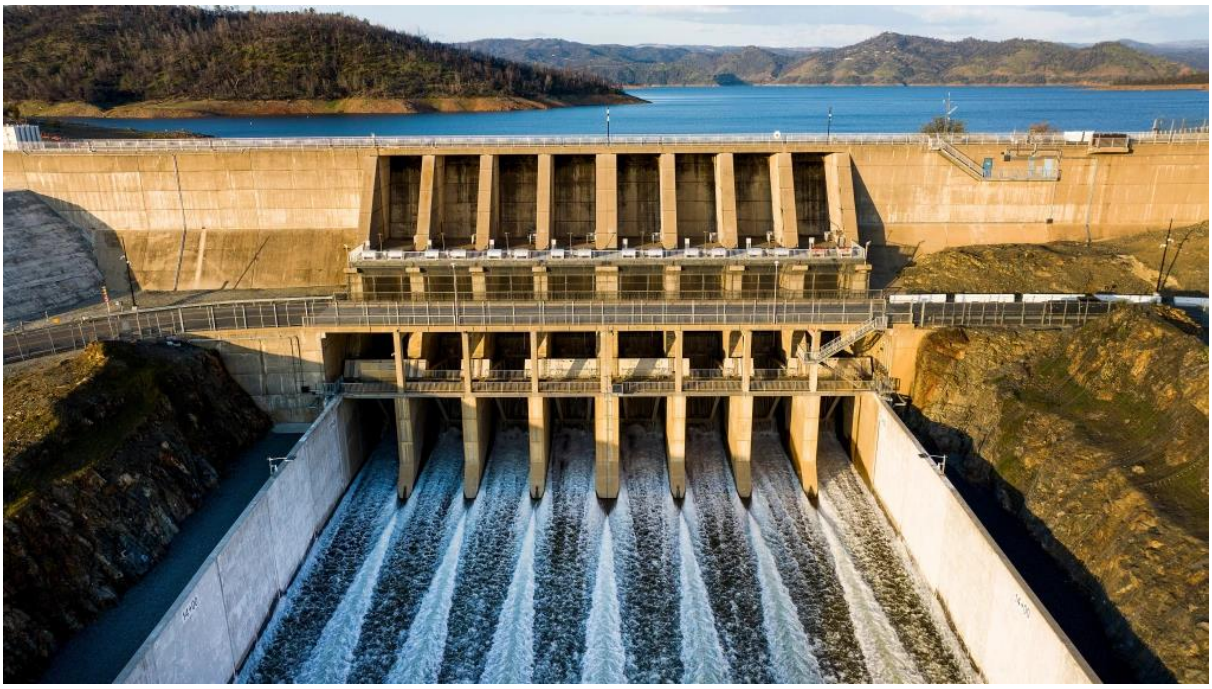
Massive snowpack's summer bonus: Clean, cheap electricity for California
Full reservoirs mean a big boost in hydropower, a major change from recent drought years
Mercury News | May 9, 2023 | Paul Rogers



Water flows through the Oroville Spillway at Lake Oroville on Saturday, March 25, 2023, in Butte County, Calif. The California Department of Water Resources was releasing water to create room at the reservoir for anticipated snowpack melt. At the time of this photo, the reservoir stood at 82 percent of capacity and 118 percent of its historical average. (AP Photo/Noah Berger)

The huge snowpack that has blanketed the Sierra Nevada this winter has done more than end California's drought and extend ski season. It's also changing how Californians keep the lights on.

With reservoirs full across the state, hydroelectricity generation from dams is expected to expand dramatically this summer, after three dry years when it was badly hobbled.

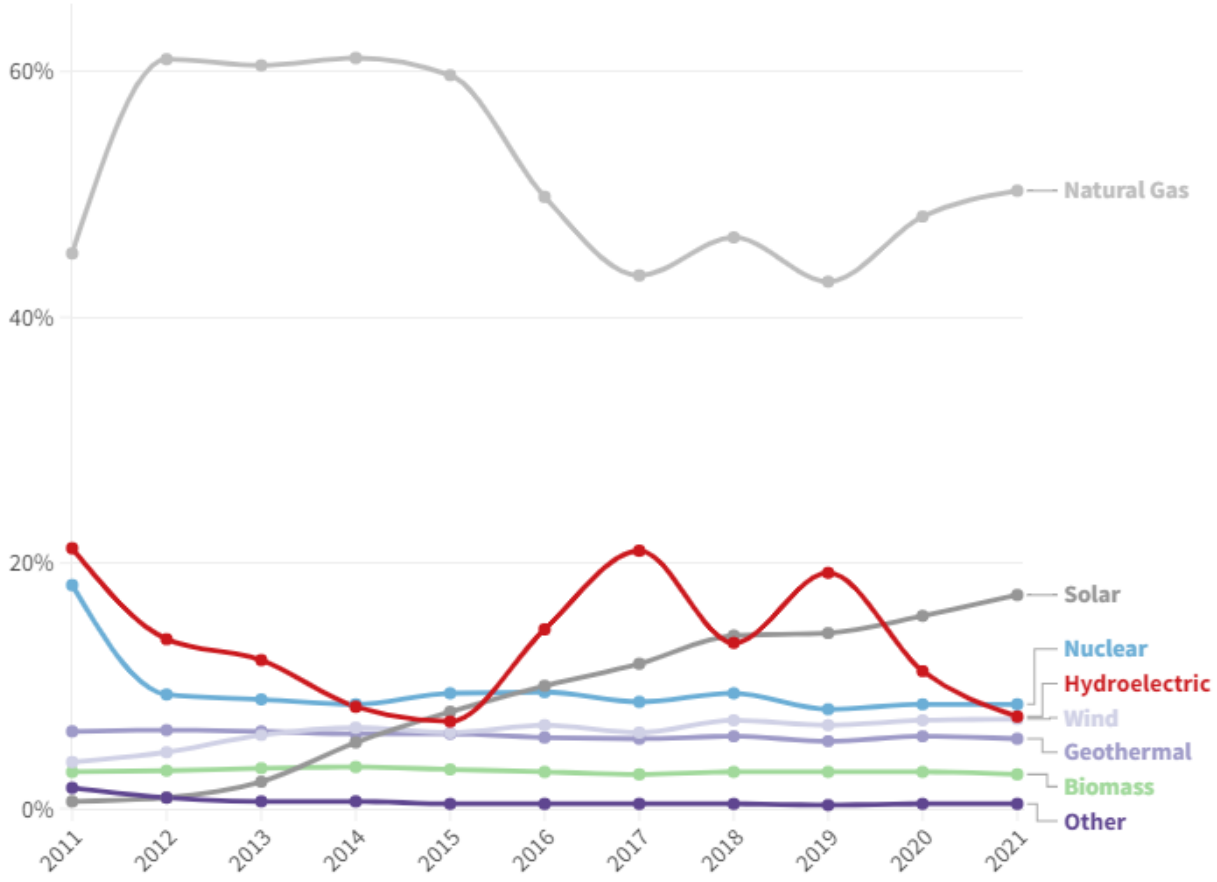
In 2017, a wet year similar to this one, hydropower made up 21% of all the electricity generated in California. But by 2021, in the middle of California's most recent drought, it provided just 7%.

This year, billions of gallons of water are once again spinning turbines in power plants at huge dams like Shasta, Oroville and Folsom, and will be all summer and into the fall as the snowpack melts.

THE UPS AND DOWNS OF HYDROELECTRIC

Hydropower, a cheap, clean source of electricity, rises and falls dramatically in California depending on whether the state is in a drought or not, a trend that affects everything from ratepayer bills to air pollution levels.

Percent of electric generation in California by method



Source: California Energy Commission • Graphic by Bay Area News Group

More hydropower means more clean electricity, less need to burn natural gas and other fossil fuels, less risk of blackouts during heat waves, and less smog and greenhouse gas emissions, experts say.

“It gives us more tools in the toolbox, more capacity to work with,” said Lindsay Buckley, a spokeswoman for the California Energy Commission, a state agency in Sacramento.

“It’s amazing. It was unexpected from Mother Nature. We’re going to make the best of it.”

After more than a dozen atmospheric river storms soaked Northern California between Christmas and March, hydropower production jumped 88% in California in the first three months

of 2023, compared with the same time period last year, according to a report released in April by the U.S. Department of Energy. It is projected to increase 81% overall this year from 2022.

Over the past 20 years, California has been steadily increasing the amount of solar and wind power it requires utilities to purchase to reduce smog and greenhouse gas emissions. Those laws are working — about 35% of the state's electricity is from renewable sources now like solar and wind, and 59% if large hydropower and nuclear are included.

A drone provides an aerial view of a cloud mist formed as water flows over the four energy dissipator blocks at the end of the Lake Oroville Main Spillway. (Ken James / California Department of Water Resources)

But the greener power grid has come at a cost: Less reliability.

During severe heat waves, millions of Californians turn on their air conditioners, spiking demand for electricity. At night when the sun begins to set, solar farms go off line, even as demand remains sky high.

That's what happened last September, when all-time heat records tumbled across California, including 118 degrees in Calistoga, and the day before 116 in Livermore and 109 in San Jose.

Blackouts were narrowly averted, but only after Gov. Gavin Newsom urged Californians to curb electricity use between 4 p.m. and 9 p.m., and relaxed air pollution rules to allow temporary natural gas-fired “peaker” plants and other generators to fire up.

Full reservoirs reduce the risk of a repeat this year, experts say.

“It gives us a clean resource we haven’t had as much of in the past few years to help meet the swings in electricity demands,” said Michael Wara, director of the Climate and Energy Policy Program at Stanford University’s Woods Institute for the Environment. “That means we can rely less on natural gas.”

To help improve reliability, state regulators have ordered utilities to put in place huge battery systems to store solar power on sunny days, then let it out on the grid at night. In 2019, California had 250 megawatts of battery storage. It has 5,000 megawatts now — roughly the same as 10 natural-gas fired power plants.

Newsom also signed a bill in September, over the objections of some activists, to keep Diablo Canyon, the state’s only nuclear power plant, open for another five years after its 2025 planned closure date.

To be sure, extra hydropower this year won’t solve all the state’s energy challenges.

The Pacific Northwest, which often sells hydroelectricity to California in wet years, didn’t have as rainy of a winter this year, and may want to buy some from PG&E, which owns 60 hydroelectric plants, and other dam owners.

California, which in most years imports about 25% of its power, shouldn’t say no, said Severin Borenstein, a professor of business at UC Berkeley.

“We definitely don’t want to set a standard where states refuse to sell to other states that are in desperate straits,” he said. “California is a big importer of electricity.”

In theory, all the hydropower this year should help PG&E ratepayers, because it is cheaper than other electricity sources. But details are not clear yet.

“We won’t know how much hydro has offset other costs to purchase power until early 2024 when all the data are in,” said PG&E spokesman Paul Moreno. “Factors like a hotter-than-normal, or cooler-than-normal summer could come into play.”

More hydropower also is likely to reduce air pollution.

Electricity generation makes up 16% of the state’s greenhouse gas emissions, the third-largest category behind transportation (38%) and industry (23%). Running water through turbines reduces emissions compared with burning natural gas.

It’s a similar story with smog. Although power plants are not a major statewide source of smog compared to vehicles and other sources, older plants can have major impacts on nearby neighborhoods.

“Drought is a driver of chronic pollution exposure,” said Jordan Kern, assistant professor of forestry and environmental resources at North Carolina State University and lead author of the study. “But heat waves are responsible for these incredible spikes in emissions in a short period of time.”

One of the more alarming symbols of California’s recent drought came at Lake Oroville, California’s second largest reservoir, where on Aug. 5, 2021, water levels fell so low that the power plant had to be shut down for the first time since it opened in 1967.

Then, the reservoir was 24% full. Today it is 94% full and the turbines are humming.

“The snowpack buys us time to put more batteries in the field,” said Wara. “Every year we can do that we get further away from the risk of blackouts during summer heat waves.”

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Zone 7 Water Agency Ends Drought Emergency & Mandatory Conservation
The board of the agency that sells treated water wholesale to the Tri-Valley is no longer requiring 15 percent water conservation.
Patch | April 25, 2023 | Michael Wittner


Lake Del Valle reservoir in Livermore is near capacity.

LIVERMORE, CA — The board of the Zone 7 Water Agency, which sells treated water wholesale to the Tri-Valley, voted unanimously April 19 to end the drought emergency and the 15 percent mandatory conservation requirements, following one of the wettest winters on record. That is welcome news for Dublin, San Ramon, Pleasanton and Livermore, which all purchase their water from Zone 7.

On March 24, Gov. Gavin Newsom issued an executive order lifting statewide restrictions, and a number of local water agencies around the Bay Area, including the Alameda County Water District, the East Bay Municipal Utility District, and the Contra Costa Water District followed suit.

In the fall of 2021, the Zone 7 Board voted to mandate a 15 percent reduction in water usage in response to severe drought conditions and reduced water supply allocations from the state. The State Water Project, which is run by the California Department of Water Resources, announced

last Thursday that it is increasing allocations to 100 percent of agencies' requested supply. The last time the state agency fully met water requests was in 2006.

During the drought, allocations dropped as low as five percent, and local water agencies turned to the local groundwater basin for supply. The Tri-Valley was successful in cutting its water usage by 15 percent from the previous year, which amounted to 1.7 billion gallons of water saved.

"We are grateful to the Tri-Valley community for their successful efforts to conserve water during the drought. We recorded some of the driest years on record for our area recently, and times like these remind us that water is a precious commodity," Zone 7 Board of Directors President Sarah Palmer said in a statement. "Working together, our community saved 1.7 billion gallons of water in 2022 and we thank every resident in our community who reduced outdoor watering, replaced grass lawns with native and drought tolerant plants, saved their shower warm up water, and made other efforts to achieve these savings. Your small changes have made a big difference."

Mandatory restrictions are no longer in place, but Zone 7 is still encouraging residents to try to conserve water as much as possible. In a resolution, the agency asked residents to aim for five percent voluntary conservation.

Statewide, certain restrictions continue to apply, such as bans on watering ornamental grass on commercial properties. The Dublin San Ramon Services District voted to implement certain water waste restrictions, which include:

- Using drinking water for washing sidewalks, driveways, buildings, and other hard surfaces.
- Individual washing of cars without a shut-off nozzle.
- Irrigating turf and ornamental landscape within 48 hours of measurable rainfall.
- Irrigating ornamental turf on street medians or commercial properties.
- Using drinkable water for street cleaning or construction unless no other source of water can be used.

Newsom's executive order still retains a state of emergency for all 58 counties to allow for drought response and recovery to continue, and preserves all current emergency orders focused on groundwater supply.

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California Water Board releases Drinking Water Needs Assessment
For the first time, the report examines causes behind chronically failing water systems and incorporates customers' ability to pay into its risk analysis.
WaterWorld | May 3, 2023

The California State Water Resources Control board has released its third annual Drinking Water Needs Assessment, which describes the overall health of the state's water systems and domestic wells and helps direct the funding and regulatory work of the Safe and Affordable Funding for Equity and Resilience (SAFER) drinking water program.

The report for the first time examines the causes behind chronically failing water systems and incorporates community-level socioeconomic factors, including customers' ability to pay, into its analysis of the risks systems face.

The analysis and findings will guide where the State Water Board focuses its technical assistance and how it prioritizes funding in the 2023-2024 Fund Expenditure Plan, due to come before the board this fall. Across all its funding sources, the SAFER program provided more than $758 million in 48 planning and construction projects in 2022, and over $21 million in technical assistance. Thanks to increased infrastructure funding from the state's General Fund and the federal Bipartisan Infrastructure Law, assistance for drinking water projects increased 150% from 2021.

In 2022, the SAFER program completed 27 water system consolidations, with another 316 currently in the planning or funding stages. Since the SAFER program began in 2019, 94 consolidations have been completed, benefitting 56,000 people, and overall, 185 more water systems are providing safe drinking water, benefitting 1.2 million Californians.

"Our Needs Assessment helps us ground our technical support and funding decisions for drinking water solutions in solid data so we can target assistance to where it can have the most impact," said Darrin Polhemus, deputy director with the Division of Drinking Water. "Each year, we accumulate more lessons and data that enable us to add depth and sophistication to our SAFER program work. Our regular engagement with the public has been extremely valuable to updating our methodology so that our analysis stays relevant and can be used — and shared — as an effective tool for us to build sustainable solutions collectively."

Key findings of the 2023 Needs Assessment are:

- Of the 3,053 water systems analyzed on January 1, 2023, 381 systems were listed as failing, meaning they do not meet one or more key Human Right to Water goals for providing safe, accessible or affordable drinking water and/or maintaining a sustainable water system. Collectively these failing systems serve approximately 787,000 people.
- At least half of failing water systems (or 5% of all public drinking water systems statewide) have consistently failed for three or more years. Ninety-seven percent of

those have fewer than 3,300 connections, with the majority exceeding safe water quality levels for primary contaminants such as arsenic.

- Forty-two percent of the systems on the failing list are considering consolidation or are in the course of developing a long-term solution with SAFER technical and funding support. Consolidation with larger, high-capacity systems is one sustainable solution to help communities secure long-term access to safe drinking water.
- Of the 2,672 systems not on the failing list, 512 systems are at risk of failing due to water quality or shortage issues, their customers' inability to pay, or limited technical, managerial or financial capacity. Collectively these at-risk systems serve approximately 1.3 million people.

The report examines the risks that financial limitations of a customer base can pose, leaving some of these water systems unable to collect sufficient revenue to meet long- term operational and maintenance expenses or invest in necessary upgrades. Using an updated methodology that includes poverty and housing costs to assess community- level affordability, the report found that approximately 23% of systems that serve disadvantaged or severely disadvantaged communities face a medium-to-high affordability burden. In contrast, only about 9% of systems that serve non-disadvantaged communities do.

"It's said that you can't manage what you don't measure," said Jennifer Clary, California Director at Clean Water Action. "That was true for a very long time for small California communities. The Drinking Water Needs Assessment provides critical information about who lacks access to safe drinking water and why, as well as who is at risk of losing access in the future. It's an invaluable resource."

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