BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD POLICY COMMITTEE MEETING

February 4, 2022

Correspondence and media coverage of interest between January 11, 202 and February 3, 2022

Correspondence

From: Nicole Sandkulla, CEO/General Manager
To: The Hon. Anson Moran, President and Members of the Commission, SFPUC
Date: January 31, 2022
Re; BAWSCA Review of the SFPUC Bi-Annual 10-Yr Capital Improvement Plan for the Water Enterprise and Hetch Hetchy Water for FY 2022-32 through FY 2032-33

From: Steve Ritchie, Asst. General Manager, Water, SFPUC
To: SFPUC Wholesale Water Customers
Date: January 31, 2022
Re: Initial Water Supply Availability Estimate

From: Janine Zacharia
To: BAWSCA Board of Directors
Date: January 26, 2022
Subject: Mercury News Article: *"Opinion: Greywater rain systems save water, alleviate sprinkler guilt"*

From: Los Vaqueros Reservoir Expansion Project
To: Stakeholders
Date: January 25, 2022
Subject: Monthly Report

From: Peter Drekmeier, Policy Director, Tuolumne River Trust
To: BAWSCA Board of Directors
Date: January 24, 2022
Re: Materials to Share

Media Coverage

Water Supply Conditions:

Date: February 2, 2022
Source: Mercury News
Editorial: As snowpack shrinks, will Gov. Newsom finally show leadership?

Date: February 1, 2022
Source: Sacramento Bee
Article: 'Drought still far from over.' Sierra snow survey shows results of dry January

Date: January 31, 2022
Source: Mercury News
Article: California drought: Sierra Nevada snowpack falls below average after dry January

Date: January 31, 2022
Source: San Francisco Chronicle
Article: California's snowpack slips below average after dismally dry January, renewing concerns about drought

Water Supply Conditions, cont'd.:

Date: January 25, 2022
Source: KCRA
Article: Season snowfall totals have dropped since 1970 in the Sierra, but average precipitation has gone up

Date: January 24, 2022
Source: Department of Water Resources
Article: After snowy December, California suddenly turns dry, magnifying drought concern

Date: January 20, 2022
Source: Associated Press
Article: California water districts to get more water than expected

Date: January 11, 2022
Source: Capitol Weekly
Article: After recent wet spell, thoughts turning anew to storage

Water Conservation:

Date: February 1, 2022
Source: Marin Independent Journal
Article: Marin water district proposes prohibiting decorative turf

Date: January 29, 2022
Source: San Francisco Chronicle
Article: Discount rain barrels promise big water savings – if we get more storms

Water Supply Management:

Date: February 1, 2022
Source: Palo Alto Weekly
Article: City Council rejects proposal to sell Palo Alto's water rights

Date: January 22, 2022
Source: Newsbreak
Article: What California's drought could teach other states in the West

Date: January 11, 2022
Source: California Natural Resources Agency
Article: State Agencies Detail Progress Implementing Water Resilience Portfolio

Water Policy:

Date: January 31, 2022
Source: Modesto Bee
Article: MID and TID seek much more water from Tuolumne in wet years

Date: January 31, 2022
Source: Legislative Analyst's Office
Article: State Water Resources Control Board – Bay Delta Plan Update

Water Infrastructure:

Date: January 27, 2022
Source: Bay Area News Group
Article: Proposed ballot measure to build more California dams, desalination projects likely to be Withdrawn due to lack of money and signatures

Bay Area Water Supply & Conservation Agency

January 31, 2022

Via email

The Hon. Anson Moran, President
and Members of the Commission
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: BAWSCA Review of the SFPUC Bi-Annual 10-Yr Capital Improvement Plan for the Water Enterprise and Hetch Hetchy Water for FY 2022-32 through FY 2032-33

Dear President Moran and Members of the Commission,

Created by the California Legislature through AB2058 in 2002, the Bay Area Water Supply & Conservation Agency (BAWSCA) represents the interests of 24 cities and water districts, and two private utilities that serve over 1.8 million residential customers and 40,000 businesses in Alameda, San Mateo, and Santa Clara Counties. A primary role of BAWSCA is to monitor the San Francisco Public Utilities Commission's (SFPUC) operation and long-term maintenance of the San Francisco Regional Water System (RWS) that provides two-thirds of the water supply delivered by BAWSCA's 26 member agencies to their customers. The SFPUC's 10-year Capital Improvement Program (10-year CIP) presents the critical projects necessary to ensure long-term water supply reliability for the BAWSCA member agencies and their customers.

The 2018 Amended and Restated Water Supply Agreement (WSA) between the City/County of San Francisco and its Wholesale Customers includes a requirement for BAWSCA's input to SFPUC's CIP development process (see WSA Section 6.09). In this current CIP development cycle, the amount of engagement with BAWSCA represented a significant departure from the previous 10-year CIP development cycle, during which more meetings with BAWSCA were held and additional materials were provided well in advance of the SFPUC's budget hearings. BAWSCA received a briefing meeting with SFPUC staff on 12/6/2021 at which time only a partial set of preliminary materials was shared. While additional materials were received on January 6, 2022, they were in draft form. In conversations with SFPUC staff, they have committed to meeting the obligations of the WSA with significantly more engagement moving forward and with future 10-year CIP cycles.

BAWSCA offers the following comments, which are relevant for both the Water Enterprise 10-year CIP and the Hetch Hetchy Water 10-year CIP:

1. **The SFPUC should review and make changes to its CIP planning and project delivery efforts to address its trend in not meeting its CIP delivery targets.** As with the prior 10-year CIP, the SFPUC's approach to funding the first two years of the CIP is to use the already appropriated funds to maintain progress and minimize new appropriation requests in those fiscal years. The need for this approach at this time has been explained to BAWSCA. However, this method should not be standard practice in

the future as appropriating funds well over what can be reasonably expended gives a false sense of expected productivity. BAWSCA appreciates that the SFPUC is taking a closer look at project delivery and looks forward to better understanding the changes being made internally and seeing improved capital program delivery results.

2. **BAWSCA recommends the use of appropriate placeholder funding where necessary to provide greater level of transparency regarding what funding may be needed in latter years of the 10-year CIP.** In his presentation to the Commission at its January 14, 2022 budget hearing, Steve Ritchie, SFPUC Assistant General Manager for the Water Enterprise, pointed out that certain CIP projects, such as Pilarcitos Dam, San Andreas Dam, and Bay Division Pipeline No. 4) are not fully funded in the CIP, and therefore, the monies proposed in the CIP to fund the work required is significantly lower than what will actually be needed in coming years. BAWSCA agrees with Mr. Ritchie that more exacting costs estimates will be generated in the short-term, following the completion of additional facility assessments. However, this approach may pose a constraint to doing future work in the expected timeframes as future CIPs with greatly increased budgets in certain projects may require phasing work on other projects to balance cash flow needs. Placeholder funding would provide a greater level of transparency regarding what funding may be needed in latter years of the 10-year CIP cycle.

3. **For future 10-Year CIPs, BAWSCA suggests that the SFPUC consider including separate tables and spreadsheets that document projected cash flows.** Such cash flow tables would be similar to the current tables which show budget appropriation. In this approach, an initial column would indicate the prior year's cash flow (indicating monies spent in the year prior to the 10-year cycle) followed by the anticipated cash flow for each year in the 10-year cycle. This cash flow table will show timing of project activity much more clearly than can be inferred from the appropriations table, avoiding the confusion that can be created by concepts such as the use of already appropriated funding. BAWSCA is willing to meet with SFPUC to provide examples of how other water agencies incorporate such a concept in their CIP documentation.

4. **BAWSCA is pleased to see that the project data sheets that accompany the 10-year CIP documentation have been revised for this particular cycle, such that they provide much more detail.** Specifically, the data sheets now include information stipulating the total budget proposed, the project's start and finish date, the current stage the project is in, as well as text that provides a more detailed description of specific work actions that will be taken in the coming years. The discussion in the tables also notes if the scope of the project has been modified since the prior CIP was adopted.

BAWSCA is focused on ensuring that the SFPUC successfully delivers a 10-year CIP that includes the necessary projects with appropriate implementation schedules, robust cost estimates, and budgets.

BAWSCA appreciates the efforts of the SFPUC staff to develop the 10-year CIP and the opportunity for discussions that have been constructive for both BAWSCA and SFPUC, and beneficial to the water customers. BAWSCA understands that this particular 10-year CIP has

been more challenging than many of those that preceded it, and we are pleased to see that the SFPUC has continued to incorporate, into the CIP, a robust number and type of projects that are required to maintain the integrity of the RWS.

Sincerely,

Nicole Sandkulla
CEO/General Manager

TF/NS//le

cc: Dennis Herrera, SFPUC, General Manager
Steven Ritchie, SFPUC, Assistant General Manager of Water Enterprise
Alan Johanson, SFPUC, Chief Engineer / Assistance General Manager of Infrastructure
Alison Kastama, SFPUC, BAWSCA Liaison
BAWSCA Board of Directors
BAWSCA Water Management Representatives
Allison Schutte, Hanson Bridgett, LLP, Legal Counsel

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

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: January 31, 2022

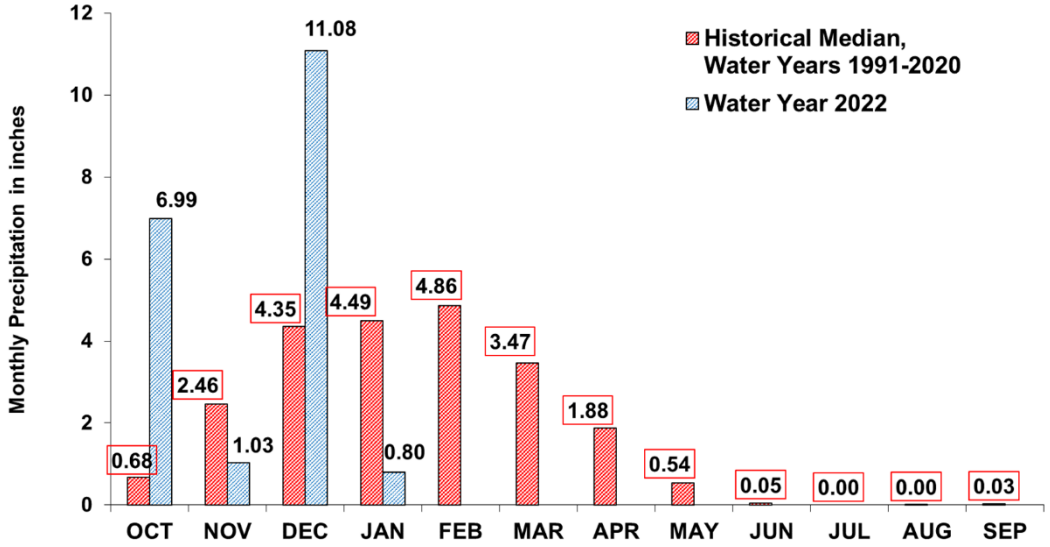
RE: Initial Water Supply Availability Estimate

This memo provides the initial water supply availability estimate for this year and the current hydrologic conditions.

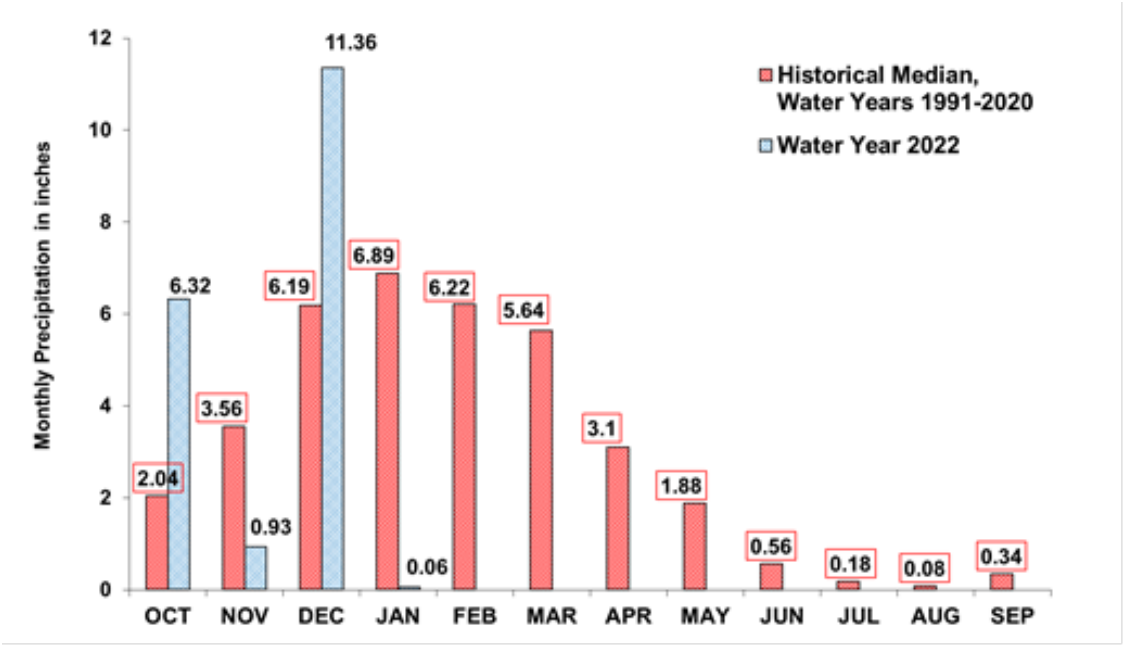
The current Water Year has thus far been a mix of wet and dry conditions. As the charts below show, both the Hetch Hetchy watershed and the local watersheds show a very wet October and December but extremely dry conditions since the December storms. In fact, January 2022 has turned out to be the driest January on record for precipitation at Hetch Hetchy.

The local watersheds have received 87.28 % of mean annual rainfall of 26.91 inches. The Hetch Hetchy watershed has received 50.89% of mean annual rainfall of 35.58 inches. While the first snow survey has not been completed yet, the lower elevation snow sensors are showing the snowpack to be at about median for this time of year.

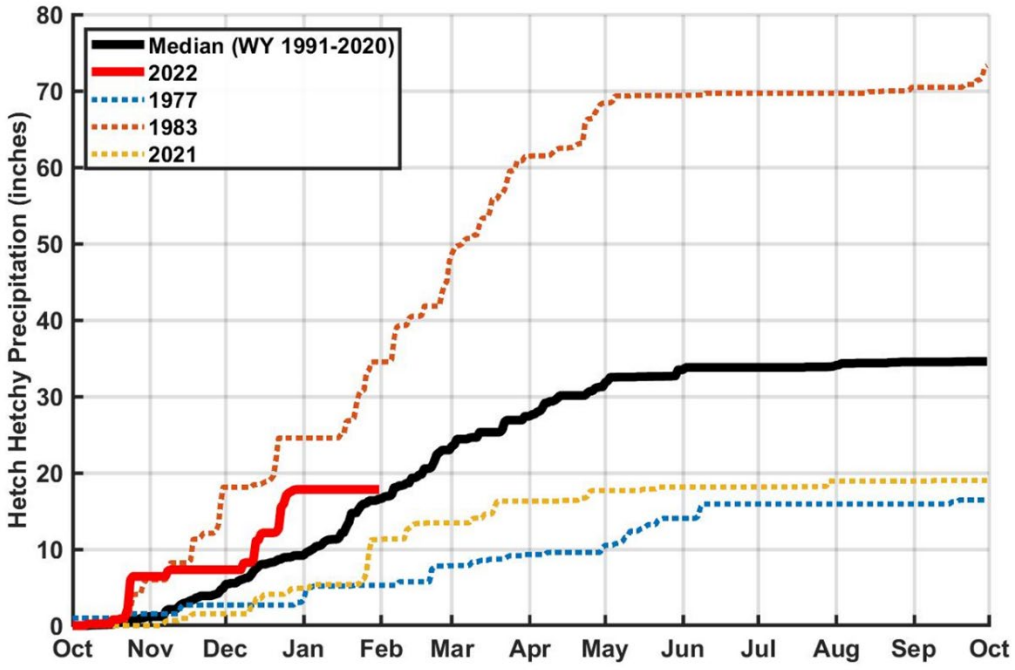
Bay Area 7-station Precipitation Index as of January 30, 2022



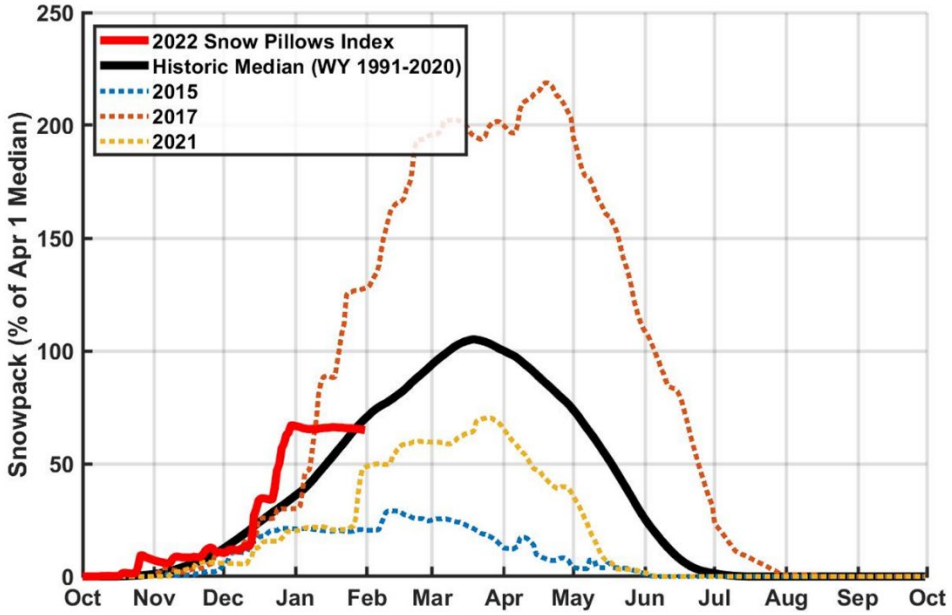
Upcountry 6-station Precipitation Index as of January 30, 2022



Hetch Hetchy Precipitation as of January 30, 2022



Upcountry Snowpack as of January 30, 2022



Reservoir storages (without Water Bank) are above where they typically are this time of year. Calaveras Reservoir has also continued to refill and consequently is adding to our reservoir storage.

Storage as of: 31-Jan-2022

Reservoir	Current Storage[1,2,3] (AF)	Maximum Storage[4] (AF)	Available Capacity (AF)	Percent of Maximum Storage	Normal Percent of Maximum Storage[5]
Tuolumne System					
Hetch Hetchy	294,400	360,360	65,960	81.7%	**68.9%**
Cherry	240,100	268,800	28,700	89.3%	-
Eleanor	21,520	21,495	0	100.0%	-
Water Bank	337,700	570,000	232,300	59.2%	**98.4%**
Total Tuolumne Storage	**893,720**	**1,220,655**	**326,960**	**73.2%**	-
Local System					
Calaveras	67,236	96,670	29,434	69.6%	-
San Antonio	46,554	53,266	6,712	87.4%	-
Crystal Springs	51,247	58,309	7,062	87.9%	-
San Andreas	16,094	19,027	2,933	84.6%	-
Pilarcitos	3,070	3,030	0	100.0%	-
Total Local Storage	**184,201**	**230,302**	**46,141**	**80.0%**	-
Total System Storage	1,077,921	1,450,957	373,101	**74.3%**	**81.4%**
Total without water bank	740,221	880,957	140,801	**84.0%**	-

[1] Upcountry storage is the date's 8AM storage value taken from USGS data

[2] Water bank storage reported by HHWP for 01/30/2022

[3] Local storage is the date's 8AM storage value taken from USGS data

[4] Hetch Hetchy maximum storage is with drum gates activated. Cherry and Eleanor maximum storage is with flashboards out. All maximum storages taken from rating curve.

[5] The ratio of median storage for this day over maximum storage capacity. Median storage for this day is based on historical storage data from years 1991 - 2020

A high pressure ridge remains in place along parts of the California coast that are pushing storms in the Pacific to the north of our watersheds. Forecasters are split on whether this ridge will dissipate in February.

On November 23, the SFPUC declared a water shortage emergency and adopted a voluntary systemwide water use reduction of 10 percent. Current systemwide reductions are provided in the table below.

For the Period July 1- January 21			
CUSTOMER GROUPS	**FY2019/2020 AVG. MGD**	**FY2021/2022 AVG. MGD**	**% REDUCTION**
San Francisco Customers	**64.3**	**54.7**	**14.9%**
Wholesale Customers	**139.8**	**130.8**	**6.4%**
TOTAL	**204.1**	**185.5**	**9.1%**

The SFPUC, in partnership with BAWSCA, will be pushing out regional conservation messaging on billboards throughout the service area to further encourage water saving. At this time, the SFPUC is not making any requests for further water demand reductions but will be monitoring the water supply conditions carefully in the coming months. The SFPUC will provide an update of the water supply conditions at the February 17th Annual Wholesale Customer Meeting. Another update on water supply availability will be provided on March 1st with a final water supply availability memo issued in early April following the last snow survey of the year.

From:	Janine Zacharia
To:	bawscaboardofdirectors
Subject:	from Janine Zacharia, San Mateo County resident, re greywater Mercury News piece
Date:	Wednesday, January 26, 2022 9:04:51 AM
Attachments:	TheMercuryNews_20220123.pdf

Dear BAWSCA Directors,

I wanted to share with you a piece I wrote for Sunday's San Jose Mercury News about our recent greywater installation.

As a journalist, our experience led me to report out what incentives there are for residents to install such laundry-to-landscape and shower-to-landscape systems. I found shockingly few. Those that exist are paltry.

This seems like a missed opportunity to me for residents to conserve water.

I welcome your feedback on the suggestions I proposed in the piece.

I have also attached a PDF in case you cannot access the online version I linked to.

Regards,
Janine

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Janine Zacharia
Stanford University
Cell: 202-251-7193
http://janinezacharia.net

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Opinion: Greywater rain systems save water, alleviate sprinkler guilt

If the state wants to show it is taking the drought seriously, it should provide more funds to expand rebates

Mercury News | January 22, 2022 | Janine Zacharia

Joseah Rosales of Greywater Landscape Design installs a backyard greywater system on Dec. 15. (Janine Zacharia photo)

With roughly half of California's urban water use going outdoors, mostly for irrigation, I've been searching for the perfect barrel to alleviate my sprinkler guilt. So, amid forecasts of another dryer-than-average winter, I was thrilled when San Mateo County advertised free rain barrels for residents last fall.

"I want this," I wrote to my husband. But by the time I tried to register, all 330 barrels were gone, and there was a waitlist of 200.

I next contacted Oakland-based WaterSprout for help with a barrel. But they said because of "extremely high interest" they were only taking on new home construction or major remodel projects. Another indicator I wasn't the only Californian wanting to conserve water.

Finally, I found Joseah Rosales of Greywater Landscape Design who persuaded me within minutes that my barrel's savings would be a drop in the bucket compared to what I could do with a greywater system.

Suddenly, we could save thousands of gallons compared to just 50 or 500 with a barrel. As my husband wisely noted: It doesn't rain often here, but it rains every day in our house.

After ballparking our annual number of showers, baths and loads of laundry as a family of four, Rosales calculated that by installing laundry-to-landscape and shower-to-landscape systems, we could irrigate most of our backyard plants with reused water.

It took less than two days to install the low-tech system of pipes and mulch basins. When I showed it to two of my neighbors, they immediately scheduled consultations too.

Given the prospect of longer and more frequent droughts — researchers predicted that California could soon see five-year stints of no snow at all — it is shocking how little California does to promote meaningful, urban water reuse, relying instead on fines to encourage cutbacks that won't be widely enforced.

Like PG&E's gripes about residential solar power, water utilities aren't incentivized to help homeowners use less water. "Going partially off the grid … is not as attractive to them because it can impact their sales and ultimately their financial health," Newsha Ajami, a Stanford water expert, told me. This needs to be fixed with subsidies or some other state action.

We were fortunate to have the cash upfront — $1,800 for laundry-to-landscape and $5,800 for the shower system — an investment we'll eventually recoup in savings on our water bill. But while there's financing for solar, nothing similar exists for greywater systems, putting these attractive conservation mechanisms out of reach for many.

If the state wants to show it is taking the drought seriously, it should provide more funds to expand rebates. Santa Clara County offers a $400 rebate for a greywater system. San Francisco offers $225. Contra Costa County offers up to $50. The East Bay Municipal District also offers up to $50. San Mateo County, where we live, offers none.

Since Valley Water's Graywater Rebate Program began in 2014, only 66 have been issued for residential laundry-to-landscape systems in a service area of nearly 2 million people. When Valley Water piloted a direct-install program in 2019-2020, they put in 71.

"Greywater is definitely an underutilized resource even in very conservation- or sustainability-minded communities," Justin Burks, senior water conservation specialist at the Santa Clara Valley Water District, said.

Greywater mandates would be most effective in scaling all this up, the way developers are now limited in how much grass can be put in new construction in California, or an earlier drought that

led to rules on ultra-low-flush toilets. For starters, Sacramento should at least follow San Francisco and require all new construction over 100,000 square feet to include a greywater system and provide more subsidies for home installations.

Some won't be able to install greywater because of cost, inaccessible pipes or a shortage of contractors. But our Redwood City retrofit, while pricey, was easy and empowering. It allowed me to channel my climate change anxiety into action and removed all guilt about watering my plants.

Despite all I've learned about greywater's superior savings, I still plan on getting a 530-gallon barrel. I want to save every drop.

# # #

Janine Zacharia, a former Washington Post reporter, is the Carlos Kelly McClatchy lecturer in the Department of Communication at Stanford University.

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LOS VAQUEROS RESERVOIR EXPANSION PROJECT

JANUARY 25, 2022

UPCOMING ACTIVITIES

January 26 at 1:00 p.m. – Design Review Team meeting via Teams

January 26 at 4:00 p.m. - LVE General Managers Meeting via Teams

February 9 at 9:30 a.m. – JPA Board Meeting via Zoom

February 22 at 2:00 p.m. – Plan of Finance workshop via Zoom

UPCOMING LAP BOARD COORDINATION

January 27 at 9:00 a.m. – Valley Water Storage Committee

ADDITIONAL PROJECT INFO

https://www.ccwater.com/lvstudies

https://www.usbr.gov/mp/vaqueros/

https://cwc.ca.gov/Water-Storage/WSIP-Project-Review-Portal/All-Projects/Los-Vaqueros-Reservoir-Expansion-Project

www.losvaquerosjpa.com

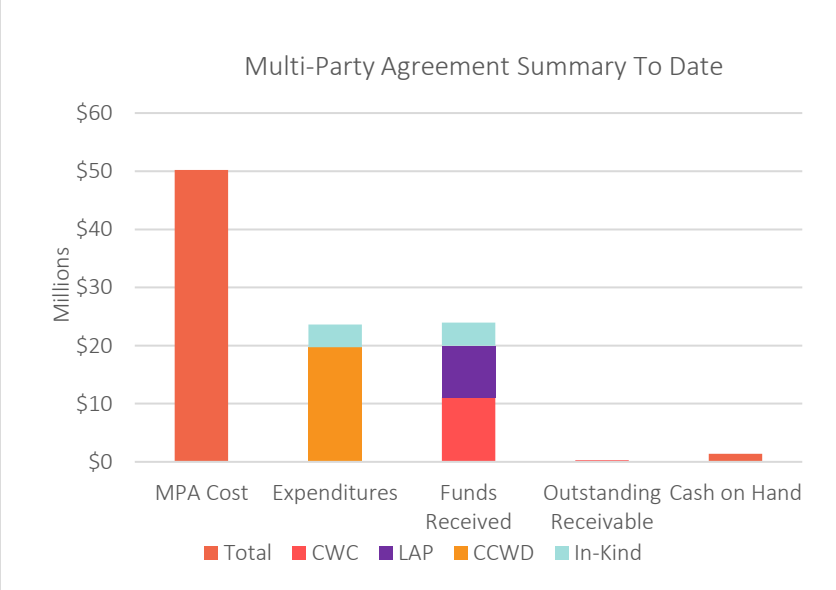
MONTHLY REPORT

FUNDING

The FY22 Continuing Resolution that went into effect September 30th included $50 million in Federal funding for the Project. This is in addition to the $14 million that was appropriated in FY21. Future Federal funding requests include the remainder of the maximum federal share of 25 percent of the total project cost (approximately $160 million). Some portion of the federal funding share may be available in the Infrastructure Investment and Jobs Act that was signed on November 15.

Amendment No. 3 to the Multi-party Cost Share Agreement has been fully executed and the first invoice of $448,560 per agency was sent out last week.

The following chart provides an overview of the MPA expenditures through November 30, 2021. The in-kind services, funds received, outstanding receivable, and cash on hand are shown through December 16, 2021. All LAPs remain in good standing on progress payments.



JPA BOARD OF DIRECTORS MEETING

On January 12 the Los Vaqueros Reservoir Joint Powers Authority (JPA) Board of Directors met via Zoom. Director Paul Sethy was elected as Treasurer. The JPA Chair will appoint Directors and Alternates to three committees: Finance, Operations and Engineering and Communications and Outreach. Committee meetings will be scheduled beginning in February. The next monthly JPA Board Meeting has been scheduled for February 9 and it is anticipated that the meeting agenda packet will be distributed to JPA

Directors and Alternates on Thursday, February 3 and posted to the JPA website on Friday, February 4.

PERMITTING

U.S. Fish and Wildlife Service (USFWS) is reviewing additional requested information related to the terrestrial Biological Assessment (BA). A Historic Properties Treatment Plan and Memorandum of Agreement, to support Section 106 of the National Historic Preservation Act consultation, are being developed. USFWS continues review of the Eagle Take Permit application. California Department of Fish and Wildlife (CDFW) began work on the Incidental Take Permit for terrestrial species. The second draft of the Incidental Take Permit for aquatic species has been reviewed CDFW and staff are addressing comments. An updated Compensatory Mitigation Plan addressing CDFW comments which supports the federal and state Endangered Species Act permitting processes has been submitted to Reclamation for review. CDFW continues review of the Lake and Streambed Alteration Agreement package. The U.S. Army Corps of Engineers (USACE) and Central Valley Regional Water Quality Control Board (CVRWQCB) continue review of their respective permit packages. A Delta Plan Consistency Package has been prepared and will be submitted soon following outreach to key stakeholders that is currently in progress.

DESIGN

CCWD met with key local stakeholders to review Transfer-Bethany Pipeline (TBP) alignment adjustment options on January 19. CCWD continued coordination with the California Department of Water Resources (DWR) on the 30 percent design of the Transfer-Bethany Pipeline Turn-in to the California Aqueduct.

Design of the LVE dam expansion and coordination with the California Division of Safety of Dams continues to progress. Preliminary design of Pumping Plant No. 1 is complete, and coordination with Western Area Power Administration is ongoing to support construction of a new substation. CCWD also initiated discussions with landowners to confirm locations of groundwater disposal during construction.

The first meeting of the Design Review Team has been scheduled for January 26, 2022 to provide technical updates on project progress and an overview of the dam design.

From:	Peter Drekmeier
To:	bawscaboardofdirectors
Subject:	Materials to Share
Date:	Monday, January 24, 2022 1:43:01 PM
Attachments:	McNellis - Is S.F."s Approach to the Drought all wet.pdf

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Dear Chair Larsson and BAWSCA Board Members:

I like to share a few resources with you.

First is an article on page 2 of "The Acorn" about what baby salmon need — https://cms.capitoltechsolutions.com/ClientData/EffieYeaw/uploads/2021AcornWinter_FINAL1.pdf

The key ingredient is floodplain habitat, which is why the higher flows in the Bay Delta Plan are so important. Fortunately, the SFPUC's Long-Term Vulnerability Assessment all but tells us the SFPUC doesn't need to worry about running out of water. You can read TRT's overview here — https://static1.squarespace.com/static/5eebc0039b04b54b2fb0ce52/t/61e87d6fe2d1ed45e2c4b5c8/1642626418156/TRT+Notes+on+the+LTVA.pdf

Finally, I'd like to share the attached editorial from the SF Business Times. It makes the case that inflated impacts from the Bay Delta Plan are a bigger threat to housing than the Plan itself.

Happy reading!

-Peter

Peter Drekmeier
Policy Director
Tuolumne River Trust
peter@tuolumne.org
(415) 882-7252

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January 14, 2022
By John McNellis

SAN FRANCISCO BUSINESS TIMES

Is our Approach to the Drought all wet?

Drought: (noun) 1. A prolonged period of abnormally low rainfall, leading to a shortage of water

Despite our spectacular rainy season thus far, California fits within the first half of the definition of a drought: We are in a prolonged period of abnormally low rainfall. But what about our shortage of water? Is it that critical? Must water must be rationed? Should we be fined for showering alone? Not in San Francisco.

Statewide, California's water reserves are low: Our reservoirs are collectively at 43 percent of their total capacity. But beyond scaring water consumers into rationing,

statewide numbers aren't all that useful because California doesn't have a single unified water system. Rather we have six separate but interconnected major water systems and literally scores of smaller ones. In fact, we have over 1500 reservoirs in the state. These systems do cooperate with one another—a small ocean is annually shipped from northern to southern California—but no governmental authority exists to compel, say, Marin County to pipe its excess water (its reservoirs are 93 percent full today) to the Isabella reservoir in Kern County which stands at only 10 percent.

Our six major water systems are unique, each at least somewhat dependent on local rainfall and each with its own issues. But they do have certain traits in common, principally the hoarding of water. According to the **Pacific Institute**, a non-profit devoted to solving the world's water problems, our largest suppliers of urban water persistently over-estimate their users' future water demands. Why? Engineers would tell you that the water mavens are using bad data: old numbers that reflect wasteful consumption patterns from decades past and population growth projections that are too robust. Cynics would simply say that's what bureaucrats do: They cling tenaciously to whatever it is they should be distributing, be it tax refunds, insurance proceeds or water.

That brings us to San Francisco's water system—the Tuolumne River/Hetch Hetchy System of ten reservoirs. **Peter Drekmeier**, former Palo Alto mayor and policy director of the **Tuolumne River Trust**, explains that when this system is at peak capacity, San Francisco has six years' worth of water without needing to ration a single drop. This bears repeating: Once our dams are topped off, we have a six year water supply. Climatologists know from tree ring measurements that, in the past 1100 years, California has never gone six years without rain. And today, despite two consecutive drought years, the Hetch Hetchy System is already back to 76.1 percent of its total capacity, meaning San Francisco has roughly a 4 ½ year supply of water with no need of rationing.

Yet the **San Francisco Public Utilities Commission (SFPUC)**, the agency that regulates our water still wants to impose rationing and is resisting state efforts to increase the Tuolumne's unimpaired flow for the benefit of riparian flora and fauna, notably our wild salmon. The SFPUC justifies its parsimony in two ways: first, it inflates future water demand projections despite the fact that, thanks to widely

adopted conservation efforts, San Francisco's customers are using thirty percent less water than they did thirty-five years ago; second, according to Drekmeier, the agency bases its rationing requirements on a theoretical drought scenario that hasn't occurred in measurable history, an 8.5 year mega-drought comprised of the worst drought we've ever had (the 6 years from 1987 through 1992) plus the two driest years on record (1976-77). Figures don't lie, but assumptions do.

But what's wrong with keeping every bucketful behind a dam? Isn't stored water money in the bank? Yes and no. To oversimplify this: Our reservoirs can't be near capacity during the rainy season; until July 1 st of each year, they need sufficient remaining capacity to accept new rains and snowmelt without fear of flooding. And since we have a wildly outsized rainy season every four or five years, this means that the thrifty water agencies must wrench open the flood gates and do a massive water dump in that fourth or fifth year. Drekmeier insists that we would all be far better off—especially the Tuolumne's riparian dependents—if the SFPUC used realistic rainfall and usage numbers and released more water on a consistent basis.

An analogy to business is imperfect, but it might illustrate the point. If you're too cautious in deal-making—if you lard every pro-forma with nightmare contingencies—your new projects will never pencil out and you're out of business. If we're too cautious with water, if we hold it back against an eternity of dry days, we're also out of business. We hand those who would stop development a rallying cry—"How can you propose another subdivision when there isn't enough water for our existing residents?" And, worse, we seriously threaten the flora and fauna downstream from our reservoirs.

Come to think of it, water is a bit like money: Rather than hoard it, far better to spread water around and do some good with it.

This essay first appeared in the San Francisco Business Times. All of John's essays may be viewed at *McNellis.com*

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THE ACORN

American River Natural History Association Quarterly Magazine – Winter 2021

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President's Message, Winter 2021

Laurie Weir

We started this year with great concerns over the impacts of the pandemic and the inevitable changes it would have on the Effie Yeaw Nature Center. Throughout the year we made significant adjustments in how we operate and made successful efforts to increase fundraising to make up for our reduced program revenues. The challenges were very real and we are delighted to put 2021 in the rearview mirror! Along with all of the challenges, there were changes to the American River Natural History Association Board of Directors.

In August, the American River Natural History Association Board reluctantly said good bye to Jackie DeLu. Jackie is a fierce advocate for children, animals, and nature education. She and her family are long-time supporters of the Nature Center. Jackie served as Vice President and Secretary of the Board. Over the years, the Natural History Association benefited from Jackie's experience and insights. Our sincere thanks to Jackie for all her efforts!

Our board members bring experience and skills including backgrounds in teaching and education; forest science and fire management; environmental science; project management; successful business leadership; environmental and employment law; and medicine, finance, and investments. Over the course of the past year we added to these skillsets by bringing on new members to the Natural History Association Board of Directors.

We were very pleased to welcome Randy Getz to the Board in January. Randy is an investment broker for CBRE. He and his wife, Pat Mahony, are long-time supporters of the Nature Center.

We welcomed Robin Kren to the Board in May. Robin is a retired educator, and has prior experience serving on the YMCA and Girl Scout boards of directors. Her skills and experience are already of great benefit to the board as she is currently serving as Board Secretary.

In August, we welcomed Greg Knox and Neil Brown to the Board. Greg Knox is a Financial Analyst for Guidewire Software. Greg served in the United States Marine Corp from 2011 – 2017.

Neil Brown is a Finance Specialist for the Intel Corporation. He is a Captain in the United States Air Force Reserve, piloting the C-17 Globemaster III aircraft.

Both Greg and Neil are Fellows in the Nehemiah Emerging Leaders Program in Sacramento. The mission of this leadership is to develop a cohort of empowered and diverse leaders with the skills and passion to lead in their professional, personal, and civic lives. We are very excited to have the skills and experience of Greg and Neil on the American River Natural History Board of Directors!

While many of our board members are actively working in environmental fields, all are great advocates and enthusiasts for the natural environment. We are very happy to have such a diverse pool of talent on the Board.

-Laurie Weir

The Acorn is published quarterly by the American River Natural History Association (ARNHA), a 501(c)(3) non-profit organization that supports the Effie Yeaw Nature Center and Nature Study Area.

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Cover: Salmon on rocky shore. Photo by Kathy Kayner.

Re-Creating Habitat for Sacramento Valley Salmon

The life of a Chinook salmon in the Sacramento Valley two hundred years ago was very different from what salmon experience today. Chinook have lived in the American River for millions of years. The largest of Pacific salmon species, Chinook are anadromous, meaning they are born in freshwater, migrate to the ocean, and return to freshwater to spawn (lay eggs), and then die. Historically salmon returning from the ocean were unhindered by dams and might travel far up the American River into the foothills and mountains to dig their nests and lay eggs in loose gravel under flowing water.

Figure 1: Juvenile chinook salmon in the American River. (John Hannon, US Bureau of Reclamation photo.)

Juvenile Chinook salmon (Figure 1) evolved to take advantage of seasonally flooded river valley habitats that were created when rivers over-topped their banks in the rainy season and spread across the landscape. These shallow floodplains provided important foraging and rearing habitat for out-migrating juvenile fish. The protection and abundant food (insects, crustaceans, and other invertebrates) provided by the wetlands allowed juveniles to thrive and grow before heading down the river to the ocean.

California's Central Valley encompasses an area of more than 13 million acres, and it is estimated that 30% of that area (4 million acres) was wetlands before the gold rush and major western settlement began in the 1850s. The land on the valley floor flooded nearly every winter, wiping out all farms and settlements that didn't occupy the highest ground. By the 1920s, California created a statewide system of levees and a flood bypass system built to confine the major river channels within their banks. Later, large dams were added to the flood control system. These structures were incredibly effective for protecting the Central Valley floor from flooding.

However, the unforeseen ecological consequence of this flood protection system was not only to prevent salmon populations in the rivers from reaching their historic spawning grounds, but also to prevent juvenile salmon from having access to wetlands for foraging. With 90% of historical floodplains either developed or disconnected from river ecosystems, juvenile salmon in the Central Valley are now largely confined to faster-flowing water in deep river channels, which does not produce the high concentration of food that shallow, slow-moving wetlands do. The result is reduced growth of juvenile fish (Figure 2) and a dramatic decrease in salmon populations.

Figure 2: Relative growth of fish in floodplain, canal, and river habitats in 2016. These fish all started out the same size and spent 3 weeks in their respective habitats. Floodplain residence is a keystone life history adaptation of Chinook salmon that provides substantial growth benefits. (CalTrout photo.)

Today, Chinook returning to the American River to reproduce are stopped at the Nimbus Dam with 75% of their historic spawning beds no longer accessible (Figure 3). To compensate, reproductive fish and their eggs are harvested and fertilized at the Nimbus Fish Hatchery. Juveniles hatched from these eggs are reared for many months at the fish hatchery, fed commercial fish food, and later released into the river or trucked and released into San Francisco Bay or the ocean. Very few are hardy enough to survive to complete their development in the ocean and return to fresh water rivers to reproduce several years later.

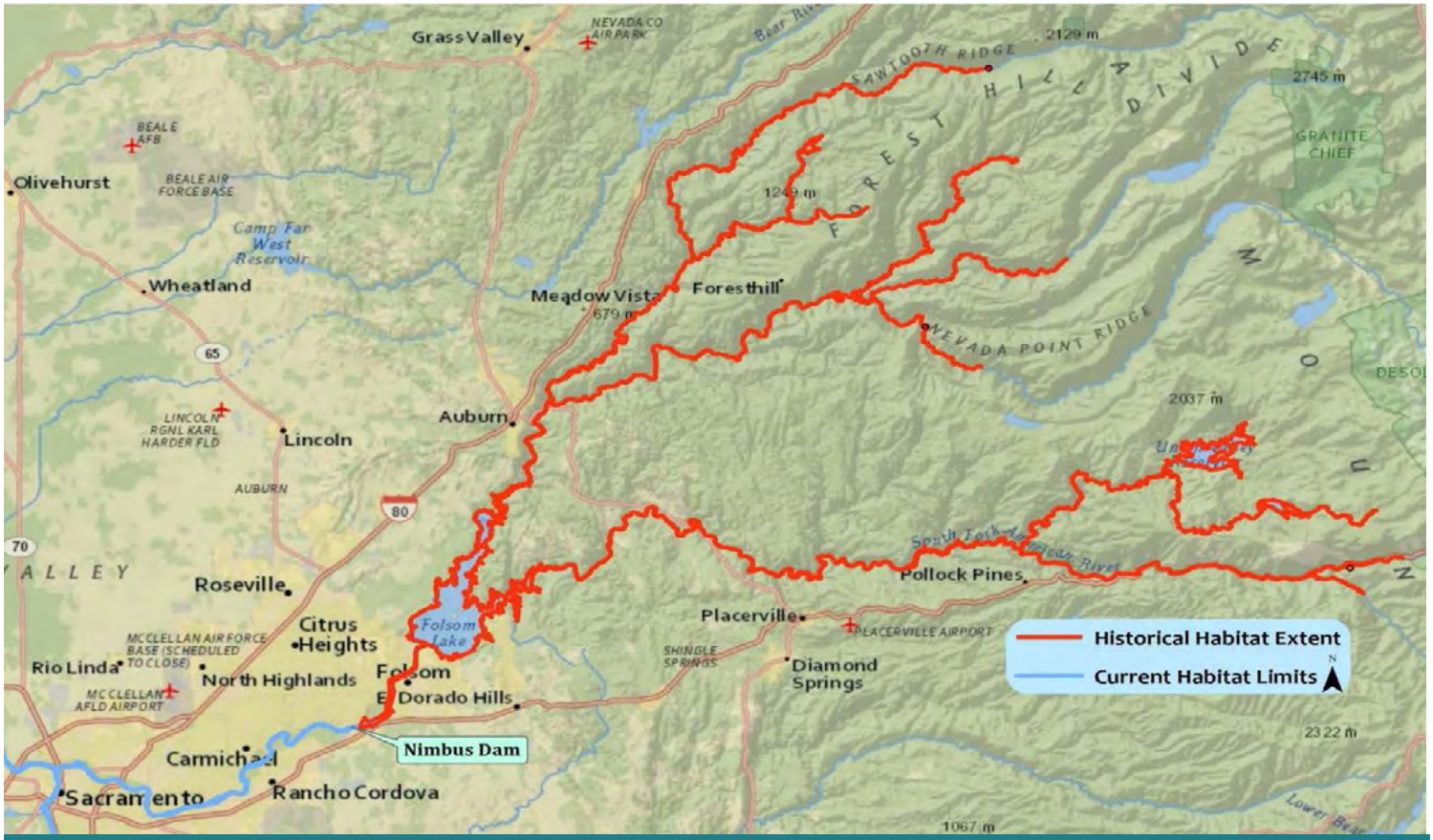


Figure 3. Red lines indicate historic habitat and spawning grounds for salmon in the American River watershed. Blue line indicates current habitat limitations for salmon reproduction. Image courtesy of Water Forum.

Because the Central Valley has lost more than 90% of its historical wetlands, and a significant removal of dams and levees in California is unlikely, scientists have been looking for other ways to re-create habitats more conducive to salmon survival. Locally, the Yolo Bypass is a large-capacity secondary channel that diverts floodwaters away from cities and contains runoff on dormant agricultural lands: it can provide juvenile salmon with foraging grounds on occasion, but it requires a lot of water in the river channel to activate, and, even when it is flooded, it drains quickly, which limits its use as a reliable seasonal foraging habitat.

Working with rice farmers, water districts, and conservation groups such as Ducks Unlimited, scientists at the nonprofit group California Trout (CalTrout) have developed two water management programs that rice farmers can employ during the fallow season to improve habitat and food sources for juvenile salmon. These programs are based on the fact that shallow-flooded rice fields mimic the natural floodplain wetland conditions where algae grows and plant matter is consumed by microbes, fueling the growth of small insects and crustaceans that are the main source of food for juvenile salmon.

In the Nigiri management program, rice growers inside the bypass slow the drainage rate of their flooded fields, prolonging the availability and foraging benefits for fish that naturally colonize the fields with flood waters. Rice farmers in the historical floodplain habitat that is not accessible to fish (i.e., those outside the bypass system) can still support salmon by bringing water into their fields after harvest to produce floodplain fish food and later export it to river channels where fish feed. (See Nigiri and Fish Food programs, Figure 4).

Recent studies led by CalTrout and the UC Davis Center for Watershed Sciences suggest that these conservation efforts can have a hugely positive impact on the Central Valley's salmon populations. CalTrout data show that juvenile Chinook can grow over 10 times faster on floodplains in the bypass (powered by Nigiri) than in adjacent river habitats. And juvenile Chinook in the river with access to floodplain-subsidized food (powered by Fish Food) can grow 5-8 times faster than fish that did not receive such added nutritional benefits. This is important because the size of juvenile fish at the time they enter the ocean is the best predictor of their likelihood to survive to adulthood.

Using the Nigiri and Fish Food systems together increases the potential to provide valuable juvenile rearing habitat and produce tons of aquatic invertebrates to augment river food webs using California's dormant winter rice fields as surrogate floodplains.

What about Chinook salmon and steelhead trout in the American River where there are no adjacent rice farmers? The Water Forum group is addressing this problem by not only building spawning beds to enhance egg-laying but also constructing rearing habitats for juveniles. Alcoves are being built at the sides of the river to provide a safe space for young fish. The alcove at Effie Yeaw is 1000 feet long and lined with large tree roots, crowns and logs to provide nooks for juveniles to hide and grow (Figure 5). Willows and other plants will be installed to encourage the invertebrate species important for salmon nutrition and development. The new salmon restoration site just completed at Effie Yeaw and Ancil Hoffman Park is the tenth habitat restoration project built by Water Form along the American River since 2008. See the Fall 2021 issue of The Acorn and www.waterforum.org/AH for more information on this project.

Figure 4: Examples of habitat in each of CalTrout Central Valley's fish conservation programs. Fish Food (left) pumps managed floodplain water through levees back to rivers where fish can benefit from their high concentration of aquatic invertebrates. Nigiri (right) activates floodplains in the flood bypass system and allows fish to enter. The line down the middle of the Nigiri image is the Freemont Weir being overtopped by floodwater from the Sacramento River (right of the line) and inundating the Yolo Bypass (left of the line), creating 90,000 acres of fish-accessible floodplain habitat. (CalTrout photos.)

Figure 5. A new 1000-foot-long alcove has been built by Water Forum along the American River at Effie Yeaw to provide habitat for juvenile salmon.

This article was compiled in consultation with Biologists from CalTrout: Jacob Montgomery, M.S., Central Valley Project Manager; and Cliff Feldheim, M.S., Project Manager. They provided biological information, some text, photos and research data. Find out more about CalTrout projects at caltrout.org. The FishFood Story is detailed at www.caltrout.org/article/the-current-june-2020/the-fish-food-story. Compiled and edited by Mary Louise Flint and Eric Ross.

Village Enhancements

By Krystin Dozier

The entryway and village at Effie Yeaw are undergoing a facelift! The Nature Center has long needed upgrades and improvements to its entry and village areas where thousands of visitors pass through each year on their way to the trails. While approximately 50,000 people enter our Nature Center building each year, perhaps 150,000 more head out to the Nature Study Area without entering or interacting with our Naturalists, especially during times when the Nature Center building is closed. To better connect with these visitors and meet our educational mission, we needed to revamp our entrance. Changes in our village will address four major areas of enhancement and engagement.

Kiosk

Our entry point has been widened to encircle the kiosk as a focal point. When the kiosk improvements are complete, visitors will be welcomed with a variety of interpretive information about local flora and fauna as well as cultural history to enhance their experience. The structure, originally built in the 1970s, will have a new roof, viewing panels, and solar lighting to extend the viewing hours and provide greater safety and security. Interpretive signage throughout the village also will allow us to make use of technology to capture younger audiences and deliver information in multiple languages.

Opening up the kiosk area to the parking lot to create a new entrance.

Playscape

Families with small children will enjoy family time in our new playscape area, designed to expose toddlers to nature in a safe and shaded environment. In addition to the permanent structures for large motor skill development, play kits can be checked out from reception for more nature-based learning activities, targeted to an age 5-and-under audience.

Lowe's staff working to clear the playscape.

Large equipment was needed to deliver and place massive tree slabs for the new playscape.

Pollinator Garden

The previous butterfly garden, lovingly planted and tended by Sigrid Trevino, has long needed better access to sun for native wildflowers and pollinator plants to thrive. With an expanded garden area, we will be able to reach into the sunshine and showcase more native plants. The garden will educate children and families about the important role of pollinators in our lives.

Volunteers preparing the new pollinator garden beds and paths.

Plants in the Replica Nisenan Maidu Village

The Maidu Village area already has many plants that native peoples consider "gifts of nature" and an important part of Maidu traditions. Natural plant materials are used by Maidu people for food, medicine, clothes, toys, games, baskets, containers, tools, and structures. New interpretive signage throughout the village will tell the story of these traditions and the interplay of Maidu life with nature.

Contributors

This amazing opportunity to address multiple long-standing needs was made possible through a generous grant from Lowe's Home Improvement stores. Not only did Lowe's provide significant funding, they also brought work crews on-site to provide much of the skilled labor.

We would not have been awarded this grant without fund sourcing and support from HandsOn Sacramento. As a regional center for volunteerism, HandsOn Sacramento connects individual and group volunteers to nonprofit organizations for meaningful volunteer experience and helps nonprofits link with potential funders. HandsOn Sacramento representative Holly Brown came onsite, spoke with EYNC Executive Director, Kent Anderson, wrote up an initial concept paper, connected Kent with Lowe's, and advocated for the Nature Center, helping to secure the grant.

Teresa Blue provided financial support to refurbish the playscape area for the under-5 age group, and Boy Scout Troop 447 cleared the old playscape area. Jim Hargrove also donated funding for the interpretative signage throughout the village. Many volunteers shared their knowledge, skills, and native plant expertise as well as their time and labor to bring these changes to reality in very short order. As they say, "It takes a village" and it certainly has been a collective effort of many that will be enjoyed by so many more of our community members.

Expanded pollinator garden with Maidu hut in the background. Photo by Stacey Halper.

Krystin Dozier is an EYNC docent, receptionist, and certified California Naturalist, leading volunteer restoration efforts with a multi-year plan to reestablish pollinator and milkweed plants in the Nature Study Area.

Effie Yeaw Butterfly Garden Dedicated to Longtime Volunteer Sigrid Trevino

By Joey Johnson

On July 13th, the Butterfly Garden at Effie Yeaw Nature Center (EYNC) was dedicated to Sigrid Trevino, who created the garden in the 1990s. Sigrid began volunteering at EYNC in 1996. Since then, she has accumulated more than 1,032 service hours. When Sigrid initially signed up to volunteer, she considered being a docent, but realized this would not work out because she did not care for handling snakes. Instead, she directed her energies to the Butterfly Garden, which is just to the side of the Maidu Village.

The plants in the garden are native plants known to attract or be beneficial to butterflies that frequent the Nature Center and Nature Study Area. Over the last 15 years, Sigrid has come in weekly to help maintain it and educate people about butterfly plants.

Sigrid worked closely with Vince La Pena on developing the garden and trying to devise ways to keep the deer and other critters from consuming all the plants. They settled on a rope fence to delineate the boundaries of the garden. They knew that this was not going to keep the deer out, but it blended in with the natural surroundings. At the dedication, Sigrid shared with me how she enjoys talking to children about the plants even if they don't see a butterfly at the moment.

The garden is being renovated as a part of the village enhancement project funded by Lowe's Home Improvement stores. Sigrid is very pleased that this is happening, and she looks forward to continuing her work there after the improvements have been made.

Sigrid's family wanted to honor her and the garden dedication seemed like the perfect way. A ceremony was held with family, staff, and a few volunteers in attendance. A plaque honors her dedication to this project through the years. Sigrid's work on this special part of the Nature Center is an example of the variety of volunteer opportunities at EYNC.

Sigrid Trevino working in the Butterfly Garden.

The Butterfly Garden was dedicated July 13, 2021.

It's the 46th Anniversary of the Effie Yeaw Nature Center!

By Joey Johnson

In the years prior to 1976, the area we know as the Effie Yeaw Nature Center was a part of the Deterding Woods, owned by the Deterding family and a part of their ranch land. A teacher by the name of Effie Yeaw would bring children to the area to teach them about nature first-hand. She and her students learned about local wildlife and habitat through the Arden-Carmichael Conservation Center, which operated from 1952-1955. When that center closed, she turned to the Deterding Woods to provide nature experiences for her students, family groups, and Boy and Girl Scouts.

Effie and others living in the area knew that this spot was special and needed to be preserved so that people from all over the Sacramento area could connect with nature. She was one of the founders of Save the American River Association (SARA). This group was dedicated to protecting the area along what is now the American River Parkway from development. They worked with William B. Pond, the director of the Sacramento parks department at the time to bring this land under the protection of the County Parks. In 1965 the County Board of Supervisors approved a Land Use and Development Plan that included an interpretive nature center in Ancil Hoffman County Park. Seven years later a bond measure was approved that provided funding for the center.

In 1976 ground was broken to begin construction of the building we now call the main building or the museum building. At this ceremony the interpretive center was officially named in honor of Effie Yeaw. Effie had passed away from cancer in 1970, but members of her family were present to honor and celebrate her memory. In 2009 Effie Yeaw was honored posthumously by the California Parks and Recreation Society by bringing her into the Hall of Honor. Effie's family said that she would have thought all of this attention was a bit silly. She was more interested in getting things done.

In 2004 the Assembly Building was added to the Nature Center facilities, providing meeting spaces and a kitchen area. This building has allowed for expansion of educational programs for both children and adults.

Since the Effie Yeaw Nature Center opened, hundreds of thousands of visitors have had the opportunity to experience nature and learn about the American River Parkway and its importance to not only wildlife but to the community that surrounds it.

Effie Yeaw and children 1955.

Ground breaking for Effie Yeaw Nature Center in 1976 including Sid Inglis, Parks Commissioner (left), Don Nance, Director of County Parks (right), and unknown individual in center.

Effie Yeaw Nature Center in the early years before the addition of the Assembly Building in 2004.

HELP US PRESERVE EYNC HISTORY

Do you have a memory of Effie Yeaw or the early days of the Nature Center?

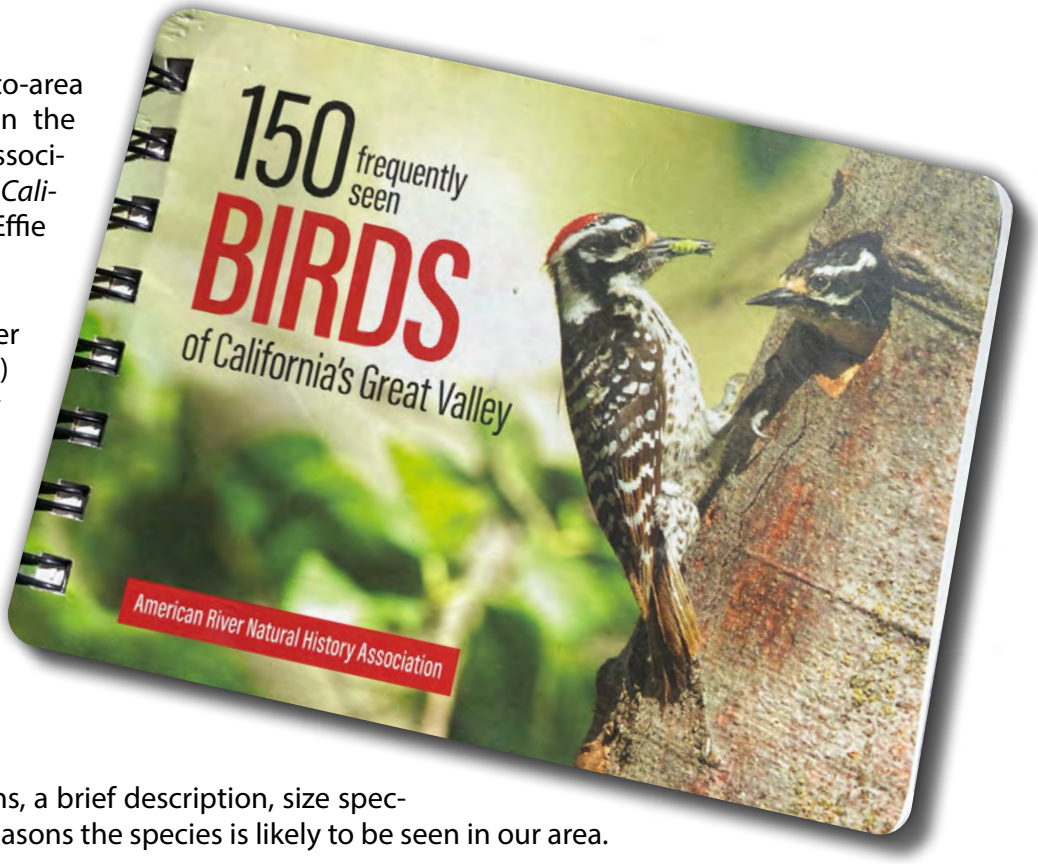
We'd like to know more.

Please send your memories to info@sacnaturecenter.net with the tag line "EYNC History".

We would also really welcome photos from the old days.

150 Birds

Looking for a gift for a Sacramento-area nature lover? Look no further than the American River Natural History Association's *150 Frequently Seen Birds of California's Great Valley* available from Effie Yeaw Nature Center.

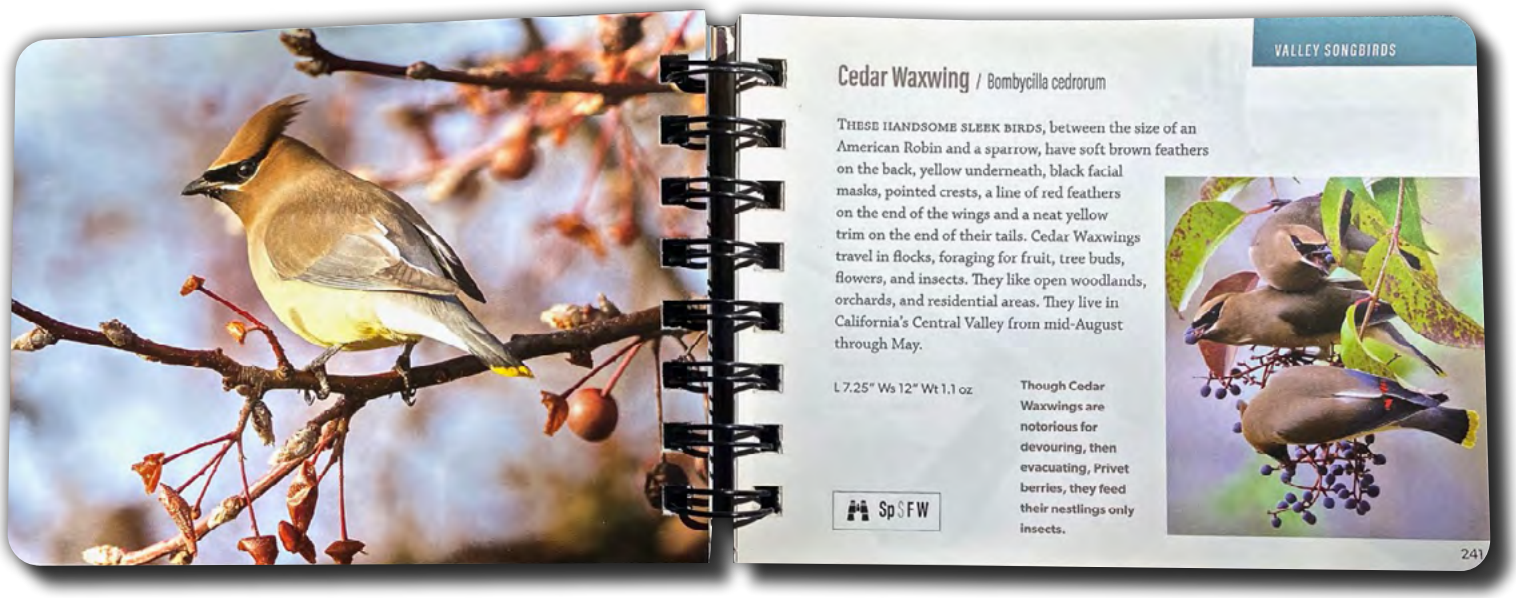


Written by longtime American River Natural History Association (ARNHA) members Molly Keller and Peggy Kennedy, this book is beautifully illustrated with photographs taken by local experts. Because it focuses only on birds you are likely to see in our area, it is much easier to use than more comprehensive birding guides, which feature many birds not common in the Sacramento area.

Each entry includes two photographs, a brief description, size specifications, and a note about which seasons the species is likely to be seen in our area.

Winter is the best time for bird watching in the Central Valley. The authors note that bird numbers in winter are often 50% higher than in other seasons because so many species migrate here from other areas, including the Arctic, South America, and the California mountains.

So, what are you waiting for? Purchase the book at Effie Yeaw's Discovery Store or online at sacnaturecenter.net/arnha/shop-books. When you buy this book, you are also supporting ARNHA and Effie Yeaw's programs.



Featured Donor: The Crosbie Family

By Kathy Fleming

Scott Crosbie.

The Effie Yeaw Nature Center (EYNC) is fortunate to have the support of the Crosbie Family. Three generations of this remarkable family have contributed time, talent and treasure to support our mission of connecting people to nature and nature to people.

The family's connection to the EYNC began with the youngest generation. Scott Crosbie was a gifted ornithologist who grew up in the Carmichael area and spent many of his childhood years exploring the wonders of nature at the Nature Center. The time he spent here had an impact. He studied biology and natural history, eventually earning a Ph.D. in Animal Biology at UC Davis with a focus on the ecology and habitat of the yellow-billed magpie and western scrub jay. He embarked on a career in wildlife biology, and was an avid birder in his spare time.

Scott introduced his parents, Dan and Heidi Crosbie, and his grandparents, Bob and Pat Crosbie, to Effie Yeaw. They also came to know and love the beauty of this special corner of Carmichael.

Scott's sudden death in 2012 devastated his family and all who knew him. His memorial service was held here at the Nature Center, a fitting location that honored Scott's passion, and provided a place of solace for his survivors. Soon after, a songbird display was installed in the Nature Center as a tribute to Scott.

Several years later, the Crosbie family turned their personal tragedy into an opportunity for other bird lovers like Scott by pledging a leadership contribution to build an Aviary on the Nature Center grounds.

Initial plans for the Aviary were developed in 2018 as part of a Master Plan that also included numerous other facility improvements. Recognizing it will take years to accomplish all that's included in the Master Plan, the Center is now focusing on completing specific elements of the Plan, such as the Aviary. Once built, the Aviary will provide a larger space for our Bird Ambassadors to spread their wings and our visitors a greater opportunity to see these magnificent creatures up close and in person.

The need for updated animal care facilities is of top priority of the Nature Center, and we are profoundly grateful to the Crosbie Family for their pledge to make it a reality with a new aviary. Their love for Scott will live on by creating a special place for the winged creatures he was so passionate about.

Bob and Pat Crosbie, grandparents of Scott Crosbie.

Kathy Fleming is Advancement Officer for the Effie Yeaw Nature Center. Find information about giving a legacy gift to EYNC at sacnaturecenter.net/support/legacy-gifts.

Jackie DeLu Steps Down from Board Service

Jackie DeLu

In August 2021, Jackie DeLu attended her last American River Natural History Association (ARNHA) Board of Directors meeting. This was a Zoom meeting, so the occasion did not include all of the snacks, beverages and hugs that would typically take place. But the Board was sad to say goodbye and wished her well.

Jackie began at Effie Yeaw Nature Center in 2006 as a volunteer. As a former elementary school teacher, she was a perfect match for serving as a docent in the school programs. She also became involved in developing the exhibits in the museum. In October of 2012, she became a board member. She was encouraged to take this step because her knowledge of education would be invaluable. She also continued her volunteer work with the nature education programs.

As a board member, she brought the point of view of an educator and passion for the Nature Center. The only times she missed meetings were when she and her husband Michael Covey were off on an adventure. She always stepped up to help host board events, contribute snacks, and support any fundraising event, such as the Spring Gala. She also served as one of the vice presidents and the board secretary.

Even though Jackie will no longer be on the ARNHA Board, she will not leave us. She will continue to serve as a docent when school programs get going again and will continue to work on updating and improving on exhibits. She will also be serving as the board president for the Carmichael Kiwanis. Jackie has been a member of that organization for years and has brought the Kiwanis and EYNC together to serve the community.

We know she will be missed by the Board, but we are glad she will continue to be a part of the work of the Nature Center.

A New Poaching Awareness Program at Effie Yeaw

Deer poaching has become a problem in the area around Effie Yeaw Nature Center (EYNC) and Ancil Hoffman Park. We have been alerted to this problem by longtime American River Natural History Association member Tim McGinn, who has been frequenting the Nature Area for more than 45 years and is very familiar with the deer herd. Tim is now working with law enforcement at the California Department of Fish and Wildlife to address the problem.

Tim has initiated a public awareness team that will help educate the public about how they can participate in the program. The four-member team consists of Kent Anderson, Executive Director of EYNC; Lt. Gregory of the California Department of Fish and Wildlife; Kathy Kayner, Board Member and Secretary of Save American River Association (SARA); and Tim McGinn, founder of the program.

Poaching becomes a serious problem between mid-October and late January. The poaching target is the antlers on the big bucks. Poaching takes place during the night hours by individuals using crossbows and night vision optics. The public can assist by recognizing suspicious activities day or night. If you see suspicious activity, record vehicle license numbers, write down descriptions of what you saw, and take photos with your phone. Report this information by calling the CalTip line 888.334.CALTIP, which is available 24 hours a day 7 days a week, or text 847411. **Do not, under any circumstances, confront a poacher.**

Donors & New Members–July through September 2021

- Ron & Cheryl Adams
- Gary & Judy Agid
- Carrie Ammerman In gratitude for the childhood Memories with Family and with my school
- Heather Applewhite
- Susan Arthur
- Ron & Iris Bachman Fund of the Sacramento Region Community Foundation
- Charleen & Bradley Baker
- Madeline Baker
- Sara Baldwin
- John & Dayle Barry
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- Kari & Richard Bauer
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- Michael Brown
- Neil Brown
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- Joseph Calzadillas In honor of Teresa Kahl
- Rebecca Cameron
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- Gail Cunha
- Joe Darin In memory of Steve Flannery
- Michael Darnell
- Sue Darst
- Alan Daurie In honor of John Lowell Daurie's birthday
- John Daurie In honor of John Lowell Daurie's birthday
- Dwight & Carole Davenport
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- Robert DELL'Agostino
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- Cecilia Delury & Vincent Jacobs
- Mirlita Dennis
- Jennifer Diehl & Sabrina Tepper
- Helen Diepenbrock In memory of Anthony Diepenbrock
- Ellen Dillinger & Richard Wood In memory of Bill Dillinger
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Overview of the SFPUC's Long-Term Vulnerability Assessment (LTVA)

The LTVA appears to be based on sound climate science, and provides a lot of useful information. However, it fails to clearly answer immediate questions, such as whether it would be reasonable for the SFPUC to reduce the length of their design drought. The design drought couples the 1987-92 and 1976/77 droughts to create a hypothetical 8.5-year drought for planning purposes. TRT and our allies have been encouraging the SFPUC to remove a year from the design drought to reduce projected (unnecessary and excessive) rationing that is the basis for their opposition to the Bay Delta Water Quality Control Plan.

We are encouraging the authors of the study to do the following:

- Run scenarios using current actual demand.
- Analyze the likelihood of the design drought actually occurring.
- Calculate how earlier runoff might improve the SFPUC's water entitlements as a result of the way water rights are structured on the Tuolumne.
- Produce more scenarios that include the instream flow requirements adopted in the Bay Delta Plan to help the SFPUC assess the actual potential impact of the Plan.

Following are some concerns we have with the Study, and a few highlights.

1) **The Study gives the impression that water demand is much higher than it actually is or is likely to be.**

The Study considers 227 million gallons per day (mgd) to be baseline demand. This figure is 16% higher than the actual current demand of 195 mgd. The Study looks at a total of six levels of demand, ranging from 16% to 71% greater than current demand.

Every LTVA Demand Figure Is Inflated

Source	Demand (mgd)	Difference from Current Actual Demand
SFPUC Annual Report FY 2020/21	195	--
TRVA Baseline	227	+16%
Baseline +15%	265	+36%
Baseline +30%	300	+54%
Baseline +45%	334	+71%
Threshold (269 TAF)	240	+23%
Threshold (365 TAF)	326	+67%

2) The Study found that annual mean precipitation is unlikely to change much, and is slightly more likely to increase than decrease.

This is a very positive prediction because we have demonstrated that the SFPUC could manage the Bay Delta Plan instream flow requirements without running out of water. The Study removes the question, "but what about climate change?" The Study states:

"According to climate projections and expert elicitations, there is a central tendency of warming of +2°C and +4°C by 2040 and 2070 (Representative Concentration Pathway [RCP] 8.5), respectively, with no clear direction of change in mean annual precipitation over the planning horizon."

p. xxii

"The Upcountry region and East Bay and Peninsula regions are in the positive precipitation domain for the winter season in 2070, and thus are somewhat more likely to see positive than negative precipitation in the near future."

p. 26

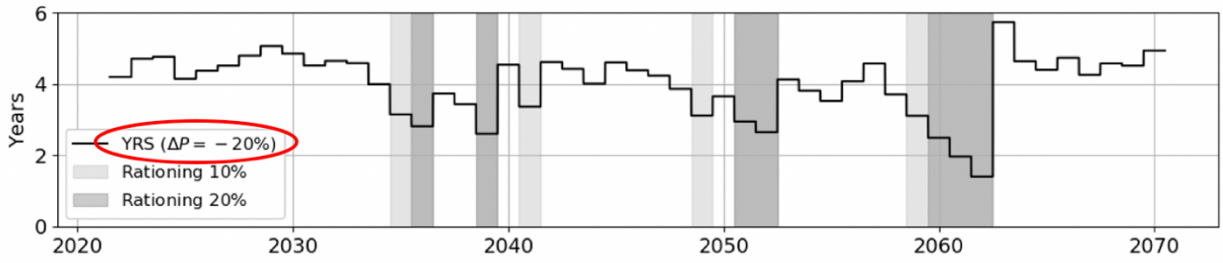
3) The Study doesn't include enough scenarios to help determine the potential impact of the Bay Delta Plan on the SFPUC's water supply.

While the study doesn't clearly incorporate the Bay Delta Plan instream flow requirements in very many scenarios, it does provide some information to help deduce the Plan's potential impact on water supply. For example, the Study states:

"The RWS [Regional Water System] is particularly vulnerable to the state-adopted new IFR [instream flow requirements] below Don Pedro Dam (State WQCP), which represents a significant reduction in water available. At a demand of 227 mgd, the effect of state-amended WQCP under current conditions is equivalent to a reduction in mean annual precipitation of about 15% in terms of the water delivery reliability (reliability around 85%, rationing in 1 out of 6.5 years on average)."

p. xxii

The graph below illustrates the potential impact of precipitation change on water supply, using the 227 mgd baseline and a 20% decrease in precipitation. Substituting the Bay Delta Plan instream flow requirements (the equivalent of 15% precipitation loss), one sees that the SFPUC is unlikely to run out of water, with more than a year's-worth of water remaining in storage at any given time. Using actual current demand would produce an even rosier picture.



Source: Excerpt from Figure 5-26.

Figure 5-26. Illustration of the Impact of Precipitation Change on the Rationing.
From top to bottom, the subplots show the Years of Remaining Supply (YRS) for the current climate, a decrease in precipitation by 20% and a decrease in precipitation by 40%. The light and dark grey areas highlight the periods of rationing with 10% (i.e., YRS<3.41 years) and 20% (YRS<3.14 years) respectively. For this example, the Realization number 6 is considered under current demand conditions (i.e., 227 mgd).

4) The Study demonstrates that the design drought is extremely unlikely to occur.

The following table shows how likely the severity of past droughts are to occur under two scenarios – demand of 240 mgd (Threshold: 269 TAF) and demand of 326 mgd (Threshold: 365 TAF). In other words, at 240 mgd demand, a two-year drought with an impact on water supply as severe as the 1976/77 drought might be expected to occur once every 98 years. A drought as severe as 1987-92 might be expected to occur once every 772 years. Multiplying these figures together, one might infer that the design drought is likely to occur once in 75,656 years.

Table 3-19. Calculated Joint Return Period for Thresholds 269 and 365 TAF.

Drought Event	Threshold: 269 TAF Joint Return Period [Year]	Threshold: 365 TAF Joint Return Period [Year]
1976-1977	98	61
1987-1992	772	537
2012-2015	236	176

5) The Study found that runoff is expected to come earlier in the season as a result of a diminished snowpack and more precipitation arriving as rain instead of snow.

The Study states:

"Therefore, an increase in temperature would result in less snowpack accumulation during winter season, as more precipitation will fall as rain rather than snow, leading to 1) a reduced spring runoff volume and magnitude and 2) an increase in winter flows. The spring runoff is also expected to occur earlier in the season (Figure 5-2)."

p. 147

"A +2°C warming leads to a spring runoff arrival 10 days prior to the baseline temperature conditions. Median of projections estimate warming around +2°C by 2040 with most projections and elicitations between +1°C and +4°C. At +4°C, the shift in timing would be closer to 20 days prior to baseline conditions. By 2070 RCP8.5, warming could reach around +4°C with most projections and elicitations between +3°C and +6°C."

p. 147

TRT's analysis suggests that if the design drought were to repeat, but runoff came three weeks earlier, the SFPUC would pick up an additional 237 thousand acre-feet (211 mgd) of water – enough to add more than a year's-worth of water to SFPUC supply. This is because the Modesto and Turlock Irrigation Districts are entitled to the first 2,400 cubic feet per second (cfs) of runoff for most of the year. But between mid-April and mid-June (time of peak runoff), the Irrigation Districts are entitled to the first 4,000 cfs of runoff. If more runoff shifts from the mid-April-to-mid-June time period into the earlier season than runoff that shifts from post mid-June into the mid-April-to-mid-June period, then the SFPUC picks up water.

6) Conclusion

If the SFPUC were to use reasonable demand projections and remove a year from the design drought, they could manage the Bay Delta Plan instream flow requirements. We believe the information provided in the LTVA supports this conclusion, and with a little additional analysis, it would confirm it definitively. If the SFPUC were to accept this conclusion, they would have no reason to oppose the Bay Delta Water Quality Control Plan.

Editorial: As snowpack shrinks, will Gov. Newsom finally show leadership?

We can't count on Mother Nature to solve our water challenges, especially given the realities of climate change

Mercury News | February 2, 2022

Anthony Burdock, left, and Sean de Guzman, chief of snow surveys for the California Department of Water Resources, check the depth of the snow pack during the first snow survey of the season at Phillips Station near Echo Summit, Calif., on Dec. 30. The survey found the snowpack at 78.5 inches deep with a water content of 20 inches. (AP Photo/Randall Benton)

Drip, drip, drip. That sound you hear is what's left of California's snowpack, melting away at an alarming rate.

The Sierra snowpack provides about 30% of the state's water needs. On New Year's Day, the snowpack stood at 168% of normal for that date, thanks to a series of storms in October and December. But by Tuesday, after a dry January, the snowpack had fallen to just 92% of its historical average.

With the window for winter snowfall rapidly narrowing with no sign of storms in the forecast, the situation will only get worse. It's very likely that the state's drought will continue into a third year. The grim reality is that we can't count on Mother Nature to solve our water challenges. Especially given the realities of climate change.

It's time for Gov. Gavin Newsom to get real about solving the state's short-term and long-term water crises.

For this year, for the immediate drought, the administration must stop promising more water than it can deliver. Despite the rapidly dwindling snowpack, the state has yet to reduce its optimistic projections for how much water it can deliver to state contractors this summer.

Newsom must also redouble efforts to get urban and agriculture users to conserve. In July, the governor asked all Californians to reduce urban water use by 15% from 2020 levels. In November, state water officials announced the total statewide reduction was just 6.8% compared with the same month a year earlier.

To their credit, Bay Area residents are doing their part. Customers of East Bay Municipal Utility District reduced water use by 22%. Santa Clara County water users reduced their consumption by 20%.

But Los Angeles and San Diego counties continue to fall far short of the governor's goal.

Then there's the long-term challenge of figuring out a statewide water plan that shields us from cyclical droughts that will only get worse with climate change — a plan that not only provides an adequate water supply through storage and conservation, but also protects the Sacramento-San Joaquin River Delta ecosystem.

Unfortunately, for generations now, our governors and legislative leaders have accomplished next to nothing. In 2007, then-Gov. Arnold Schwarzenegger acknowledged, "We don't have enough water. … At the same time, we have put so much pressure on the Delta over the years that we have broken down the system. We can no longer ignore the threats to California's fragile water system."

But Schwarzenegger and his successor, Gov. Jerry Brown, wasted the next eight years pushing for the $15.9 billion Delta twin-tunnel project, which didn't pencil out and wouldn't have added a single drop to California's water supply.

After his election in 2018, Newsom put the Delta project on a side burner. He instead focused on trying to get the major urban and ag players to reach a voluntary agreement on water flows from the Delta. Herding cats would be an easier task. Farmers have more to gain from preserving the status quo than they do in signing on to an agreement that would potentially reduce water transfers to them.

That's because, as Doug Obegi, an attorney with the Natural Resources Defense Council, noted in 2009, the state had issued water rights for four times more water than had ever flowed through the Delta. (The Delta supplies 65% of the fresh water that Californians drink.) It's a ludicrous approach that continues to this day, causing farmers and water districts to cry foul when deliveries inevitably fail to live up to those promises.

The California Constitution provides the state with the leverage needed to end the ongoing water wars. Article X, Section 2 declares "the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare."
The governor should announce that if farmers, environmentalists and water districts can't reach an agreement by this summer, he will invoke the Constitution and reset California's approach to water usage.

It's time for real leadership.

# # #

‘Drought still far from over.’ Sierra snow survey shows results of dry January
Sacramento Bee | February 1, 2022 | Dale Kasler

Sean de Guzman, right, manager of snow surveys for the California Department of Water Resources, measures the snowpack for the February snow survey with DWR water resources engineer Anthony Burdock as Andrew Reising takes notes at Phillips Station off Highway 50 on Tuesday, Feb. 1, 2022. Nathaniel Levine.

The Sierra Nevada snowpack is dwindling, and California’s drought is worsening.

A once-promising start to winter has given way to grim predictions about a third year of tight water supplies. The California Department of Water Resources’ monthly survey of snow conditions Tuesday revealed a substantial loss of snow from a month earlier, following a bone-dry January.

“Our snowpack has hit this flatline and we’re not getting any snow,” said Sean de Guzman, manager of the state’s snow surveys, after his crew completed its measurements at Phillips. “We’re starting to get more concerned.”

The results of the manual survey at Phillips, conducted amid biting winds near Echo Summit at 6,800 feet elevation, showed that the snowpack had shrunk by 2.5 feet in the past month — results that mirror recordings taken elsewhere in the Sierra.

The one bright spot was that the snow at Phillips lost only one inch of its water content in January, and remains 9% above average for this time of year. But that was of little consolation, given that dry conditions are expected to continue for the next two weeks if not longer.

“This drought is still far from over,” de Guzman said. “The real story is that we’re not accumulating (new snow).”

Snowfall in January was nearly nonexistent. The last snow recorded by UC Berkeley’s Central Sierra Snow Lab was a modest 3 inches Jan. 8.

The state measures snow levels continuously through electronic sensors embedded in the soil throughout the Sierra. The monthly surveys at Phillips, a former cattle ranch and stagecoach stop, are

a low-tech affair: Crews from the Department of Water Resources plunge a specialized hollow aluminum tube into the snow at multiple points along a 200-yard course and then calculate the depth of the snowpack by measuring what's inside the tube.

As it happens, the Phillips site sits amid countless reminders of how drought and climate change are plaguing California. Burnt trees litter, left over from last summer's Caldor Fire, dominate the landscape on both sides of Highway 50 around Phillips. The snow survey site is a mile or so from Sierra-at-Tahoe ski resort, where some facilities burned last summer. The resort hasn't yet reopened.

A month ago, after the snowiest December ever recorded in the Sierra, the survey revealed 78.5 inches of snow at Phillips. On Tuesday that was down to 48.5 inches.

In the Sierra as a whole, snow depths had been about 40% above normal. Officials believed the drought was easing and agreed to release more water to farms and cities that rely on the State Water Project, the elaborate state-run network of reservoirs and canals that supplies millions of Californians.

Now much of that progress has been wiped out.

All over the Sierra, weeks of dry weather have left snow depths 8% below average.

"January is supposed to be our wettest month of the year; we would have expected the snowpack to grow," said Michael Anderson, the state hydrologist. "We've gotten almost all the opposite. All of the benefit we got in December, we've been backing off."

Granted, some of the snow has turned into snowmelt, creating runoff to partially replenish California's parched reservoirs. Lake Oroville, the largest reservoir in the State Water Project, has added 200,000 acre-feet of water in the past month.

But Oroville is still less than half full, and about 20% below average for early February. And it's likely that some of the snow has vanished into the air.

Ben Hatchett, a climatologist with the Western Regional Climate Center in Reno, said much of the Sierra's snowpack has probably evaporated, a result of the dry weather and strong winds that have buffeted the area.

"I think we've lost a fair bit of it," Hatchett said. "We don't get that water."

A similar phenomenon occurred last year, when a spring heatwave robbed the state of an estimated 800,000 acre-feet of Sierra snowmelt and dramatically intensified the drought. An acre-foot is 326,000 gallons and 800,000 acre-feet would be nearly enough to fill Folsom Lake.

Meanwhile, scientists and state officials don't expect much relief in the near future. A persistently strong high pressure system over the northern Pacific — essentially, a dense mass of air — is pushing storms northward and preventing them from reaching California.

Anderson, the state hydrologist, said the system doesn't appear to be breaking up.

"When it comes entrenched like this," he said, "and we miss a whole month of precipitation, and it doesn't look to be going anywhere anytime soon, that's when it becomes disruptive."

There's no snow or rain in the immediate forecast, and Anderson said the long-term outlook calls for below-average precipitation through the end of March.

De Guzman summed it up simply: "We have to be prepared for a third dry year."

# # #

California drought: Sierra Nevada snowpack falls below average after dry January
Very dry January shuts off rain and snow, raising drought concerns
Mercury News | January 31, 2022 | Paul Rogers

Engineering student Amelia Nye, left, along with Anthony Burdock, center, a water resources engineer, and Sean de Guzman, right, chief of snow surveys for the California Department of Water Resources, haul equipment out during the first media snow survey of the 2022 season at Phillips Station in the Sierra Nevada Mountains in El Dorado County near Sierra-at-Tahoe ski area, on Dec. 30, 2021. (Photo: Andrew Innerarity / California Department of Water Resources)

Like the 49ers fourth-quarter lead in Sunday's NFC Championship game, California's once-impressive Sierra Nevada snowpack is steadily shrinking.

Only a month ago on New Year's Day, after big atmospheric river storms in October and December, the statewide Sierra snowpack stood at an impressive 168% of normal for that date, boosting hopes that the state's severe drought might be ending.

But on Monday, the magnificent became mediocre: The snowpack had fallen to just 93% of its historical average.

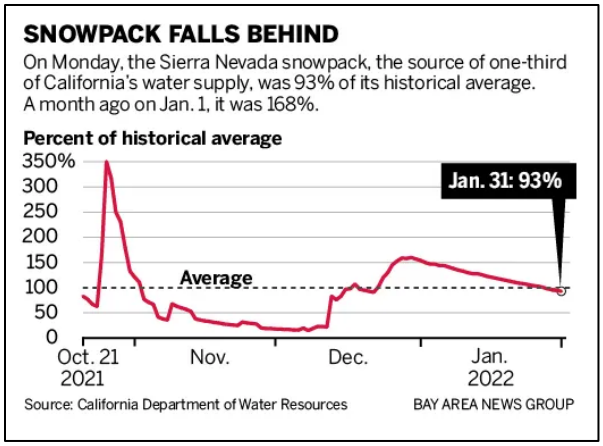
The reason is obvious to anyone who has gone to the beach or done yardwork in recent weeks: January has been exceptionally dry. The last time the Lake Tahoe area received snow was Jan. 7. The Bay Area hasn't had significant rain for 27 days. And dry, sunny weather is forecast statewide for at least the next two weeks.

Santa Clara County requires healthcare providers to offer patients COVID tests within 24 hours It's not that the snow pack is melting away. Rather, as each day passes without any additional snow, the overall total fails to grow, so the percent of historical average drops.

“This is the thing that a lot of us had feared,” said Andrew Schwartz, lead scientist at UC Berkeley’s Central Sierra Snow Lab, at Donner Summit near Lake Tahoe. “After those wonderful storms in December, the faucet just turned off. Whenever we were asked if those storms would end the drought, we said, ‘Yes, if we keep getting precipitation.’ But so far we haven’t.”

Weather forecasting models show unusually dry conditions are expected to continue across California for at least the next two weeks, with no rain or significant snow through Valentine’s Day.

“That’s going to put us in an pretty extended period of dry weather — about six weeks,” said Roger Gass, a meteorologist with the National Weather Service in Monterey. “It’s typical for us to have a dry period in the winter, but this is definitely longer than we normally have.”



A persistent ridge of high pressure over the Pacific coast has diverted storms heading for California northward all month. As a result, Juneau, Alaska, just recorded its wettest January since 1939 when records began, and the Northern Sierra, which is the watershed for many of California’s largest reservoirs, has seen just 1.3 inches of precipitation in January, or 14% of normal.

One bright spot: The big storms in December dumped 17 feet of new snow at Donner Summit and boosted reservoir levels around the state. Lake Oroville, California’s second-largest reservoir, in Butte County, has risen 118 feet since early October and is now 46% full — about 80% of normal for this time of year.

The bad news? As state water officials prepare for their monthly snow survey Tuesday at Phillips Station near Sierra-at-Tahoe, California only has two months left in its winter rain and snow season, and everything from wildfire danger to summer water restrictions is riding on how many more storms — if any — are coming between now and April 1.

“Those storms made a huge difference,” said Jay Lund, co-director of the UC Davis Center for Watershed Sciences. “It would be really awful if we hadn’t had a wet October and December. January has been one of the driest Januarys on record.”

What are the chances of strict water restrictions this summer? Too soon to tell, Lund said.

“It could go either way at this point,” he said. “A lot of the urban reservoirs are in fairly good shape. They’ve done pretty well this winter. I expect that urban water agencies probably won’t

do a lot of summer water rationing at this point. But if February and March are as dry as January, you could easily see more restrictions coming to some local areas."

It's not just the snow. Rainfall totals in cities around the state, which had been impressive a month ago, today are coming back to Earth after four dry weeks.

On New Year's Day, San Francisco had received 191% of its historical average rainfall for that date in the winter season. But Monday, that was down to 134%. Oakland fell from 219% to 152%. San Jose fell from 157% to 97%. And it was the same story in Southern California, where Los Angeles went from 257% of normal on Jan. 1 to 147% Monday.

Still, after the two driest years since 1975-77, many Bay Area water agencies have seen their water conditions improve this winter.

Both the East Bay Municipal Utility District, which serves 1.4 million people in Alameda and Contra Costa counties, and the San Francisco Public Utilities Commission, which serves 2.7 million in San Francisco, San Mateo, Santa Clara and Alameda counties, have asked their customers to reduce water use 10%.

East Bay MUD's customers cut water use 10% in December compared to December 2020, said district spokeswoman Andrea Pook. And the district's reservoirs are 68% full.

The Santa Clara Valley Water District, which serves 2 million people in and around San Jose, asked its customers to cut water use by 15% from 2019 levels. In November, the most recent month available, they cut by 20%.

But Santa Clara County is in worse shape than many other counties because its largest reservoir, Anderson, near Morgan Hill, is drained for earthquake repairs ordered by federal dam safety regulators. As a result, the 10 reservoirs in Santa Clara County operated by the Santa Clara Valley Water District on Monday were just 26% full.
The district has been purchasing water from farmers in the Sacramento Valley, pushing conservation and pumping more groundwater to make ends meet.

"We're still in bad shape," said Gary Kremen, chairman of the Santa Clara Valley Water District board. "I believe we are going to have continued water restrictions in the South Bay. We are in a different situation than other Bay Area water agencies. This Anderson thing is really problematic."

# # #

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California's snowpack slips below average after dismally dry January, renewing concerns about drought

San Francisco Chronicle | January 31, 2022 | Kurtis Alexander

Dariana Santos and Stephanie Aguilar enjoy some sledding near the Washoe Tribal Cultural Center Sno-Park in South Lake Tahoe early this month. Brian Walker/Special to The Chronicle1

Snow levels in California have fallen from their December glory after an extraordinarily dry January, stoking fears that the drought will not only continue but worsen in a third difficult year.

State officials, who will conduct the second snow survey of the season Tuesday, will find snowpack in California's mountains measuring just shy of average for this time of year. While average is better than the modest accumulation seen the past two winters, it's a disappointing drop from the 160% of average recorded a month ago.

What happens over the next two months will determine whether the state faces another year of crippling water shortages and whether the situation becomes even more severe than it's been. Most of California's precipitation occurs between November and March, and the snow that falls during this period makes or breaks water levels in the reservoirs that provide water to millions of people. Most forecasts now lean toward a dry end to this wet season.

"It's still possible that we'll make up the shortfall, but the odds are not good," said Mike Wade, executive director of the California Farm Water Coalition, an organization that represents agricultural water users. "The big problem is that even if we get more precipitation in February

and March, we went into the year with such a hole that getting back to normal water storage will be even tougher."

Current snow water content levels

Updated daily to reflect the most recent data

	% of normal for this date	% of April 1 average (the wettest time of year)
North	90%	58%
Central	90%	57%
South	95%	56%
Statewide	**92%**	**57%**

Source: DWR California Data Exchange Center

In December, a series of atmospheric rivers pounded the state with rain and snow, offering hope of turning a corner on the state's two-year drought. Many areas began the new year with near-record precipitation totals for the season.

The state's Northern Sierra Eight Station Precipitation Index, which measures water that flows to California's biggest reservoirs, showed seasonal precipitation at 152% of average at that time. On Jan. 1 San Francisco had 191% of the seasonal rainfall it typically has, according to independent forecasting company Golden Gate Weather Services.

January, however, was a different story. While breaks in rain in the middle of winter aren't uncommon, the dry weather that characterized the month is exceptional. The Eight Station Precipitation Index had dropped to 113% of average by Monday. San Francisco, which hasn't received significant rainfall since Jan. 4, is set up for a monthly total of 0.6 inches of rain, making it the city's 10th-driest January since record-keeping began in 1850, according to Golden Gate Weather Services.

Meanwhile, snowpack across the whole of the Sierra Nevada and the north state's Mount Shasta and Trinity mountains on Monday measured 93% of average for this time of year, according to the California Department of Water Resources.

"We've sort of been in this on-again, off-again pattern all season, a real dichotomy," said Jan Null, forecaster with Golden Gate Weather Services. "We're getting back to close to normal (seasonal precipitation) now. But this year we don't need normal. We need above normal."

In many parts of the state, the past two years were the driest back-to-back years in recorded history. The dearth of precipitation left reservoirs at historic lows, forced many municipal water

suppliers to impose restrictions on households and businesses, and prompted farms to cut back production of tomatoes, rice, grapes and other lucrative crops.

The two-year drought also helped propel California's two biggest wildfire seasons, in terms of acres burned. The northern Sierra's Dixie Fire and the Caldor Fire near Lake Tahoe were among last year's devastating infernos.

Short-term weather models show little chance of rain for the first half of February. A mass of high-pressure air over the Pacific, which generally prevents storms from making landfall in California, remains firmly established with little sign of letting up.

The long-term forecast by the federal Climate Prediction Center, covering late winter and early spring, shows equal chances for wet and dry weather for Northern and Central California and likely drier weather for Southern California.

The state water department is scheduled to perform manual snow measurements Tuesday as part of the agency's monthly snow survey. The work, though, serves only to confirm readings of dozens of electronic sensors across California's mountains already measuring the snowpack in real time.

State officials measure the snow by determining how much water it contains, not by its depth. This is considered a better metric for gauging how much melt-off will flow to reservoirs.

Snow typically constitutes nearly a third of the state's water supply. It's particularly important because this bounty of melted water usually comes at the end of the wet season, in late spring and early summer, when demand for water begins to peak.

Because of the drought, water levels in California's reservoirs remain well below average. This past weekend, Shasta Lake, the state's biggest reservoir, contained 55% of the water it typically holds this time of year while Lake Oroville, the second biggest reservoir, contained 80% of what it typically holds.

State officials project that California's 154 biggest reservoirs, at the end of January, will have 76% of average water storage for the month.

Jeanine Jones, interstate resources manager at the California Department of Water Resources, says water supplies remain in better shape now than they were at this time last year. While January did not bode well, she says there's still time in the wet season for the spigot to turn back on.

"At the bigger picture level, California is known for its extreme variability in precipitation," she said, "which is something we've certainly been seeing."

# # #

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Season snowfall totals have dropped since 1970 in the Sierra, but average precipitation has gone up

According to data gathered by UC Berkeley's Central Sierra Snow Lab, when snow does fall, it often contains lots of water. But that doesn't necessarily help come fire season

KCRA | January 24, 2022 | Heather Waldman

SACRAMENTO, Calif. — Snow season in Northern California has always been characterized by starts and stops, but this season may have brought a little extra whiplash with a big storm in October, a dry November, record snowfall in December to end 2021 only to be followed by a near-record dry January.

This region has seen similar extremes before, but because of climate change and resulting rising global temperatures, weather patterns are shifting to make these dramatic "dry to wet back to dry" periods more common. Tracers of this trend are showing up in climate data for the Sierra and the Western U.S. as a whole.

According to data maintained by the U.S. Environmental Protection Agency, since 1950 the average annual snowpack for the Western U.S. has declined by as much as 41% for an area roughly the size of the state of South Carolina.

There's also a notable trend for an earlier peak in the snowpack across the American West. Back in 1980, the average date for the snowpack peak was in mid-April. In 2020, that average date moved up approximately 2 weeks to the end of March. That's a sign that spring snowfall is dwindling for a large area. But what about the Sierra specifically?

The UC Berkeley Central Sierra Snow Lab has been analyzing snow data for our region for over 75 years. Andrew Schwartz is the lab's lead scientist. He said that the trend in the Western U.S.

for less snow over recent decades holds for the Sierra Mountains too, but trends for precipitation of all types are headed upward.

"We are seeing less snow every year, but we are seeing a little bit of an uptick in precipitation, so there could be a little bit of a tradeoff here. We're seeing less snow but it has a higher water content when it does fall," Schwartz said.

That higher water content is due to higher temperatures throughout Earth's atmosphere. Warmer air can hold more moisture than cooler air. That leads to heavier rain and snowstorms. It also causes snowstorms that produce more wet slush compared to drier powder.

"With the increase in precipitation overall, that's something somewhat hopeful. But that doesn't necessarily mean that it'll help with our fires in the summer either," Schwartz said.

That's because an increase in precipitation increases the chance for rain to fall on whatever snowpack there is. That causes the snow to melt faster in the spring, increasing the risk for spring flooding but then leading to less groundwater heading into the summer.

As of Monday evening, the Sierra statewide snowpack is at 106% of normal for the date. It is projected to drop below average with no rain or snow in the forecast through the end of January, although there are some signs of a little bit of activity for the first week of February.

# # #

After snowy December, California suddenly turns dry, magnifying drought concern
Many parts of central California have seen almost no rain or snow so far this month.
Department of Water Resources | January 24, 2022 | Jacob Feuerstein

With wildfire cinders in the air above the Bixby Bridge along Highway 1, Big Sur Fire and Cal Fire firefighters from nearby areas battle the Colorado Fire on Jan. 22. (Melina Mara/The Washington Post)

California is approximately halfway through what may be the most closely watched wet season in state history. A rainy October and snowy December brought some relief from the extensive, multiyear drought, but a vanishingly dry January portends continuing water challenges.

Parts of central California have seen a record lack of precipitation so far this month.

What happens in the weeks ahead will have huge implications for the summer dry season. Almost all of the precipitation that nourishes soil and fills reservoirs in the western United States falls from November through March. The amount that it rains and snows in these five crucial months has a substantial influence on a region home to tens of millions of people and billions of dollars of agricultural production.

Years with insufficient precipitation have seen huge wildfires, widespread farming woes, domestic water rations and extreme heat. For much of the West, including California, another dry winter could turn a worrying situation dire.

A promising start and sudden stop

The water year began with the immense bang of a record-setting October storm system, which dragged a Category 5 atmospheric river into California. The deluge set Sacramento's all-time single-day rainfall record, ignited flooding and all but ended a disastrous wildfire season.

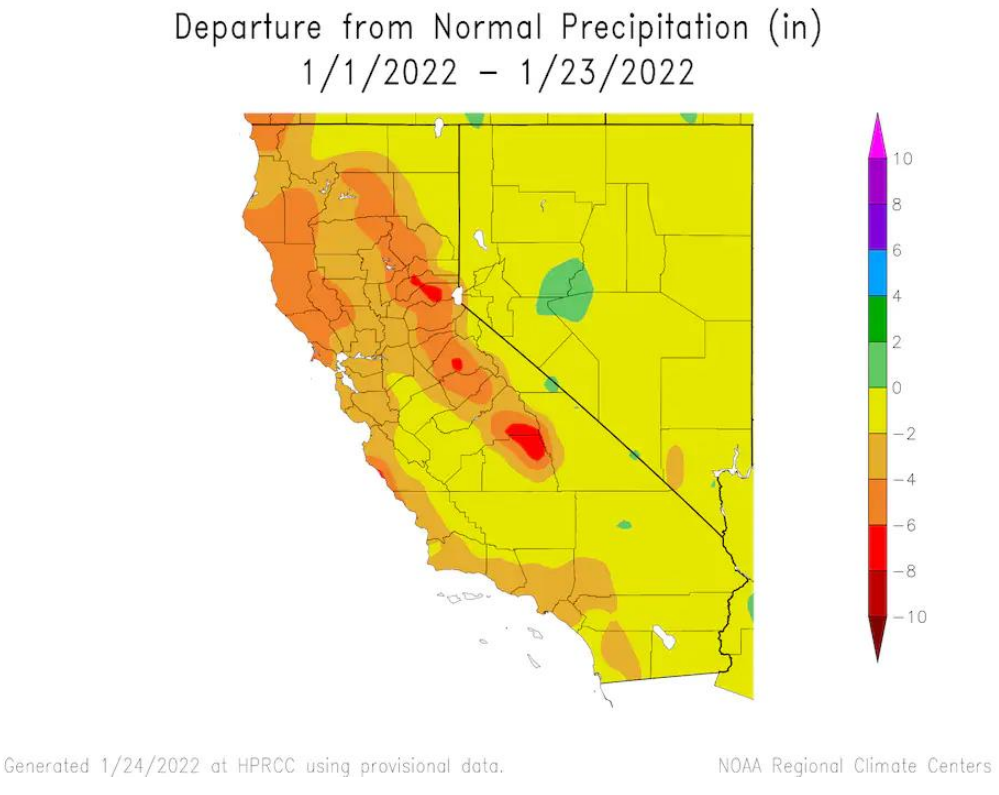
Though California had seen a lot of rain in that October storm, mountain snowpack — essential for easing drought conditions — remained largely absent. It was not until the middle of December, when a series of significant storms made landfall in the state, that this changed. Nearly continuous precipitation fell in hefty snowstorms that blanketed California's higher elevations, bringing adverse short-term effects such as power outages and road closures. But the barrage was overwhelmingly good news and brought Sierra snowpack well above normal.

By Jan. 1, total snowfall in the Sierras was over 50 percent higher than normal for the date.

The weather pattern responsible for the heavy snow allowed so-called atmospheric rivers to slam the coast repetitively. These "rivers" are plumes of moisture sucked from the tropical Pacific by long tongues of northerly wind. Weather patterns in which the high-altitude jet stream bends into a u-shape over the eastern Pacific Ocean steer such storminess toward the coastline. December saw the jet stream stuck in this offshore u-shape.

But an abrupt pattern shift in early January saw this persistent u-shape flip to an n-shape. Suddenly, the moisture-rich southwesterly wind stopped flowing, and the tap turned off.

Since then, only scant showers in January's first week have managed to blow through Southern and far Northern California. The rest of the state, including much of the Sierra Nevada range, has remained bone-dry through what is typically among the wettest times of the year.



This will probably end up as the driest January on record for much of central California. Sacramento has received only 0.05 inches, tied for fifth least on record. Just a trace of precipitation has fallen in Stockton.

Reno, Nev., has seen no measurable precipitation so far this month.

Conditions have been so dry that an unusual midwinter wildfire erupted amid gusty offshore winds Jan. 21 and 22 just south of Monterey, prompting evacuations in Big Sur and closing a portion of Highway 1.

The weather pattern that enveloped much of the West in January also promoted unusual warmth, with temperatures three to seven degrees above normal. The important Sierra snowpack, built by an ideal December pattern, has actually decreased somewhat at many sites due to melting through the warm, dry weeks.

But just as a month of monumental rain and snow is insufficient to end California's massive drought, a month of dry warmth is not enough for a complete backslide.

Precipitation for the season to date is generally at or just above average, with Sierra snowfall around 10 percent above normal. This means that a very wet season like 2016-2017, and a very dry season like 2020-2021, are both largely out of the question for the state. But whether California's drought situation remains dire into 2022, or improves significantly, depends largely on what the next month brings to the state.

The future of California's 2022 wet season

A shift from the weather pattern that all but blocked precipitation for much of the West Coast during January appears likely. However, that does not assure a wet February. In fact, dry weather may continue on balance.

While the n-shaped jet stream will probably transition quickly into a u-shape to end January, potentially bringing more storminess toward the coast, it may well shift inland, shutting down any storminess thereafter.

The American modeling system, which averages dozens of computer simulations, can clue forecasters in on atmospheric patterns weeks in advance. Here, it shows the jet stream rapidly switching structure over the West to begin February from more of an n-shape to a u-shape.

While a period of storminess will be possible as this shift occurs, the precipitation potential may quickly wane deeper into February.

There are signals that the pattern could once again switch to a wet one into March, but it is still too early to project such a development with much confidence.

The official drought outlook from the National Oceanic and Atmospheric Administration calls for drought to persist in California into the spring.

# # #

California water districts to get more water than expected
A wet winter means the DWR will release more to the districts
Associated Press | January 20, 2022 | Kathleen Ronayne

Anthony Burdock, left, and Sean de Guzman, chief of snow surveys for the California Department of Water Resources, check the depth of the snow pack during the first snow survey of the season at Phillips Station near Echo Summit, Calif., Thursday, Dec. 30, 2021. Randall Benton/Associated Press

SACRAMENTO — Last month's wet winter storms led California officials on Thursday to announce they will release more water than initially planned from state storage to local agencies that provide water for 27 million people and vast swaths of farmland.

The Department of Water Resources now plans to give water districts 15% of what they have requested for 2022. That's up from last month, when the state said it would supply 0% of requested water beyond what was needed for necessities such as drinking and bathing. It was the first time ever the state issued an initial water allocation of nothing.

State officials stressed California's drought is far from over and urged people to keep conserving water. But December storms that dumped heavy snow in the mountains and partially refilled parched reservoirs have provided some relief from what had been an exceptionally dry year.

Proposed ballot measure to build more California dams, desalination projects likely to be withdrawn due to lack of money and signatures

Still, the state hasn't seen a major storm yet this month, and most state reservoirs remain below their historic averages. The U.S. Drought Monitor shows much of California remains in severe drought.

"Dry conditions have already returned in January. Californians must continue to conserve as the state plans for a third dry year," Department of Water Resources Director Karla Nemeth said in a statement.

California stores and conveys water across the state through a vast network of reservoirs, dams and canals known as the State Water Project. It works alongside the federally run Central Valley Project to move water primarily from the state's wetter northern region to the drier south.

Gov. Gavin Newsom has asked for people to voluntarily use 15% less water than last year. Meanwhile, emergency statewide restrictions on outdoor water use took effect Tuesday, including a ban on watering lawns for 48 hours after rain. Violators can be fined up to $500 per day, though state water officials say enforcement will primarily be left to local water agencies.

Otherwise, what the increased allocation will mean for individual households and farms will largely depend on local water agencies, which have the power to set their own limits on water use.

The winter storms brought significant snowfall to the Sierra Nevada and other California mountains. A strong snowpack is critical for the state's spring water outlook, because when the snow melts it runs down into streams and boosts the state's water supply.

At the winter's first snow measurement in late December, the snow held 160% of the water it normally does at that time of year. But precipitation must keep falling through January, February and March to ensure strong supplies for the spring.

# # #

After recent wet spell, thoughts turning anew to storage
Capitol Weekly | January 11, 2022 | Uriel Espinoza-Pacheco

Is California's drought coming to an end?

Experts say no, not yet, despite the recent historic levels of rain and snow throughout the state.

And while 2021 was the driest in California in a century, 2022 is giving people hope that the seemingly interminable drought may finally be over, at least for now, following record-breaking snows along the linchpin of California's water supply, the Sierra Nevada.

It is also heightening the discussion over whether new reservoirs should be built, and nowhere is that discussion more intense than in Santa Clara County, population 1.9 million.

UC Berkeley's Central Sierra Snow lab reported that December has been the snowiest since December of 1970 and residents of the Sierra Nevada — which, appropriately, means "snowy mountain range" in Spanish — probably won't argue with that. An estimated 75 percent of Californians drink water that originates in the region.

With a number of highways, including major east-west links like I-80, being closed and lengthy power outages, the white fluffy snow quickly became an enemy for the holiday season.

Two weeks after the storms, some 3,200 homes remained without power in Nevada, Placer, El Dorado and Sierra counties.

Currently all 58 counties in the state are under some type of drought emergency proclamation. However, with the recent storms precipitation has averaged 150% to 300% percent of normal or more throughout nearly all of California, and the state's mountain snow holds more than 160% of what it normally does this time of year as well.

When it comes to water, some counties are lucky with water but others — not so much.

Santa Clara County, for example, has always had its water issues. Like many in California, it is largely relies on water from the Sacramento-San Joaquin River delta, and draws water from the the San Luis Reservoir, an imposing inland man-made lake off Highway 152 in the Pacheco Pass, and other sources.

But as the drought intensified, the San Luis Reservoir level dropped. As of Monday, Jan. 10, the level of San Luis was 415 feet, measured from seat level, up from the 341 feet measured during October.

“The reservoir’s water quality goes down when water levels are low,” noted Professor Jay Lund of the Center for Watershed Sciences at UC Davis.

Because of the all this and more, Santa Clara authorities are considering another reservoir, the Pacheco Pass Expansion Project, and the proposal is gaining traction.

The plan, in conjunction with the Pacheco Pass Water District and the San Benito County Water District, is to build a $2.3 billion dollar dam in the hills of southern Santa Clara County. It would be the largest new reservoir constructed in the Bay Area in more than 20 years.

A Pacheco Pass Reservoir already exists, with a capacity of 5,500 acre-feet; the expanded reservoir would increase the capacity to 140,000 acre-feet, “enough to supply 1.4 million people with safe, clean water for one year in an emergency,” the Santa Clara Water District said last month. (An acre-foot of water is the amount needed to cover one acre to a depth of one foot, or about 330,00 gallons, roughly the yearly amount used by a family of four.)

The expanded reservoir would be filled by a combination of rainfall, runoff from the watershed upstream of the new dam, and imported water supplies. The water released from the reservoir will help threatened fish by keeping the Pacheco Creek flowing, before seeping into the underlying groundwater aquifer as it winds toward where it meets the Pajaro River.

While the project is just coming to fruition and still isn’t fully approved, the California Water Commission reported last month that the project continues to qualify for nearly half a billion dollars in state funding.

While this may be great news to some, California’s Sierra Club and other environmentalists were skeptical.

“Construction of the reservoir will flood a 13,200 acre area that currently contains valuable wetland and oak woodland habitat. To fill the reservoir, the project will divert water from the Sacramento River, one of the main tributaries to the San Francisco Bay-Delta,” the Sierra Club noted.

Other concerns included not providing the benefits to the ecosystem and water quality conditions required by Water Storage Investment Program Regulations and not providing specific mitigation and conservation measures for the significant environmental impacts, among other things.

# # #

Marin water district proposes prohibiting decorative turf
Marin Independent Journal | February 1, 2022 | Will Houston

Landscaping work to install drip irrigation and drought tolerant plants takes place in the parking lot of The Village Shopping Center in Corte Madera, Calif. on Wednesday, July 21, 2021. (Alan Dep/Marin Independent Journal)

The Marin Municipal Water District is proposing a ban on decorative grass at commercial and municipal properties to reduce demand on local reservoir supplies.

The proposal would require most nonfunctional turf be removed over several years. Under the proposal presented by staff last month, commercial properties would be barred from installing new decorative turf beginning in March.

The prohibition would not affect residential properties, churches, homeowners association common areas, sports fields, golf course greens and play areas such as in schools and parks.

The board is set to consider the proposal at a future meeting. The new rules, if enacted, could begin in March.

“There are places where we just don’t need grass,” board Director Monty Schmitt said during a presentation last month. “And I think that that maybe hopefully will help other folks to look at their own landscaping and say, ‘Do I really need to have grass there or could I put something else that’s drought-tolerant?’”

The district, which serves central and southern Marin, estimates there is about 73 acres of non-functional turf, such as on roadway medians and grass patches along sidewalks and shopping centers.

An estimated 350 acre-feet of water would be saved annually if the turf is removed, according to district water efficiency manager Carrie Pollard. This amount equates to about 1.2% of the district's total potable water demand in 2020, or about 28,199 acre-feet. An acre-foot is about 326,000 gallons or the amount of water required to cover 1 acre under 1 foot of water.

The prohibition would also set parameters for where and how much turf commercial properties could install.

The district would only allow turf to be planted in an area of at least 1,500 contiguous square feet or larger. The total area of the grass would have to be a minimum of 30 feet in any dimension. Turf would also not be allowed closer than 10 feet to a street, sidewalk, parking lot, or other paved surfaces.

Exceptions to the rule could be considered, depending on circumstances. Pollard some examples would be grass near a child care business or a veterinary office.

Last month, staff proposed the program could begin in March, giving commercial properties and municipal governments until Jan. 1, 2025 to remove existing decorative grass. The district would provide a rebate of $3 for every square foot of grass removed in 2022 and 2023. The district already has in place a $3-per-square-foot lawn replacement rebate it has offered since last year.

The incentive would be reduced to $1 per square foot in 2024 under the proposal; no rebate would be provided in 2025. If all existing turf was removed in 2022 and 2023, the district would be paying close to $9.6 million in rebates.

Board President Larry Russell raised concerns about the schedule and potential impacts on the district's budget.

"The schedule is a little optimistic or Draconian depending on how you look at it," Russell said during the Jan. 18 presentation. "I understand the goal, but I mean, let's look at the financial side."

Board Director Cynthia Koehler said the cost does not sound like a lot compared to projects the district is considering to bolster its water supplies, such as the proposed $100 million water pipeline over the Richmond-San Rafael Bridge.

"The other water supply resilience measures we're looking at are so much more expensive," Koehler said during the meeting. "I think we should be doing all those things but this strikes me as a relatively low cost compared to some of the other options."

Board Director Larry Bragman said the resulting water savings would also be permanent, meaning the cost of the program would reduce over time.

San Rafael Public Works Director Bill Guerin said the city has been looking at ways to reduce its water use, including converting some of its landscaping to become more drought-tolerant.

“Where we don’t need to use a lot of water we would prefer to use drought-tolerant planting instead, which is both attractive and don’t use any water,” Guerin said. “I think it’s a great incentive. It would be a big advantage to us to latch on to a program like that and save a lot of water.”

Stan Hoffman, senior property manager at The Village of Corte Madera, said he would also have no objection to removing or replacing turf with more drought-tolerant landscaping. The center has previously installed drought-tolerant plants and a new irrigation system in its parking lot last year to reduce its water use.

“While the paid incentives would be appreciated by many businesses with large projects to address, we believe that saving water and reducing our water bill would be incentive enough,” Hoffman wrote in an email.

The district board expressed interest in potentially allowing property owners to retain their decorative turf if they are able to water it through rainwater catchment systems or recycled water rather than drawing on the district’s potable water supplies.

“These are the types of long-term changes we need to support and are entirely consistent with our long-term strategic goals to adapt to climate change,” Bragman said.

# # #

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Discount rain barrels promise big water savings — if we get more storms
San Francisco Chronicle | January 29, 2022 | Nanette Asimov

Volunteers load up rain barrels, sold at a discounted price to San Mateo County residents Saturday, in hopes of saving thousands of gallons of water. Nanette Asimov/The Chronicle

Emotions ran high at the big rain barrel sale that took place under sunny skies in San Carlos on Saturday, where hope was in greater supply than raindrops.

Hundreds of San Mateo County residents swung by a bayside parking lot to pick up nearly 400 of the 50-gallon barrels made of recycled plastic that they had reserved online at the discounted price of $30 apiece — including a $50 rebate — from the City/County Association of Government and its FlowstoBay.org clean water program.

“We’re just really hopeful we’ll get some rain to water our plants,” said Michael Sage of Pacifica (where sunshine is predicted all week) as he waited in a line of cars so that volunteers could load his barrel into his trunk.

Paola Flygare of Burlingame (sunshine predicted all week) hadn’t reserved a rain barrel but noticed the line of cars as she bought mulch next door. She hurried over in hopes of snagging one. Flygare was supposed to be on a plane to Tahiti with her husband on Saturday but they canceled, fearful of the coronavirus’ fast-spreading omicron variant.

“Getting a rain barrel would be a good consolation prize!” she laughed. “Hopefully, hopefully!”

The county’s water experts say the best time to get a rain barrel is now, regardless of the weather. The Bay Area typically receives 18 to 23 inches of rain a year, and a rain barrel positioned beneath a home’s downspout can collect — get ready for some math — 312 gallons of water for every half inch of rain that falls on a 1,000-square-foot roof, said Suzi Senna, the Flows to Bay program’s representative, checking details on the web as volunteers whisked barrels into car trunks around her.

Volunteers Ulla Foehr and Alex Rinear, Reid Bogert of the City/County Association of Governments of San Mateo County, Suzi Senna of the association’s Flow to Bay program, and volunteer Jesse Craft gather behind some of the 396 rain barrels they loaded into the cars of county residents who bought them Saturday at discounted prices. Nanette Asimov/The Chronicle

Put another way, 150 rain barrels can save 18,000 gallons of water, said Reid Bogert of the City/County Association of Government, who brought his 5-year-old son, Yvo, to help set things up. Between today’s sale and one in November, he said, San Mateo residents now have 700 barrels — and are poised to save 84,600 gallons of water, give or take.

If any rain falls.

Kat Thomas of Brisbane (sunshine predicted all week) hopes to collect rain for her peach, pear and plum trees, as well as the grapevines she's just planted. Although 2022 got off to a wet start, even Thomas' cactuses looked shriveled before that, after two of the state's driest years.

So why not just turn on the garden hose?

"Maybe it's guilt," Thomas said. "It just sort of feels wasteful. You hear of people having to travel miles for drinking water, and we're using pure, clean water to water plants and flush the toilet."

When it comes to choosing between a $30 rain barrel or a garbage can for half the price to collect your rainwater, Bogert of the county said you get what you pay for.

For one thing, the top of the barrel has a screen to keep out debris — and especially mosquitos, which can carry disease, he said. The barrel is also equipped with a spout at the bottom to drain the water into a bucket or watering can. There's another spout at the top for overflow, or to attach a second barrel — a process called daisy-chaining, Bogert said. The connector for that is included in the price.

Reid Bogert of the City/County Association of Governments points out the drain features of the rain barrels his agency is selling at a discounted price to San Mateo County residents to save water. Nanette Asimov/The Chronicle

Maybe the trickiest thing about getting a rain barrel is setting it up.

“You have to hacksaw your downspout,” Bogert said. The opening to a downspout hovers just above the ground. But a barrel is 3.5 feet high.

“Really? I hadn’t considered that,” said Flygare, as she hung around to find out if there would be any barrels left over she could buy.

Of the 396 rain barrels reserved online for pickup, 388 of them had been picked up by 11:50 a.m. With eight barrels remaining and the sale ending at noon, that left 10 more minutes of uncertainty. And some people, like Dennis Payne of Redwood City (sunshine predicted all week), were buying more than one.

Payne had loaded three into his Volvo SUV, planning to water his family’s tomatoes, melons, spinach and potatoes. He also hoped to buy more at the next sale. “We have five downspouts,” he said.

Flygare said she still wanted a barrel, despite the hacksaw problem. Her husband wandered by and called out that he’d be happy to hack as many downspouts as she liked.

Five minutes ticked by. No more cars pulled in, but four people called to say they were late and to ask Senna, of Flows to Bay, to set their barrels aside, which she did.

Then came noon.

“Congratulations!” Senna told Flygare. She had a rain barrel.

It’s not Tahiti, Flygare said. “But I’m really happy.”

# # #

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What California's drought could teach other states in the West
Newsbreak | January 22, 2022 | Matt Vasilogambros

MONTEREY, Calif. — The golden hills of California have turned green in recent weeks after a series of storms delivered much-needed rain and snow to a state suffering from two years of drought.

But state officials and water policy experts are still urging caution even in these wet conditions, pushing for water-saving measures as the drought is expected to continue throughout much of the West.

"Even with those rains and with that massive snowpack, the larger issues of drought in California are not resolved," said Char Miller, a professor of environmental analysis at Pomona College in Claremont, California. "No one talks about water when it's raining. We need to have the conversation now."

California remains in the grip of a dry period that has substantially depleted the state's reservoirs, facilitated some of the largest wildfires in state history and led officials to add new restrictions on water use.

This past water year (a measure that takes into account total winter precipitation), which ran from October 2020 through the end of September, was the driest in a century. Just three months into the new water year, California already has surpassed 2021's precipitation levels.

The drought has laid bare some of the challenges that California and other states face in managing their water supplies. A California conservation law being implemented during the next two decades, along with a range of actions by communities across the state, provide a preview of difficult policy choices communities across the West will have to grapple with as climate change pushes water shortages to crisis levels.

While some communities, such as Marin County just north of San Francisco, have debated building a multimillion-dollar emergency pipeline to bring in water, other communities have sought approaches that rely on reuse and recycling.

Orange County now is home to the world's largest groundwater replenishment site, a treatment plant that purifies wastewater and injects that water back into its underground aquifers, instead of pumping treated water into the Pacific Ocean.

Some communities are trying to improve their stormwater capture systems, while others are exploring turning ocean water into drinking water. San Diego County has the largest desalination plant in the western hemisphere, and other communities are considering following its example.

The infrastructure law President Joe Biden signed in November includes $82.5 billion for critical water investments nationwide, including grants, studies and federal projects.

But the problems these policies attempt to address are daunting.
California and other states swing from extreme wet to extreme dry conditions, which will only be exacerbated by the worsening climate crisis.

There's also a lack of reliable long-term weather forecasting that could predict precipitation levels throughout an entire wet season, instead of just two weeks.

"These days, it's all about being more efficient in water management," said Jeanine Jones, interstate resources manager at the California Department of Water Resources. "You need better forecasts to be more efficient."

In long dry spells, communities and farmers in many states also draw heavily on underground aquifers, many of which are being overdrafted, even in average rain years. California's Central Valley, the heart of America's produce industry, is literally sinking because of its depleting and overpumped aquifer.

Big measures are needed now to address many of these challenges, said Andrew Ayres, a research fellow at the Public Policy Institute of California, a San Francisco-based nonprofit. California has generally lagged other Western states in having comprehensive groundwater plans, Ayres said.

Arizona, for example, enacted its groundwater management act in 1980. The legislation mandated water conservation from businesses throughout the state and sought to manage groundwater consumption in five counties where overpumping was historically an issue. But some water experts have called for an update to the law to address groundwater supply issues in rural Arizona.

California policymakers enacted a law in 2014 that they hoped would increase aquifer levels through conservation efforts that not only decrease the amount being pumped but also increase water seeping back underground. The Sustainable Groundwater Management Act is still being implemented, as communities and water rights-holders have until 2040 to reach sustainable groundwater levels.

But the law's outcome is not certain, Ayres said. Water management is a complex web of state and local water authorities, long-held water rights and uncharted legal territory, he said, and the next two decades of implementing this new law will lead to difficult negotiations and sacrifices by both agricultural and urban consumers.

"There's a lot of uncertainty around solutions and what they will look like," he said.

During the past year, the state has added other restrictions for water use, including a call by Democratic Gov. Gavin Newsom for residents to voluntarily cut their water consumption by 15%, but the state fell far short of that goal. Newsom has resisted a politically fraught statewide water conservation mandate. In 2015, then-Gov. Jerry Brown, a Democrat, ordered communities to cut water consumption by 25%. The cuts ended after a year when heavy rain saturated the state and eased the drought.

Last week, the state also issued emergency regulations that target water waste by residents, including hosing down sidewalks or watering lawns soon after it rains.

These measures have been necessary even after the recent rain and snow brought some relief. The deluge of the past month soaked much of the Golden State, replenishing dammed reservoirs and underground aquifers, and revitalizing streams that until recently laid dormant and dusty. For a state with nearly 40 million residents in need of drinking water and the country's largest agricultural industry that provides a tenth of the nation's crops and livestock, this weather has been essential.

Throughout much of the past year, dangerously depleted reservoirs and lakes fell way below water lines, beaching boats and raising alarm statewide. Reservoirs, though many remain well below their historical average, have risen substantially with recent precipitation.

When considering drought conditions and the low reservoir and groundwater levels going into this winter, the state is still significantly behind healthy water levels, said Michael Dettinger, a research associate at Scripps Institution of Oceanography at the University of California, San Diego.

Drought recovery depends on what Californians and the state does now, said Heather Cooley, director of research at the Pacific Institute, an Oakland-based think tank.

There are massive challenges: Overdrafting of the state's aquifers has been exacerbated by drought, engineers have detected cracks in aqueducts and shallow wells are drying up in some rural areas. And as reservoirs dry up, there are no other major rivers to dam.

Californians can do their part, said Cooley, including by upgrading old appliances (such as dishwashers and toilets), removing grass lawns and replacing them with climate-efficient plants, and fixing leaks. Some communities, from Encinitas up to Santa Clara County, have added requirements for home and business owners to replace inefficient appliances.

California's State Water Resources Control Board last week ordered local governments to stop using drinking water to water ornamental grass on street medians. Similar policies are being implemented in other drought-ridden states. Neighboring Nevada banned strictly ornamental grass on office parks, outside malls and on road medians.

Further, the state needs to improve its timely access to data and information on water levels and consumption by consumers, said Nell Green Nylen, a senior research fellow with the Wheeler Water Institute at the Center for Law, Energy & the Environment at the University of California, Berkeley, School of Law. But, she admits, this is challenging in such a complicated management system.

It's even more challenging to manage a water system that also keeps in mind ecosystems and essential habitats for fish and wildlife, she said. Last year, nearly all the endangered winter-run chinook salmon juvenile population died in the warm Sacramento River, unable to receive cold water from snowmelt.

But all potential solutions require a drastic cultural shift and change of approach that entails sacrifice, Cooley said.

"That shift takes time," she said. "I think people are making it, but there's more we can do."

# # #

State Agencies Detail Progress Implementing Water Resilience Portfolio
California Natural Resources Agency | January 11, 2022

Over the past 18 months, state has acted to bolster drought and flood resilience across California

Governor's California Blueprint includes an additional $750 million in water investments with a focus on conservation, drought relief and protection of fish and wildlife

SACRAMENTO—A new report released today conveys significant progress made in the past 18 months to implement the Water Resilience Portfolio, the Newsom Administration's water policy blueprint to build climate resilience in the face of more extreme cycles of wet and dry.

The report summarizes work done on each of 142 separate actions called for in the Water Resilience Portfolio. The portfolio was developed by the California Natural Resources Agency, California Environmental Protection Agency, and California Department of Food and Agriculture in response to Governor Newsom's April 2019 Executive Order calling for a suite of actions that would help California communities, the economy, and the environment address long-standing water challenges while adapting water systems to a changing climate.

Recent progress includes assisting tens of thousands of Californians who depend on small water systems or domestic wells that have drinking water supply problems, dedicating hundreds of millions of dollars to improve streamflow for salmon and other native fish species, advancing the removal of four obsolete dams that block salmon passage on the Klamath River, providing extensive financial and technical assistance to local sustainable groundwater management agencies, restoring streams and floodplains, and steadily improving the state's ability to manage flood and drought.

The 2021-22 state budget included $5.2 billion in water resilience investments across California that will build momentum to carry out portfolio priorities over the next several years. On Jan. 10, Governor Gavin Newsom proposed an additional $750 million in water resilience investments, with a focus on water conservation, drought relief, protection of fish and wildlife, groundwater recharge, and support for local agencies bringing groundwater basins into sustainable conditions.

"We've made solid progress building drought and flood resilience across the state in the last 18 months," said Secretary for Natural Resources Wade Crowfoot. "At the same time, accelerating climate change has driven weather whiplash, worsening drought and flood threats in real-time. Recognizing this urgency, we have to deploy historic funding provided by the Governor and Legislature quickly and effectively, in partnership with local and regional partners. Every part of California has unique water supplies, environmental conditions, user needs, and vulnerabilities. There are no one-size-fits-all solutions to our water challenges, and the portfolio recognizes that."

The portfolio builds upon lessons learned in the 2012-16 drought, which exacerbated a long-standing struggle in many California communities. An estimated one million Californians do not have access to reliable supplies of safe drinking water. Many actions in the portfolio aim to help communities maintain and diversify their water supplies.

“Our top priority must be ensuring clean water for all Californians,” said CalEPA Secretary Jared Blumenfeld. “We’re making good progress on that front and advancing water use efficiency, stormwater capture and recycling for long-term drought resilience.” He also noted that the state budget includes $30 million for the State Water Resources Control Board to begin modernizing the state’s water diversion management data system to reduce user error, daylight existing water use metrics and trends, and create efficiencies for the regulated community and regulators.

“Modernizing California’s water right data system will help all water managers with the water supply challenges ahead,” said Secretary Blumenfeld.

Karen Ross, Secretary of the California Department of Food and Agriculture, said the portfolio and recent state budget will help water providers plan for warmer storms and more intense drought in individual watersheds, while also investing in the major water delivery systems that supply multiple regions.

“California built its major water delivery systems nearly a century ago based on precipitation patterns that are changing as average global temperatures warm,” said Secretary Ross. “We need to know what to expect, and we need flexible, well-functioning infrastructure to respond.”

Developed with stakeholder input, the Water Resilience Portfolio was released in July 2020. Thousands of individual local districts handle most water management in California, but the state plays a role in providing funding, operating major infrastructure, developing laws and policies, gathering and sharing data, conducting research, setting standards, catalyzing coordination, emergency response and forming partnerships to address problems beyond the capacity of any single region to address. The actions in the portfolio focus on these state roles and are organized around maintaining and diversifying water supplies, protecting and enhancing natural systems, building connections, and being prepared.

In coming years, state agencies will continue to track portfolio implementation and issue annual progress reports.

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MID and TID seek much more water from Tuolumne in wet years
MID and TID take a step toward capturing a lot more water from Tuolumne in wet years
Modesto Bee | January 31, 2022 | John Holland

The Modesto and Turlock irrigation districts hope to greatly increase their diversions in years when the Tuolumne River runs high.

Their boards voted Tuesday, Jan. 25, to submit a new water rights application to the state. The multi-year process could result in the districts building new storage above or below ground.

District leaders said the move was prompted in part by climate change, which has brought wilder swings between wet and dry cycles. They seek more storage from abundant years to help them through droughts in the decades ahead.

The storage projects could be costly, though details are not yet known. And some will likely draw protests from environmental and fishing groups.

The above-ground options include modestly enlarging Don Pedro Reservoir, already one of California's largest, or building smaller reservoirs within a radius of about eight miles.

The districts also will explore a connection to nearby New Melones Reservoir on the Stanislaus River. It is even bigger than Don Pedro and could make water management more flexible.

Groundwater recharge could be done via flood irrigation on farms or by creating basins for this purpose.

The districts seek up to 2.7 million acre-feet of water in wet years, roughly triple the average consumption by farmers and city residents now.

MID and TID examined rain and snow runoff back to 1998 and found 13 years when at least some water would have been available under the rights they are seeking. The total averaged about 840,000 acre-feet in those years.

The districts said the application would not interfere with other Tuolumne rights holders, including San Francisco and riverside farmers.

"This historic action demonstrates our forward thinking in seeking all avenues of available water to sustain our customers, communities and environment," MID board President John Mensinger said in a news release.

The 216-page application went to the State Water Resources Control Board, which oversees California's complex system of river rights. It could take up to two years to gather public input and study the environmental impact of the request.

The same agency is already seeking higher release from Don Pedro as part of fish protections also involving the Stanislaus and Merced rivers. MID and TID said the extra water they seek to store could be released in ways that help fish.

TUOLUMNE RIVER TRUST'S VIEW

The Tuolumne River Trust favors groundwater recharge over new reservoirs in MID and TID's future. The group also urges further water conservation by farmers.

The Tuolumne got as low as 12% of its natural volume during the 2012-16 drought, and salmon suffered, said an email from Peter Drekmeier, policy director at the Trust.

“Once the Tuolumne River ecosystem is guaranteed more of the water it needs, we will be eager to work with the water agencies to help figure out ways to meet their water demands (or to reduce them without compromising productivity),” he said.

The Trust and other groups also support restoration of natural floodplains. They buffer the threat to downstream homes while sustaining wildlife and recharging groundwater.

TAPPING THE TUOLUMNE SINCE 1887

MID and TID use about half the Tuolumne supply on average. An eighth goes to the Hetch Hetchy system, serving parts of the Bay Area. The rest goes to farmers with riparian rights, close to the river, and to flows required for fish and water quality.

The two districts got their first rights to the Tuolumne soon after forming in 1887. The early 1890s brought La Grange Reservoir, a small impoundment still in use today. In 1923, the districts built Old Don Pedro Reservoir, holding up to 289,000 acre-feet. The current Don Pedro was completed in 1971, at 2.03 million acre-feet. It put its namesake dam completely underwater.

Tuesday’s action was the first time since 1951 that MID and TID have filed for new water rights. That was for the larger Don Pedro, which took two decades to license and build.

Today, the districts supply about 210,000 acres of farmland. MID also treats water for use in Modesto and a few smaller cities. Turlock and Ceres residents will get treated river water from a plant scheduled for completion next year.

The new rights would apply to excess runoff between Nov. 1 in a wet year and the following June 14. That roughly coincides with the start of the storm season and much of the snowmelt that ensues.

SEVERAL POSSIBLE RESERVOIR SITES

The application examines several projects that could contain high flows that now go out to sea via the Sacramento-San Joaquin Delta. Some were studied in the past by the districts or other agencies. The cost estimates are still being refined, MID spokeswoman Melissa Williams said by email Friday.

Several projects are off-stream storage, which can be less controversial than damming rivers. They would use earthen embankments to hold water delivered by canals.

Details on all the possible surface projects:

Enlarging Don Pedro: Raising the dam could add 105,722 acre-feet of storage, about 5% of the current capacity. But this could back the reservoir into part of a whitewater stretch treasured by rafters. Don Pedro is already the sixth-largest reservoir in California and the biggest under local rather than state or federal ownership.

New Melones connection: The northernmost arm of Don Pedro lies just a few miles from the southern end of New Melones. They could be connected with a pipeline or tunnel across Highway 108-120. New Melones can hold up to 2.4 million acre-feet. The Oakdale and South

San Joaquin irrigation districts have rights to the first 600,000 acre-feet of inflow each year. The reservoir also supplies the federal Central Valley Project via massive pumps in the Delta.

Lower Cooperstown off-stream reservoir: An embankment at this spot could contain up to 192,000 acre-feet. It is about three miles northwest of Modesto Reservoir, an existing part of MID's distribution.

Upper Cooperstown off-stream: 110,000 acre-feet, five miles northeast of Modesto Reservoir.

Roberts Ferry off-stream: 16,000 acre-feet, just east of Modesto Reservoir.

Cardoza Ridge off-stream storage: 503,200 acre-feet, four miles east of La Grange.

Montgomery Lake off-stream: 517,000 acre-feet, eight miles south of La Grange.

Dickenson Lake off-stream: 104,000 acre-feet, two miles west of Turlock Lake, which is part of TID's system.

RECHARGING AQUIFERS

The groundwater recharge in the application includes the current practice of providing extra water to farmers in wet years. It can reach the aquifers if they use flood irrigation rather than drip or sprinklers.

Recharge also can happen in basins built for this purpose, or through seepage from reservoir bottoms. The districts note that these efforts will help them comply with a state mandate to make groundwater use sustainable by about 2040.

The listed projects total 3.46 million acre-feet of storage, well above the 2.7 million sought in the application. Only some of the projects would be carried out.

"We will explore all possibilities for financing including partnerships with other agencies and applying for any available outside funding," Williams said.

The Tuolumne River Trust has just begun the review the application.

"We'll keep an open mind and will likely weigh in once the EIR is available," Drekmeier said. "... What we want to avoid is enabling conditions on the Tuolumne to become even worse."

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State Water Resources Control Board— Bay-Delta Plan Update
Legislative Analyst's Office | January 31, 2022

Summary. In this post, we discuss the State Water Resources Control Board's (SWRCB's) efforts to update the water quality control plan for the Sacramento-San Joaquin Bay-Delta and its source rivers. Updating the water quality objectives for the Bay-Delta watershed is long overdue and should be a high priority for the state to complete, particularly given rapid population declines in native fish species that depend on the Bay-Delta ecosystem. The Governor proposes redirecting $1.4 million in ongoing General Fund that is currently being used for contract consultant services to instead establish and support five new permanent positions at SWRCB to work on updating the plan. While we believe the proposal is reasonable and recommend its adoption, we also recommend the Legislature engage with the administration regarding its time line for updating the plan and whether additional actions can be taken to help expedite this process.

Background

SWRCB Regulates Bay-Delta and Its Source Rivers Through Water Quality Control Plan. Pursuant to the state Porter-Cologne Water Quality Control Act and federal Clean Water Act, SWRCB regulates water quality for the waters of the state, including its rivers and streams. As a component of implementing these responsibilities, in 1978 the board adopted a water quality control plan for the Sacramento-San Joaquin Bay-Delta, known as the Bay-Delta Plan. This plan establishes water quality objectives—such as flow requirements—that are intended to protect "beneficial uses" in the Bay-Delta and its source rivers. Specified beneficial uses include fish and wildlife, agriculture, and municipal and industrial water uses. The plan also includes programs of implementation to achieve the stated objectives, including monitoring and compliance actions.

Board in Process of Updating Bay-Delta Water Quality Control Plan. Given changing conditions and water uses over the past four decades, SWRCB has occasionally made updates to the Bay-Delta Plan. While the overall plan received some updates in 2006, the last major update was in 1995. SWRCB has been in the process of developing new updates to the plan since 2009. In 2018, the board adopted Phase I of these new updates, which includes new water quality flow objectives for the lower San Joaquin River and its tributaries (the Stanislaus, Tuolumne, and Merced Rivers), as well as updated salinity objectives for the South Delta. Specifically, to improve conditions for fish and wildlife, the new flow standards call for 40 percent of unimpaired flow in the rivers. The required flows can be adjusted within a range of 30 percent to 50 percent between February and June depending on other actions and conditions in the fisheries. (According to SWRCB, current unimpaired flows in these rivers range from 21 percent to 40 percent on average, but can run as low as 6 percent in dry or drought years, and average 10 percent to 20 percent during certain times of the year that are critical for migrating fish.) The board is now developing a program of implementation for these new standards.

SWRCB is still in the process of working on Phase 2 of its plan updates, which will include new water quality objectives and a program of implementation for the Sacramento River, its major tributaries, and the Bay-Delta estuary itself. The board states that it hopes to adopt new flow standards in fall 2023, with development of the implementation plan to follow. Because

implementing these new standards will necessitate adjustments to water rights, SWRCB is still weighing options for how it will incorporate those changes once it has approved the new flow objectives, including potentially through adopting new regulations or through adjudicative water rights proceedings.

SWRCB Currently Spends $9.1 Million Annually on Updating Plan. Currently, SWRCB receives $9.1 million in ongoing funding it dedicates towards updating and beginning to implement changes to the Bay-Delta Plan, including $7.5 million from the General Fund and $1.6 million from the Water Rights Fund. Of this funding, $4.1 million supports 17 existing SWRCB staff—including two in the Office of Chief Counsel—and $5 million is used for contracted consultant services, such as to develop environmental documents and conduct scientific and economic modeling and analyses.

Bay-Delta's Native Species Experiencing Rapid Declines. As stated in the Phase 1 plan update, "native fish species that migrate through and inhabit the Delta have experienced dramatic population declines in recent years, bringing some species to the brink of extinction." For example, the plan highlights that the San Joaquin River basin experienced an 85 percent net loss in returning adult fall-run Chinook salmon from 1985 to 2017. Trends are similarly bleak in the Sacramento River, where recent drought conditions have precipitously exacerbated escalating declines for winter-run Chinook salmon. Moreover, the Delta Smelt, a fish endemic to California that only occurs in the Bay-Delta and which used to be the most abundant fish in the estuary—once numbering in the millions—has not been observed in the wild at all for the past four years. Such trends are not solely related to existing flow requirements, and have been exacerbated by loss of habitat, impediments to fish passage such as dams and weirs, water diversion systems including pumps, recurring drought conditions, and warming temperatures. However, SWRCB has the responsibility to adopt and enforce water quality objectives that help protect fish and wildlife given that is one of the statutory beneficial uses in the Bay-Delta.

Governor's Proposal

Redirects $1.4 Million in Existing Funding From Contracts to New Staff. The Governor proposes redirecting $1.4 million from the $5 million in ongoing General Fund that is currently being used for contract consultant services to instead establish and support five new permanent positions at SWRCB. These positions would help with plan implementation and monitoring activities, including potential regulatory actions. The proposed approach would retain $3.6 million for contracted activities and would be cost-neutral for the state.

Assessment

Reasonable to Increase SWRCB Staffing Levels to Accomplish New Tasks. We find the Governor's proposal to increase SWRCB's staffing capacity for the next steps of developing and implementing Bay-Delta Plan updates to be reasonable. Implementing the new water quality objectives for the San Joaquin River and developing new standards for the Sacramento River-Delta portion of the plan represents increased workload for the board. Moreover, the upcoming tasks—such as advising on implementation decisions, developing regulatory actions, conducting enforcement, and overseeing ongoing monitoring—would benefit from consistent and continuing internal staff expertise; contracted consultants would not be appropriate entities to conduct such activities.

Swift Adoption and Implementation of Plan Updates Is Important. Updating the water quality objectives for the Delta watershed is long overdue and should be a high priority for the state to complete. As noted, the last major update was nearly 30 years ago. Water uses, ecosystem conditions, and the statewide population that depends on water that passes through the Bay-Delta all have changed significantly since then, producing a critical need for an updated operating framework. Additionally, the impacts of climate change—including higher average temperatures, more frequent and prolonged droughts, more wet and warm atmospheric river storms, and rising sea levels encroaching into the San Francisco Bay and Delta estuary—already are beginning to affect conditions in the Bay-Delta and its source rivers, and will increasingly do so in the coming years. These changes will render the existing water quality objectives even more outdated. The current standards and regulatory framework have not been sufficient to protect fish and wildlife in the watershed. If current trends continue, the state is poised to lose some of its native species to extinction. Moreover, the prolonged process of waiting for new water quality standards to be specified and implemented creates uncertainty for water users and thereby complicates their planning and operational decisions.

Additional Oversight and Legislative Action Might Help Expedite Plan Adoption and Implementation. While the Governor's budget proposal to add five new positions is reasonable and relatively modest, the Legislature could take this as an opportunity to engage with the administration and consider broader issues related to the Bay-Delta Plan update. In particular, given the prolonged time line for and importance of updating the plan, the Legislature may want to consider whether it could take steps to help expedite SWRCB's progress. Such steps could include providing additional funding, further increasing staffing levels, or adopting statutory guidance or deadlines.

Recommendations

Adopt Governor's Proposal to Redirect Existing Funding to Support Five New Staff. We recommend the Legislature adopt the Governor's proposal to redirect $1.4 million in existing General Fund from contracted consultants to instead fund five new SWRCB positions. The board would benefit from additional in-house expertise to address upcoming workload associated with implementing Phase 1 and developing, adopting, and implementing Phase 2 of the Bay-Delta Plan.

Explore Whether Additional Steps Are Needed to Expedite Progress. We also recommend that the Legislature engage with the administration regarding its time line for updating the plan and whether additional actions can be taken to help expedite this process. For example, the Legislature could ask SWRCB to respond to questions in spring budget hearings, policy committee oversight hearings, or through meetings with staff or board members. Key questions for the Legislature to discuss with the administration include:

- What Is the Board's Time Line for Achieving Improved Outcomes in the Bay-Delta? Are there actions that can be taken to expedite this time line?
- What Barriers Have Impeded Adoption and Implementation of Plan Updates? Why have the plan updates taken so long to adopt and implement? What is the board doing to

address these barriers? Are there steps the Legislature can take to help address existing or anticipated future obstacles?

- Would Additional Resources Help Expedite Progress? Would supplemental funding for staff and/or consulting contracts help achieve plan milestones more quickly?
- What Interim Steps Can Be Taken to Improve Outcomes? What actions are being undertaken to improve conditions for at-risk native fish species while the state waits for plan updates to be adopted and implemented?

Proposed ballot measure to build more California dams, desalination projects likely to be withdrawn due to lack of money and signatures

Despite drought, supporters haven't built a big enough coalition for water measure

Bay Area News Group | January 27, 2022 | Paul Rogers

This aerial view of Shasta Dam near Redding, Calif., taken Oct. 20, 2021, shows a noticeably low water level. Despite December rains, Shasta Lake, California's largest reservoir, was just 35% full on Wednesday Jan. 26, 2022. (Photo: Andrew Innerarity/California Department of Water Resources)

Despite California's drought, a proposed statewide November ballot measure to speed up the construction of new dams and other large water projects — and provide billions of dollars to fund them — has fallen short in its fundraising goals and is likely to be withdrawn by early next week.

The initiative would require that 2% of California's general fund, or about $4 billion, be set aside every year to expand water supplies. Those could include new dams and reservoirs, desalination plants, recycled water plants and other projects such as upgrading canals and pipes. The measure also would streamline permitting for those projects.

But the campaign has failed to gain momentum and is far short of the nearly 1 million signatures needed by the end of April to qualify for the ballot.

Organizers say to have any chance, they must raise $10 million by Feb. 1 to hire paid signature gatherers and ramp up efforts. As of Wednesday, they had raised only $165,000, nearly all of it from Central Valley farmers.

“We haven’t been able to find big donors who have been willing to come in and make this happen,” said Edward Ring, a spokesman for the campaign, known as More Water Now.

“If somebody called us in the next week and said ‘I don’t care how much this costs, get it on the ballot,’ we could,” he added. “But after Feb. 1, we can’t. You have to draw the line somewhere.”

The measure, known as the “Water Infrastructure Funding Act of 2022,” needs 997,132 signatures of registered voters by April 29 to qualify for the November statewide ballot.

But Ring said volunteers have obtained “less than 100,000” with only about 90 days until the deadline.

Supporters of the measure, who include farmers, desalination advocates and several Southern California water agencies, say California has not built enough new reservoirs, desalination plants and other water projects in recent decades because there are too many delays, too many lawsuits and too much red tape.

But environmentalists mobilized fast to oppose the campaign.

They said that the measure would limit the power of state agencies like the Coastal Commission, shift funds from other state priorities, and violate a longstanding principle where local users of water help pay the costs of big projects in their areas rather than having the state’s general fund pick up most or all of the tab.

“I’m pleased that it’s likely to die a quiet and unlamented death,” said Ron Stork, a senior policy advocate with Friends of the River, an environmental group in Sacramento. “It was pretty bold, and a significant commitment of taxpayer resources for projects that are ordinarily supposed to be paid for by the beneficiaries of the project.”

An analysis by the nonpartisan state Legislative Analyst’s Office found the measure would save local governments money, but that it also would cost the state general fund as much as $100 billion to hit the measure’s requirement that 2% of the fund go to new water projects every year until 5 million acre feet of new water supply was established.

For reference, all of California’s farmers, cities and government agencies use about 40 million acre feet of water a year. Shasta Lake, the state’s largest reservoir, holds 4.5 million acre feet of water when full and is 35 miles long.

Ring said huge storms in December reduced the severity of the drought just as fundraising efforts were ramping up. Also, he said, COVID made it difficult for volunteers to collect signatures. He said if they shut down the campaign, as is likely, they will try for a 2024 measure.

Some longtime water experts said the campaign's key stumbling block was its inability to build a coalition and raise money from large labor unions representing construction workers.

Influential groups need to be brought in early to help craft such measure, said Jerry Meral, former deputy director of the California Department of Water Resources.

"People want to see the text," said Meral, who has placed nine measures about water, parks, wildlife and transportation on the statewide ballot. "They want to kibitz the text. It's very hard to go out with a finished, filed initiative and try to fundraise on it."

Meral said unions often talk privately with Democratic governors and align their interests. If Gov. Gavin Newsom opposed the measure, he said, it is unlikely that labor unions that need his support on other issues would cross him.

Asked Wednesday if Newsom has an opinion on the proposed measure, his spokeswoman, Erin Curtis, deferred.

"Nothing to add on this one at this time," she said.

Andrew Meredith, president of the State Building and Construction Trades Council of California, one of the state's largest construction unions, said his organization was following the campaign.

"We have been watching to see if it gathers the requisite momentum to justify a contribution from our membership," he said. "We need to be diligent and ensure that our contributions translate to a net benefit for our members."

In July, following two record-dry years, Newsom declared a drought emergency and asked Californians to voluntarily cut water use 15% from 2020 levels.

Newsom's administration also is moving ahead with plans to distribute $2.7 billion for new water storage projects from Proposition 1, a bond approved by voters in 2014. Seven projects have qualified to share that money, including expanding Los Vaqueros Reservoir in Contra Costa County, building a new reservoir near Pacheco Pass in Santa Clara County, building Sites Reservoir in Colusa County, and constructing four new groundwater banks.

They must obtain all their permits before the state will issue checks, a process critics say has taken too long.

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