



AGENDA ITEM NO. 7.F.

DATE: February 24, 2022
TO: Board of Directors
FROM: Rene A. Ramirez, Operations Manager

SUBJECT: RECEIVE REPORT ON:

- 1. California and San Francisco Regional Water System Drought Conditions; and**
 - 2. MPWD's Water Conservation Update**
-

RECOMMENDATION

Receive verbal report.

FISCAL IMPACT

None.

BOARD ACTION: APPROVED:____ DENIED:____ POSTPONED:____ STAFF DIRECTION:____

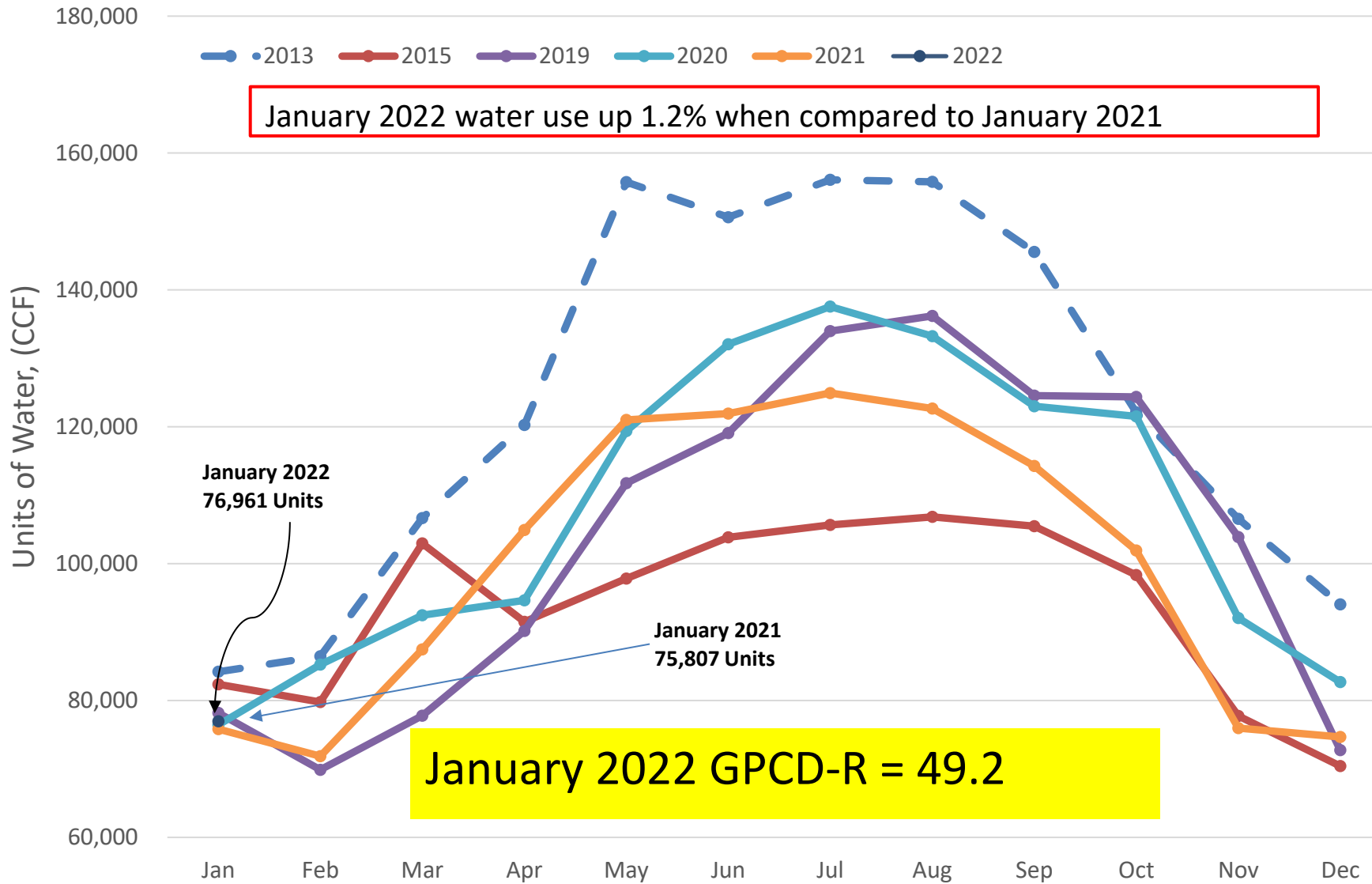
UNANIMOUS__ WHEELER__ VELLA__ ZUCCA__ JORDAN__ SCHMIDT ____

Water Conservation:

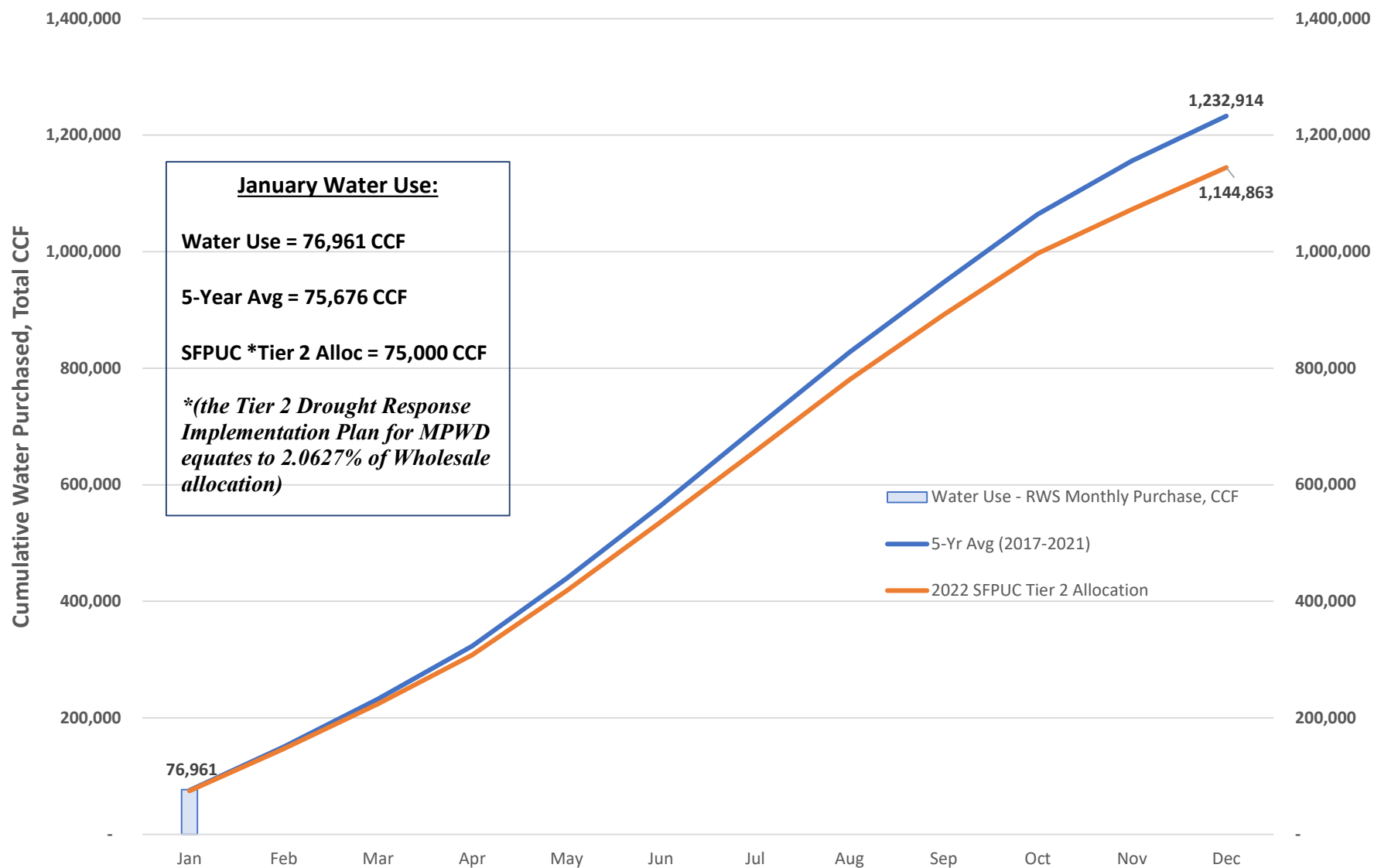
Recent 2-Month Comparison Summary

2020/2021 MONTH	2020/2021 UNITS	2013 UNITS	PERCENT CHANGE*	CUMULATIVE WATER SAVINGS*	2020/2021 GPCD	2013 GPCD
December 2021	74,686	94,062	-20.6%	-21.2%	60.2	74.1
January 2022	76,961	84,202	-8.6%	-20.0%	62.1	66.3
2020/2021 MONTH	2019/2020 UNITS	2013 UNITS	PERCENT CHANGE*	CUMULATIVE WATER SAVINGS*	2019/2020 GPCD	2013 GPCD
December 2020	82,686	94,062	-12.1%	-11.6%	66.7	74.1
January 2021	75,807	84,202	-10.0%	-11.4%	61.1	66.3

MPWD Annual Water Use

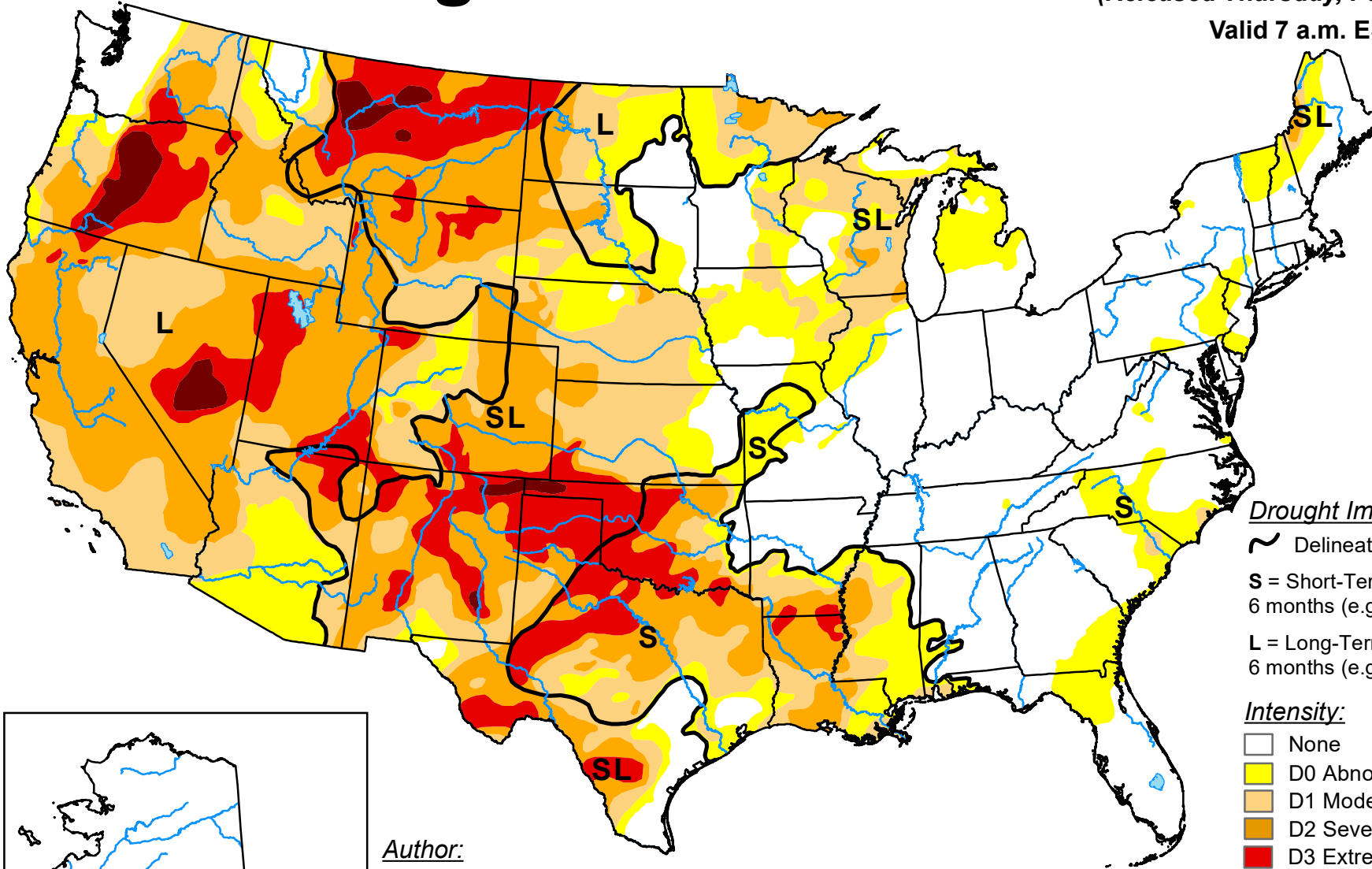


Comparing Monthly Cumulative Water Use with:
5-Year Average and SFPUC 2022 Tier 2 Water Allocation



U.S. Drought Monitor

February 8, 2022
 (Released Thursday, Feb. 10, 2022)
 Valid 7 a.m. EST

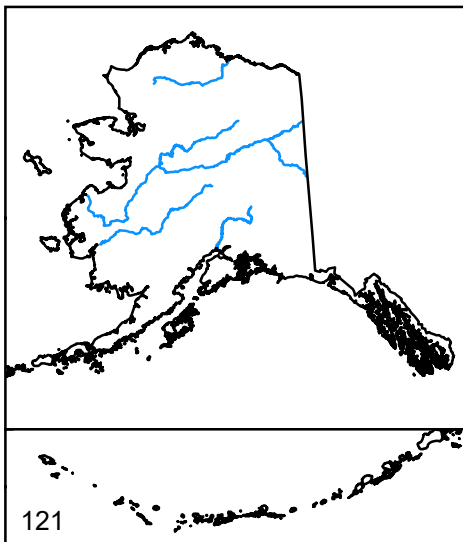


Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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



Author:
 Deborah Bathke
 National Drought Mitigation Center

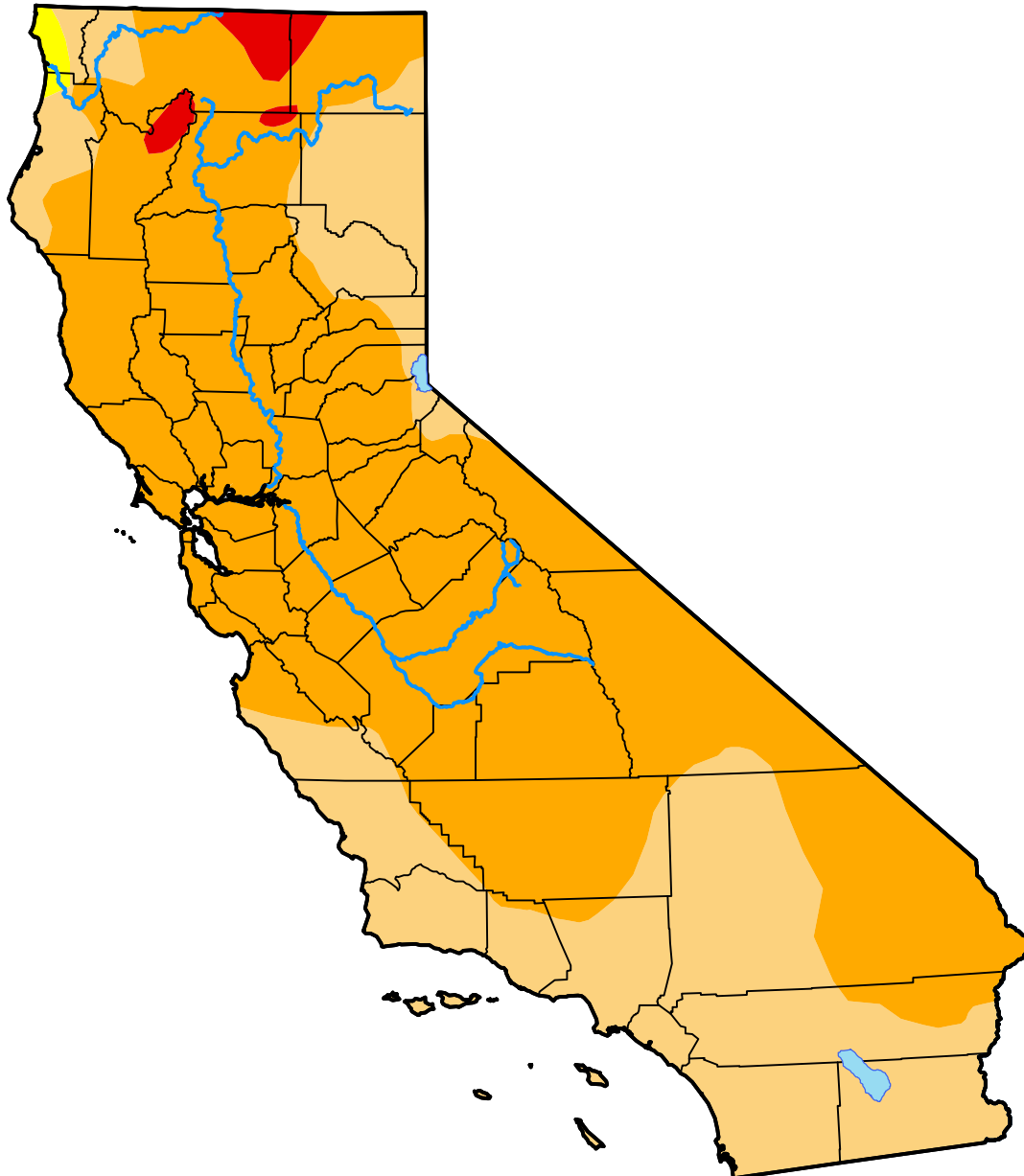
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



droughtmonitor.unl.edu

U.S. Drought Monitor California

February 15, 2022
(Released Thursday, Feb. 17, 2022)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.57	66.39	1.39	0.00
Last Week <i>02-08-2022</i>	0.00	100.00	99.25	66.39	1.39	0.00
3 Months Ago <i>11-16-2021</i>	0.00	100.00	100.00	92.43	80.28	37.62
Start of Calendar Year <i>01-04-2022</i>	0.00	100.00	99.30	67.62	16.60	0.84
Start of Water Year <i>09-28-2021</i>	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago <i>02-16-2021</i>	0.70	99.30	84.88	57.58	30.99	3.75

Intensity:

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

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

Author:

Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

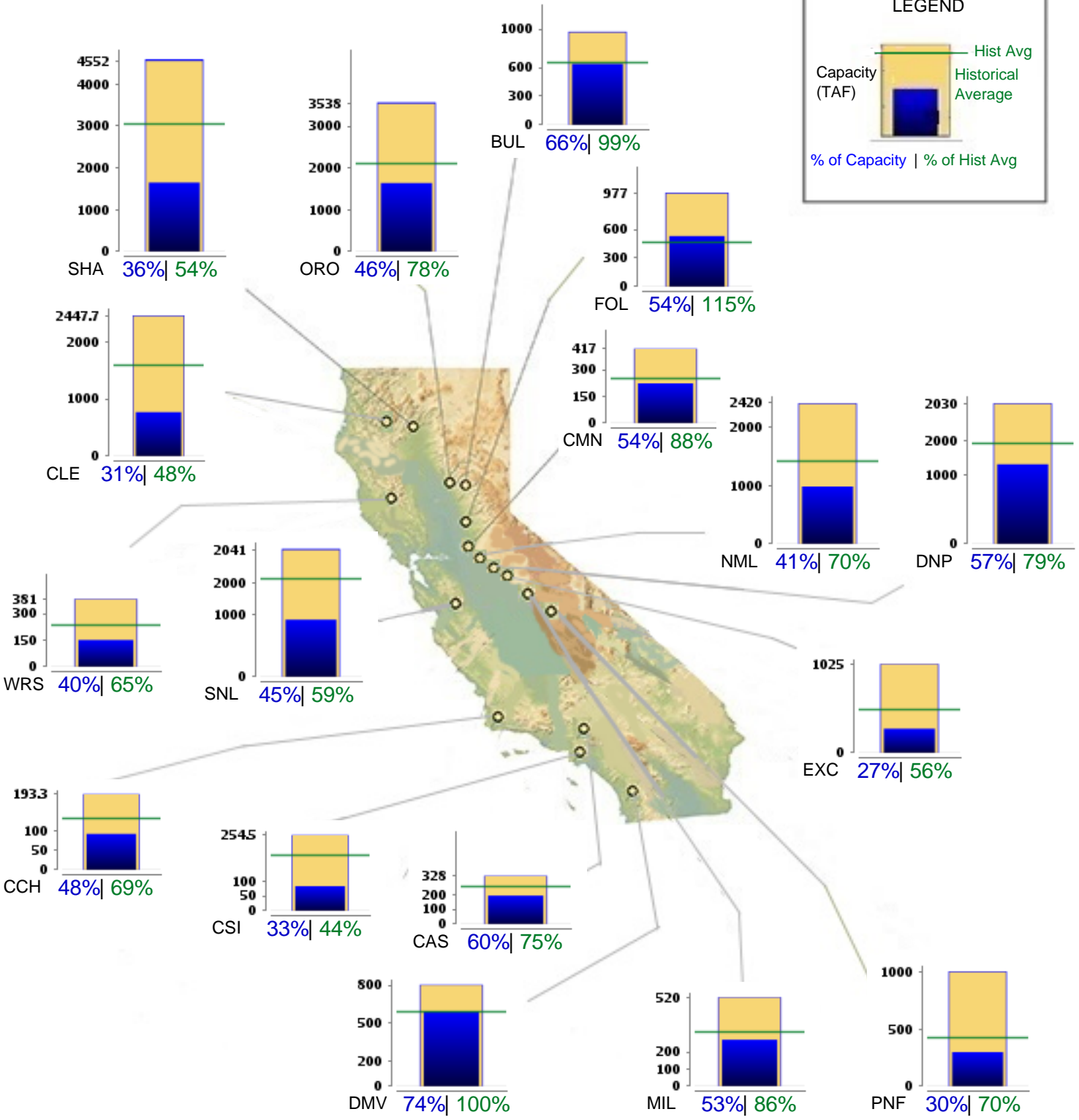
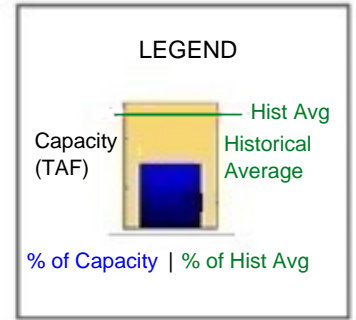


CURRENT RESERVOIR CONDITIONS

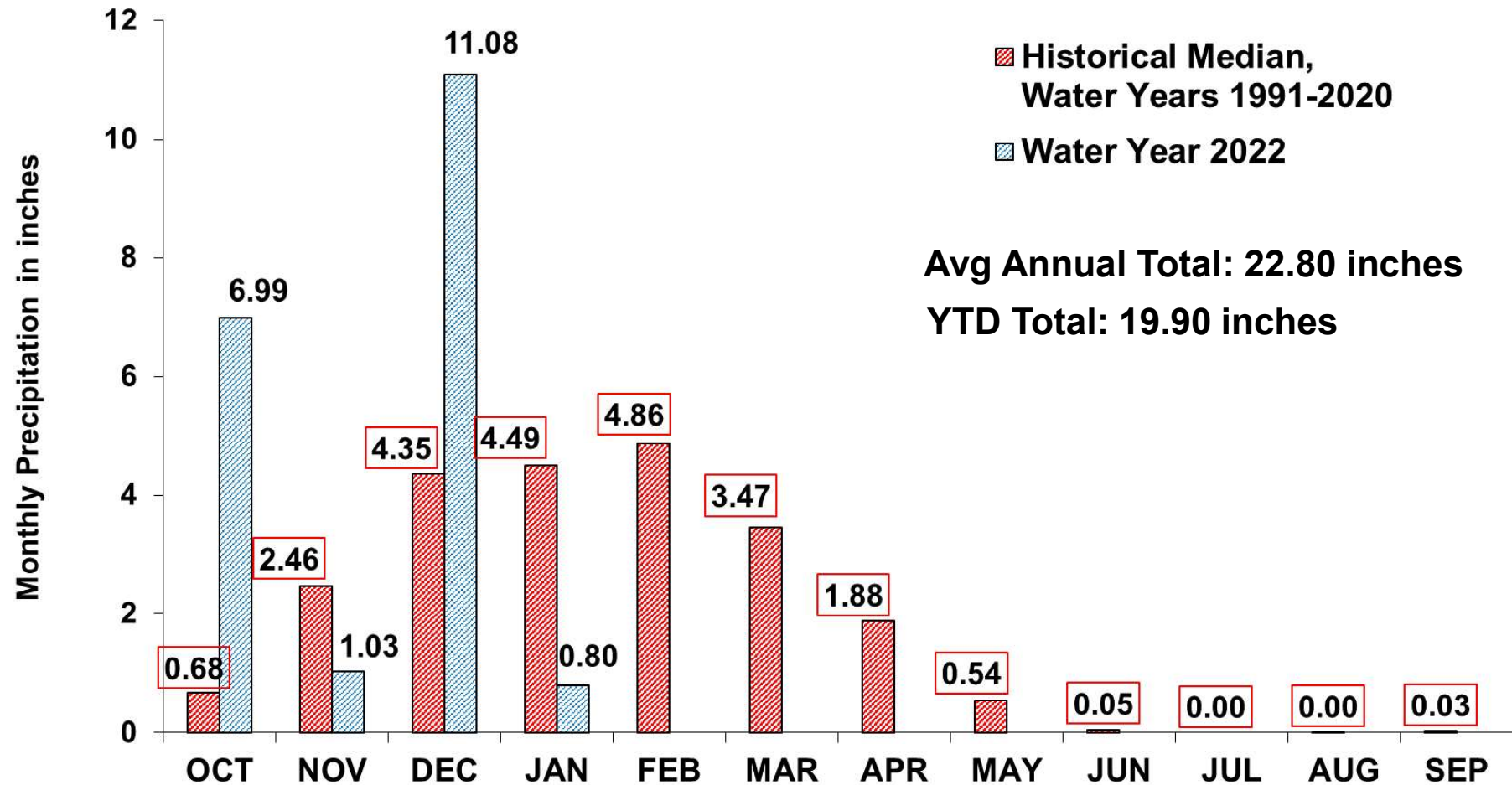
CALIFORNIA MAJOR WATER SUPPLY RESERVOIRS

Midnight - February 9, 2022

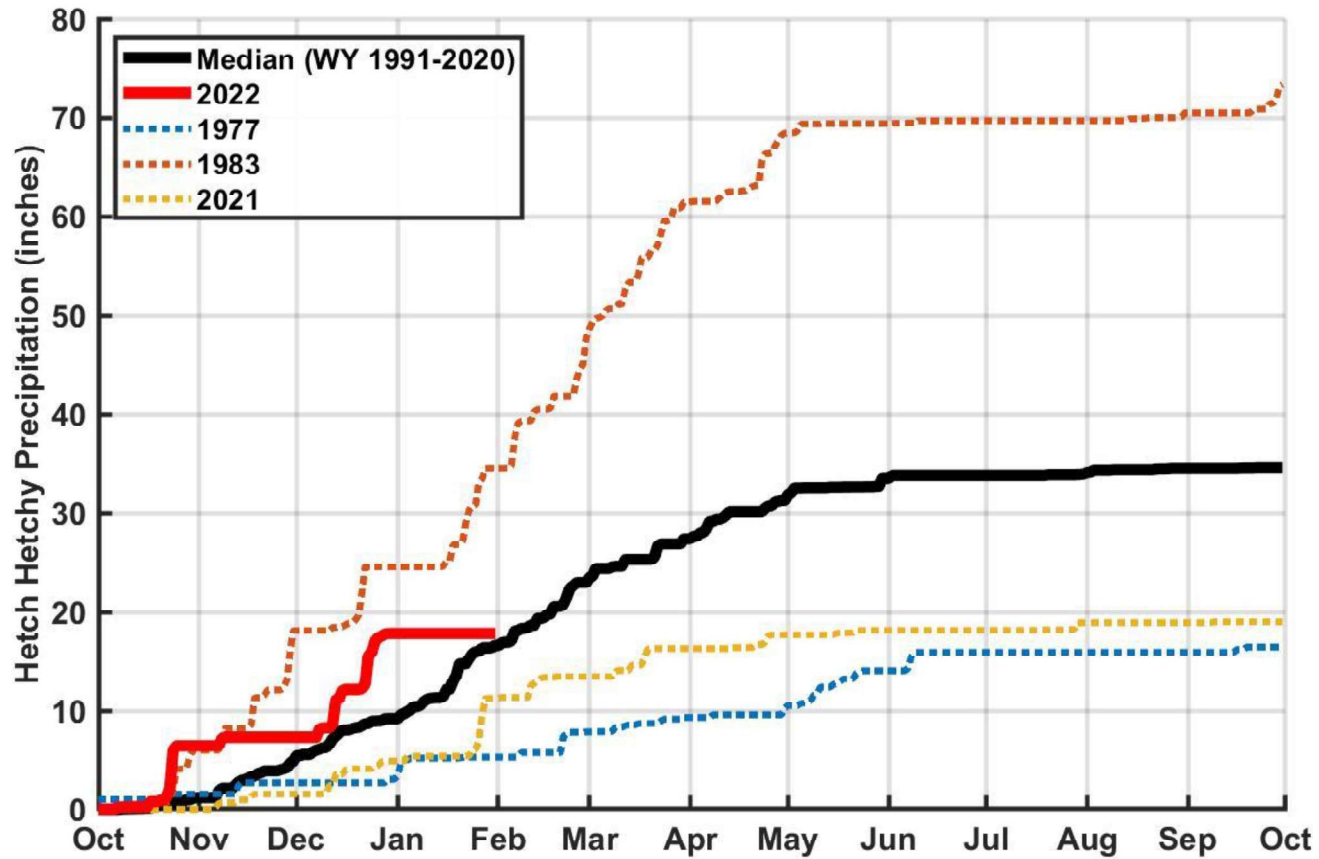
CURRENT CONDITIONS



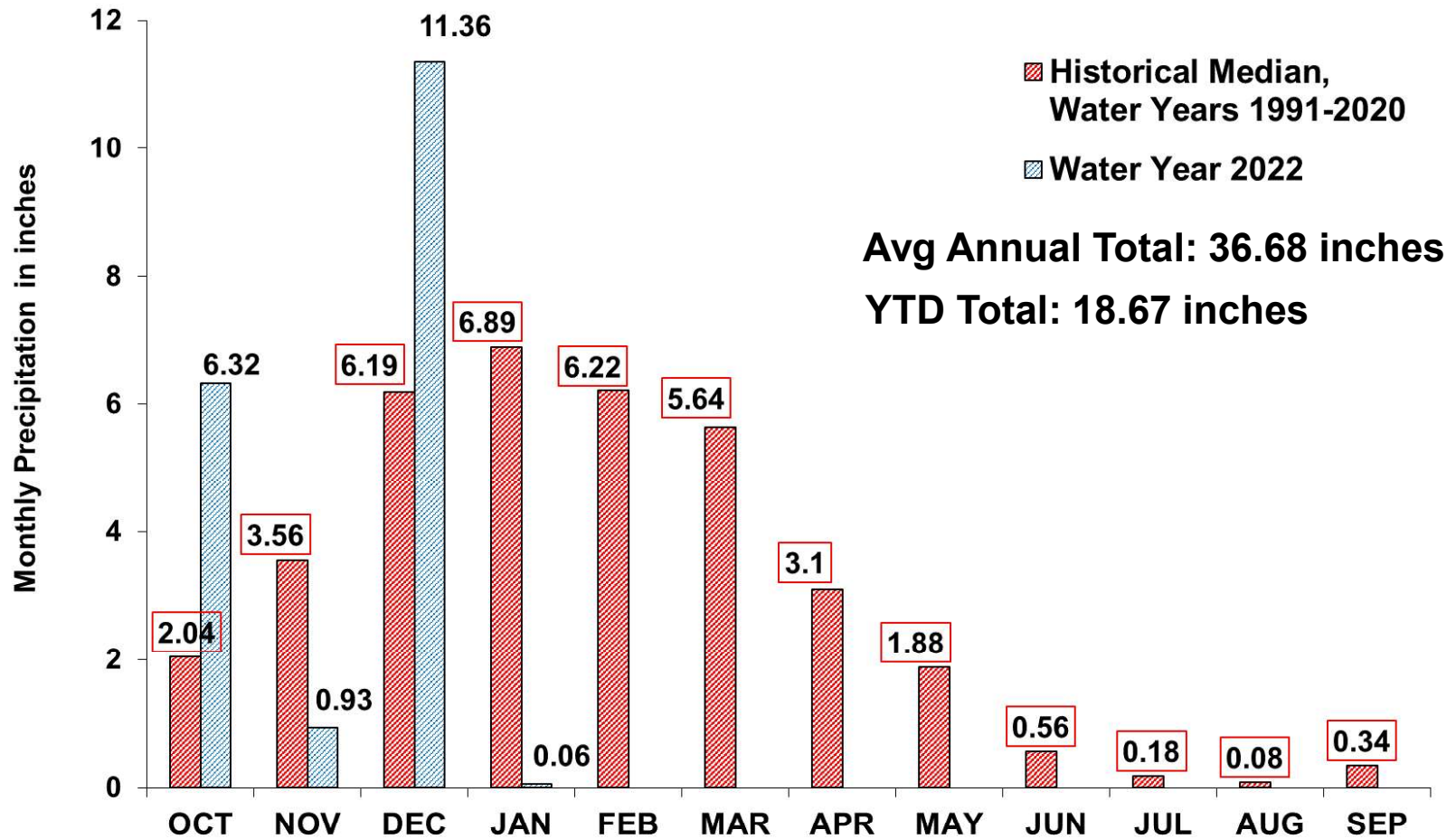
Bay Area 7-station Precipitation Index as of January 30, 2022



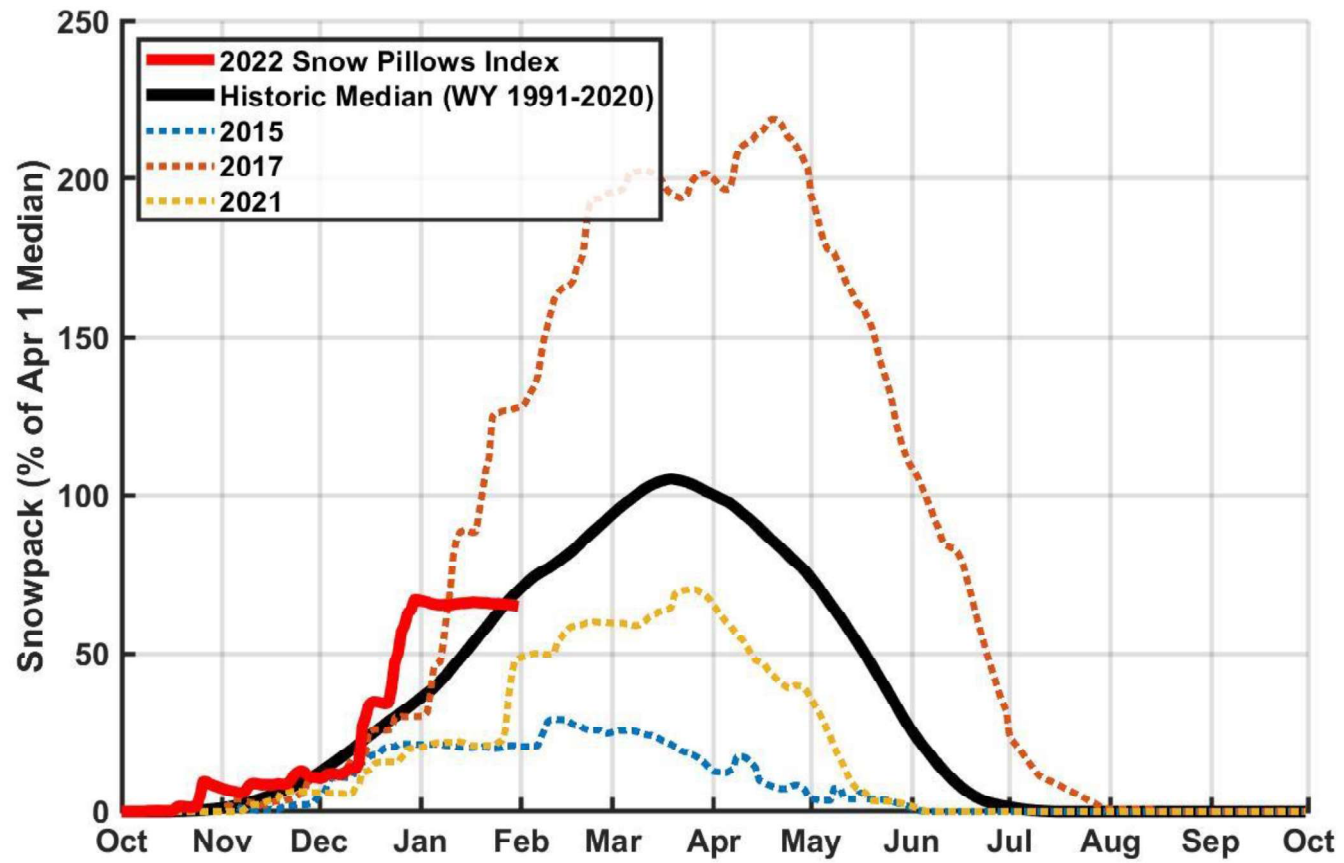
Hetch Hetchy Precipitation



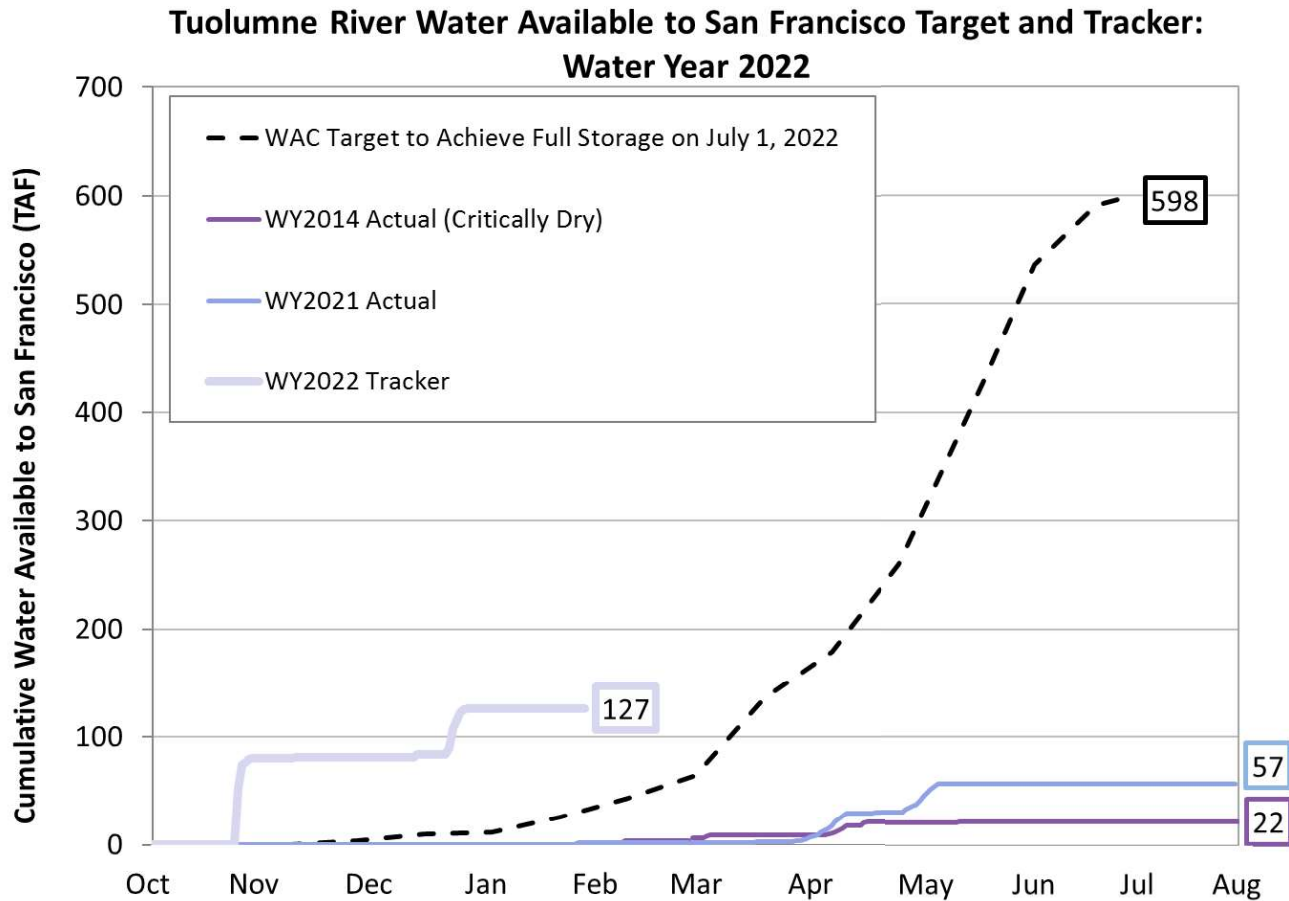
Upcountry 6-station Precipitation Index as of January 30, 2022



Upcountry Snowpack



Tuolumne River Water Available to the City



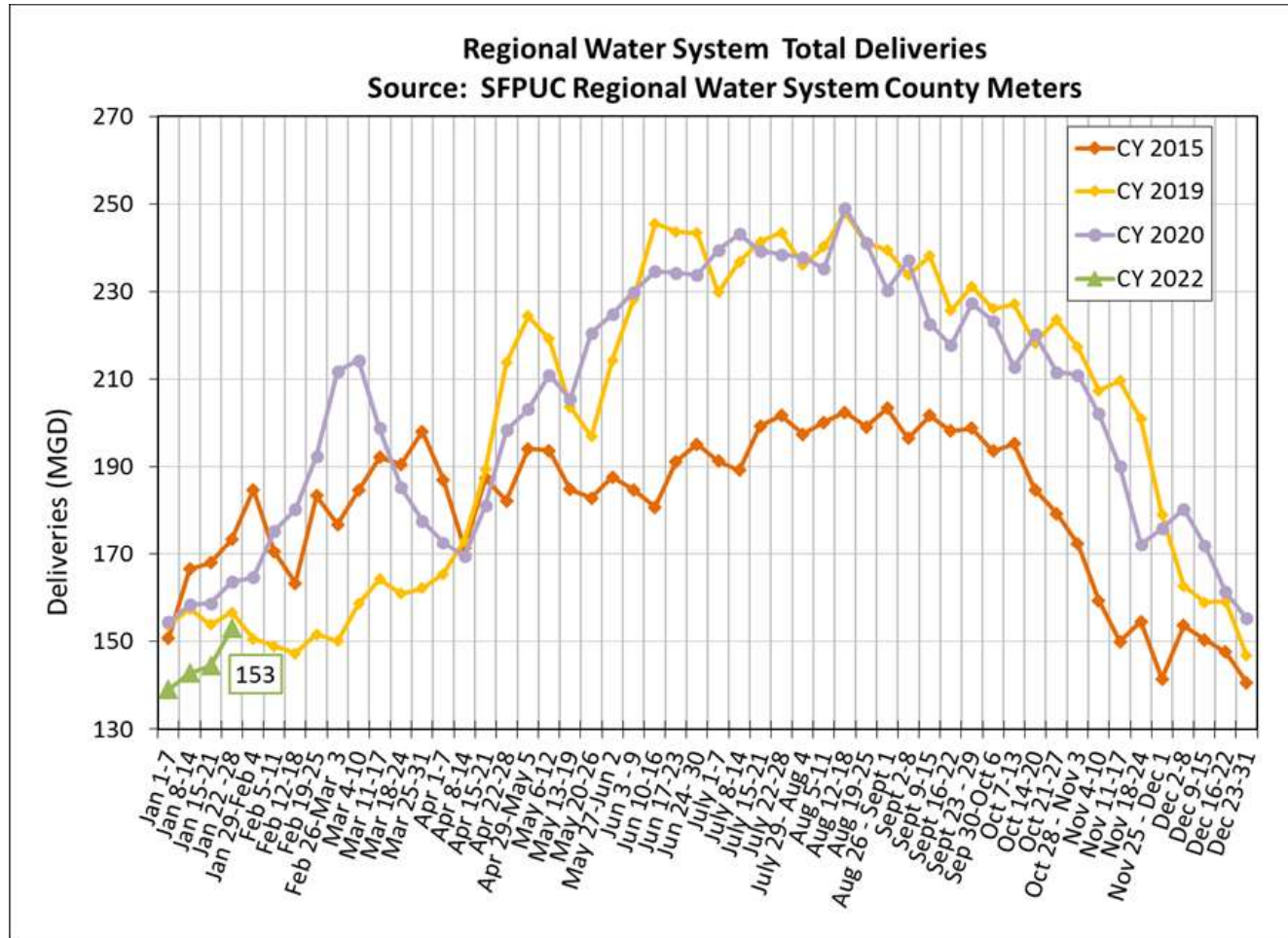
RWS - Storage Conditions

Most Recent Two Month Comparison

	Maximum Storage Acre-Feet	1/3/2022		2/1/2022	
		Current Storage Acre-Feet	Pct. Of Maximum Storage	Current Storage Acre-Feet	Pct. Of Maximum Storage
Tuolumne System					
Hetch Hetchy Rsvr	360,360	275,300	80.8%	294,400	81.7%
Cherry Rsvr	268,800	246,000	91.5%	240,100	89.3%
Lake Eleanor	21,495	23,290	100.0%	21,520	100.0%
Water Bank	570,000	348,682	61.2%	337,700	59.2%
Total Tuolumne Storage	1,220,655	893,272	74.4%	893,720	73.2%
Local Bay Area Storage					
Calaveras Rsvr	96,670	68,732	71.1%	67,236	69.6%
San Antonio Rsvr	53,266	51,336	96.4%	46,554	87.4%
Crystal Springs Rsvr	58,309	55,948	96.0%	51,247	87.9%
San Andreas Rsvr	19,027	17,180	90.3%	16,094	84.6%
Pilarcitos Rsvr	3,030	3,126	100.0%	3,070	100.0%
Total Local Storage	230,302	196,322	85.2%	184,201	80.0%
Total RWS Storage	1,450,957	1,089,594	76.1%	1,077,921	74.3%

SFPUC Reported on Jan 6, 2022 that:
Hetch Hetchy is 28% above last year
Cherry Reservoir is 27% above last year
Lake Eleanor is 209% above last year

Total Deliveries





Water Use Reduction Tracker

For the Period July 1, 2021 - January 28, 2022			
CUSTOMER GROUPS	FY2019/2020 AVG. MGD	FY2021/2022 AVG. MGD	% REDUCTION
San Francisco Customers	64.2	54.7	14.9%
Wholesale Customers	138.4	129.8	6.2%
TOTAL	202.6	184.5	9.0%



Drought Campaign

- Drought Campaign is Active
 - Google Ads launched 1/27:
All Wholesale Region zip codes are in rotation for our 14 Google ads.
 - We will share metrics as we receive them.
- Social Media Toolkit & Campaign Collateral:
 - We have sample posts for your use.
 - Please tag SFPUC on social at these handles:
Twitter: [@MySFPUC](#) Facebook: [@MySFPUC](#) Nextdoor: [SF Water, Power, Sewer](#)

Southwest drought is the most extreme in 1,200 years, study finds

The past 22 years rank as the driest period since at least 800 A.D.

By Diana Leonard – Washington Post

2/14/22 at 7:36 p.m. EST

The extreme heat and dry conditions of the past few years pushed what was already an epic, decades-long drought in the American West into a historic disaster that bears the unmistakable fingerprints of climate change. The long-running drought, which has persisted since 2000, can now be considered the driest 22-year period of the past 1,200 years, according [to a study published Monday in the journal Nature Climate Change](#).

[Previous work](#) by some of the same authors of the new study had identified the period of 2000 through 2018 as the second-worst megadrought since the year 800 — exceeded only by an especially severe and prolonged drought in the 1500s. But with the past three scorching years added to the picture, the Southwest’s megadrought stands out in the record as the “worst” or driest in more than a millennium.

“Without climate change, this would not be even close to as bad as one of those historical megadroughts,” said Park Williams, a climate scientist at the University of California at Los Angeles. “The thing that is really remarkable about this drought period is that temperatures have been warmer than average in all of the years but one.”

The double whammy of searing heat and persistent drought in recent years reflects the steady increase in global temperatures brought on by the burning of fossil fuels. The authors attribute 19 percent of the severe 2021 drought, and 42 percent of the extended drought since the 21st century began, to human-caused climate change.

Scientists refer to this combined hot and dry effect as “aridity” — a warm and thirsty atmosphere that can pull moisture from soil and plants, melt snow, and intensify heat waves.

“All of the climate models agree that when greenhouse gases go into the atmosphere and temperatures rise, that’s going to enhance the ability of the atmosphere to pull water out of ecosystems,” Williams said.

This “background drying” brought on by a warmer atmosphere can dwarf occasional wet or cool periods. For example, the Southwest’s 2021 drought maintained its grip despite robust monsoon rains and record summer precipitation in some areas, in part because of extraordinary heat waves early last summer, and generally above-average temperatures.

The study’s tree-ring record also provides a sobering view of what is possible in the West. “The tree rings tell us that there can actually be very, very extreme dryness in the West without the help of climate change at all,” Williams said. “Even without climate change, we can have monumentally severe and long-lasting droughts.”

The study finds that the 21st century has been substantially drier than the previous five decades, with 8.3 percent less precipitation, and nearly 1 degree Celsius (1.8 Fahrenheit) warmer than the period from 1950 to 1999.

And scientists have made clear that future warming could bring even more crippling and frequent droughts. Last summer, a report by the U.N. Intergovernmental Panel on Climate Change found that even as global warming can bring more extreme rainfall and flooding in some areas, it can also fuel more intense drought in many regions.

That analysis found that at the current warming trajectory, droughts in drying regions that previously occurred only once every 10 years are now happening about 1.7 times per decade, on average. If the Earth warms 2 degrees Celsius, scientists expect those once-rare events to take place roughly 2½ times per decade, on average.

But the West's most recent megadrought isn't just written in scientific data. It has manifested in the shrinking water levels of Lake Mead and Lake Powell, which last summer reached their lowest on record. These reservoirs have declined during the 21st century with rising temperatures, despite intermittent wet years.

The intensifying drought looks to continue in 2022 — unless a miraculous spring season brings a return of the storm track and moisture-rich atmospheric rivers.

While the study covers only the period through 2021, drought conditions have taken a turn for the worse in 2022. After a promising start to the wet season in December, unusually dry conditions have persisted over much of California since January.

California's snowpack declined to just 73 percent of normal [as of Monday](#), after being at 160 percent of normal in December.

The Central Sierra Snow Lab run by the University of California at Berkeley tweeted that its snowpack [lost 5 percent of its water content](#) amid unusually warm weather over the past week. At its monitoring site, the snowiest December on record has been followed by a record streak of [37 days without precipitation](#).

The parched conditions laid the groundwork for a recent record-setting winter heat wave in California.

From Wednesday through Sunday, the National Weather Service in Los Angeles issued the first heat advisory on record during the winter months in Southern California. Scores of record high temperatures were set, from San Diego to San Francisco.

Death Valley soared to 94 degrees on Feb. 11, its [highest temperature recorded so early](#) in the season.

The hot, dry weather, combined with gusty winds, fueled several brush fires in Southern California late last week. California has seen more than [12 million acres burn](#) in the past decade, and 18 of the top 20 largest wildfires in state history [have occurred in the past two decades](#).

Forecasters at the National Weather Service [predict drought conditions to persist](#) through the spring.

The authors of the paper also see no end in sight to the West's arid reality. "This drought will very likely persist through 2022," they wrote, "matching the duration of the late-1500s megadrought."

Williams said that tree-ring records do provide some reason for hope — megadroughts do eventually end when the rains return. Those rains are arriving in increasingly intense bursts as the atmosphere warms.

"The way you get out of droughts in the West is probably changing," he said. Droughts may end abruptly during extremely wet years, like 2017, but then quickly reverse course again into another multiyear dry spell.