

San Francisco Public Utilities Commission Hydrological Conditions Report September 2022

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As the Central Sierras head into a third La Nina year it is as important as ever to ensure the high elevation weather stations are in working order. The pictures document a field expedition to the Horse Meadow Weather Station (<https://cdec.water.ca.gov/webgis/?appid=cdecstation&sta=HRS>) which measures temperatures and snow water equivalent at 8,400 feet in elevation, a 20 mile hike into the watershed supplying water to Cherry Reservoir. Data gathered at Horse Meadow are used to drive models of future inflows into SFPUC upcountry reservoirs. Horse Meadow Weather Station is owned, operated, and maintained as part of a cooperative between California Department of Water Resources, Stanislaus National Forest, and the SFPUC.

System Storage

Current Tuolumne System and Local Bay Area storage conditions are summarized in Table 1.

Table 1 Current System Storage as of October 1, 2022							
	Current Storage		Maximum Storage		Available Capacity		Percentage of Maximum Storage
	acre-feet	millions of gallons	acre-feet	millions of gallons	acre-feet	millions of gallons	
Tuolumne System							
Hetch Hetchy Reservoir ¹	282,529		360,360		77,831		78%
Cherry Reservoir ²	243,511		273,345		29,834		89%
Lake Eleanor ³	18,608		27,100		8,492		69%
Water Bank	252,329		570,000		317,671		44%
Tuolumne Storage	796,977		1,230,805		433,828		65%
Local Bay Area Storage							
Calaveras Reservoir	58,039	18,912	96,824	31,550	38,785	12,638	60%
San Antonio Reservoir	42,710	13,917	52,506	17,109	9,796	3,192	81%
Crystal Springs Reservoir	51,325	16,724	58,377	19,022	7,052	2,298	88%
San Andreas Reservoir	17,108	5,575	18,996	6,190	1,889	615	90%
Pilarcitos Reservoir	2,327	758	2,995	976	668	218	78%
Total Local Storage	171,509	55,886	229,697	74,847	58,189	18,961	75%
Total System	968,486		1,460,502		492,017		66%

¹ Maximum Hetch Hetchy Reservoir storage with drum gates activated.

² Maximum Cherry Reservoir storage with flash-boards in.

³ Maximum Lake Eleanor storage with flash-boards in.

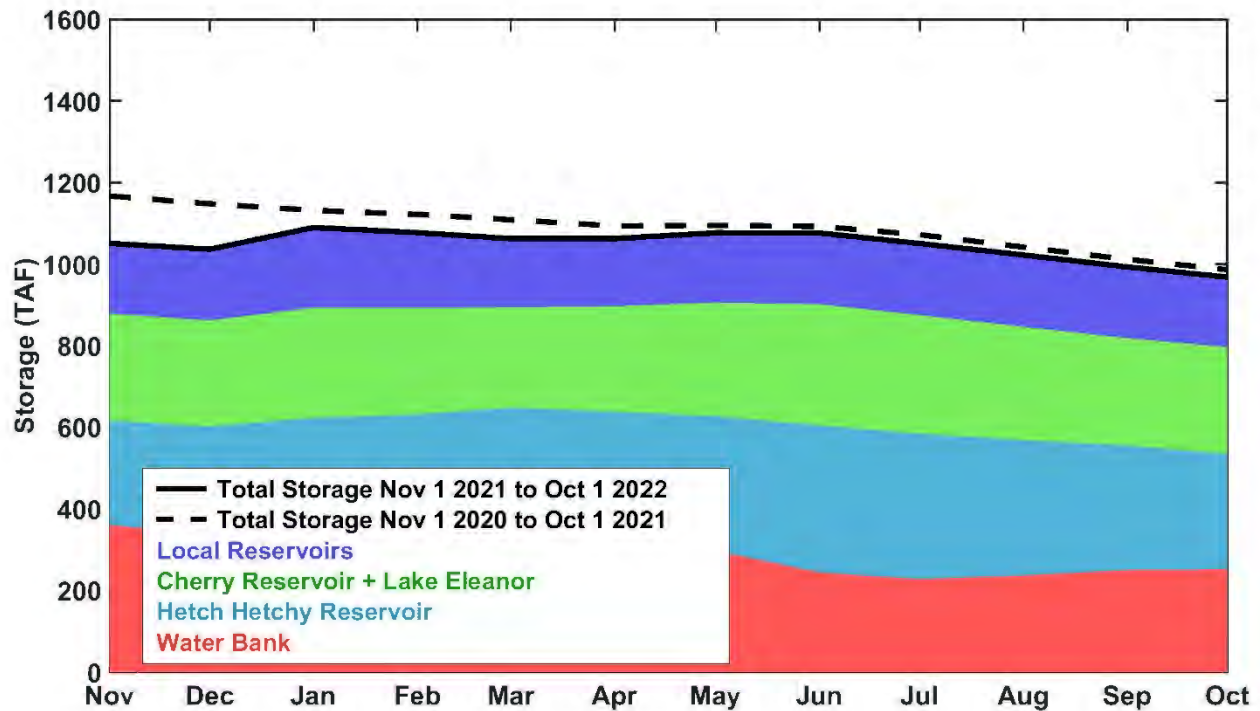


Figure 1: System storage for past 12 months. Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index

Current Month: The September 2022 six-station precipitation index was 1.41 inches, well above the median long-term index for the month of 0.16 inches.

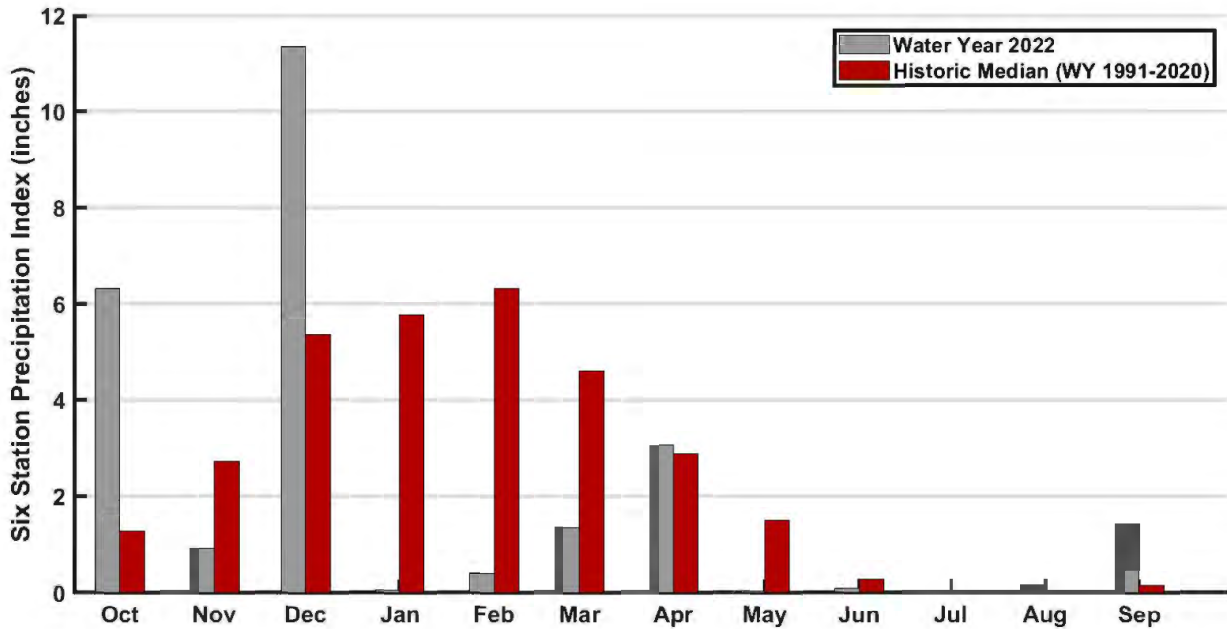


Figure 2: Monthly distribution of the six-station precipitation index relative to the monthly precipitation medians. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

Cumulative Precipitation to Date: As of September 30, the six-station precipitation index for Water Year (WY) 2022 was 25.2 inches, which is 81% of the median annual total. The Hetch Hetchy Weather Station received 1.69 inches of precipitation in September resulting in a total of 25.87 inches for WY 2022, or 75% of median. The cumulative WY 2022 Hetch Hetchy precipitation is shown in Figure 3 in red.

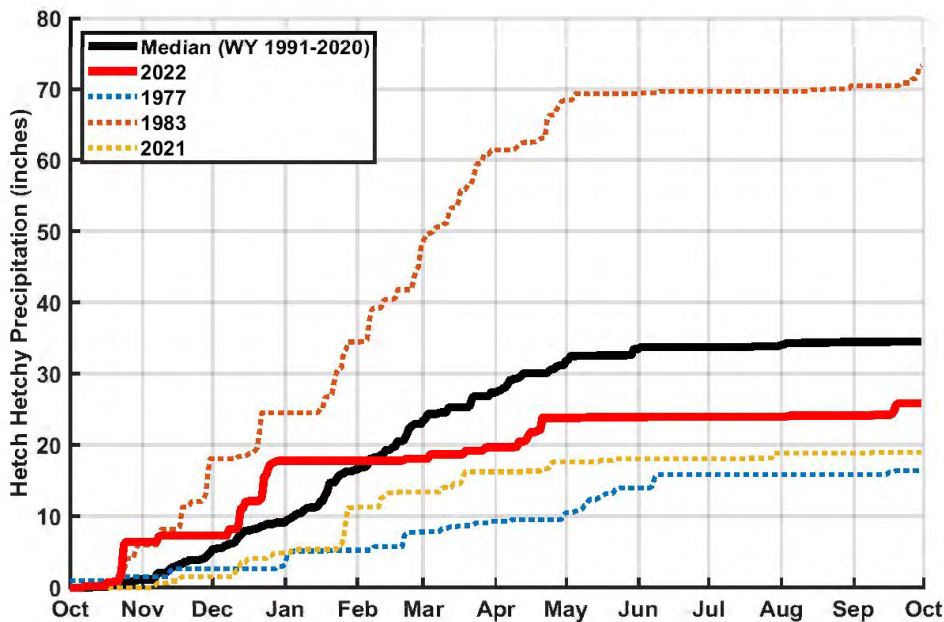


Figure 3: Water Year 2022 cumulative precipitation measured at Hetch Hetchy Weather Station. Median cumulative precipitation measured at Hetch Hetchy Weather Station and example wet and dry years are included with Water Year 2021 for comparison purposes.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange for September 2022 and Water Year 2022 is summarized below in Table 2.

Table 2. Calculated Reservoir Inflows and Water Available to City								
* All flows are in acre-feet	September 2022				October 1, 2021 through September 30, 2022			
	Observed Flow	Median ¹	Mean ¹	Percent of Mean	Observed Flow	Median ¹	Mean ¹	Percent of Mean
Inflow to Hetch Hetchy Reservoir	454	1,669	3,314	14%	494,294	703,970	762,304	65%
Inflow to Cherry Reservoir and Lake Eleanor	2,376	1,537	1,969	121%	341,161	465,619	508,322	67%
Tuolumne River at LaGrange	12,204	8,681	12,079	101%	1,137,736	1,664,299	1,942,410	59%
Water Available to City	0	0	5	0%	201,328	580,260	870,173	23%

¹Hydrologic Record: 1991-2020

Hetch Hetchy System Operations

Water deliveries via the San Joaquin Pipeline were reduced on September 29th from 205 MGD to 179 MGD.

Hetch Hetchy Reservoir power draft and stream releases during the month totaled 23,820 acre-feet. Hetch Hetchy Reservoir minimum instream release requirements for September 1 – 14 were 80 cfs, and 65 cfs for September 15-30. Total precipitation for Water Year 2022, as of October 1, has resulted in a Water Year Type B for Hetch Hetchy Reservoir. Hetch Hetchy Reservoir instream release are 50 cfs for October.

Cherry Reservoir power draft and stream releases totaled 3,076 acre-feet for the month of September with power draft providing recreational releases. The required minimum instream release from Cherry Reservoir for September was 15 cfs and decreases to 5 cfs for October. Lake Eleanor required release for September 1-15 was 20 cfs and decreased to 10 cfs on September 15. Lake Eleanor releases will remain at 10 cfs for October.

The Cherry-Eleanor pumps operated from September 9 through September 26 and transferred 5,944 acre-feet of water from Lake Eleanor to Cherry Reservoir.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant was offline for most of September, production was less than 1 MGD for the month. The Sunol Valley Water Treatment Plant production for the month was 27 MGD.

Regional System Water Delivery

The average September delivery rate was 204 MGD, which is 5% below the August delivery rate of 214 MGD.

Local Precipitation

The rainfall summary for September 2022 is presented in Table 3.

Weather Station Location	September		October 1, 2021 through September 30, 2022	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos Reservoir	0.43	430%	43.44	129%
Lower Crystal Springs Reservoir	0.37	1,233%	23.51	106%
Calaveras Reservoir	0.71	710%	16.20	90%

*Mean Period = WY 1991-2020

Water Supply and Planned Water Supply Management

Water Year 2022 began with a significant atmospheric river in late October 2021 and was followed up with a large storm system in late December 2021, resulting in a snowpack 160% of normal. This wet fall was followed by the driest January-March period on record – 1.82 inches measured precipitation compared to a previous low of over 4 inches. The snowpack on April 1st was 40% of normal. This led to well below average inflows – WY 2022 total inflows at Hetch Hetchy Reservoir were 494,294 acre-feet (65% of normal), and Water Available to the City was 201,328 acre-feet (23% of normal; Figure 4).

Due to carryover storage and conservative water resource management, all three upcountry reservoirs were relatively full for the end of the summer season. Hetch Hetchy Reservoir, Cherry Reservoir and Lake Eleanor storages are declining as current and forecasted inflows are less than minimum instream releases and SJPL deliveries.

Hetch Hetchy Reservoir is drafting via SJPL deliveries and minimum instream releases. Cherry Reservoir and Lake Eleanor are drafting via minimum instream releases. Water Bank is currently crediting as upcountry reservoir releases exceed inflows.

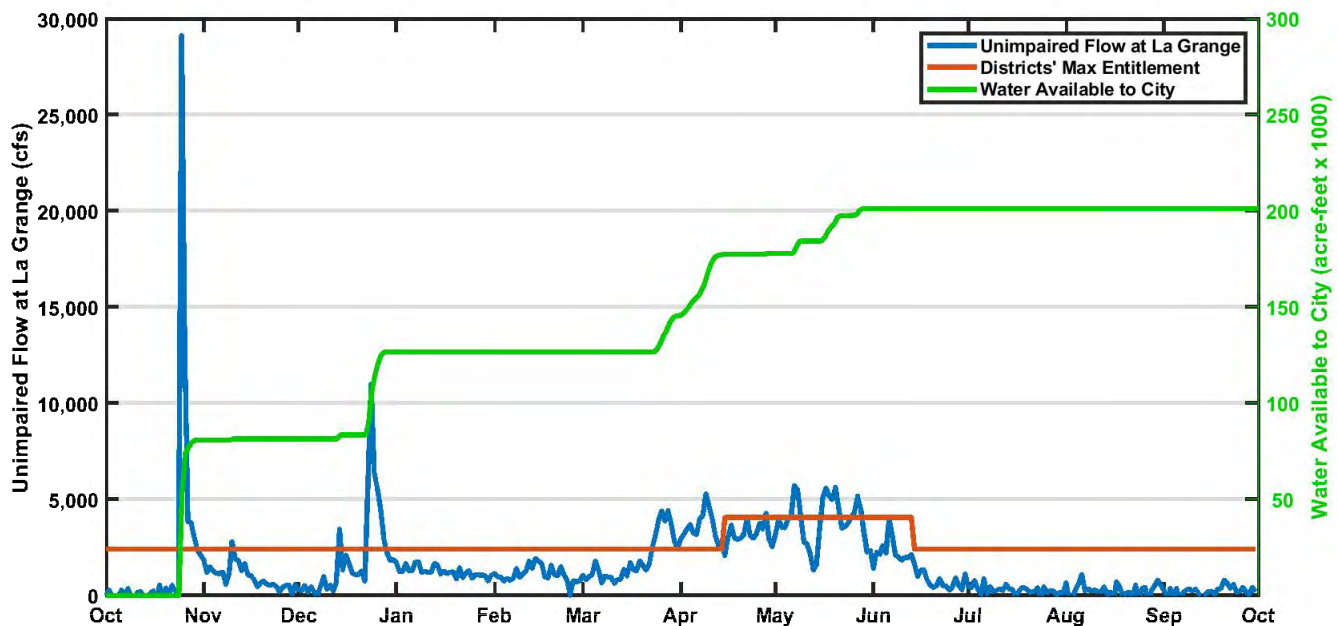


Figure 4: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City.