BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD OF DIRECTORS MEETING

January 12, 2023

Correspondence and media coverage of interest between December 17, 2022 and January 11, 2023

Correspondence

From:	Gustav Larsson, BAWSCA Board Chair Nicole Sandkulla, BAWSCA CEO/General Manager
To:	Dave Warner and Peter Drekmeier
Date:	January 11, 2023
Subject:	Meeting Request *in response to Dec. 16th email and Dec. 19th Letter*

From:	Steve Ritchie, SFPUC Asst. General Manager, Water Enterprise
To:	Peter Drekmeier,
Date:	January 10, 2023
Subject:	In response to December 12th Letter to Commission Pres. Ajami regarding Alternative Water Supply Program

From:	Tom Francis, BAWSCA Water Resources Manager
To:	Steve Ritchie, SFPUC Asst. General Manager, Water Enterprise
Date:	January 9, 2023
Subject:	BAWSCA's Review of the SFPUC's FY 2021-22 Annual Report on Water Enterprise-Managed Capital Projects

From:	Dave Warner and Peter Drekmeier
To:	Gustav Larsson, BAWSCA Board Chair Tom Chambers, BAWSCA Board Vice Chair Randy Breault, Board Policy Committee Chair Karen Hardy, Board Policy Committee Vice Chair Nicole Sandkulla, BAWSCA CEO/General Manager Tom Francis, BAWSCA Water Resources Manager
Date:	December 19, 2022
Subject:	Meeting Request

From	Nicole Sandkulla, BAWSCA CEO/General Manager
To:	Peter Drekmeier
Date:	December 16, 2022
Subject:	Re; Meeting Request

From:	Peter Drekmeier and Dave Warner
To:	Gustav Larsson, BAWSCA Board Chair Tom Chambers, BAWSCA Board Vice Chair Randy Breault, Board Policy Committee Chair Karen Hardy, Board Policy Committee Vice Chair Nicole Sandkulla, BAWSCA CEO/General Manager Tom Francis, BAWSCA Water Resources Manager
Date:	December 16, 2022
Subject:	Meeting Request

From:	Los Vaqueros Reservoir Expansion Project
To:	CCWD Board
Date:	December 16, 2022
Subject:	Monthly Report

Correspondence, cont'd.

From: Peter Drekmeier, Tuolumne River Trust Policy Director
To: President Newsha Ajami and SFPUC Commissioners
Date: December 15, 2022
Subject: Comparing Water Demand Projections Between Valley Water and the SFPUC

From: Peter Drekmeier, Tuolumne River Trust Policy Director
To: President Newsha Ajami and SFPUC Commissioners
Date: December 12, 2022
Subject: Item 6e: Alternative Water Supply Program Quarterly Report

Press Release

From: Alameda Creek Alliance
Date: December 12, 2022
Press Release: Chinook Salmon Return to Alameda Creek: Perfect timing to Use Newly Constructed Fish Ladder for Upstream Migration

Media Coverage

Policy:

Date: January 10, 2023
Source: Maven Breaking News
Article: This Just In: Governor Newsom Releases 2023-24 State Budget Proposal; Here's What is Proposed for Water and Climate Spending

Climate Change and Drought:

Date: January 11, 2023
Source: Yahoo News
Article: As storms batter California, Newsom says state is 'proof that the climate crisis is real'

Date: December 30, 2022
Source: Patch
Article: California Parched By Historic Drought: 2022 in Review

Water Supply Conditions:

Date: January 11, 2023
Source: Mercury News
Article: California storms: Reservoirs are filling quickly, boosting water supplies after years of Drought

Date: January 11, 2023
Source: Bay City News
Article: Latest Storms Are Filling Reservoirs, But Most Remain Below Capacity

Date: January 10, 2023
Source: Newsweek
Article: What Will It take to Get California Completely Out of Drought?

Water Supply Conditions, cont'd.:

Date: January 6, 2023
Source: San Francisco Chronicle
Article: Here's where California reservoirs stand after atmospheric river storms this week

Date: January 6, 2023
Source: Daily Correspondent
Article: California's Snowpack Is High Above Average – but its Drought is Far From Over

Date: January 5, 2023
Source: San Jose Mercury News
Article: Look at how much California's snowpack has grown in the last 12 days. Is the drought over yet?

Date: December 30, 2022
Source: LA Times
Article; Miracle or mirage? Atmospheric rivers end California drought year with heavy snow and rain

Water Supply Management:

Date: January 12, 2023
Source: CBS
Article: California's drought has led to a groundwater overdraft in the San Joaquin Valley

Date: January 9, 2023
Source: Public Policy Institute of California
Article: Adapting to a Water-Scarce California

Date: January 9, 2023
Source: Shasta Scout
Article: Here's What You Need To Know About Water Releases From Shasta Dam

Date; January 9, 2023
Source: Washington Post
Article: Can California's massive rain solve its historic drought?

Date; January 3, 2023
Source; Daily Journal
Article: Hetch Hetchy pipeline scheduled for maintenance in San Mateo County

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BAWSCA
Bay Area Water Supply & Conservation Agency

January 11, 2023

Via E-mail

Mr. Dave Warner
Via dwar11@gmail.com

Mr. Peter Drekmeier
Via peter@tuolumne.org

Subject: Meeting Request

Dear Dave and Peter,

This letter is in response to your December 16, 2022 email and subsequent December 19, 2022 letter, which both reference the San Francisco Public Utilities Commission (SFPUC) Alternative Water Supply Program (AWSP) and associated AWSP Quarterly Reports.

BAWSCA supports the need for and benefit of regular, factual, clear and precise reporting on important regional water supply efforts, including the AWSP. BAWSCA recently met with the SFPUC to discuss your issue and relayed to the SFPUC that anything it can do to improve clarity in the AWSP Quarterly Reports would be useful, including further clarity in the 2045 obligations and demands. BAWSCA will also express this opinion to the Commission and staff directly.

Your letter references potential use of information from BAWSCA's recently completed "Regional Water Demand and Conservation Projections Update." This report provides updated total demand projections through 2045 for the BAWSCA member agencies. Updated SFPUC projected purchases, along with the use of other supplies to meet projected total demand, will be available for the BAWSCA member agencies in Spring 2023 and published in BAWSCA's Annual Survey for use by the SFPUC and others.

Lastly, the SFPUC will be requested to provide an update to the BAWSCA Board of Directors on the AWSP in late Spring/early Summer given the June 30, 2023 deadline for a final Alternative Water Supply Plan to be provided to the Commission. This information will be available for you and other interested parties. We appreciate your interest in this very important reporting about water supply.

Regards,

Gustav Larsson
Chair of the Board

Nicole Sandkulla
CEO/General Manager

GL:NS/le

cc: Mr. Tom Chambers, Vice-Chair, BAWSCA Board of Directors
Mr. Randy Breault, Chair, BAWSCA Board Policy Committee
Ms. Karen Hardy, Vice-Chair, BAWSCA Board Policy Committee
Alison Schutte, Hanson Bridgett, LLP

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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

January 10, 2023

Peter Drekmeier
Tuolumne River Trust
P.O. Box 3727
Sonora, CA 95370

Dear Peter,

In response to your December 12, 2022 letter to Commission President Ajami regarding our Alternative Water Supply Program Quarterly Report "Water Supply Needs", we have attached our prior email correspondence from October 2022 which addresses several statements from your letter.

In general, as we have previously stated, the Alternative Water Supply Plan is a planning document, which must consider the full extent of our water supply needs into the future. To this end, we include the 9 mgd of historical demand from San Jose and Santa Clara as part of our planning effort. We also utilize established population projections from regional planning documents (Plan Bay Area).

The Alternative Water Supply Plan will outline an expected gap between water supply and water supply needs for the planning horizon of 25 years. It is our intent to plan for our obligations but only build for demand. Adding a facility or water supply will be carefully planned and staged over time to only build for the needs that exist or are fully expected at that time.

We also will review the next Quarterly Report to determine if we can clarify the report in response to the issues you have raised.

Sincerely,

Steven R. Ritchie

Steven R. Ritchie
Assistant General Manager, Water

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From: Moses, Matt
To: Ritchie, Steve
Cc: Levin, Ellen
Subject: FW: AWS Quarterly Report Needs - Public Records
Date: Wednesday, December 21, 2022 3:19:44 PM

Steve, here's the email that I reminded Peter about, and that Nicole subsequently asked about.

From: Moses, Matt
Sent: Wednesday, October 26, 2022 12:45 PM
To: Peter Drekmeier <peter@tuolumne.org>; Ritchie, Steve <SRitchie@sfwater.org>
Cc: Kothari, Manisha <MKothari@sfwater.org>; Kehoe, Paula <pkehoe@sfwater.org>; Levin, Ellen <elevin@sfwater.org>
Subject: RE: AWS Quarterly Report Needs - Public Records

Hi Peter, your questions are answered below:

My First Question
Why were water supply needs in June 2021 (the equivalent of "Obligations" in the September document) 15 mgd lower than in September 2021?

The assessment of water supply need that was presented in the AWS quarterly reports in June 2021 and prior was developed using an extension of the water supply analysis from the WSIP program. Essentially, changes to SFPUC water supply since the WSIP analyses were completed were tallied to estimate the water supply shortfall. Then, beginning in September 2021, the analysis presented in the AWS quarterly reports was based on the SFPUC water supply and demand worksheet. The worksheet incorporates a more complete estimate of the effect of drought rationing than the earlier tally of supply changes. This accounts for most of the change that you asked about. Several additional changes to SFPUC water supply estimates were also included in the September estimate that were not included in the prior estimates.

The 15 MGD difference between these two methods results from:

- Reduced water supply from the Groundwater Storage and Recovery (GSR) project. This update reflects water quality issues and other changes to the project since WSIP planning estimates were developed. This accounts for approximately 1 MGD of the difference between the June and September estimates.
- Reduced water supply from Crystal Springs Reservoir. This update reflects the ongoing fountain thistle mitigation, which was not included in WSIP planning estimates. This accounts for approximately 1 MGD of the difference between the June and September estimates.
- The two changes described in the bullets above are to SFPUC firm yield, which is one component of SFPUC's ability to provide a given level of water supply. Another important component is the water supply shortage (or "rationing") during droughts. The effect of this rationing is quantified in the SFPUC water supply and demand worksheet. It is also included in the WSIP analyses, but changes in rationing volume due to changes in water supply were not incorporated in the earlier "tally" method of assessing SFPUC water supply from the June 2021 quarterly report and prior. So when the method was changed in the September

quarterly report, the rationing volume was updated to better reflect the whole tally of changes to firm yield. Essentially, the effect of the water supply changes on rationing is that "10% of a smaller number is less than 10% of a bigger number." This update accounts for approximately 13 MGD of the difference between the June and September estimates.

- For more information on the SFPUC water supply and demand worksheet, including how firm yield and rationing policy volume are estimated, please refer to the materials at the link below.

My Second Question: Why did the Bay Delta Plan's impact on water supply change from 93 mgd to 105 mgd?

This question refers to a presentation of SFPUC water supply estimates with and without the Bay Delta Plan. The water supply estimates were produced with the SFPUC water supply and demand worksheet. Again, the water supply values in the worksheet are annual averages of water supply yields over the SFPUC design drought period.

Here is a description of the Bay Delta Plan-related numbers that you asked about:

- The estimate of SFPUC water supply without Bay Delta Plan contributions is 257 MGD of total yield, which is the sum of the system firm yield of 227 MGD and the volume associated with the rationing policy established for the WSIP program. That rationing policy includes 3 years of 10% rationing and 3.5 years of 20% rationing over the 8.5-year design drought. The volume associated with the rationing policy changes as the firm yield changes, as noted above. In this case, the volume of the rationing policy is 30 MGD. That gives a total yield (firm yield + rationing) equal to 227+30 or 257 MGD.
- The estimate of SFPUC total supply with Bay Delta Plan contributions included is 152 MGD. The effect of Bay Delta Plan contributions is a 93 MGD reduction in firm yield, so firm yield in this case is equal to 227-93 = 134 MGD. The volume associated with the same WSIP rationing policy (3 years of 10% rationing, 3.5 years of 20% rationing) is 18 MGD. So the total system yield in this case is 134+18 = 152 MGD.
- As described above, the effect of the Bay Delta Plan on SFPUC firm yield is estimated to be a reduction of 93 MGD. And the corresponding effect on the rationing volume is estimated to be a reduction of 12 MGD. These add up to the other number you asked about, 105 MGD, which is an estimate of the SFPUC total yield.

For more information on how to use the SFPUC water supply and demand worksheet, and how it works, please refer to the video of the training that SFPUC provided. It's at the link below (you have to scroll down to get to the video link once you are at the web page). Also see the user guide for the worksheet, which is available at the same link.

https://www.sfpuc.org/programs/future-water-supply-planning/planning-tools-and-documents

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From: Peter Drekmeier <peter@tuolumne.org>
Sent: Tuesday, October 25, 2022 3:06 PM
To: Ritchie, Steve <SRitchie@sfwater.org>

Cc: Moses, Matt <MMoses@sfwater.org>; Kothari, Manisha <MKothari@sfwater.org>; Kehoe, Paula <pkehoe@sfwater.org>; Levin, Ellen <elevin@sfwater.org>
Subject: Re: AWS Quarterly Report Needs - Public Records

Thank you, Steve. I will look forward to hearing from Matt.

-Peter

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

> On Oct 25, 2022, at 1:29 PM, Ritchie, Steve <SRitchie@sfwater.org> wrote:
>
> Peter – we received your PRA request, and I wanted to let you know you will be getting that we have no responsive records to the request because there are none. We discussed it, and we concluded that we should respond more directly to your questions. I've asked Matt to respond to you directly on the questions you have asked. Hopefully, that will clear up any misunderstanding.
>
> Steve.
>
> ---
>
> **From:** Kothari, Manisha <MKothari@sfwater.org>
> **Sent:** Tuesday, October 25, 2022 12:51 PM
> **To:** Ritchie, Steve <SRitchie@sfwater.org>
> **Subject:** FW: AWS Quarterly Report Needs - Public Records
>
> ---
>
> **From:** Peter Drekmeier <peter@tuolumne.org>
> **Sent:** Friday, October 21, 2022 12:58 PM
> **To:** Kothari, Manisha <MKothari@sfwater.org>
> **Cc:** Kehoe, Paula <pkehoe@sfwater.org>
> **Subject:** Re: AWS Quarterly Report Needs - Public Records
>
>

Hi Manisha and Paula,

Thank you for your time the other week. It was helpful.

I wanted to give you a heads-up that I just submitted the attached new PRA request. My understanding from our conversation was that you were not involved in the change in numbers for water supply needs, but rather were given the new numbers by other staff members. Therefore, you probably won't be involved in this more targeted request.

I looked at the new BAWSCA agency requests, and in addition to San Jose and Santa Clara, I found four agencies that are requesting supplies higher than their ISGs. They are San Bruno (1.53 mgd), Daly City (1.52 mgd), Purrissima Hills (0.52) and ACWD (0.04). The total is 3.61 mgd, which probably shouldn't be considered obligations (nor the 9 mgd for SJ/SC).

I still don't understand how the Water Supply Needs changed so much. You mentioned 1.2 mgd for the Groundwater Storage and Recovery Project, 1 mgd for Crystal Springs, and the remainder as a result of supply yield being 234 mgd in the WSIP, but higher now (I hope I got that right). It seems to me that if supply was less in the past, then the shortfall would have been greater, versus the opposite. Perhaps the documents I requested will shed some light.

Have a good weekend.

-Peter

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

> On Sep 30, 2022, at 3:29 PM, Kothari, Manisha <MKothari@sfwater.org> wrote:
>
> Kothari, Manisha is inviting you to a scheduled Zoom meeting.
>
> Topic: Kothari, Manisha's Personal Meeting Room
>
> Join Zoom Meeting
> https://sfwater.zoom.us/j/4155543256
>
> Meeting ID: 415 554 3256

One tap mobile
+16699006833,,4155543256# US (San Jose)
+12133388477,,4155543256# US (Los Angeles)

Dial by your location
+1 669 900 6833 US (San Jose)
+1 213 338 8477 US (Los Angeles)
+1 669 219 2599 US (San Jose)
+1 646 518 9805 US (New York)
Meeting ID: 415 554 3256
Find your local number: https://sfwater.zoom.us/u/kdZSI26qHE

<Mail Attachment.ics>

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Bay Area Water Supply & Conservation Agency

January 9, 2023

Via email

Steven Ritchie
Assistant General Manager, Water Enterprise
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: BAWSCA's Review of the SFPUC's FY 2021-22 Annual Report on Water Enterprise-Managed Capital Projects

Dear Mr. Ritchie,

BAWSCA has reviewed the SFPUC's FY 2021-22 Annual Report on Water Enterprise-Managed Capital Projects (Current Annual Report). Based on that review, this letter presents BAWSCA's comments and questions.

Background

As of 2020, the SFPUC has prepared and provided to BAWSCA an "Annual Report" on enterprise-managed projects in compliance with the Section 6.09.I.1 of the Amended and Restated Water Supply Agreement (WSA) which states

> *"In each fourth quarter of the fiscal year CIP Quarterly Projects Report, the SFPUC will also address the status of Regional projects in the 10-Year CIP that have an estimated cost of less than $5 million, noting any such projects that are behind schedule and describing the SFPUC's plan and timeline for either making up the delay or adopting a revised project schedule."*

Each year since 2020, BAWSCA has provided comments on the Annual Report, including suggestions to enhance the document in future years. The information shared in the Annual Report details work on small projects, generally less than $5M in cost, which are not tracked in the Water Enterprise (Regional) and Hetch Hetchy (Water and Joint) quarterly reports. Tracking these projects is important to both BAWSCA and the SFPUC because they represent about 25% of the Regional Water Enterprise (WE) CIP and Programmatic budgets, and about 20% of the Hetch Hetchy Water (HH) CIP budget.

New Section Added to the Current Annual Report Provide Helpful Information

The Current Annual Report includes the following new sections in response to BAWSCA's requests and comments on the report produced in the previous year:

- Added "Section 2 – Capital Plan and Budget Financial Notes". This new section is helpful in that it illustrates how the realigned remaining balance was created.

- Added "Section 4 – Project List". This new section is helpful in that it provides a complete list of all the active projects in each category. It assists the reader in identifying projects completed in the reporting period as well as which ones have not been carried over from the prior year.
- *Added "Section 15.* – Addendum: Response to BAWSCA's Comments on FY2020-2021 Annual Report. BAWSCA appreciates this formal response to BAWSCA input on the prior year's Annual Report.

Suggestions, Questions, and Minor Corrections on Content Provided in the Current Annual Report

BAWSCA has reviewed the Current Annual Report and identified select places where additional information is needed to present a complete picture of the work performed. BAWSCA understands that the Current Annual Report is final, and asks that a letter be provided by the SPFUC that provides the information requested, posed in the "questions" below, or a response as to why that information is not available. BAWSCA is open to meeting with SFPUC staff to go over these questions as well.

Suggestions:

1. Section 2 – Capital Plan and Budget Financial Notes. BAWSCA suggests that in future Annual Reports this section be used to present summary financial information at the category level of reporting, such as a bar chart with expenditures in the reporting year and another one with expenditures in the prior reporting year. This would serve to illustrate where the effort was made in the reporting year and how that may have shifted from the prior year.
2. Section 4 – Project List. BAWSCA suggests that in future Annual Reports that SFPUC should add an "*" to projects new to the Report.
3. Section 15 – Response to BAWSCA's Comments. The SFPUC's inclusion of their response to BAWSCA's comments on the prior year's Annual Report is helpful, and BAWSCA suggests to continue this practice moving forward.

Questions:

1. Page 12. On-Line Water Quality Sampling. Please provide a brief summary of the performance of the Ravenswood Water Quality Sampling Station.
2. Page 14. Sunol Valley Water Treatment Plant & East Bay Fields. This project is noted as closed (FY21-22 activities were funded from other water treatment program sources). Since this project is classified as "Continuous," where would ongoing needs described in the scope be addressed in the future?
3. Page 21. Sunol Valley Chloramination Facility Chemical Piping Improvements. This project is noted as closed. How much of the upgrade work (items 1-4) was completed? Since this project is classified as "Continuous," where would ongoing needs described in the scope be addressed in the future?
4. Page 25. Regional Cross Connection. The beginning balance for FY21-22 was $1,768,716. The expenditures for FY21-22 were $2,007,199. How can the project spend more than was available in the budget? Notes on the FY21-22 expenditures for the Vault

Upgrades R&R project (page 29) says $500,000 was transferred to the Regional Cross Connection project. Is this the additional funding source for the apparent budget shortfall?

5. Page 27. Regional Water System Tunnel Inspections. The scope of this project was moved to the Pipeline Inspection and Repair Project – are there any plans for tunnel inspection for this project in 22-23? None are shown on page 39 under the Future Work section.
6. Page 29. Vault Upgrades R&R. The future work section notes no planned work in FY22. Should that read FY22-23?
7. Page 31. Arc Flash Studies. It appears that all work is done for this project. If so, why isn't it closing out?
8. Page 33. Pump Station Upgrades. Noted that this project will not continue into FY22-23 and that a new project will continue the activities covered by this continuous program. The Future Work to be Performed section should indicate the type of planned activities for FY22-23 as it is not provided elsewhere in the report (no data sheet for Pump Station Upgrades R&R). Also, as there were expenditures of $418,633 in FY21-22 without an identified budget, did the funding come from unspent FY20-21 budget?
9. Page 36. Water Metering Upgrade. Noted that this project will not continue into FY22-23 and that a new project will continue the activities covered by this continuous program. The Future Work to be Performed section should indicate the type of planned activities for FY22-23 as it is not provided elsewhere in the report (no data sheet for Water Metering Upgrades R&R).
10. Page 38. Pipeline Inspection & Repair. The Regional Water Systems Tunnels Inspection work is being incorporated into this project in FY22-23 (see page 27). Are there any planned tunnel inspection activities for FY22-23 to be identified in the Future Work to be Performed section? Also, the beginning balance for FY21-22 was $1,495,620. The expenditures for FY21-22 were $1,772,766. How can the project spend more than was available in the budget?
11. Page 43. Dam Condition Assessments and Related Studies. The expenditures for FY21-22 are in an order of magnitude less than in prior years. The list of activities is similar to past years for this project. Why such a low expenditure? The reported amount of $33,392 appears to be only the amount needed to fund the San Andreas Dam and Reservoir activities reported for FY21-22. Have maintenance activities like goat grazing and vegetation management been included in the small capital projects historically? Are some of these types of activities funded under the SFPUC's operating budget?
12. Page 46. Radio Communication. The beginning balance for FY21-22 was $1,867,873. The expenditures for FY21-22 were $3,505,274. How can the project spend more than was available in the budget?
13. Page 55. Rollins Road Building R&R. The beginning balance for FY21-22 was $500,000. The expenditures for FY21-22 were $890,844. How can the project spend more than was available in the budget?
14. Page 60. Millbrae Yard Security Upgrades. Did the Millbrae Yard security project bid/award occur this fall?

15. Page 61. Sunol Valley Water Treatment Plant Water Quality Trailer. The beginning balance for FY21-22 was $1,422,630. The expenditures for FY21-22 were $1,837,315. How can the project spend more than was available in the budget?
16. Page 67. Watershed and ROW Infrastructure (Programmatic). What is the threshold for including a routine maintenance item like mowing, goat grazing, or feral pig control into the capital program? How much of this project is SFPUC routine staff labor?
17. Page 69. Alameda Watershed Structures. The beginning balance for FY21-22 was $0. The expenditures for FY21-22 were $347,528. How can the project spend more than was available in the budget? What is the expected total cost of this project and will it close out at the end of FY22-23?
18. Page 73. Long-Term Monitoring and Permitting (Capital). The descriptions of reporting year activity and future work to be performed are consistent with the level of activity in the prior year report. However, the expenditures in FY21-22 are several orders of magnitude larger than in previous years. What is the cause for the increase? Are future years expected to have expenditures at a similar level, or are they likely to reflect expenditure rates of past years? Also, the PTD Actuals figure is not correct if the expenditures in FY21-22 are actually $2,492,049 (PTD FY21-22 of $2,492,638 less PTD FY20-21 of $491,098 = Expenditures FY21-22 of $2,001,540). How much of the 2021-2022 expenditures were related to Calaveras Dam?
19. Page 75. Should provide Long-Term Monitoring and Permitting (Programmatic) data sheets but has repeated the page for Long-Term Monitoring and Permitting (Capital). Please provide the correct sheets to BAWSCA.
20. Page 77. Natural Resources Planning. One element of this project is to fund research and implementation of carbon sequestration projects. Has SFPUC completed any of these types of projects in the watershed under the capital program? If so, please briefly describe.
21. Page 80. R&R Priest Reservoir Landslide. The beginning balance for FY21-22 was $0. The expenditures for FY21-22 were $48,100. How can the project spend more than was available in the budget?
22. Page 118. R&R Hetch Hetchy Boat Ramp and Access Improvements. The project notes that no future work is expected at this time. Does that mean the ramp replacement project is on hold?

Minor Corrections:

1. Page 5. Project List. Typo for Pump Station Upgrades which is listed as on Page 38, but is actually on Page 33.
2. Page 6. Project List. Typo for R&R Priest Dam Condition Assessment & Monitoring which is categorized as “continuous” but shows as a “project” on the actual data sheet.
3. Page 42. San Andreas Dam and Reservoir. Typos in transferring expenditure amounts for FY19-20 and FY20-21 (see the prior year’s Annual Report).
4. Page 58. Sunol Yard Interim Improvements R&R. Typos in transferring expenditure amounts for FY19-20 (see the prior year’s Annual Report).
5. Pages 123-124. Native Plant Nursery. Appears to be a duplicate of the Native Plant Nursery information presented on pages 65-66.

In closing, BAWSCA commends the SFPUC for the work and effort required to produce the Current Annual Report. It represents continuous improvements over the prior year's Annual Report, and the details provided serve as a useful way for BAWSCA to track the progress of the work. Suggestions provided by BAWSCA in this letter are offered with the intention of making future Annual Reports an even better means to track the progress of the work, as well as an easier way for SFPUC staff to provide the necessary input to those at the SFPUC charged with the report preparation.

BAWSCA anticipates that the SFPUC will want to meet to discuss the contents of this letter. BAWSCA sees such a meeting as advantageous.

Thank you for the opportunity to review and comment on the Current Annual Report. If you would like to discuss this letter prior to the organization of any follow-up meetings and or a response letter, please contact me at 510-944-4392, or email me at tfrancis@bawsca.org.

Sincerely,

Thomas B. Francis
Water Resources Manager

TF/ns

cc:

Stephen Robinson, SFPUC, Chief Engineer / Assistant General Manager of Infrastructure
Katie Miller, SFPUC, Director, Water Capital Projects and Programs
Alison Kastama, SFPUC, BAWSCA Liaison
BAWSCA Water Management Representatives
Allison Schutte, Hanson Bridgett, LLP, Legal Counsel

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Lourdes Enriquez

From: Dave Warner <dwar11@gmail.com>
Sent: Monday, December 19, 2022 9:31 AM
To: Nicole Sandkulla; glarsson@sunnyvale.ca.gov; tchambe@comcast.net; rbreault@ci.brisbane.ca.us; khardy@santaclaraca.gov; Tom Francis
Cc: Peter Drekmeier; Lourdes Enriquez; Allison C. Schutte (aschutte@hansonbridgett.com); bud.wendell
Subject: Re: Meeting Request - Further information
Attachments: BAWSCA leadership meeting request re SFPUC data clarity 2022-12-19.pdf

Dear BAWSCA Leadership,

Thank you for considering our request for a zoom meeting. Attached is a letter with further information as requested by Board Chair Larsson.

While not listed in the letter, also included in this email are Bud Wendell, Allison Schutte, and Lourdes Enriquez.

Kind regards,

Dave & Peter

On Fri, Dec 16, 2022 at 5:09 PM Nicole Sandkulla <NSandkulla@bawsca.org> wrote:

> Hello Peter and Dave,
>
> I have consulted the Board Chair regarding your email below and I am responding to you at his direction.
>
> Chair Larsson has requested that you send a letter to this same group of Board Members that presents the findings that you wish to share with BAWSCA and any further information. Following receipt of that clarifying correspondence, a decision can be made about any subsequent meetings.
>
> Regards,
>
> Nicole
>
> ---
>
> Nicole M. Sandkulla

December 19, 2022

Board Chair Gustav Larsson
Board Vice Chair Tom Chambers
Policy Committee Chair Randy Breault
Policy Committee Vice Chair Karen Hardy
CEO and GM Nicole Sandkulla
Water Resources Manager Tom Francis
Via email

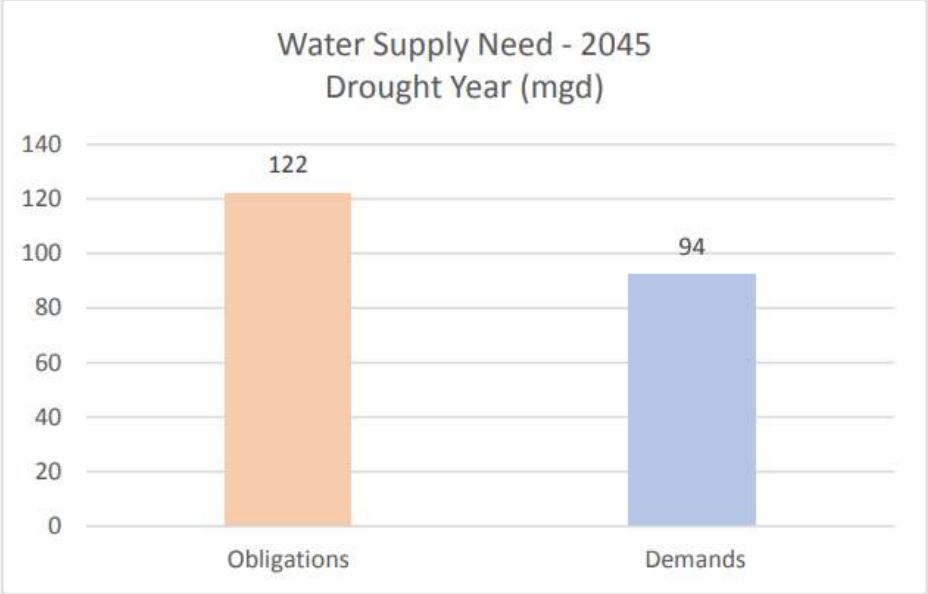
Re: Meeting Request

Dear BAWSCA Leaders,

Thank you for considering our request to meet to discuss improving the clarity of the data the SFPUC provides as it relates to water supply needs. Improving data clarity benefits everyone particularly on a topic core to water supply reliability and cost. We think the spirit of the SFPUC staff that prepare the quarterly alternate water supply (AWS) reports are well meaning, but they have been degrading, perhaps inadvertently, the clarity of the water supply needs data. Having BAWSCA press for data clarity would likely drive the SFPUC to take action to improve reporting. Out of respect for your time, here is a brief overview of our findings.

The chart below, provided in the December 2022 Alternative Water Supply Program Quarterly Report, is a primary example. Without closely reading the text in advance of the chart and the text and chart in section 3.3.2 of the report and asking questions, it is hard to understand exactly what these numbers represent. Do they include 9 mgd for the two interruptible customers, Santa Clara and San Jose? Yes. Do they include the additional 6.5 mgd requested by Santa Clara and San Jose? No. Do they reflect BAWSCA's latest demand study? No. Do they reflect 93 mgd of instream flows as required by the Bay Delta Plan? No (instead they reflect 105 mgd for reasons that we still don't understand).

Figure 1. Anticipated Water Supply Need in 2045



As recently as the June 2021 report, there was better clarity to what the numbers represented. In the June 2021 report one could see that the 9 mgd was included for the interruptible customers, the additional 6.5 mgd requested by them was also included (but not included in the December 2022 report). The Bay Delta Plan impact of 93 mgd was included (but instead 105 mgd was used in the December 2022 report). San Mateo Creek required instream flows of 3 mgd was included. With respect to the differences between the reports, even a careful reader could not identify these changes nor understand why they were made.

To explain the importance of understanding exactly what makes up the numbers: The San Francisco Westside Enhanced Water Recycling project to be completed in the next 6 months has a cost of $216 million to produce an average of 2 mgd of recycled water. By our thumbnail calculation, this comes to a $3,600 cost per acre foot based on a 30 year amortization and $500/acre foot operations and maintenance cost (and excludes any debt service cost). Such a cost is 70% more than BAWSCA's 2023 wholesale price per acre foot. If other AWS projects have costs in this range and we need the projects to supply Santa Clara and San Jose, it may not make sense to make them permanent customers. This brings up other issues related to the chart such as other demand scenarios and cost impacts.

There are other assumptions that also should have been disclosed. For example, the assumed rationing sequence used for the numbers was slightly less than the Design drought rationing sequence without consideration of the Bay Delta Plan. In a situation where alternative water supplies might cost as much as $3,600 per acre foot, it would seem prudent to use a slightly more aggressive rationing sequence, such as starting

20% rationing in year 3 or 4 of a drought rather than year 6. If the underlying rationing sequence had been disclosed there's a chance a slightly more aggressive sequence might have been chosen in the first place.

You as our BAWSCA leadership need to be able to easily understand the makeup of water supply needs as presented by the SFPUC and not otherwise require special analysis to arrive at basic data.

We look forward to the chance to review our findings in a little more depth and discuss a path forward.

Sincerely,

Dave Warner and Peter Drekmeier

Lourdes Enriquez

From: Nicole Sandkulla
Sent: Friday, December 16, 2022 5:10 PM
To: Peter Drekmeier; glarsson@sunnyvale.ca.gov; tchambe@comcast.net; rbreault@ci.brisbane.ca.us; khardy@santaclaraca.gov; Tom Francis
Cc: Dave Warner; bud.wendell; Lourdes Enriquez; Allison C. Schutte (aschutte@hansonbridgett.com)
Subject: RE: Meeting Request

Hello Peter and Dave,

I have consulted the Board Chair regarding your email below and I am responding to you at his direction.

Chair Larsson has requested that you send a letter to this same group of Board Members that presents the findings that you wish to share with BAWSCA and any further information. Following receipt of that clarifying correspondence, a decision can be made about any subsequent meetings.

Regards,
Nicole

Nicole M. Sandkulla
Chief Executive Officer/General Manager
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402
Ph: (650) 349-3000
Cell: (650) 743-6688
EMail: NSandkulla@BAWSCA.org
Website: www.BAWSCA.org

From: Peter Drekmeier <peter@tuolumne.org>
Sent: Friday, December 16, 2022 1:18 PM
To: glarsson@sunnyvale.ca.gov; tchambe@comcast.net; rbreault@ci.brisbane.ca.us; khardy@santaclaraca.gov; Nicole Sandkulla <NSandkulla@bawsca.org>; Tom Francis <tfrancis@bawsca.org>

Cc: Dave Warner <dwar11@gmail.com>
Subject: Meeting Request

Board Chair Gustav Larsson
Board Vice Chair Tom Chambers
Policy Committee Chair Randy Breault
Policy Committee Vice Chair Karen Hardy
CEO and GM Nicole Sandkulla
Water Resources Manager Tom Francis

Dear BAWSCA Leaders:

As you likely are aware, over the last couple years the SFPUC has quietly been making changes to how it presents water supply needs, particularly as it relates to alternative water supply planning. These changes are germane to BAWSCA's goals of a reliable water supply at a reasonable price. They impact alternative water supply planning, our already high cost of water, and whether or not to make Santa Clara and San Jose permanent customers. We'd like to share our findings with you and explore ways to improve the clarity and robustness of the data the SFPUC provides. Having clear data benefits collaborative discourse and decision making.

We'd like to request a zoom meeting with the six of you to take you through our work and discuss a path forward.

Sincerely,
Peter Drekmeier & Dave Warner

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

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From: Peter Drekmeier <peter@tuolumne.org>
Sent: Friday, December 16, 2022 1:18 PM
To: glarsson@sunnyvale.ca.gov; tchambe@comcast.net; rbreault@ci.brisbane.ca.us; khardy@santaclaraca.gov; Nicole Sandkulla; Tom Francis
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Peter Drekmeier & Dave Warner

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

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LOS VAQUEROS RESERVOIR EXPANSION PROJECT

DECEMBER 16, 2022

UPCOMING ACTIVITIES

December 22 at 1:00 p.m. – JPA Finance Committee Meeting

January 11 at 9:30 a.m. – JPA Regular Board Meeting

January TBD – Legal workgroup meeting for service agreements

January TBD – Finance workgroup for service agreements

UPCOMING LAP BOARD COORDINATION

TBD – 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

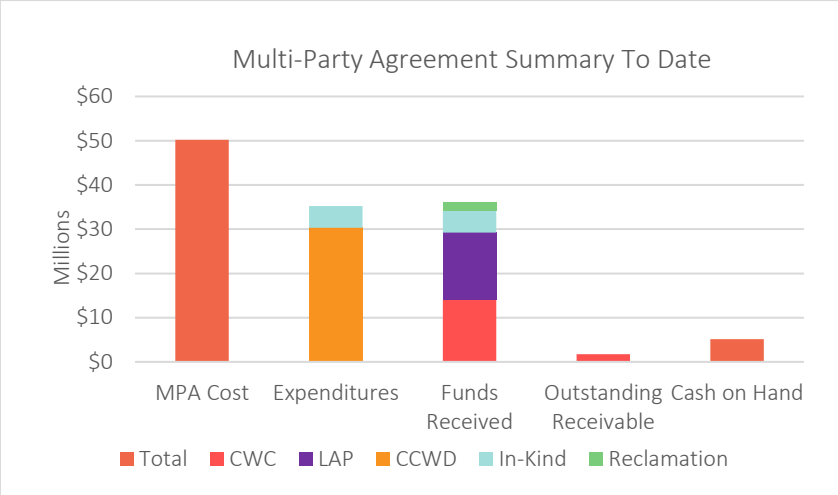
www.losvaquerosjpa.com

MONTHLY REPORT

FUNDING

Amendment No. 4 to the Multi-party Cost Share Agreement is on target to be fully executed by the end of the year. The local cost share proposed for each agency is $1,094,000.

The following chart provides an overview of the Multi-party Agreement (MPA) expenditures through October 31, 2022. The funds received, outstanding receivable, and cash on hand are shown through October 31, 2022.



JPA BOARD OF DIRECTORS MEETINGS

On December 14 the JPA Board of Directors met via teleconference. The JPA adopted conflict of interest code and authorized Executive Director to pursue indicative credit rating with S&P. The next monthly JPA Board Meeting has been scheduled for January 11 and the meeting agenda packet will be distributed to JPA Directors and Alternate Directors on Thursday, January 5 and posted to the JPA website on Friday, January 6.

PERMITTING

U.S. Fish and Wildlife Service (USFWS) continues work on the Biological Opinion for terrestrial species. USFWS Migratory Bird Program staff continue drafting an Environmental Assessment for their eagle take permit action. California Department of Fish and Wildlife (CDFW) continues work on the Incidental Take Permit for terrestrial species and Lake and Streambed Alteration Agreement. Meetings have been ongoing with CDFW to finalize modeling for aquatic Incidental Take Permit application. Central Valley Regional Water Quality Control Board (CVRWQCB) issued its Section 401 permit on June 30, 2022. The U.S. Army Corps of Engineers (USACE)

continues work on its Section 404 permit which will be issued after Reclamation issues its Record of Decision. Draft water rights change petitions have been prepared and submitted to staff at the State Water Resources Control Board for preliminary review.

DESIGN

A Notice to Proceed was issued to GEI to kick off Capital Project Management (CPM) activities. Early activities are intended to develop a Project Management Plan, assess risk management activities to date and develop a comprehensive risk management plan, and to develop a project controls needs assessment to assist in selection of a Project Management Information System that will support CCWD's efforts. In addition, CCWD has approved performing a technical review of the Pumping Plant No. 1 Replacement 60-percent design.

CCWD is currently reviewing the data report resulting from inspection of the Transfer Pipeline, the inlet/outlet pipeline to the Los Vaqueros Dam. The data report will be used to verify the pipeline condition and to develop any recommended improvements that may be needed to withstand the higher pressure requirements of the increased water level of the expanded reservoir. A summary report is anticipated in early 2023.

The 90-percent design of the Transfer-Bethany Pipeline Turn-In to the California Aqueduct was submitted to the California Department of Water Resources to review. Coordination continues to define the process for approval of a Turn-In Agreement and any other actions needed to support the final award hearing. Analyses and discussions with DFW about other TBPL alignment options outside of the DWR right-of-way continue to progress. CCWD is also preparing recommendations to support selection of the property rights that should be procured for the pipeline right-of-way.

CCWD and Reclamation continue to review 60-percent design of the Pumping Plant No. 1 Replacement. Physical model testing of PP1 has been completed, including witness testing by CCWD and by the District's 3rd party hydraulic modeling technical review expert.

CCWD continues to develop responses to comments and updated plans, specifications, and technical memoranda for the dam expansion in response to comments resulting from review by the California Division of Safety of Dams (DSOD). All comments are anticipated to be resolved and the design re-submitted in early 2023 for DSOD approval.

Tuolumne River Trust

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December 15, 2022

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

Re: Comparing Water Demand Projections Between Valley Water and the SFPUC.

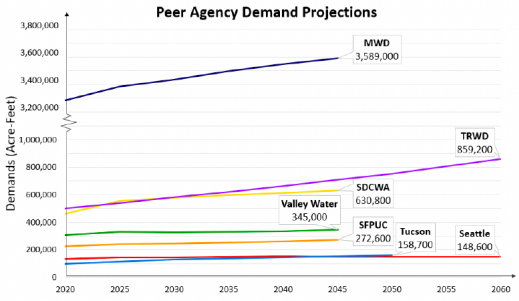
Dear President Ajami and Commissioners:

The following graph was included in a Valley Water presentation on November 22, 2022 titled "MAP 2022 – Water Supply Plan Benchmarking Study and Project Evaluation Framework."

It shows that between 2000 and 2020, population in the Valley Water service area grew by 18%, while population in the SFPUC service area grew by 15%. As one might expect, due to the slightly larger percentage of population growth in Valley Water territory, their overall water use declined by less (-20%) than in the SFPUC service area (-23%). The decline in per capita water use appears to be about the same.

Major Findings - Demand Projection

9



Agency	% Change, Historical to Existing			% Change, Existing to Future Projections		
	Years	Water use	Population	Years	Water use	Population
Valley Water	2000-2020	-20%	18%	2020-2045	13%	36%
SFPUC		-23%	15%	2020-2045	21%	34%
MWD		-16%	13%	2020-2045	9%	16%
SDCWA		-33%	14%	2020-2045	36%	16%
TRWD		25%	39%	2020-2060	114%	79%
Tucson Water		-23%	16%	2020-2050	61%	47%
PWD	Data not found					
SPU	2000-2020	-20%	22%	2020-2040	15%	14%

valleywater.org

Valley Water

Attachment 2
Page 9 of 26

Projections for 2020 to 2045 predict a very different scenario. Population growth in the Valley Water service area is projected to increase by 36%, while population growth in the SFPUC service area is projected to increase by a

comparable 34%. However, SFPUC water use is projected to increase by a much larger percentage (21%) than in the Valley Water service area (13%). I assume the SFPUC numbers were calculated using figures from the 2020 Urban Water Management Plan.

The large difference in projected per capita water use should give us all pause. Please direct your staff to explain how this could possibly be the case.

Thank you.

Sincerely,

Peter Drekmeier
Policy Director

Cc: BAWSCA Board of Directors

Tuolumne River Trust

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December 12, 2022

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

Re: Item 6e: Alternative Water Supply Program Quarterly Report

Dear President Ajami and Commissioners:

For several months, we have been investigating why "Water Supply Needs" in the SFPUC's Alternative Water Supply Program Quarterly Reports (AWS Reports) are so much higher than they used to be. This issue is of great importance, because under-projecting water supply needs could lead to shortages, while over-projecting could lead to stranded assets and unnecessary rate increases.

Based on the information provided in this letter, we strongly encourage you to hire an outside, independent expert to review our assessment and analyze the SFPUC's water supply needs.

After reviewing SFPUC documents and receiving answers to our questions from SFPUC staff, we make the following conclusions.

1) The 9 mgd of historical demand from San Jose and Santa Clara was included in "Obligations" beginning in September 2021. This increased projected demand from the BAWSCA member agencies from 184 mgd to 193 mgd. However, the SFPUC's contractual obligation to the BAWSCA agencies is capped at 184 mgd. The 9 mgd of demand from San Jose and Santa Clara should not be considered an obligation on top of the SFPUC's contractual obligation of 184 mgd.
2) Beginning with the September 2021 AWS Report, the SFPUC used outdated rationing figures that were established before the Bay Delta Plan was updated in 2018. The Bay Delta Plan's unimpaired flow requirement would trigger rationing sooner and at higher levels. Using the SFPUC's actual rationing methodology would reduce "Water Supply Needs" considerably.
3) In determining water supply "Demands," the SFPUC used demand projections from the 2020 Urban Water Management Plan (UWMP), based on Plan Bay Area population projections, plus an additional 10 mgd of BAWSCA demand, despite the fact that staff has acknowledged figures in the UWMP are an "outside envelope" and are unlikely to materialize.

Water Supply Needs "Obligations" Are Highly Inflated

"Obligations" in the AWS Reports represent water supply needs under contractual obligations using the Design Drought methodology. "Obligations" increased from 98 mgd in June 2021 to 122 mgd beginning in September 2021. TRT's calculations suggest "Obligations" should be closer to 87 mgd. That's a substantial difference of 24 mgd between the June and September 2021 reports, and 35 mgd between what the current AWS Report claims and what TRT has calculated. We believe we have identified where some of the disparity comes from.

<u>9 mgd Demand from San Jose and Santa Clara</u>

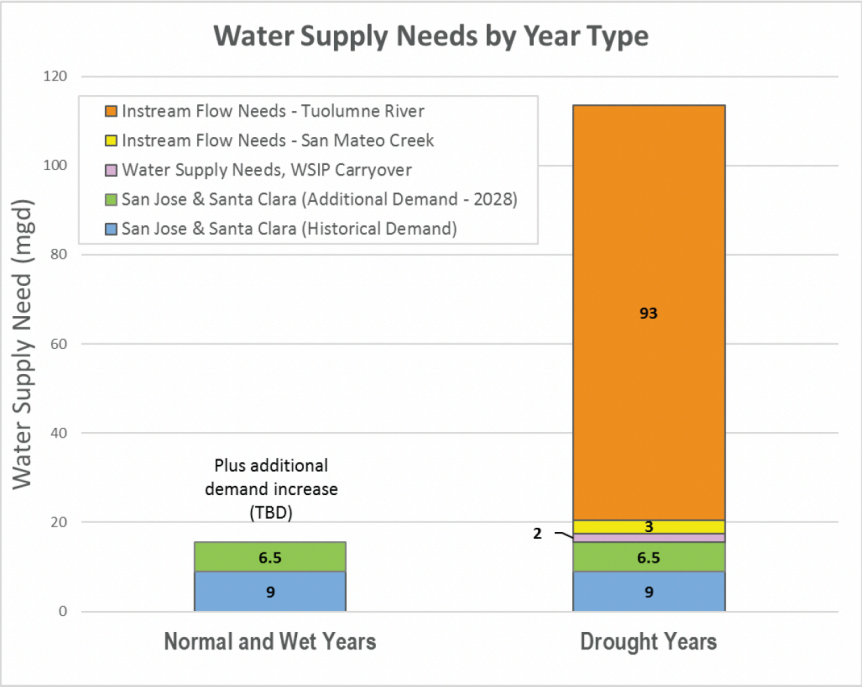
Item 14 on the December 13, 2022 agenda addresses a feasibility study for the South Bay Purified Water Project. It accurately describes San Jose and Santa Clara as "temporary, interruptible" customers. However, the AWS Report treats the 9 mgd of water historically delivered to the cities as "Obligations." We appreciate that in the current report the issue has at least become a bit more transparent.

The June 2021 AWS Report stated:

> The central planning considerations of the program are to meet the following current water supply needs:
>
> 1. Up to 98 million gallons per day (mgd) in drought years (to meet current needs for existing customers and offsetting commitments to the environment); and
> 2. Between 9 and 15.5 mgd in all years (9 mgd is the minimum to make San Jose and Santa Clara permanent customers of the SFPUC).

The June 2021 AWS Report included the following graph.

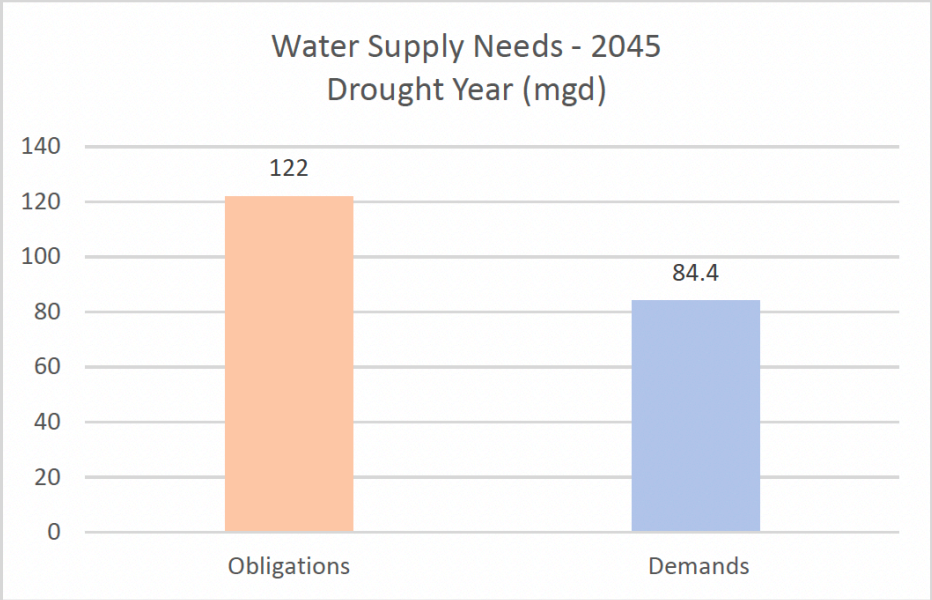
Figure 1. Current Anticipated Water Supply Needs in the Planning Horizon



The 2 mgd described as "WSIP Carryover" is additional water the SFPUC determined it might need at the time the Water System Improvement Program (WSIP) was adopted in 2008 to manage the Design Drought at 265 mgd systemwide demand without exceeding the Level of Service Goal of 20% rationing. If implemented, the Bay Delta Plan unimpaired flow requirement would add an additional Water Supply Need of 93 mgd. Adding up the WSIP Carryover, Instream Flow Needs for the Tuolumne, and 3 mgd of Instream Flow Needs for San Mateo Creek produces the 98 mgd of Water Supply Needs cited above.

Beginning in September 2021, "Water Supply Needs" was separated into "Obligations" and "Demands." Prior to September 2021, AWS Reports only included what is currently referred to as "Obligations." The following graph, showing "Obligations" as 122 mgd is from the September 2021 AWS Report.

Figure 1. Anticipated Water Supply Needs in 2045



"Obligations" in the above graph includes the 9 mgd of historical demand from San Jose and Santa Clara, in addition to the SFPUC's contractual obligation of 184 mgd to the BAWSCA agencies.[1] The 9 mgd should not be considered an obligation.

SFPUC Rationing Methodology

The SFPUC's rationing methodology is explained in Appendix K of the 2020 Urban Water Management Plan as follows:

> In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water use reduction is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of water use, is maintained through the design drought sequence."

The rationing methodology cited above was not used to produce the 122 mgd of "Obligations" listed in the September 2021 AWS Report, nor any Report since. Instead, the SFPUC used rationing figures produced using the rationing methodology in 2008 when the WSIP was

[1] Confirmed in an email from Manisha Kothari to Peter Drekmeier on September 29, 2022.

adopted, but before the Bay Delta Plan was updated. With the Bay Delta Plan in place, as assumed in Figure 1 of the September 2021 AWS Report, the SFPUC should rerun the numbers. Doing so would require rationing to begin earlier and increase faster.

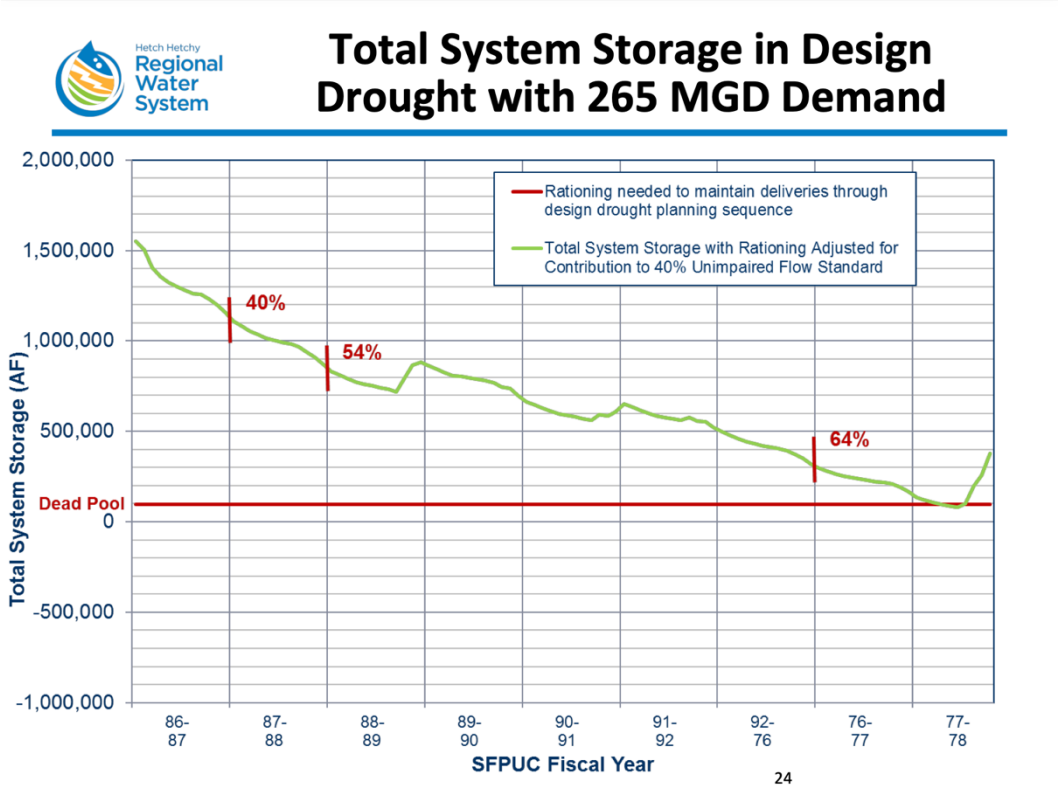
SFPUC staff explained rationing used in the September 2021 AWS report as follows:

> The estimate of SFPUC water supply without Bay Delta Plan contributions is 257 MGD of total yield, which is the sum of the system firm yield of 227 MGD and the volume associated with the rationing policy established for the WSIP program. **That rationing policy includes 3 years of 10% rationing and 3.5 years of 20% rationing over the 8.5-year design drought**. The volume associated with the rationing policy changes as the firm yield changes, as noted above. In this case, the volume of the rationing policy is 30 MGD. That gives a total yield (firm yield + rationing) equal to 227+30 or 257 MGD.[2]

In other words, beginning in September 2021, the rationing numbers used to help determine "Water Supply Needs" assumed no rationing in Years 1 and 2 of the Design Drought, 10% rationing in Years 3 to 5, and 20% rationing in Years 6 to 8.5.

The rationing numbers and timing determined necessary to manage the Design Drought at the time the WSIP was approved would fail to enable the SFPUC to manage the Design Drought if the Bay Delta Plan were implemented. In fact, the SFPUC has argued it could not manage the Bay Delta Plan flows without exceeding the Level of Service Goal of limiting rationing to no more than 20%. The following graph shows the levels of rationing the SFPUC claims would be necessary to manage the Design Drought if the Bay Delta Plan were implemented.

[2] Email from Matt Moses to Peter Drekmeier on October 26, 2022.



It is clear that starting rationing at 10% in Year 3, and not increasing it to 20% until Year 6 is not how the SFPUC would impose rationing if the Bay Delta Plan were implemented. Imposing rationing earlier and at higher levels would reduce "Water Supply Needs" substantially. Starting 20% rationing in Year 3 rather than Year 6 would have an incremental favorable impact on "Water Supply Needs," which should be factored when considering alternative water supplies.

Calculating Water Supply "Demands"

<u>Inflated Water Demand Projections</u>

The issue of inflated water demand projections has been raised many times, and was addressed at the SFPUC's July 16, 2021 workshop on water demand projections and demand management. At the workshop, Steve Ritchie stated:

> "I want to make sure it's clear that the Urban Water Management Plan is not intended to be an actual projection of demands, because plan developments may or may not occur or may be delayed for a variety of reasons…and the projections presented in the 2020 Urban Water Management Plan are closer to an outside envelope of what the demands may be in 2045 rather than actual demands."

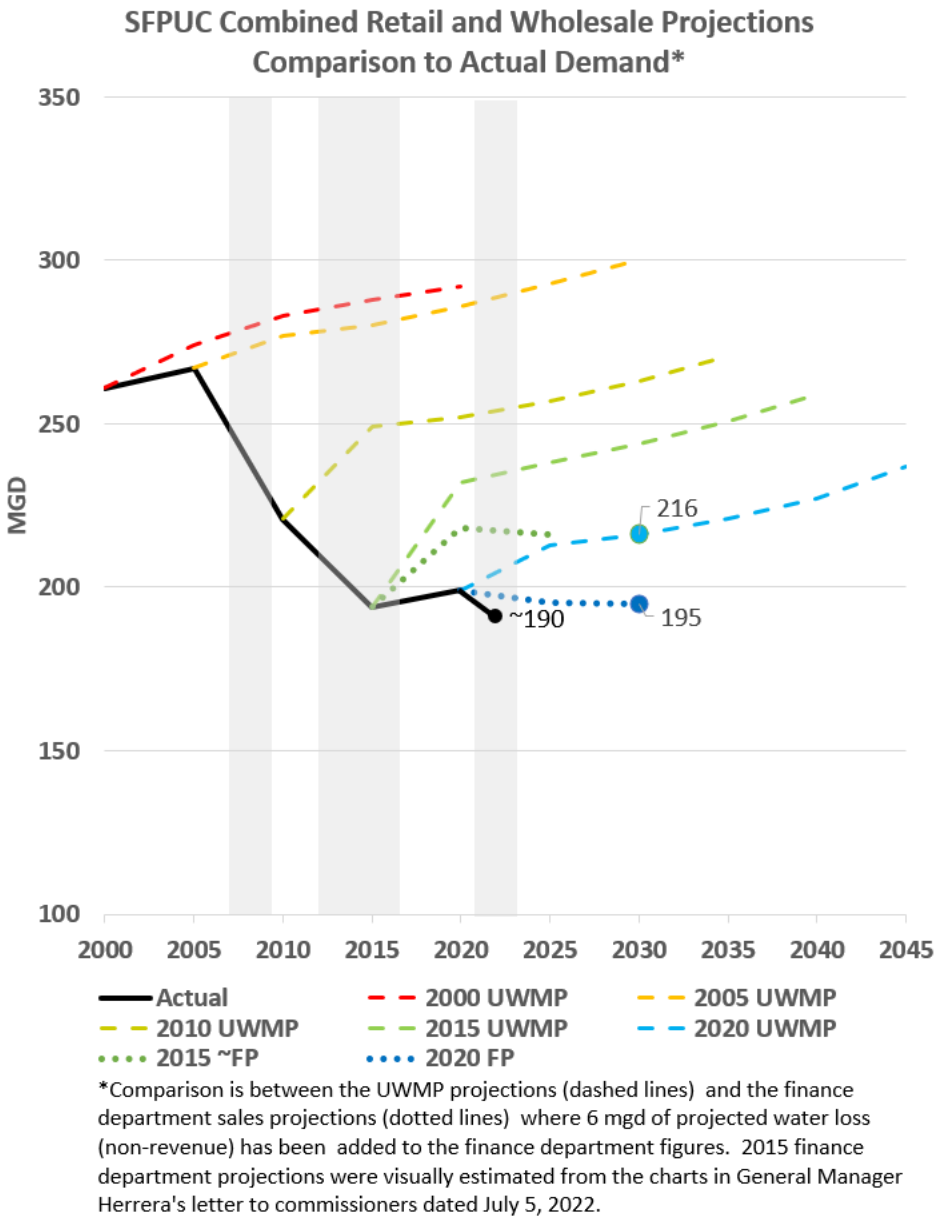
The accuracy of water demand projections was again addressed in an SFPUC report titled "Water Enterprise and Finance Bureau Water Demand Projections," dated July 5, 2022. The report stated:

> "It [UWMP Act] was not intended to establish the projected water demands that would be used for all operational and planning purposes…the projections represent an outside bound of whatever demand will occur in the next 25 years...These demands will likely always be greater than actual demands because not all developments materialize, or they materialize slower than projected."

And:

> "By contrast, for the purpose of financial planning and for short term water system management, we estimate the demand that we are likely to experience. For budgeting and rate setting we use demand projections that are as close to actual as we can make them."

We found Figures 1 and 2 in the report to be difficult to decipher, because the vertical axes were condensed and wholesale projections were separated from retail projections, making it challenging to understand the full picture. To better highlight the differences between the Water Enterprise and Finance Bureau projections, we produced the following graph using the information provided in the report. While both the Water Enterprise and Finance Bureau have over-projected water demand, the Finance Bureau has been much closer to the actuals. The Water Enterprise has continuously over-projected significantly.



*Comparison is between the UWMP projections (dashed lines) and the finance department sales projections (dotted lines) where 6 mgd of projected water loss (non-revenue) has been added to the finance department figures. 2015 finance department projections were visually estimated from the charts in General Manager Herrera's letter to commissioners dated July 5, 2022.

Inflated Population Growth Projections

The primary driver for inflated water demand projections is inflated population growth projections. This issue came up at the July 16, 2021 workshop, to which then SFPUC President Anson Moran gave the following directive:

> "…we be given information about the differences between Department of Finance and the Plan Bay Area and what those differences really are, and within that, what portion of that reflects legal mandates such as affordable housing targets and what is more aspirational."

After a ninth month delay, staff finally provided two paragraphs explaining how the Dept. of Finance and Plan Bay Area determine population growth projections, but failed to address the issues raised by President Moran.

BAWSCA's 2022 Regional Water Demand and Conservation Projections Update

BAWSCA's water demand update, dated December 5, 2022, includes a sensitivity analysis that explores how different assumptions might affect water demand. Scenario A is the UWMP scenario, using Plan Bay Area population growth projections. Scenario E used CA Dept. of Finance population projections. Note that demand includes water provided by other sources in addition to the SFPUC. Using consistent assumptions, current demand is 205 mgd. Under Scenario E, water demand would remain flat until at least 2045, a conclusion similar to that of the SFPUC Finance Bureau (10-year horizon).

Table 7-1. Future BAWSCA Region-Wide Water Demands (in MGD) Under Scenarios A Through E

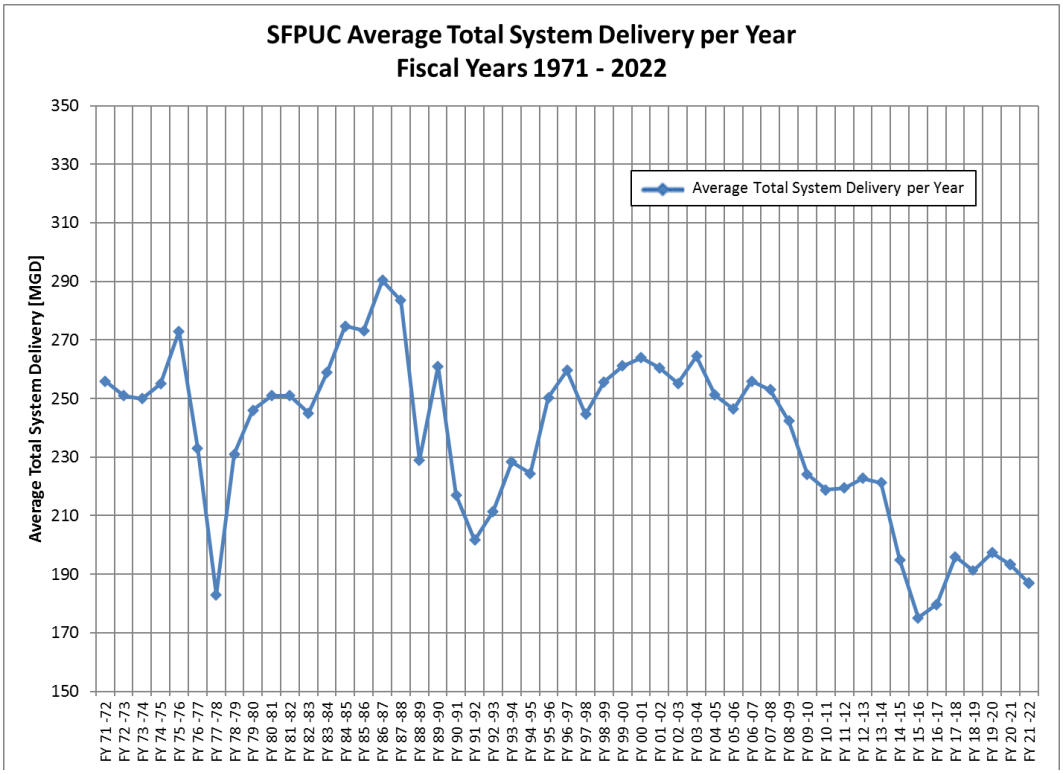
Year	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
2025	218	216	218	216	213
2030	222	214	217	214	207
2035	229	214	217	214	204
2040	238	216	220	215	201
2045	254	223	228	223	204

Table 7-2. Future BAWSCA Region-Wide Population Under Scenarios A Through E

Year	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
2025	1,974,169	1,949,292	1,974,169	1,949,292	1,919,754
2030	2,073,412	2,023,826	2,073,412	2,023,826	1,966,197
2035	2,188,305	2,107,557	2,188,305	2,107,557	2,016,617
2040	2,304,144	2,191,015	2,304,144	2,191,015	2,066,227
2045	2,456,565	2,302,236	2,456,565	2,302,236	2,133,051

SFPUC Regional Water System Delivery Remains Low

According to the Water Resources Division Annual Report (Item 6h), RWS water delivery in FY 2021/22 was 182 mgd. This marks eight straight years in which demand has been below 200 mgd. This supports the Finance Bureau and BAWSCA's Scenario E projections.



AWS Reports Should Include Upper and Lower Demands

Given the SFPUC's approach of "planning for obligations, but building for demands," the AWS Reports should include a third (more likely) column based on SFPUC Finance Bureau sales projections labeled "Lower Demand Projections." The column that is currently labeled "Demands" should be changed to "Upper Demand Projections."

In conclusion, we strongly encourage you to hire an outside, independent expert to investigate the issues raised in this letter and thoroughly review the SFPUC's "Water Supply Needs."

Sincerely,

Peter Drekmeier
Policy Director

Dave Warner
TRT Volunteer

Cc: BAWSCA Board of Directors

Chinook Salmon Return to Alameda Creek

Perfect Timing to Use Newly Constructed Fish Ladder for Upstream Migration

For Immediate Release: December 12, 2022
Contact: Jeff Miller, Alameda Creek Alliance, (510) 499-9185, jeff@alamedacreek.org

Fremont, CA – Early winter storms have attracted migration of adult Chinook salmon into lower Alameda Creek in Fremont for the second consecutive year. The salmon have the potential to use newly-constructed fish ladders to bypass a concrete weir and two small dams that were formerly barriers to fish migration. These are the first salmon in more than half a century that could swim into the upper watershed to reach suitable spawning habitat, in Niles Canyon, Sunol Valley, and lower Arroyo de la Laguna in Pleasanton.

“These auspicious salmon have impeccable timing, arriving just as the water district finishes testing the new fish ladder and is putting it into operation, and benefitting from two decades of restoration efforts,” said Jeff Miller, director of the Alameda Creek Alliance. “We welcome the return of Chinook to the Alameda Creek watershed, where they were once a native fish, and look forward to steelhead trout also using these fishways to ascend the creek this winter.”

Nearly a dozen salmon were seen on December 5 below the new fish migration ladder where the BART tracks cross Alameda Creek in Fremont. For nearly half a century anadromous fish such as salmon and steelhead trout had been blocked from spawning in the Alameda Creek watershed by a cement weir below the tracks and two inflatable rubber dams used for water supply operations. The Alameda County Water District has been testing the operation of the two fish ladders. Alameda Creek Alliance volunteers photographed and videoed the salmon at the entrance to lower fish ladder today. Fisheries biologists with the East Bay Regional Park District and San Francisco Public Utilities Commission, as well as more than 75 Alameda Creek Streamkeeper volunteers, will be monitoring upstream reaches of Alameda Creek and tributaries, to determine if these salmon made it upstream through the ladder and where they will spawn.

The return of salmon will benefit other native wildlife in the watershed. On December 8, a family of river otters that recently arrived at Quarry Lakes adjacent to lower Alameda Creek, found the migrating salmon and were photographed feasting on one of the large adult Chinook. A resident mating pair of bald eagles that has nested at Ardenwood Historic Farm near lower Alameda Creek in Fremont, is often seen catching fish in Alameda Creek and the eagles are expected to find and feed on spawned-out salmon.

“The return of otters and salmon heralds hope for more healthy ecosystems, not to mention that endearing otters and inspiring salmon are excellent ambassadors for protecting and restoring our local watersheds,” said Miller. “We’re now seeing results from two decades of restoration projects, which could transform the ecology of Alameda Creek. We hope Alameda Creek will have an outsized impact on recovery of steelhead trout in the region. It’s profoundly gratifying to see watershed residents and the local water agencies taking pride in bringing back native fish and wildlife.”

The Chinook salmon are most likely strays from Central Valley fish hatcheries, however, Chinook from the nearby Guadalupe River in San Jose could explore Alameda Creek as well. Chinook of hatchery origin began spawning in the 1990s in South Bay streams, where there are now small numbers of naturally reproducing fish. Chinook historically spawned in Alameda Creek, evidenced by ancient salmon remains found in Native American shell mounds along the creek in Fremont. Recent scientific studies and DNA sequencing have provided proof of historic Chinook salmon runs in Santa Clara County in the Guadalupe River. Downtown San Jose is now the southernmost major metropolitan area hosting salmon runs in the

United States. A genetic analysis done on Chinook salmon sampled from recent returns to the Guadalupe River watershed revealed that the fish are closely related to Feather River Hatchery strains. Chinook will likely repopulate Alameda Creek now that fish passage projects are completed.

River otters were extirpated by fur trappers from the Bay Area by the 1930s, but have recently been reintroducing themselves to the region. After trapping of otters in California was banned in 1961, and pollution was reduced by implementation of the Clean Water Act in the 1970s, efforts began in the 1980s to restore and revitalize Bay Area streams. River otters started returning to the Bay Area in 1989, and to the East Bay in 2013, including at Lake Temescal and Lake Merritt in Oakland, and Coyote Hills Regional Park along lower Alameda Creek. The Quarry Lakes otters showed up in 2022. East Bay otters probably came here from the Sacramento-San Joaquin Delta. River otters can travel long distances along creeks (even through culverts) and on dry land, and young males disperse in search of their own territory. River otters are now breeding successfully around much of San Francisco Bay and along the Marin and Sonoma coasts. Most of what we know about Bay Area river otters is due to the River Otter Ecology Project (www.riverotterecology.org).

Chinook Salmon photos by ACA member Dan Sarka

Background

Since steelhead trout in the Bay Area were listed as a threatened species under the Endangered Species Act in 1997, a consortium of organizations and agencies has cooperated on restoration projects to allow migratory fish to reach spawning habitat in upper Alameda Creek. Partners in the Alameda Creek Fisheries Restoration Workgroup have completed nearly two dozen fish passage projects in the watershed since 2001, including removal of small dams and other fish passage barriers, construction of fish ladders, replacement of road culverts, and installation of fish screens at water diversions. Water agencies are also working on projects to improve stream flows and restore stream and riparian habitat along Alameda Creek and its tributaries. These restoration projects now make up to 20 miles of potential spawning and rearing habitat in Alameda Creek and its tributaries accessible to ocean-run salmonids.

The Alameda County Water District and Alameda County Flood Control District completed a critical fish ladder at a former barrier to fish migration, a 12-foot cement drop structure known as the BART weir. The new fish ladder will allow steelhead and salmon to migrate under the BART tracks and past an adjacent inflatable rubber dam used for water supply operations. In 2019 ACWD completed another fish ladder at a second inflatable rubber dam one mile upstream in the flood control channel. ACWD has spent $80 million on fish passage projects, with the cooperation of 24 partner agencies and stakeholders, and raised $33 million in grants so far to help pay for fish-friendly improvements in lower Alameda Creek. Alameda Creek is a local water supply and accounts for roughly 40 percent of ACWD water serving 357,000 people in Fremont, Newark and Union City. These projects will allow ACWD to continue operations of its rubber dams and other facilities along the creek to recharge the Niles Cone Groundwater Basin sustainably.

In 2018 the San Francisco Public Utilities Commission finished rebuilding the seismically-challenged Calaveras Dam in the upper Alameda Creek watershed. The new reservoir now operates with cold water releases in the summer to help trout rear downstream of the dam. The SFPUC also built a new fish ladder and fish screens at the associated Alameda Diversion Dam in upper Alameda Creek. This diversion dam is now operated to bypass much more of the winter and spring high flows in upper Alameda Creek. The enhanced stream flows will help migratory fish get further upstream to better habitat.

There is now only one remaining major fish migration barrier on the mainstem of Alameda Creek, a cement apron across the creek in the Sunol Valley protecting a gas pipeline owned by PG&E. The Fisheries Workgroup is coordinating with PG&E to relocate the pipeline and remove the cement barrier.

Multiple agencies are planning a project to restore former salt ponds near the mouth of Alameda Creek to tidal marsh as part of the South Bay Salt Pond Restoration. This project will create estuary habitat near the outlet of Alameda Creek that could be critical to growth and survival of salmonids.

Alameda Creek is considered an ‘anchor watershed’ for steelhead trout, since it has regional significance for restoration of the threatened fish to the entire Bay Area. Steelhead, salmon and lamprey are anadromous fish, living out their adult lives in the ocean and migrating up freshwater streams and rivers to spawn. Suitable habitat for cold water fish has been blocked and reduced by construction of dams and other barriers, and habitat has been degraded by water diversions, urban development, stream channelization and other modifications to the Alameda Creek streambed. Steelhead are also impacted by pollution and runoff from roads, and introduced and invasive fish.

The Alameda Creek Alliance is a 2,000-member strong community watershed group, dedicated to protecting and restoring the natural ecosystems of the Alameda Creek watershed. The Alameda Creek Alliance has been working to restore steelhead trout to the Alameda Creek watershed since 1997.

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THIS JUST IN … GOVERNOR NEWSOM RELEASES 2023-24 STATE BUDGET PROPOSAL; HERE'S WHAT IS PROPOSED FOR WATER AND CLIMATE SPENDING

Maven Breaking News | January 10, 2023

Governor Gavin Newsom today introduced his 2023-24 state budget proposal. Funding for water resilience and drought is included under the climate change section.

The budget for 2021 and 2022 allocated approximately $54 billion over five years to address climate change; Newsom's proposal maintains approximately $48 billion (or 89 percent). With the projected decline of revenues, the budget proposal across several programs which are partially offset by shifts to other funding sources. These reductions will be restored if there is sufficient revenue next year.

The specifics are below; the budget proposal for climate change spending is embedded at the bottom of this post.

Drought response and water resilience

California is experiencing large swings between drought and flood, and due to climate change, those swings are becoming more severe. Last year, water project operators made only minimal deliveries to farms and cities, and wildlife managers took extraordinary action to protect fish and wildlife.

The three-year period from 2020 to 2022 is now the driest on record going back to 1896. The recent winter storms have provided the best start to California's snowpack in over a decade. However, as seen last winter, a wet December led to above average snowfall but was followed by the driest January, February, and March on record.

In August 2022, Governor Newsom announced "California's Water Supply Strategy, Adapting to a Hotter, Drier Future," which lays out California's strategy and priority actions to adapt and protect water supplies in an era of rising temperatures. It calls for investing in new sources of water supply, accelerating projects, and modernizing how the state manages water through new technology. As California continues to experience weather swings that deliver temporary boosts to the snowpack, there is intensifying flood risk, even during drought. The new normal extreme weather patterns place a heightened importance on flood preparedness and response.

The 2021 and 2022 Budget Acts committed $8.7 billion over multiple years to support drought resilience and response designed to help communities and fish and wildlife avoid immediate negative impacts as a result of extreme drought, while continuing to advance projects and programs that prepare the state to be more resilient to future droughts and floods.

The Budget maintains $8.6 billion (98 percent) of previously committed funding to minimize the immediate economic and environmental damage from the current drought and support hundreds of local water projects to prepare for and be more resilient to future droughts. The Budget includes $194 million in General Fund reductions across various programs. If there is

sufficient General Fund in January 2024, reductions not otherwise delayed will be restored. See the Introduction Chapter for further information on this trigger.

In addition, the Budget also includes new strategic investments to continue supporting the state's drought response, accelerate implementation of the state's water supply strategy, and increase flood preparedness and response.

SIGNIFICANT BUDGET ADJUSTMENTS

NEW INVESTMENTS

- Urban Flood Risk Reduction—$135.5 million General Fund over two years to support local agencies working to reduce urban flood risk.
- Delta Levees—$40.6 million General Fund for ongoing Delta projects that reduce risk of levee failure and flooding, provide habitat benefits, and reduce the risk of saltwater intrusion contaminating water supplies.
- Central Valley Flood Protection—$25 million General Fund to support projects that will reduce the risk of flooding for Central Valley communities while contributing to ecosystem restoration and agricultural sustainability.
- 2023 Drought Contingency—$125 million General Fund one-time as a drought contingency set-aside to be allocated as part of the spring budget process, when additional water data will be available to inform future drought needs.
- Planning and Permitting for New Water Supplies—$4.7 million Waste Discharge Permit Fund in 2023-24, and $5.7 million Waste Discharge Permit Fund and $408,000 Safe Drinking Water Account ongoing to support planning and permitting for projects that produce new water supplies.
- Modernizing Water Rights—$31.5 million General Fund one-time in 2023-24 to continue development of the Updating Water Rights Data for California Project to enhance California's water management capabilities.
- Urban Water Use Objectives—$7 million General Fund over four years to implement Chapter 679, Statutes of 2022, (SB 1157), which established a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts. This approach is based on water use efficiency standards for certain categories of water use, including indoor residential water use.
- San Joaquin River Basin Groundwater Recharge: Water Availability Analysis and Technical Assistance—$4.9 million General Fund over five years to continue to provide local water districts methodologies and tools to conduct water availability analyses, which will help facilitate groundwater recharge, one of the core pillars of the Water Supply Strategy.
- Stream Gages—$4.7 million General Fund over two years to begin reactivation of historical stream gages, consistent with the SB 19 Stream Gaging Prioritization Plan and as called for in the Water Supply Strategy.

ADDRESSING THE BUDGET PROBLEM

- Watershed Resilience Programs—A reduction of $24 million General Fund in 2023-24 and a delay of an additional $270 million General Fund to 2024-25. This maintains approximately $470 million (95 percent) across various watershed resilience programs.
- Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Cleanup—A reduction of $70 million General Fund in 2023-24 and a delay of an additional $30 million General Fund to 2024-25. This maintains approximately $130 million (65 percent) of PFAS cleanup resources.
- Water Recycling—A reduction of $40 million General Fund in 2023-24. This maintains approximately $760 million (95 percent) to support water recycling and groundwater clean-up.
- State Water Efficiency and Enhancement Program—A reduction of $40 million General Fund in 2022-23. This maintains approximately $120 million (75 percent) to support farm water use efficiency projects.
- Aqueduct Solar Panels—A reduction of $15 million General Fund in 2021-22. This maintains approximately $20 million (57 percent) to support aqueduct solar panel pilot studies.
- Water Refiling Stations at Schools—A reduction of $5 million General Fund in 2022-23, which eliminates funding for this purpose.

WILDFIRE AND FOREST RESILIENCE

The ongoing impact of climate change on California's wildlands continues to drive critically dry fuel conditions and longer, more severe fire seasons. The 2021 and 2022 Budget Acts committed $2.8 billion over four years to continue strengthening forest and wildfire resilience statewide.

The Budget maintains $2.7 billion (97 percent) of funding to advance critical investments in forest health and fire prevention to continue to reduce the risk of catastrophic wildfires, as well as resources for fire protection in the state's wildfire response. The Budget includes $91 million in General Fund reductions across various programs, which are partially offset by a $14 million shift to Proposition 98. If there is sufficient General Fund in January 2024, reductions not otherwise offset by other funds will be restored. See the Introduction Chapter for further information on this trigger.

SIGNIFICANT BUDGET ADJUSTMENTS

- Climate Catalyst Fund—A reduction of $10 million General Fund in 2020-21 and $31 million in 2021-22. This maintains approximately $8 million (16 percent) to support the Climate Catalyst Fund.
- Stewardship of State-Owned Lands—A reduction of $10 million General Fund in 2022-23 and $15 million in 2023-24. This maintains approximately $280 million (92 percent) for resilient forests and landscapes on state-owned lands.

- Defensible Space Inspections—A reduction of $5 million General Fund in 2023-24. This maintains approximately $20 million (80 percent) to support defensible space inspections.
- Monitoring and Research—A reduction of $5 million General Fund in 2023-24. This maintains approximately $33 million (87 percent) to support monitoring and research.
- Workforce Training—A reduction of $15 million General Fund in 2023-24, which is partially offset by a shift of $14 million to Proposition 98 for similar purposes. This maintains approximately $53 million (98 percent) to support workforce training.

KLAMATH DAM REMOVAL

This spring, work begins to remove dams, improve river health, address declines in fish populations and support communities in the Klamath Basin. Removal of the four hydroelectric dams in California and Oregon will restore access to hundreds of miles of habitat unreachable for salmon and steelhead for more than a century and revitalize tribal communities and lifeways for generations to come.

The Klamath Hydroelectric Settlement Agreement, signed by both Oregon and California governors in 2010 and amended in 2016, contemplated dam removal to achieve free-flowing conditions for fish passage, restoration, and transfer of project lands for recreation, restoration, and further Tribal partnerships. In November 2022, the Federal Energy Commission gave final approval for a plan to remove the dams in California and Oregon.

The Budget includes $2 million General Fund in 2023-24 and $1.3 million ongoing and five permanent positions for the Department of Fish and Wildlife to establish two new programs to support the protection and management of fish and wildlife, recreational opportunities, and collaborative Tribal partnerships before, during, and after dam removal.

View the complete budget proposal here.

# # #

As storms batter California, Newsom says state is 'proof that the climate crisis is real'
Yahoo News | January 11, 2023 | David Knowles

Debris from a storm is washed up on a beach in Aptos, Calif. (Mario Tama/Getty Images)

BERKELEY, Calif. — Over the past few weeks, California has gone from extreme drought to unrelenting flooding, experiencing a form of “whiplash” that its governor said is “proof that the climate crisis is real."

Gov. Gavin Newsom, who declared a state of emergency for the state last week in response to a succession of storms fueled by atmospheric rivers of moisture, connected the dots Tuesday between climate change and the storms that have so far been blamed in the deaths of at least 17 people and are expected to result in damages of close to $1 billion.

The sudden juxtaposition from the worst drought in state in 1,200 years to the third rainiest 15-day period on record, behind storms that befell California in 1862 and 1866, has left many Americans wondering how climate change can be blamed for both seemingly contradictory events.

Peter Gleick, a climate scientist and the founder of the Pacific Institute in Oakland, Calif., told Yahoo News that while it will take time to assess how the current storms in the state have been influenced by climate change, the switch from one extreme to another is consistent with global warming.

“We don’t know until we’ve looked at the data exactly how climate change is influencing these storms that are now hitting California, but we do know that all weather today is influenced by human-caused climate change," Gleick said. “We have ideas for how the current events are being influenced by climate change. We understand the mechanisms, but it’s often weeks or even months afterward before we can look at the data and see exactly what happened.”

 A blue heron stands at the banks of the Los Angeles River, Jan. 10. (Sarah Reingewirtz/MediaNews Group/Los Angeles Daily News via Getty Images)

Using historical data, statistics, climate models and comparisons of atmospheric greenhouse-gas concentrations, climate scientists have already begun examining how climate change has affected the storms that have unloaded half of California's annual rainfall average in just 16 days. But Gleick stressed that the current body of scientific knowledge already points to certain conclusions about what California is now enduring.

“We know that temperatures are going up around the world and we know that a warmer atmosphere holds more water. We know that the Arctic is being severely disrupted by climate change and the ice is disappearing and that is influencing the jet stream and the pressure systems in the Pacific [Ocean],” he said. “All of those factors make storms more extreme. So when I say that I’m confident that the current storms we’re seeing are influenced by climate change, it’s because I’m confident that all weather today is influenced by climate change. I’m not saying climate change is causing these storms, but it is certainly influencing them.”

Attributing individual weather events solely to climate change is usually too simplistic, according to most climate scientists, but climate change does make extreme precipitation events more likely.

For instance, a study by an international team of scientists and published Wednesday in the journal Advances in Atmospheric Sciences found that ocean temperatures in 2022 were the hottest ever recorded. That fact, in turn, has resulted in a variety of consequences for the world's weather, including the super-charging of rains like the ones battering California.

Cars sitting in floodwaters in Planada, Calif., on Wednesday (Justin Sullivan/Getty Images)

“Warmer oceans mean there is more potential for bigger precipitation events, like we’ve seen this past year in Europe, Australia, and currently on the west coast of the U.S.” Michael Mann, a climate scientist at the University of Pennsylvania and one of the study’s authors, told the Guardian.

In November, prior to the arrival of the heavy rains, UCLA climate scientist Daniel Swain co-authored a study that found that, thanks to climate change, the chances of a mega-flood on a par with the one that struck California in 1862, killing thousands, had doubled.

“I guarantee you that most people in California are not thinking that one of the biggest risks of a warming climate is the risk of extreme flooding. But that is one of the things that I would highlight as the largest risks in California,” Swain told Yahoo News for its series “Finding Safe Haven in the Climate Change Future.”

While the current California storms are not as severe as in 1862, the excess moisture in the atmosphere due to rising global temperatures has increased the possibility that a catastrophic event of that magnitude will recur, even as the risk of extreme drought is also pushed higher due in part to faster rates of evaporation.

“We’re now no longer able to avoid some of the consequences of climate change. It’s here, it’s not hypothetical. It’s our new day-to-day reality and it’s going to get worse,” Gleick said.

# # #

California Parched By Historic Drought: 2022 In Review

As 2022 comes to a close, we take a look at how the driest period in 126 years has affected the Golden State.

Patch | December 30, 2022 | Rachel Barnes

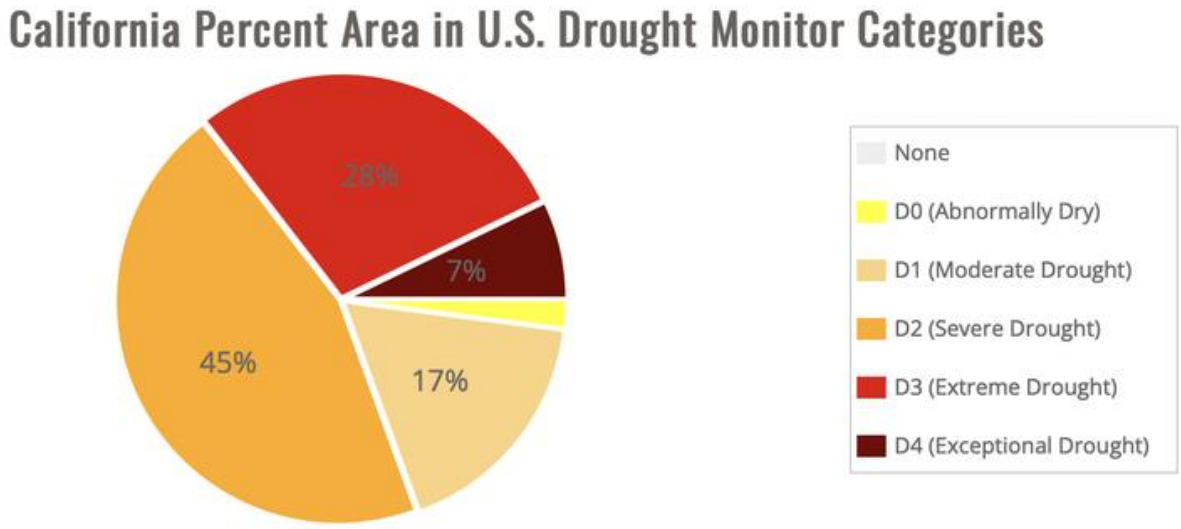
State officials are still worried as extreme drought conditions persist in California, making the three-year period from 2020 to 2022 the driest on record since 1896. (Shutterstock)

CALIFORNIA — As 2022 comes to a close on a year of historic drought, more than a quarter of the Golden State is facing extreme drought conditions, and the New Year isn't expected to provide much relief.

The three-year period from 2020 to 2022 is the driest on record in the last 126 years. However, there is some cause for optimism as an atmospheric river washes over parts of the state in the final week of the year.

As of Thursday, the U.S. Drought Monitor reported that 28 percent of the state was facing extreme drought conditions, down from 32 percent reported around the same time in 2021. Still, more of the Golden State is experiencing exceptional drought conditions than last year up from one percent to 7 percent.

Every single one of California's 58 counties are under a drought emergency proclamation, and residents were asked to reduce their water use by 15 percent more than they were asked to conserve in 2020.

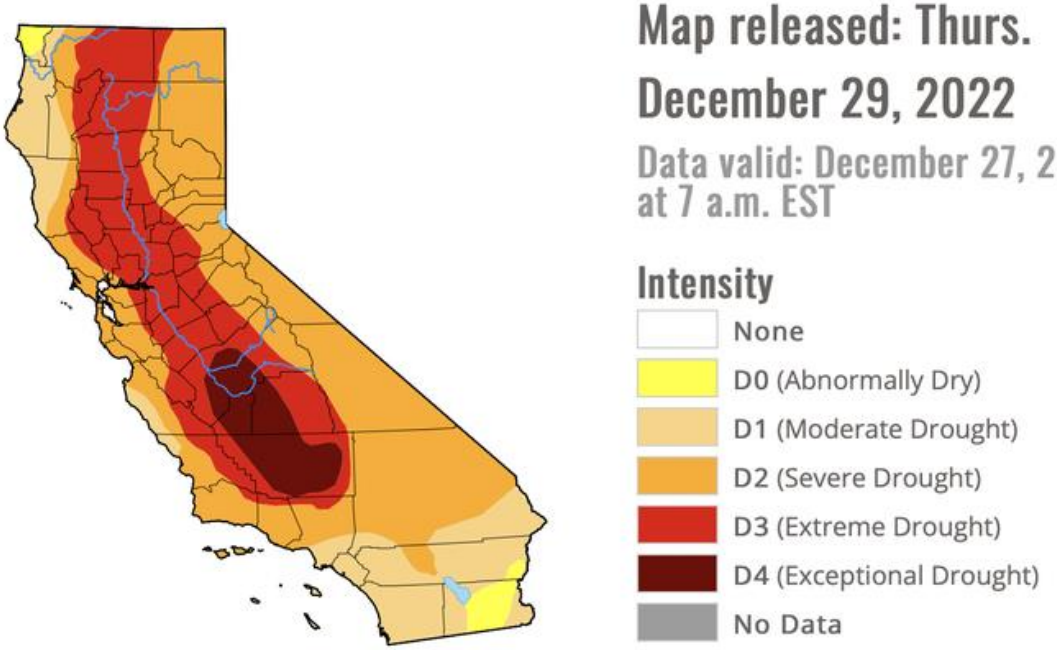


(U.S. Drought Monitor)

In an exceptional drought, which 7 percent of the state is facing, fields are left fallow, orchards are removed, vegetable yields are low, honey harvest is small, and the fire season is very costly. The number of fires and area burned are extensive in exceptional drought conditions. Additionally, fish rescue and relocation begin as river and lake levels drop. Pine beetle infestations occur in California forests, and tree mortality is high. Wetlands dry up, the survival of native plants and animals is low, and fewer wildflowers bloom. Lastly. wildlife death is widespread, and algae blooms appear.

In an extreme drought, which is affecting 28 percent of the state, livestock need expensive supplemental feed, cattle and horses are sold because little pasture remains. Fruit trees bud early, and producers begin irrigating in the winter. Fire season lasts year-round; fires occur in typically wet parts of state; burn bans are implemented; water is inadequate for agriculture, wildlife, and urban needs; reservoirs are extremely low, and hydropower is restricted.

During a severe drought, which is affecting 45 percent of the state, grazing land is insufficient and fire season is longer. Under these conditions, fires burn with high intensity over wider swatches of land. Additionally, trees are stressed and wildlife diseases increase.



California's drought status as of Thursday, Dec. 29, 2022. (U.S. Drought Monitor)

In December, the Metropolitan Water District's Board of Directors declared a regional drought emergency for Southern California as the agency prepares for a fourth consecutive drought year.

The MWD imports around half of its water supply to Southern California from the Colorado River and the northern Sierra, but supplies from those sources have been reduced in recent years by the drought. The past three years saw the lowest deliveries in water supply from the Colorado River and the Sierra to the Southern California region in history.

"Conditions on the Colorado River are growing increasingly dire," said Gloria D. Gray, the board's chair. "We simply cannot continue turning to that source to make up the difference in our limited state supplies. In addition, three years of California drought are drawing down our local storage."

Gray added that some residents may have felt "somewhat protected from these extreme conditions over the past few years."

"They shouldn't anymore," Gray said. "We are all affected."

The State Water Resources Control Board also readopted an emergency regulation in an effort to bolster California's water conservation efforts and prohibit wasteful water practices, the board announced on Dec. 9.

Originally adopted in January of 2022, the regulation was extended until January 2024 and applies to all water users including individuals, businesses and public agencies. Wasteful water practices include watering lawns when it rains, decorative fountains without recirculating pumps and washing vehicles without an automatic shutoff nozzle. Those who violate the emergency regulation could be met with warning letters, water audits or fines.

“Extending the ban on these wasteful practices helps all of us make water conservation a daily habit,” said E. Joaquin Esquivel, chair of the State Water Board. “And, as we can see from the state’s recent double-digit conservation percentages during some of the driest months of the year, our emergency conservation regulations and actions by local suppliers are having a cumulative impact.”

A Look Back: 2022 And The California Drought

As 2022 comes to a close, we take a look back at how the extreme California drought has started to affect our lives, and what our local, regional, state and federal elected officials have done and are doing about the worrying water shortage.

Feb. 24, 2022: Storm Runoff Water To Be Collected For Pass Area Residents

Construction began in March on a multimillion-dollar project to collect stormwater that will be delivered to hundreds of Pass Area families a year.

Work on the $7,558,650 Beaumont Master Drainage Plan Line 16 project is designed to boost local water supplies and reduce flooding in the Pass Area, according to the announcement from the Beaumont-Cherry Valley Water District.

May 3, 2022: Water Restrictions Ordered In Calabasas Amid Declared Shortage

Six million residents in Southern California faced water restrictions in June after water officials declared a severe shortage emergency amid the state's worsening drought.

Residents across dozens of Southland cities fell under such restrictions as the region continued to experience severely limited water supplies, according to the Metropolitan Water District.

June 13, 2022: Mandatory Water Use Restrictions In Effect For Newark

Following two critically dry years and due to current water supply constraints, the Alameda County Water District declared a water shortage emergency in Newark, Fremont and Union City and has adopted an ordinance with mandatory water use restrictions aimed at reducing water use by 15% across the Tri-City area.

Aug. 3, 2022: Recycled Water For French Valley Landscaping Getting Significant Boost

A $4.42 million contract to complete a pipeline intended to significantly boost use of recycled water for landscaping in the French Valley area was approved in August by the Eastern Municipal Water District Board of Directors.

Work was slated to begin in the fall and wrap up in autumn 2023, according to the Perris-based EMWD.

A total of 12,300 feet of 12-inch-by-8-inch water pipeline will be constructed along Benton and Pourroy roads in French Valley, the EMWD stated.

Aug. 31, 2022: Water Agency Experts Predict A Fourth Year Of Drought, Urge Bay Area Residents To Conserve More

California water conservation experts sounded an alarm at the end of August. They warned Bay Area residents to brace for a fourth dry year in a row, as the drought persists.

"We are making investments across the state and in the Bay Area to help build our resilience to drought and to climate change," said Wade Crowfoot, the California National Resources Agency Secretary. "The conservation actions we take now will pay off in water reliability later in the future."

People in the Bay Area have stepped up conservation efforts over the last several years.

Sept. 8, 2022: Drought- and Heat-Stressed Berkeley Trees Need Water

As a crushing heat wave continued in the Bay Area, residents were advised to not only drink water themselves, but give their trees a drink as well.

Drought-stressed trees in the Bay Area suffered even more because of the scorching temperatures, said arborist Darya Barar of East Bay-based HortScience Bartlett Consulting.

Trees' immune systems are more susceptible to pests and disease with less water. Some species, like the coast redwood, have seen an "insanely steep" decline over the last 10 years due to the drought, the arborist said.

Sept. 20, 2022: Pass Area Water Official On Drought: People Must Know Seriousness

Riverside County water suppliers told the Board of Supervisors that conservation efforts are aiding the region in weathering the current severe drought, but their future ability to meet demand will depend on new infrastructure and changes in consumption habits.

"As the watersheds dry up in the Southwest, we need to be concerned about some things," Beaumont-Cherry Valley Water District Manager Dan Jaggers told the board during a presentation on the drought emergency. "As the drought continues, we will begin to have further restrictions. People need to know how serious this is."

# # #

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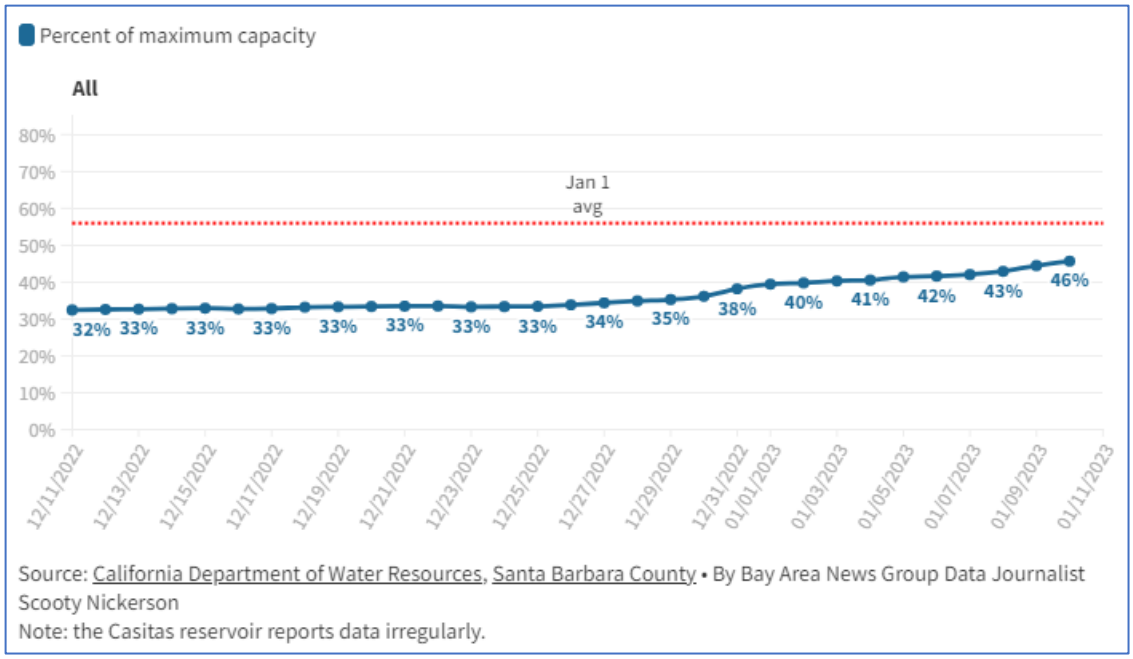
California storms: Reservoirs are filling quickly, boosting water supplies after years of drought
Some Bay Area reservoirs are 100% full, as Oroville rises 97 feet
Mercury News | January 11, 2023 | Paul Rogers

Almaden Reservoir in San Jose, Calif. spills Tuesday, Jan. 10, 2023, after filling to capacity during the latest storms. (Karl Mondon/Bay Area News Group)

Across the Bay Area and California, the past two weeks of soaking storms have brought mudslides, floods and power outages. They've also brought something not seen in years — billions of gallons of water rushing into reservoirs, renewing hopes that the state's relentless drought may come to an end this spring.

Six atmospheric river storms since the end of December have dumped half a year's worth of rain on San Francisco, Oakland, Sacramento and other Northern California cities in two weeks. The ferocious weather has saturated soils and bolstered runoff while also smothering the Sierra Nevada in snow, leaving the statewide snowpack Wednesday at a breathtaking 226% of its historical average and setting up reservoirs to receive more water when it melts later this spring.

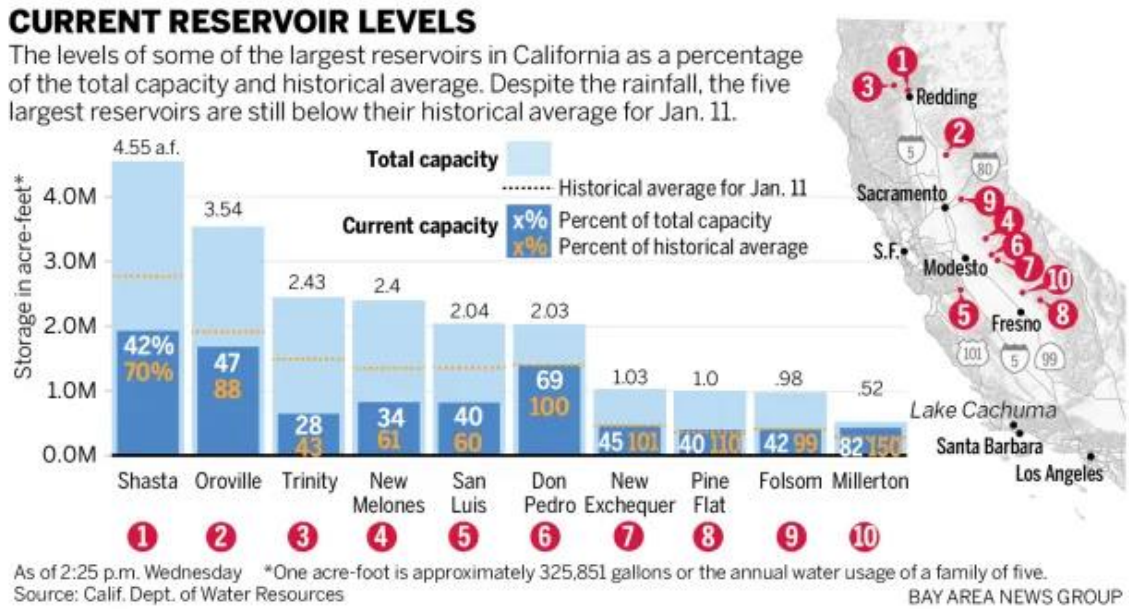
"There's no getting around it. This is great for reservoir storage," said Jeffrey Mount, a professor emeritus at UC Davis and senior fellow at the Public Policy Institute of California's water center. "It will clearly help the drought. We are likely to have full reservoirs this spring because there's such a huge snowpack."



Since Dec. 1, California's 154 largest reservoirs have gone from 67% of their historical average capacity to 84%, adding roughly 4.7 million acre feet of water in six weeks — or enough for the annual consumption of 23 million people.

Shasta, the state's largest reservoir at 35 miles long, has risen 37 feet since Dec. 1. The second largest, Oroville, in Butte County, has risen 97 feet, barely a year after state officials shut off the hydroelectric turbines in its dam for the first time in its 50-year history because of extremely low water levels.

"We're all ecstatic," said Lesley Nickelson, owner of Oroville Cycle, a store that sells boating and motorcycle equipment a few miles from Oroville Dam. "The marina has been way down at the bottom of a dirt hill for the past few years. People haven't been going out on the lake. Now the boat ramps are underwater again. People are going back."



The turnaround in some areas is stunning. On Monday, Lake Cachuma, the largest reservoir in Santa Barbara County, was 37% full. By Wednesday, following a pounding atmospheric river storm, it was 80% full.

Some reservoirs, such as Folsom northeast of Sacramento or Millerton, near Fresno, have risen so fast that their operators are releasing water to free up space and reduce flood risk for homes and businesses downstream.

“When there is storm after storm, we’re trying to make sure we are ready and prepared,” said Kristin White, Central Valley Operations director for the U.S. Bureau of Reclamation, which operates Folsom and Millerton.

To be sure, many of California’s biggest reservoirs are steadily rising but are still a long way from being full. On Wednesday, Shasta, near Redding, was 42% full, up from 31% on Dec. 1 but still only 70% of its historic average for the date. Oroville was 47% full Wednesday, up from 27% on Dec. 1 and now at 88% of its historical average.

Last year, a very wet December gave way to the driest January, February and March in a century, drawing the state back into drought after raising people’s hopes.

“We are certainly tracking better than last year,” said Molly White, operations manager of the State Water Project. “So far so good. This winter is on a good trajectory. We’ll see what happens in the next few months.”

State and federal officials caution that unseasonably hot weather in the coming months could melt much of the snowpack, or strong high pressure ridges could block new storms.

“Last year the spigot turned off,” White said. “We need to be patient to see how the winter unfolds.”

This week, many smaller local reservoirs already had filled completely.

In Marin County, all seven reservoirs operated by the Marin Municipal Water District were 100% full for the first time in four years. Loch Lomond Reservoir near Ben Lomond in the Santa Cruz Mountains, which provides water for nearly 100,000 people in Santa Cruz, began spilling Sunday.

The seven reservoirs operated by the East Bay Municipal Utility District were 84% full Wednesday and rising. All three agencies said they do not expect to impose water restrictions or fines this summer.

“This is a relief. We have been waiting for these kind of storms for years now,” said Nelsy Rodriguez, a spokeswoman for East Bay MUD, which serves 1.4 million people in Alameda and Contra Costa counties. “It’s fantastic news after the last few years of non-stop bad news.”

In Silicon Valley, four of the 10 reservoirs operated by the Santa Clara Valley Water District are at or near 100% full — Almaden, Coyote, Chesbro and Uvas. But the district’s entire system is only 51% full because its largest reservoir, Anderson, near Morgan Hill, was ordered drained in 2020 by federal dam safety officials to complete a $1.2 billion earthquake safety project.

“We’re seeing a big boost to the reservoirs,” said Matt Keller, a district spokesman. “But the fact that Anderson is down is a real issue obviously for our local water supply. We are relying a lot on groundwater and imported water.”

As the climate continues to warm, scientists say more severe dry periods, followed by intense wet years, are becoming the norm. Eight of the past 11 years in California have been drought years. A study last year from Columbia University found that the last 22 years were the driest 22-year period in the American West in 2,000 years.

California must do a better job of capturing water in wet years to reduce the impacts of dry years on cities, farms, fish and wildlife, experts say.

“We have shifted into a pattern where we have to be much more careful about our use of water,” Mount said. “We need to do more to sock away water in the wet years.”

The state should build more stormwater capture projects, as Los Angeles is doing, fund more projects to flood fields and orchards to recharge groundwater, and construct more off-stream reservoirs, Mount said.

Tim Quinn, a former water fellow at Stanford University who also ran the Metropolitan Water District of Southern California, agreed.

“We need to build it into our minds that we live in a state that is in a continual state of drought, punctuated by occasional very wet periods,” Quinn said. “How do we take advantage of the wet years?”

# # #

Latest Storms Are Filling Reservoirs, But Most Remain Below Capacity
Bay City News | January 11, 2023 | Eli Walsh


Uvas Reservoir west of Morgan Hill. File Photo by Tarmo Hannula

Many of California's water reservoirs have been at least partially replenished by the winter storms that have doused Northern California in recent weeks, according to state and local water data.

Most of the state's largest reservoirs, including Lake Oroville, the San Luis Reservoir and Lake Sonoma remain below their historical averages for early January, sitting at around 40 percent of their total capacity.

Those levels are up significantly from one month ago, however, when many reservoirs sat at between 20 and 30 percent of their capacities, according to data from the California Department of Water Resources.

Statewide, California's reservoir storage is at roughly 78 percent of its annual average for Jan. 8, according to the most recent data.

“While these storms have been great, we still, from a water supply standpoint, (are) below average and we'd like to see that storage picture improved,” John Yarbrough, assistant deputy director of the State Water Project, said Monday in a briefing on the state's weather forecasts and water supply.

But while the larger reservoirs remain below their historical averages, the recent storms have pushed some smaller reservoirs in the Bay Area beyond their standard capacities.

The Almaden Reservoir, Uvas Reservoir and Coyote Lake, all in Santa Clara County, are all above 100 percent of their respective capacities, according to Santa Clara Valley Water.

The Lexington Reservoir and Chesbro Reservoir are also above 75 percent of their capacities. The elevations of all five reservoirs have increased by at least 10 feet over the last two weeks.

Water Resources Director Karla Nemeth said Monday that even with all the rain in Northern California over the last two weeks, state water officials won't know its effect on drought conditions until later this year. For now, the state remains under a drought emergency designation.

“As our traditionally wet season progresses and we have a better understanding of what's going to happen with all of that snowpack and we have a better understanding of what's happening in different parts of the state relative to water supply availability, that's how we'll start to emerge out of a drought emergency,” she said.

# # #

What Will It Take To Get California Completely Out of Drought?
Newsweek | January 10, 2023 | Jess Thomson

After two weeks of storms that have flooded thousands of homes and caused millions of dollars of destruction, you would think that California's drought woes would have been washed away.

Important reservoirs have seen huge rises in their water levels, and areas of "extreme drought" have disappeared following the deluges, with more wet weather set to hit the state this week.

But California's drought troubles aren't over yet, experts warn, as the storms may have brought too much rain at once, not enough snow that will melt into reservoirs in spring, and don't make up for the fact the past three years have been exceptionally dry.

'A Really Big Hole to Fill'

"The recent rains are very important in helping to prevent another dry year," Richard G. Luthy, a professor of civil and environmental engineering and water infrastructure expert at Stanford University, told Newsweek. "2020, 21 and 22 were exceptionally dry years. In 2022, Jan, Feb and Mar, normally wet months, were the driest since records were kept in the late 1800s."

"Lake Oroville and Shasta, the two biggest reservoirs, are still below average for this time of year. We have a really big hole to fill from three drought years in a row."

Drought-ridden riverbed beneath New Melones Bridge in California. The state has experienced drought for years, but the rainfall this week has replenished some groundwater. ISTOCK / GETTY IMAGES PLUS

It will take a lot more rain to refill these surface reservoirs, let alone replenish the groundwater water stores.

But Jacob Petersen-Perlman, a water resources geography expert and assistant professor at East Carolina University, told Newsweek it's hard to say exactly how much rain would be needed due to the large number of variables involved.

"It's important to remember that timing and type of precipitation (rain vs. snow) is crucial for staying out of drought," Petersen-Perlman said. "Timing also matters—all the rain at once means that much of it will run off into the ocean instead of filling California's reservoirs. Second, if it continues to rain like it has been raining in California but not enough snow falls in the Sierras, drought may still persist."

'Too Much, Too Fast'

Petersen-Perlman said that if temperatures warm up too fast, much of the snowpack will melt too quickly and maintaining river flows for the summer will become much more difficult. Additionally, if the rains come too quickly and inconsistently, they may not refill California's aquifers sufficiently to relieve groundwater drought.

Water flows down the spillway at Nicasio Reservoir after days of rain have brought the reservoir to near capacity on January 9, 2023, in Nicasio, California. JUSTIN SULLIVAN/GETTY IMAGES

"Surface water levels are only part of the picture—groundwater levels will likely still remain chronically low, because (rain or no rain) we deplete more groundwater than is replenished," Aakash Ahamed, a hydrologist and co-founder of the Water Data Lab, told Newsweek.

"Over the last 25 years, we have lost more than 150 km3 of groundwater from California, which would take many many years of rain to replace, even if there were no consumptive use for municipal or agricultural purposes."

"Emptying underground groundwater reservoirs show the bigger picture, and we'd need 150 MAF [million acre-foot] of water (3x total storage capacity of 50MAF) to replenish them—that's unlikely to happen anytime soon because we pump groundwater faster than it replenishes every year," Rich Pauloo, a hydrogeologist and co-founder of the Water Data Lab, told Newsweek. "It's a huge problem, and we'll run out of groundwater in 100-400 years at business as usual rate depending on the location."

In a normal year California gets around 200 MAF of rain and snow, and it captures about 25% of this in surface reservoirs (50MAF combined capacity), Pauloo said.

"This year, statewide, currently we're 134% of normal for this time of year, but only 53% of normal for the full water year ending September 30, 2022 (we can still have dry Feb-May)," Pauloo said. "Our best hydro climate models still can't see more than a few weeks out—drought prediction remains an intractable scientific challenge. Surface reservoirs are at 78% average levels. Groundwater reservoirs are around 10% of normal across the state."

Despite the large amount of rain needed, the current rainfall can be used strategically to ensure maximum groundwater replenishment.

"One opportunity to address this problem is through managed aquifer recharge—diverting surface water to replenish groundwater when abundant surface reserves are available (like now)," Ahamed said.

Wettest Ever Stretch

December 26 to January 4 is now the record holder for the wettest 10-day stretch ever in San Francisco, and on December 31, 5.46 inches of rain fell in a single day in San Francisco.

"Nearly all of California has seen much above average rainfall totals over the past several weeks, with totals 400-600% above average values. This has resulted in nearly saturated soils and increasingly high river levels," said the National Weather Service in a statement on January 10.

This has helped bring down drought levels. U.S. Drought Monitor data shows the "exceptional drought" classification that covered 7 percent of the state as of December 27 has completely disappeared in the past fortnight.

Additionally, 2.07 percent of California is not classified as being under drought conditions, with some small slivers of "abnormally dry" land present in Del Norte County on the Oregon border, and Imperial County and Riverside County in the south.

On October 4, 2022, only 0.23 percent of the state was classified as "abnormally dry" rather than under the influence of drought. And more rain is forecast for the rest of the week across California.

'We Need More Big Storms'

"The hits keep coming in CA," tweeted the National Weather Service. "The next and most potent storm of the series will bring yet another round of heavy rain on already flooded rivers & saturated soils, high winds that may topple trees/power lines, and heavy snow on top of an enormous snowpack."

However, the outlook for the rest of the 2023 wet season is harder to predict: it might not rain as much as it has for months, putting the reservoirs and groundwater levels at risk of drying out again.

"We are hopeful that the reservoirs will be full at the end of this season, we just need several more big storms," Luthy said. "But it's hard to predict several months into the future. After a wet December in 2021, spring 2022 was a big disappointment."

# # #

Here's where California reservoirs stand after atmospheric river storms this week
San Francisco Chronicle | January 6, 2023 | Jack Lee

House boats float on Lake Oroville in June 2022. The reservoir's water storage volume increased by 13% after recent rains. Carlos Avila Gonzalez, Staff Photographer / The Chronicle

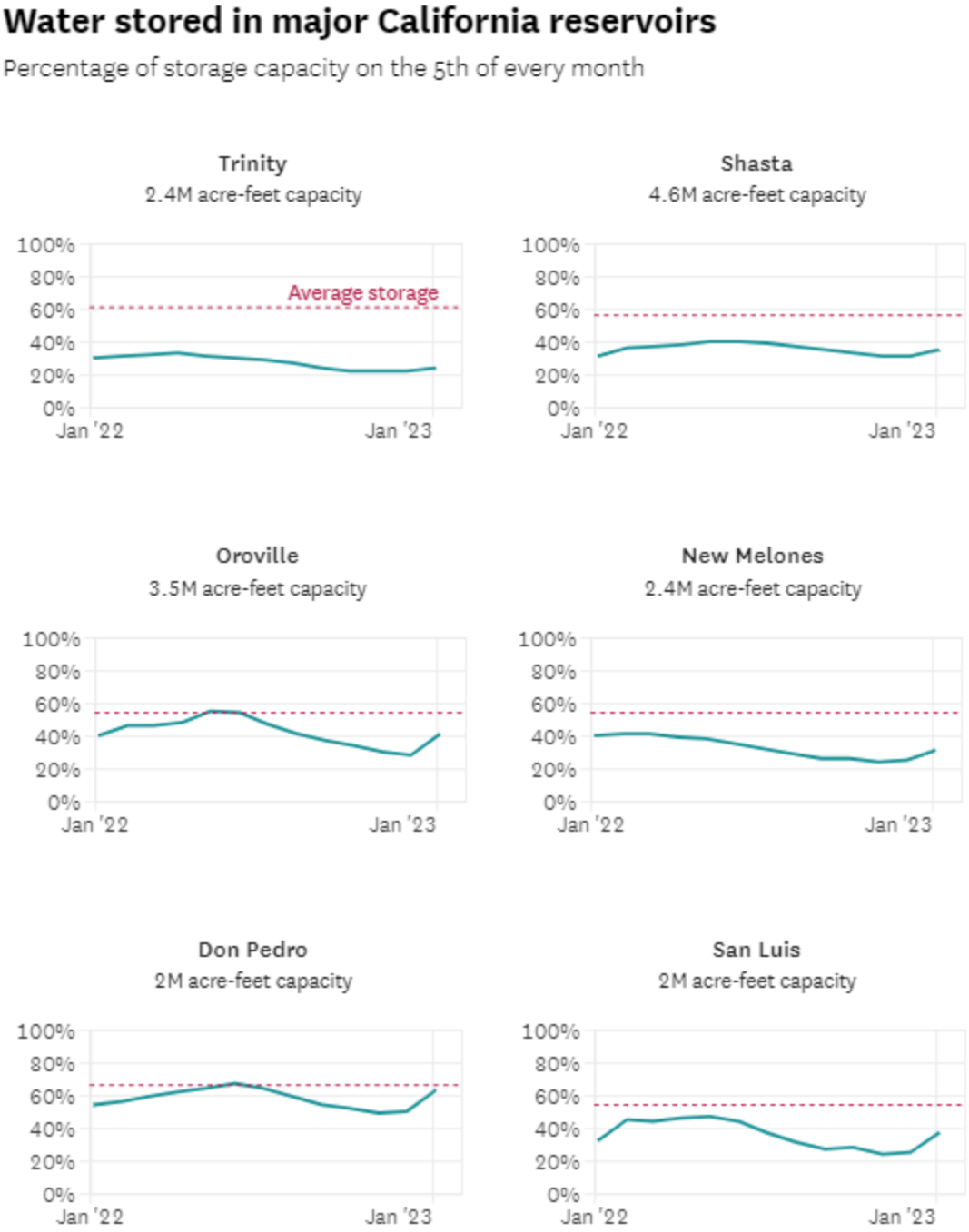
Heavy rains and strong winds have torn through the Bay Area, as storms fueled by an atmospheric river sweep across California. Data shows storage levels at the state's major reservoirs have made substantial gains due to recent downpours.

Statewide reservoir storage is up to 78% of average for this time of year, as of Jan. 5. By comparison, about a month ago, California's reservoirs across the state were 68% of average.

While the state's largest reservoirs are still below historical averages, all increased over the past month. Lake Shasta, the state's largest reservoir by storage volume, rose from 31% to 35% of its total capacity of 4.5 million acre-feet. One acre-foot is the equivalent of one acre of land — about three quarters the size of an average football field — covered in one foot of water, or 325,851 gallons.

Lake Oroville jumped from 28% to 41% of its total capacity of 3.5 million acre-feet during the same period.

Despite significant recent rainfall, one week of storms isn't enough to dramatically improve California's water supplies, said Jeanine Jones, drought manager for the California Department of Water Resources.



One acre-foot is equivalent to 325,851 gallons. Average storage is based on data from 1991 to 2020.
Chart: Jack Lee and Yuri Avila / The Chronicle · Source: California Data Exchange Center

“We need to see sustained accumulation of precipitation throughout the season,” Jones said. “It's great that we're having some storms and getting precip, but we need that to continue.”

California’s major reservoirs are still far below their total capacity, but that’s partly intentional this time of year.

“We're in the flood season and that means that reservoirs have to hold down their elevations,” Jones said. “They won't start storing water for water supply until the March, April timeframe, when the flood control requirements come off.”

Flood control requirements keep reservoirs well below their total capacity to leave space for precipitation during California’s wet season, between November and March, when the state typically receives about half of its yearly precipitation. Three more atmospheric river storms are expected to produce more rain in Northern California over the next week. But there aren’t concerns that dams will spill over, Jones said.

Another factor is the ongoing drought, which has left extra room in some of California’s major reservoirs, said Sharon Tapia, Division Manager with the California Department of Water Resources Division of the Safety of Dams.

“Due to the drought, most major reservoirs remain below their historical average, with ample storage for continued runoff,” Tapia said. “Smaller reservoirs nearing capacity may release water at this stage under flood regulation storage guidelines from the U.S. Army Corps of Engineers.”

Some reservoirs in Central California, which have seen a lot of precipitation this water year, are not only close to historical averages — a few even have more water than normal. Folsom Lake, for example, is at 128% of its historical average for Jan. 5. But it still is only holding 53% of its total capacity of 977,000 acre-feet.

“Right now, we still have lots of capacity in the system to manage floods,” Jones said. “If it were to rain for a month straight, we'd be in a different situation, certainly. But all we can say right now is that we know that the next week, week and a half or so is going to be wet.”

# # #

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California's Snowpack Is High Above Average—but Its Drought Is Far From Over

While extreme storms have boosted the state's snowpack, they've also caused destructive flooding

Daily Correspondent | January 6, 2023 | Sarah Kuta

California Department of Water Resources officials prepare to measure the snowpack at Phillips Station in El Dorado County, California, on Tuesday. Kenneth James / California Department of Water Resources

California's snowpack is off to a good start this winter, inspiring cautious optimism that the state may get some respite from its extreme drought.

After the state's first formal snow survey on Tuesday in the Sierra Nevada, officials announced that the statewide snowpack is measuring 174 percent of the historical average for this time of year. That's the third-largest snowpack in the past 40 years, trailing only 1983 and 2011.

Officials keep a close eye on snowpack because, when all that snow melts in the spring, it will help fill California's parched reservoirs and underground aquifers. The Golden State has already experienced three straight years of drought, and forecasters expect another hot, dry year in 2023.

Today, most of the state is in "severe" or "extreme" drought, as rated by the U.S. Drought Monitor. Water levels are also down in many of California's reservoirs: Lake Oroville is 41 percent full and Lake Shasta is 35 percent full, per the California Department of Water Resources (DWR). Groundwater, which accounts for 60 percent of the state's annual water

supply in drought years, is also hurting: 64 percent of the state's wells are measuring below normal levels, per the DWR.

Though this first snowpack measurement was promising, officials warn that conditions could evolve for the worse over the three remaining months of the snow season. And they have good reason to be cautious: Last January, statewide snowpack levels were 160 percent of the historical average. But then the state experienced its three driest months ever recorded. By April, the snowpack had dropped to just 38 percent of average, per the DWR.

"While we see a terrific snowpack—and that in and of itself may be an opportunity to breathe a sigh of relief—we are by no means out of the woods when it comes to drought," said Karla Nemeth, the DWR director, at the snow measurement ceremony Tuesday in El Dorado County, as reported by the Associated Press' Adam Beam.

Strong storms in December helped boost the state's snowpack levels. However, those same storms are triggering dangerous floods in other parts of California.

On New Year's Eve, heavy rains and strong winds from a so-called atmospheric river storm downed power lines, flooded roads and damaged levees in Sacramento County, reports the Sacramento Bee's Michael McGough. At least six people have died as a result of the storms.

In San Francisco, floodwater submerged cars and poured into businesses, reports ABC7 News' Cornell Barnard. Many of the city's 25,000 storm drains became clogged with debris.

And with more potentially destructive storms in the forecast, California's governor, Gavin Newsom, declared a state of emergency on Wednesday.

Heavy rains flooded Northern California in late December and early January. Justin Sullivan via Getty Images

"We anticipate that this may be one of the most challenging and impactful series of storms to touch down in California in the last five years," said Nancy Ward, who directs the California Governor's Office of Emergency Services, at a news conference this week, as reported by FOX40's Sergio Robles.

Officials say these are actually normal conditions for this time of year, historically. Winter storms have simply been absent in recent years because of drought, reports the Los Angeles Times' Ian James.

Still, they warn that human-caused climate change is likely to make extreme storms like these more common—and that even this rain is not enough to reverse the region's drought.

"Climate change is bringing never-before-seen extremes—from record dry periods with temperatures reaching new heights to intense storms that produce rivers of water in short periods of time," says Deven Upadhyay, executive officer and assistant general manager of the Metropolitan Water District of Southern California, to the Los Angeles Times. "We must learn how to manage through these extremes."

# # #

Look at how much California's snowpack has grown in the last 12 days. Is the drought over yet?

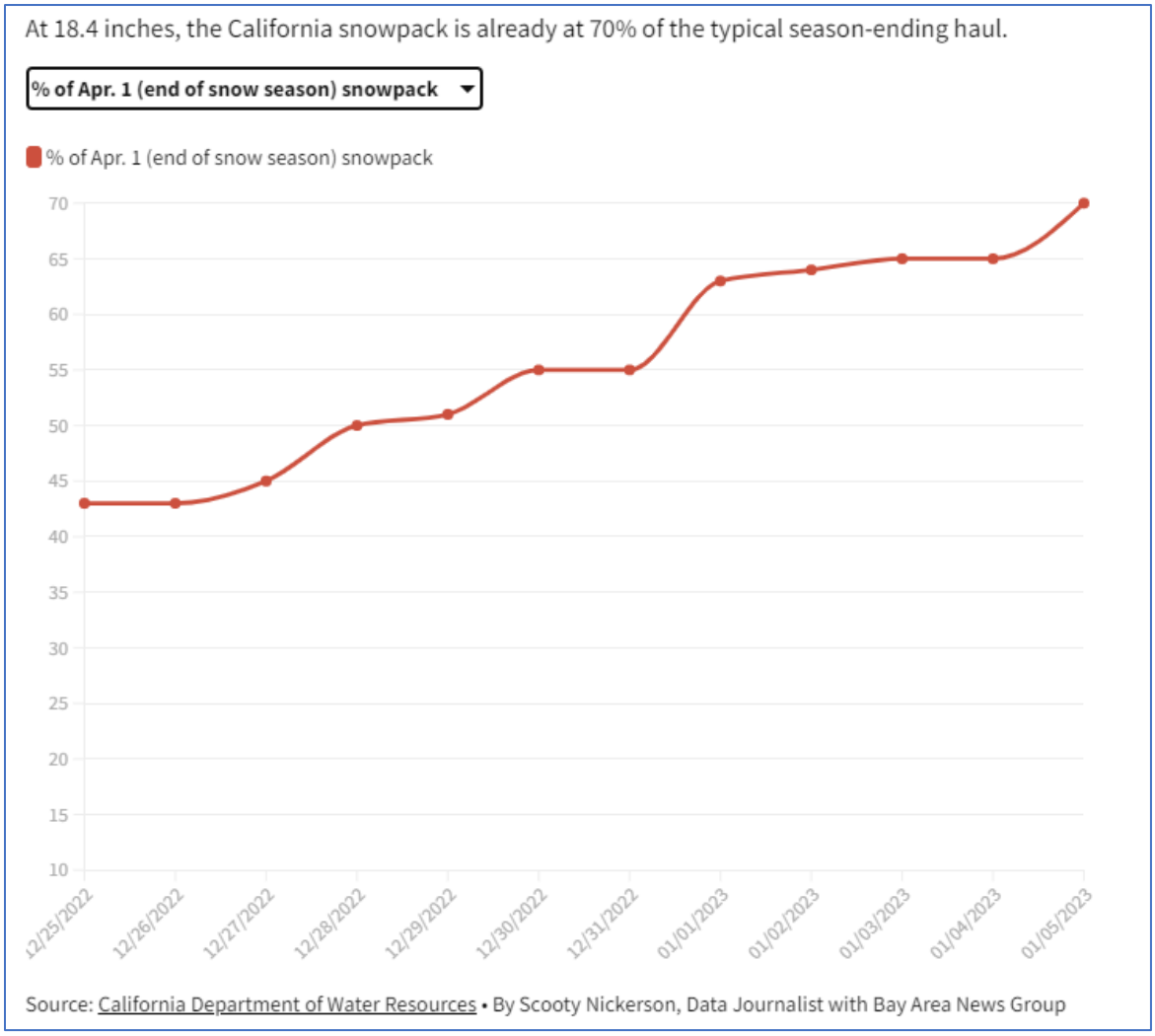
The National Weather Service forecasts that the current slate of storms will dump up to 20 inches of additional snow on the peaks of the Tahoe basin.

San Jose Mercury News | January 5, 2023 | Scooty Nickerson

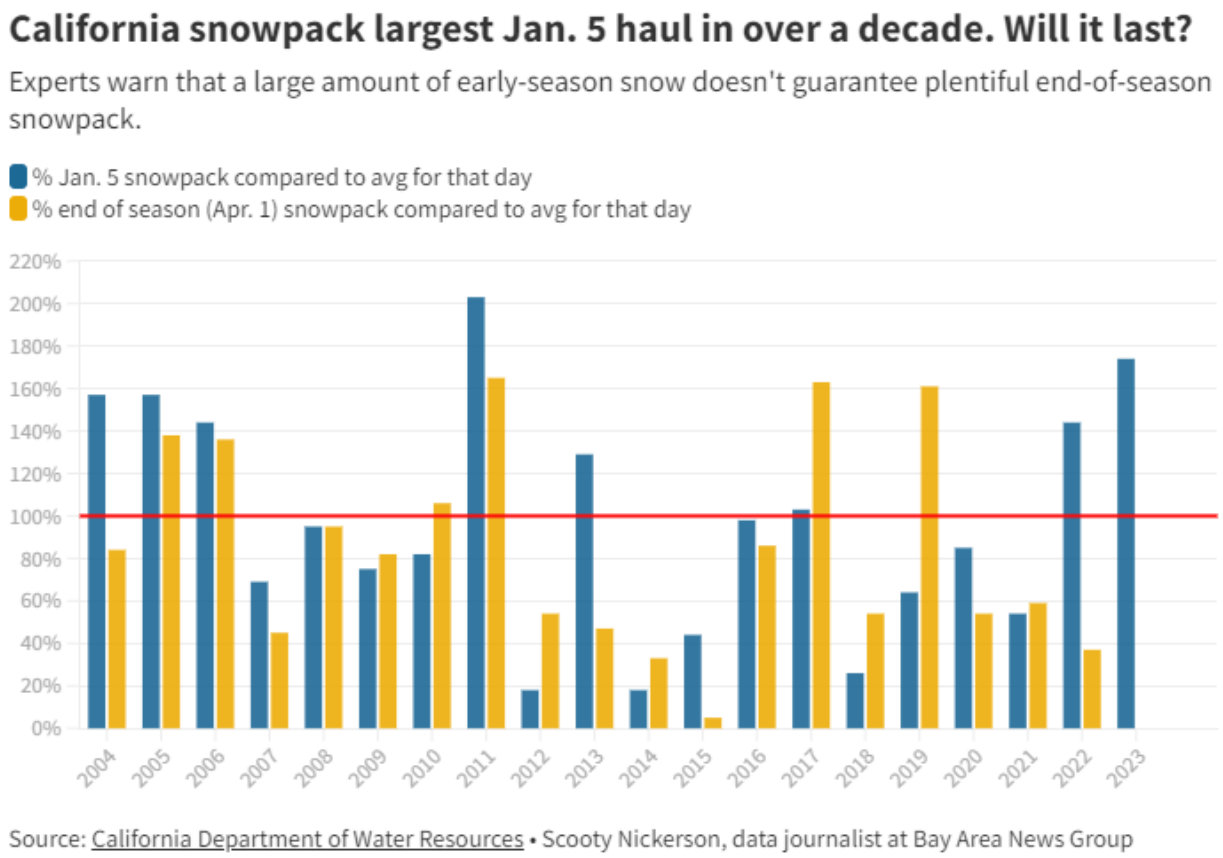
The Golden State's snowpack has grown meteorically in the last weeks, with more snow expected to blanket the California Sierra in the coming days.

On Thursday the state's snowpack registered at 18.4 inches, up from just 11.3 inches at Christmas. That's about 70% of the snowpack that we usually accumulate by the end of the snowy season on April 1. While that doesn't sound like a lot of snow — winter storms can dump two feet of snow at a time — the number is capturing something called the "snow water equivalent." That's the depth of water that would cover the ground if all the snow melted.

And it's likely to go up again this coming week. The National Weather Service forecasts that the ongoing slate of storms slamming the state will dump up to 20 inches of fresh snow on the Tahoe Basin's largest peaks by Friday morning.



But what does this all mean for the California drought? Looking at past year's data, it's clear that early downpours do not always lead to bountiful end-of-season snowpacks. Of the seven years in the last two decades where the state registered above average snowpack on Jan. 5, only four ended the snowy season with above average snow hauls.



And many of the state's reservoirs are still well below their typical levels for this time of year. Without consistent precipitation in the coming months, we may once again find ourselves gripped by drought by next summer.

But this season is already an outlier. On Thursday, California had the second largest snowpack for this time of year in the last two decades. Only 2007 beat this year's haul. And with so much additional snow in the forecast, this year may yet catch up.

# # #

Miracle or mirage? Atmospheric rivers end California drought year with heavy snow and rain

LA Times | December 30, 2022 | Hayley Smith

A small group of people are doused by water as waves crash against the shore
People react as waves crash against the shore at Fort Point National Historic Site in San Francisco.(Stephen Lam / San Francisco Chronicle via Associated Press)

After the driest start to any year on record, California will end 2022 with snow-capped mountains, soaked roadways and — in some places — flood warnings.

The soggy end to an otherwise bone-dry year came as something of a surprise. Only weeks earlier, officials sounded the alarm about a rare third appearance of La Niña — a climate pattern in the tropical Pacific that is often associated with dry conditions in the state. On Thursday, skiers in Mammoth enjoyed some of the deepest snow in the nation, while in Los Angeles, a steady drizzle signaled stronger storms to come.

Officials said the parade of atmospheric rivers dousing the state will probably continue in the days ahead, providing a glimmer of optimism after a year marked by water restrictions, drying wells and perilous lows on the Colorado River. But though California's wet season has defied expectations so far, the pattern must persist to truly undo several years of significant rain deficits.

“The moisture that we’re getting now is a big help, but we need more — a lot more — to really put a major dent in the drought,” said Richard Heim, a meteorologist with the National Centers for Environmental Information and one of the authors of the U.S. Drought Monitor.

Still, the damp December has come as a welcome change. While the drought monitor shows nearly 81% of the state under severe, extreme or exceptional drought, that’s a notable improvement from three months ago, when about 94% of the state was classified in the three worst categories. Heim said next Thursday’s update should show even more gains.

“When we’re dealing with drought in the West, in some regards we have to take it slow in showing improvement because reservoirs take forever to refill and you really need a good mountain snowpack,” he said. “And we don’t know if we have a good mountain snowpack for the snow season until somewhere around April 1.”

State climatologist Mike Anderson of the Department of Water Resources said the storms could signal the decay of La Niña, which arrived as anticipated but started to weaken around the winter solstice on Dec. 21, when Earth stopped tilting away from the sun in the Northern Hemisphere. Around the same time, regional high-pressure systems weakened, which allowed some of the storms to push through, he said.

“We’re kind of seeing things that are more in tune with what we would expect climatologically, and lot of it has to do with that high pressure yielding in its strength,” Anderson said. “In previous winters, it hung in there strong and prevented storms from making their way into California.”

The late December storms have also delivered some improvements when it comes to the state’s snowpack and reservoirs. California’s snow water equivalent, or the amount of water contained in the Sierra Nevada snowpack, was at 156% of normal for the date on Thursday.

The state's two largest reservoirs also saw gains, with storage in Lake Shasta at 1.47 million acre-feet, up from 1.4 million at the start of December, and Lake Oroville at 1.12 million acre-feet, up from 965,000 at the start of December, Anderson said.

But he cautioned that more moisture is needed. Though high for the date, the snow water equivalent is still only 51% of its April 1 average, meaning that if no more rain and snow were to fall, the wet season would end with about half of what's needed. Similarly, though Shasta and Oroville have improved, both remain well below normal for the time of year.

"It just has to sustain itself, because we still have two more of the wettest months of the year to go, and we really need them to be wet as well, where this year they were record dry," Anderson said.

But though the storms have brought welcome moisture, they have also created instances of havoc across the state. Winter hazards, including snow, ice and fog, have already prompted some road closures in portions of Central and Northern California, and travel could be "near impossible" in some places through the weekend, the National Weather Service said.

Hannah Chandler-Cooley, a meteorologist with the weather service in Sacramento, said the atmospheric rivers are coming from the tropics, not the Arctic, so they are warm systems that could bring rain instead of snow to elevations as high as 7,000 feet. Flood watches and warnings have been issued in several areas, including Lake Tahoe, Hanford and Sacramento, where several inches of rain are expected to fall.

Officials in the region are particularly concerned about flooding in communities along the Cosumnes, Mokelumne and Sacramento rivers, as well as potential urban flooding in areas with poor drainage and low-lying areas and roadways, she said.

"There will be small towns and homes and roads and farms that could be impacted, but it will be a bit more localized to just those few river points, and not all of the river systems in Northern California," she said.

Despite the potential hazards, the storms are undoubtedly beneficial for the parched state. The latest outlook from the National Oceanic and Atmospheric Administration's Climate Prediction Center now shows an equal chance of above- or below-average precipitation in Northern California in January, but it's not a guarantee.

Heim recalled that 2021 saw a similarly wet December, which was then followed by California's driest-ever January through March on record in 2022. He feared a similar pattern could play out next year.

"A few months of really wet weather, well, it's not going to make much of a dent in these deficits that have accumulated over the years and are reflected in the low reservoirs," Heim said. He

added that Lake Mead, the largest reservoir on the Colorado River, has more than 20 years of precipitation deficits to make up for.

But such dire conditions seemed a world away from the scene at Mammoth Mountain on Thursday, where officials were bracing for up to 5 feet of snow on top of the 2 to 3 feet received earlier this week.

“This has been an incredible start to the season here at Mammoth,” Lauren Burke, the resort’s spokesperson, told The Times. “It is a true winter wonderland up here.”

# # #

Times staff writer Grace Toohey contributed to this report.

California's drought has led to a groundwater overdraft in the San Joaquin Valley
CBS | January 12, 2023 | Evelyn Taft

Faced with ongoing drought, farmers in California have sought ways to find a precious natural resource: water.

In the San Joaquin Valley, an area in central California known as the breadbasket of the world, people have long bolstered the water supply by pumping from underground basins. But experts say people have been overdrafting groundwater for years.

Agriculture is a booming industry in California, employing around 420,000 people across the state and supplying more than 400 different types of crops to consumers around the world. But with limited access to water, and with rain and snow hard to come by, reservoir levels are at record lows. Rivers have even dried up.

While storms have inundated California with moisture in recent days and there has been an improvement in drought conditions, more than 97% of California was experiencing at least moderate drought as of last week, according to the U.S. Drought Monitor.

Amid the challenges, people have resorted to groundwater pumping, which accounts for about 10 % of water use in the San Joaquin Valley, which is home to acres of barren land.

Derick Grabow, a sixth-generation well driller, said usable water used to be just 60 to 100 feet beneath the surface. But that has since changed.

"For good water," he said, "we're going about 1,000 to 1,400 feet deep average for us."

Groundwater accumulates in subterranean bodies of porous rock or sediment called aquifers. But generations of pumping have left them significantly depleted. Nearly two-thirds of California's monitoring wells are below normal levels.

The process went unregulated until the passage of a 2014 state law that aims to end overdrafting by the 2040s.

Grabow said that now, amid the ongoing drought, the wait to get a well is about a year, if not longer. Grabow said his wells go for about half a million dollars each.

Grabow said drilling is necessary. "And, you know what ... what sucks the most is, of course, the farmer, the dairyman, the customer is paying for it."

Jesus Benitez, who has been living in the city of Visalia for 14 years, said the domestic well that supplies water to his property only works sometimes. That's because a nearby farm's industrial pump draws water from the same source.

As a result, Benitez said, his trees are drying up. What was once his front lawn is now gone. At times, even self-care and household chores are a challenge.

"I had to tell my wife, you know, 'Hey, don't wash the clothes right now because they're pulling water,'" he said.

Over 1 million California residents are currently without safe drinking water, and the majority are low-income people of color, said Susana De Anda, executive director and co-founder of the California-based Community Water Center, which works to end the drinking water crisis.

She said groundwater pumping has led to rampant pollution, making some water unsafe for consumption.

"The Central Valley is beautiful," she said. "We grow food here. But we also use a lot of fertilizer, and that contributes to nitrate contamination. However, we don't just have nitrates. We have a variety of other contaminants. Just here in Mr. Benitez's home, he has nitrates and uranium."

Meanwhile, local water districts have started to limit groundwater pumping.

William Bourdeau, executive vice president of Harris Farms, one of the largest operations in the region, sits on the board of his water district, the largest in the country.

"I do feel strongly that we need to come together as a water community and work together to overcome these challenges," he said. "There's plenty of opportunity for all of us to succeed."

California's Department of Water Resources said the state could lose up to 10% of its water supplies over the next two decades.

According to one estimate, squeezed water access could force farmers in the San Joaquin Valley to take 500,000 acres of land out of production. And even with the recent rain, the groundwater supply in California may never fully recover.

# # #

Adapting to a Water-Scarce California
Public Policy Institute of California | January 9, 2023 | Ellen Hanak

With the arrival of a series of atmospheric rivers in recent weeks, drought-weary Californians are now confronting the weather whiplash that is a hallmark of our state's climate. Flooding, power outages, and downed trees are now dominating the news. It's a remarkable shift from the past few years, which saw the driest three-year period in the state's recorded history. And while it's tempting to think the drought is now over, it's not—and if anything, the recent shift in conditions highlights just how much Californians need to prepare for wetter wets and drier dries.

The past year was very important for California water. Water managers found ways to innovate and adapt. As a result, cities fared relatively well during this dry, hot year, thanks to years of investments in water conservation, water system interconnections, storage, and new supplies. Furthermore, the state responded more nimbly to dry wells and water supply threats in small, at-risk communities, and made earlier moves to reduce allocations where needed to protect other water users and environmental flows. And while the drought was undeniably hard on agriculture, California's farmers demonstrated the resilience they're known for.

But there's more work to be done. Water supplies are tight, and managers are preparing for a possible fourth year of drought. And perhaps most troubling, freshwater ecosystems have endured a deepening crisis that's further harmed the state's struggling fish and waterbirds.

At the PPIC Water Policy Center, we continue to conduct rigorous research to inform key debates about how to respond to the challenges of our changing climate. In 2022 our experts looked at:

Changing land uses in the San Joaquin Valley: It is now widely accepted that hundreds of thousands of acres of farmland in the San Joaquin Valley will need to come out of irrigated in production to reduce groundwater overdraft and meet the mandates of the Sustainable Groundwater Management Act (SGMA). The big question is: what are the best ways to support the valley's communities, economy, and environment as these agricultural lands are retired?

We released a trio of reports that examined this question from multiple angles, illuminating dust and air quality concerns (and best practices for containing dust), looking at water-limited cropping as an alternative to fallowing, and exploring solar development as a new—and possibly attractive—use for fallowed lands. We also released a pair of blog posts that explored using fallowed lands in the San Joaquin Valley for rangeland or habitat restoration.

Challenges for freshwater ecosystems: Freshwater ecosystems have been on life support for years. We've continued our work looking for solutions, and this year's report on storing water for the environment considers a potentially game-changing way of managing water to benefit freshwater ecosystems. We interviewed people doing fascinating work to preserve the state's fisheries, and looked at how water trading can be used to help ecosystems. And we interviewed one of the state's premier experts on river restoration.

Supporting California's agriculture: California's agriculture had a lot to contend with in 2022. Historic reductions in surface water deliveries have had major impacts in some farming regions, and drought also continued to stress the state's groundwater reserves. We released a policy brief that documented what drought has cost the sector, and then explored our findings in a well-attended event. We gave testimony about SGMA implementation in farming regions.

Accounting for where the water goes. California's water managers are now adjusting, in real time, to changes in hydrologic conditions that once would have been unthinkable, as we explain in this year's Priorities for California's Water report. Data will be key to these efforts, especially in critical watersheds like the Sacramento–San Joaquin Delta, which has been hit hard by the current drought. We tracked where the water went in the Delta watershed and suggested strategies to make the most of scarce supplies. And we looked at the links between water and energy, recognizing that savings in the energy sector will benefit water—and vice versa.

The path forward will demand flexibility and creativity. As Department of Water Resources director Karla Nemeth said at our fall conference in November, there is no silver bullet to fix California's water woes. What's needed, she said, "is like 'Everything, Everywhere, All at Once'"—multiple interlocking solutions that can be deployed swiftly as needed to protect people, agriculture, and the environment from the worst impacts of climate change.

We devote our work to exploring constructive solutions, and our success depends on you, our growing family of agency staff, community groups, environmental groups, growers, researchers, water managers, researchers, and others. Your time and interest in our work is vital. We couldn't do it without you!

Look to our weekly blog to keep you up to date on California's pressing water issues, and we wish you all a safe and prosperous 2023.

# # #

Here's What You Need To Know About Water Releases From Shasta Dam.

Some community members have expressed concerns that the Bureau of Reclamation may be releasing more water than necessary during recent precipitation events. Doing so, they worry, would reduce the amount of water being stored for next year's irrigation needs. Reclamation Area Manager Donald Bader says the irregular timing of water releases may be what's confusing the public.

Shasta Scout | January 9, 2023 | Annelise Pierce

Photo by Johannes Krupinski on Unsplash

Like much of California, Shasta County has received drenching storms over the past week.

That influx of precipitation means careful monitoring of the state's man-made water infrastructure which includes the Central Valley Project, a 400-mile-long network of dams, reservoirs, canals, and hydroelectric power plants that's central to managing California's water.

Major CVP Facilities

Dam and Reservoir	Storage Capacity (acre-feet)
Shasta Dam and Reservoir	4,552,000
Trinity Dam and Reservoir	2,448,000
Folsom Dam and Reservoir	977,000
New Melones Dam and Reservoir	2,420,000
Friant Dam and Reservoir	520,000
San Luis Dam and Reservoir	966,000 (Federal share)

A graph from the Bureau of Reclamation shows the storage capacity of major Central Valley Project facilities.

In Shasta County, the federal Bureau of Reclamation (“Reclamation”) began construction of the Central Valley Project’s keystone facility, Shasta Dam, in 1938.

The 652-foot high cement dam holds back water from the Sacramento, Pit, and McCloud Rivers that would otherwise flow unimpeded down the Sacramento River.

Storing water behind the Dam in the Shasta Reservoir allows federal officials to release this valuable resource only when the government determines it’s most needed.

That’s particularly important to users within the Anderson Cottonwood Irrigation District, or A.C.I.D., whose summer irrigation allocations come from Shasta Reservoir. Over the last week, some community members have used the A.C.I.D. Water Users Association Facebook group to express concerns about water releases from Shasta Dam since winter rains have started.

In response, Shasta Scout reached out to Donald Bader, Northern California Area Manager for Reclamation, which manages Shasta Dam. Here’s what we learned.

How Is Water From Behind Shasta Dam Being Used?

Bader says balancing competing demands for Shasta Dam water isn’t easy because of the number of federal and state laws and water contracts that regulate how Dam water is used and when and how it can be released.

Shasta Dam water releases serve multiple purposes, including managing flood risk, generating hydroelectric power, and providing access to water for environmental benefit and agricultural use.

“We got our contractual allocations,” Bader said, “But we’re also obligated to meet all the regulatory environmental needs. We got demands coming from all directions.”

How Much Water Is Released During Winter Months?

From November through February each year, state law requires Reclamation to manage Shasta Dam water in a way that supports the release of a minimum of 3,250 cubic feet per second (CFS) (average) daily into the Sacramento River. That daily minimum was set by California’s State Water Resources Board’s Order 90-5 in 1990. It’s intended to protect fish and wildlife downstream of the Dam.

Importantly, Order 90-5 dictates water releases not from Shasta Dam, but from the smaller Keswick Dam.

Water released from Shasta Dam flows into the Keswick Reservoir before reaching the 157-foot Keswick Dam nine miles downstream. Keswick serves as an”afterbay” dam, allowing water managers to regulate Shasta Dam water releases in a way that ensures a consistent flow of water downstream into the Sacramento River for environmental benefit.

“It’s really the only reason Keswick was built,” Bader explained, “to be a regulating reservoir. A lot of your big dams have the same setup.”

A.C.I.D. General Manager Jered Shipley describes Keswick’s regulatory effect this way:

“If you think of Shasta and Keswick as one big Dam . . . Keswick is the onramp to the freeway. . . . (the two reservoirs are) essentially one large reservoir with a regulating point.”

Notably, daily average water release rates from Shasta Dam may vary as long as releases from Keswick Dam remain constant at the 3,250 CFS required by law.

Date	Shasta	Keswick
1/6	1468	3341
1/5	1051	3335
1/4	1819	3330
1/3	2792	3342
1/2	2866	3338
1/1	2611	3335

A table generated by Shasta Scout shows comparison in water releases in CFS from Shasta Dam and Keswick Dam over the first 6 days of January. Data source: U.S. Geological Survey

Water Releases Are Measured By Speed, Not Volume

Those increases in power needs across the grid, said Berry, are what results in surges of water releases from the Dam. Those releases may flow much faster than the minimum average daily release of 3,250 CFS but they only occur for a relatively short period of time.

While Keswick Dam is releasing water at a constant 24-hour rate of 3,250 cubic feet per second, Shasta Dam is releasing water only intermittently but sometimes temporarily at much higher flow rates.

DATE / TIME PST	RES ELE FEET	STORAGE AF	OUTFLOW CFS	INFLOW CFS
01/08/2023 20:00	--	1,758,303	25	31,993
01/08/2023 21:00	942.79	1,760,866	25	31,041
01/08/2023 22:00	942.95	1,763,351	25	30,090
01/08/2023 23:00	943.14	1,766,336	25	36,152

Data from the California Department of Water Resource’s Data Exchange Center Shows inflows and outflows measured by flow rate out of Shasta Dam on January 8, 2023. Note that water is measured by the flow rate with which is was released from Shasta Dam, measured in cubit feet per second, during four releases throughout the day. The chart does not show how long the water was released at that flow rate, which would be necessary to determine the volume of water released from the Dam. Find Shasta Dam daily inflow and outflow water data here.

For community members trying to monitor water releases from the Shasta Reservoir, understanding how the two Dams release water at different times and flow rates to create a consistent volume of water moving downstream can create significant confusion. The occasional higher-flow-rate water releases from Shasta Dam can easily be misinterpreted as implying a greater total volume of water released over a 24-hour period.

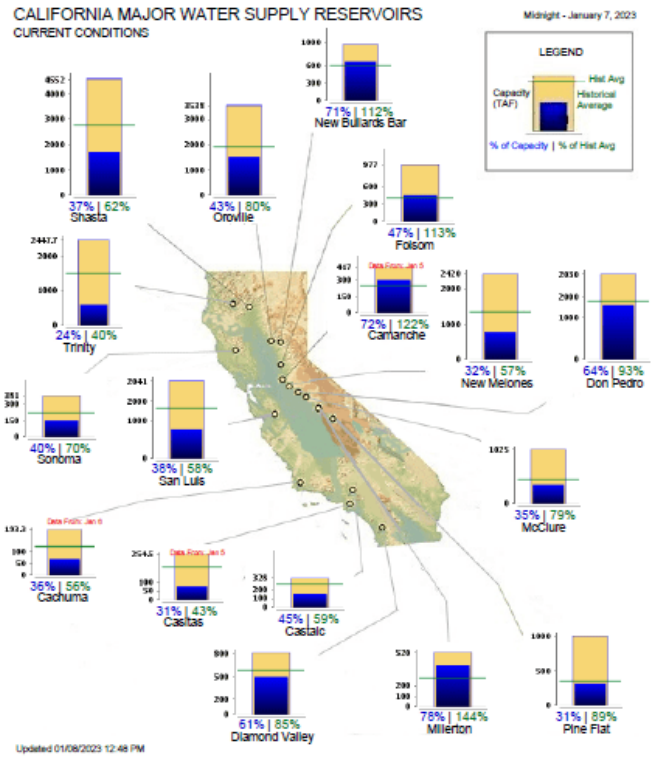
It's important to remember that cubic feet per second or CFS is a measurement of flow rate, not volume, which is why data from Reclamation showing fast CFS rates does not necessarily indicate high volumes of water released. The total volume of water released in a day is a function of both how quickly it is released and for how long. Keswick Dam's minimum daily water release, 3,250 CFS, equals a total daily water volume of 6446 acre-feet. An acre-foot is roughly the volume of water needed to cover a football field to a depth of one foot.

For those who've fished at Keswick Reservoir, Berry says, the differences in the speed and timing with which the two Dams release water can be seen in the dramatic changes in Keswick Reservoir levels.

"Sometimes you'll head out fishing and when you come back several hours later through the same channels there's huge rocks everywhere that were underwater when you started out," Berry explained. "They've turned off the valve at Shasta Dam but at Keswick the water is still releasing at a constant rate like it always does. And that drops the level of the Keswick Reservoir."

What about Water Releases For Flood Control?

As of January 7, Shasta Reservoir has risen to 37% of capacity, an increase of 3% just over the last week.



Source: California Department of Water Resources.

But it’s not until the rains raise Shasta Reservoir levels into the 70 – 75% percent of capacity range that Reclamation will institute flood operations, Bader said. Flood operations require Dam managers to work hand-in-hand with the Army Corp of Engineers, which manages flood control for California’s dams and rivers because careful timing of increased releases from both Dams is necessary to insure water releases protect those downstream, Bader said.

“We have a flood curve from the Army Corp of Engineers that we follow when we go into flood ops,” Bader said. “We’re managing the flow of water, timing it so it doesn’t increase flooding (too much) downstream.

Keswick Reservoir is primarily fed by releases from Shasta’s Reservoir, but also receives water from other sources. While no increased releases from Shasta Dam are planned, significant increases in side flow from those other sources, may result in higher water releases from Keswick over the next few days and weeks, Reclamation Public Affairs Officer Mary Lee Knecht said.

Those releases won’t change Reclamation’s intent to save as much water behind Shasta Dam as possible, for summer use, Bader said.

“Sometimes we have to release a little bit more on a day or two . . . (but) we’re saving every bit of water for storage that isn’t needed for that minimum release.”

# # #

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Can California's massive rain solve its historic drought?

Across the world, drought plagued places are experimenting with storm water technology to take advantage of downpours

Image without a caption

Washington Post | January 9, 2023 | Pranshu Verma

California could get 22 trillion gallons of rain in the coming days. But what does that mean for the state's drought?

In a perennial problem that even when California does get rain, much of it runs off into the ocean or is otherwise uncollected. But there's new storm water technology that could help change that, scientists say, as the decades-old discipline shifts to help water managers collect rainwater, purify it and store it for times of drought.

Much of the new technology is often referred to as "green infrastructure," and can be a more subtle way to collect rainwater off the roofs of houses or sidewalks, and have it sift through porous concrete or grassy fields into reservoirs for later use.

Still, to make a dent, it will require more government investment, technological advances and overcoming political obstacles, they said.

To learn more, The Washington Post talked with Andrew Fisher, a professor of hydrogeology at the University of California in Santa Cruz, and David Feldman, the director of the University of California Irvine's water institute.

The conversation has been edited for length and clarity.

What is storm water technology?

Fisher: It's kind of two pieces. In general, storm water management is, first and foremost, about mitigating the hazards, avoiding the nuisance, avoiding the flooding and avoiding the damage [that comes with storm rain].

But we know that storm water is also potentially a resource. So, another arm of storm water management is figuring out what to do with some of that water. How can we hold it back? How can we store it until we're able to use it later?

Why hasn't it solved California's droughts already?

Fisher: When climate changes, the statistics change. Most of the storm water infrastructure was built 20, 30, 40 years ago, and a lot of it was built based on old data. So [drainage pipes] that were designed for 10 year events, 20 year events, 30 year events are too small. A lot of our infrastructure that was built decades ago is undersized.

Feldman: California is planning to do an enormous amount of work with storm water capture and harvesting, but the actual implementation of these projects will take time. In many cases, it may take years.

Land has to be acquired, things need to be built, environmental assessment studies need to be undertaken, and probably most importantly, the public in the areas in which this water is being harvested, needs to be brought on board.

How is storm water technology adapting to solve droughts?

Feldman: Storm water harvesting is an extremely old technology. You could go back to ancient Israel, for example, or other parts of the Middle East, in which basically rainwater harvesting techniques were widely utilized.

So what's the new wrinkle? I would say it is this notion of green infrastructure — where you don't use a lot of concrete and build storage reservoirs and dams. Instead, you come up with more expedient, more sensible ways of using the natural environment such as parks, wetlands, swampy areas or ponds to intermittently store water.

But unless you're really looking for it, the technology may be hard to discern. You see parks that have wetlands that are sort of doubling as habitat for various forms of wildlife and being replenished by [and store] rain.

You'll also notice that neighborhoods increasingly have less impervious surfaces. Impervious surfaces are being replaced by grass and open fields and porous pavement to allow the water to regenerate groundwater basins for example. You're also seeing on tanks to store water, those sorts of things.

Fisher: Twenty years ago, 30, 40 years ago, storm water was really just thought about primarily as a nuisance. But because of the drought, and because of increased demand on groundwater, I would say there's a big change that's taking place.

One of these areas is in imaging the subsurface, and understanding better where our water is, and where there is space for storage. We need to use underground storage because you simply can't store enough storm water on the surface.

Will storm water technology end California's droughts?

Fisher: I would say no. Drought is highly variable. [And] California's climate swings between very wet and very dry conditions. Collecting storm water doesn't change any of those any of the things. But what storm water technology can do is be part of a solution.

Feldman: Storm water harvesting [is] a piece of a complex puzzle. It will not solve all of our problems, but it can solve an appreciable portion of our problems.

We might not want to use rainwater for drinking. However, that water can be treated to various degrees of reuse, at least in order to, for example, irrigate plants or irrigate landscaping.

# # #

Hetch Hetchy pipeline scheduled for maintenance in San Mateo County
Daily Journal | January 3, 2022 | Nicholas Mazzoni

Kids play on the Sawyer Camp Trail by the Crystal Springs Reservoir in San Mateo.

Beginning early January, the Hetch Hetchy watershed will close its pipelines for maintenance, leaving the county to consume what water is currently stored in the Crystal Springs and San Andreas reservoirs.

“Residents may notice a change in their water quality, or they may not, but nobody should have concerns,” Nicole Sandkulla, chief executive officer for Bay Area Water Supply and Conservation Agency, said.

The Hetch Hetchy pipeline, which provides water to more than 2.8 million Bay Area residents, will shut from Jan. 3 to March 8 to allow for annual maintenance improvements. The project is a part of the San Francisco Public Utilities Commission’s and BAWSCA’s $140 million project to repair, upgrade and rehabilitate a 19-mile stretch of the mountain tunnel, the Moccasin Powerhouse and Reservoir and the San Joaquin Pipeline that is in need of repairs.

Sandkulla said the project won’t impact customers’ water rates or service. The project will be funded by preexisting water rates, two-thirds of which BAWSCA is responsible for, and the projects are conducted during the winter because demand for water is low during that time, she said.

Still, Sandkulla urges people to turn off automatic timers for their lawns and gardens and be aware of how much water they consume because the county is relying on its local water storage.

“We are still in a drought despite the heavy rain,” Sandkulla said.

The Hetch Hetchy system consists of more than 280 miles of pipelines, more than 60 miles of tunnels, 11 reservoirs, five pump stations and two water treatment plants, which deliver approximately 260 million gallons of water per day.

Roughly 85% of the water comes from Sierra Nevada snowmelt, traveling 160 miles from gravitational pull from Yosemite to the San Francisco Bay Area. The remaining 15% is captured from rain runoff that flows to the Alameda and Peninsula watersheds. After the Loma Prieta earthquake, in 1989, and the drought in the 1990s, it became apparent the aging water system was in need of an overhaul, according to BAWSCA.

Joseph Sweiss, spokesperson for SFPUC, said the pipeline is shut down, inspected and repaired as needed.

“We live off of our local water supply every winter and take the upcountry system offline for maintenance,” Sweiss said.

While the pipeline is being repaired, the winter rain has been building on existing water levels at the Hetch Hetchy drainage basin. Craig Shoemaker, meteorologist for the National Weather Service, said water levels at the drainage basin are doing really well.

He has reasonable confidence that January will be an active wet month, which will add to water levels and help alleviate drought concerns.

“Generally, a lot of the sites are 150-200% compared to normal levels down there,” Shoemaker said. “It’s been wet over the Central Sierra and these coming rain systems are definitely helping.”

# # #