

San Francisco Public Utilities Commission

Hydrological Conditions Report

November 2019

J. Chester, C. Graham, N. Waelty, December 9, 2019



Rancheria Creek as it enters Hetch Hetchy Reservoir. Rancheria Creek is the third largest direct tributary to Hetch Hetchy Reservoir; behind the Tuolumne River and Falls Creek.

System Storage

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

Table 1 Current System Storage as of December 1, 2019							
	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	265,896		340,830		74,934		78%
Cherry Reservoir ²	215,255		268,810		53,555		80%
Lake Eleanor ³	16,554		21,495		4,941		77%
Water Bank	569,875		570,000		125		100%
Tuolumne Storage	1,067,580		1,201,135		133,555		89%
Local Bay Area Storage							
Calaveras Reservoir	60,592	19,744	96,824	31,550	36,231	11,806	63%
San Antonio Reservoir	47,252	15,397	50,496	16,454	3,244	1,057	94%
Crystal Springs Reservoir	49,785	16,223	58,377	19,022	8,591	2,799	85%
San Andreas Reservoir	17,061	5,559	18,996	6,190	1,936	631	90%
Pilarcitos Reservoir	2,450	798	2,995	976	545	177	82%
Total Local Storage	177,141	57,721	227,688	74,192	50,557	16,471	78%
Total System	1,244,721		1,428,823		184,112		87%

¹ Maximum Hetch Hetchy Reservoir storage with drum gates deactivated.

² Maximum Cherry Reservoir storage with flash-boards out.

³ Maximum Lake Eleanor storage with flash-boards out.

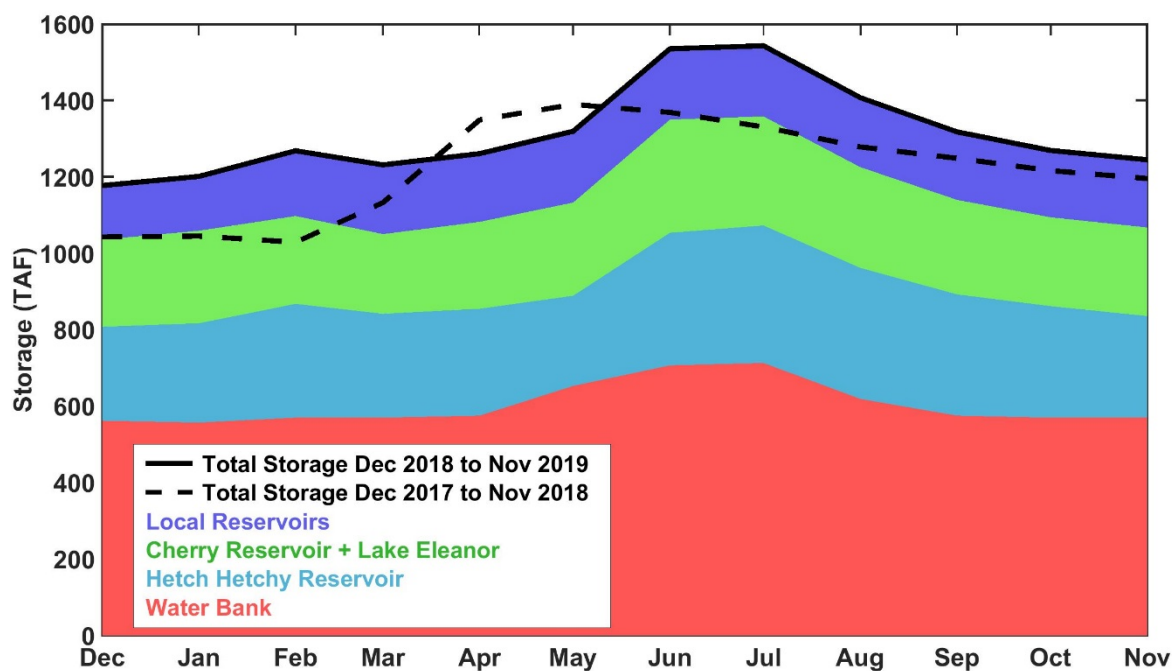


Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index

Current Month: The November six-station precipitation index was 3.05 inches, or 73% of the average index for the month. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

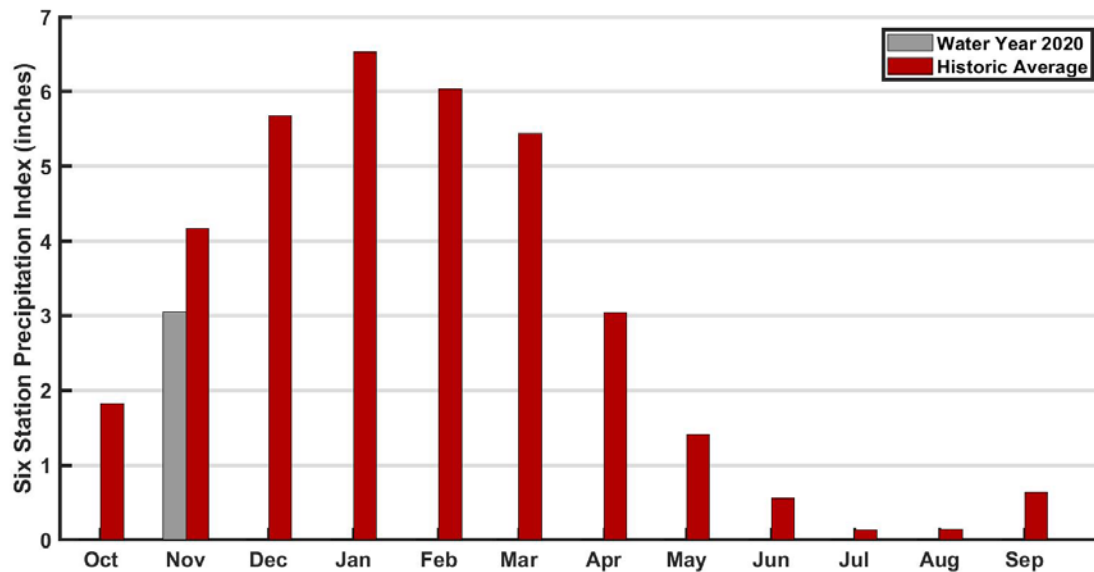


Figure 2: Monthly distribution of the six-station precipitation index as compared to the annual average precipitation for November 2019. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

Cumulative Precipitation to Date: As of December 1st, the six-station precipitation index for Water Year 2020 were 3.05 inches, which is 9% of the average annual water year total. Hetch Hetchy Weather Station received 2.73 inches of precipitation in November, for a total of 2.73 inches for Water Year 2020. The cumulative Hetch Hetchy Weather Station precipitation is shown in Figure 3 in red.

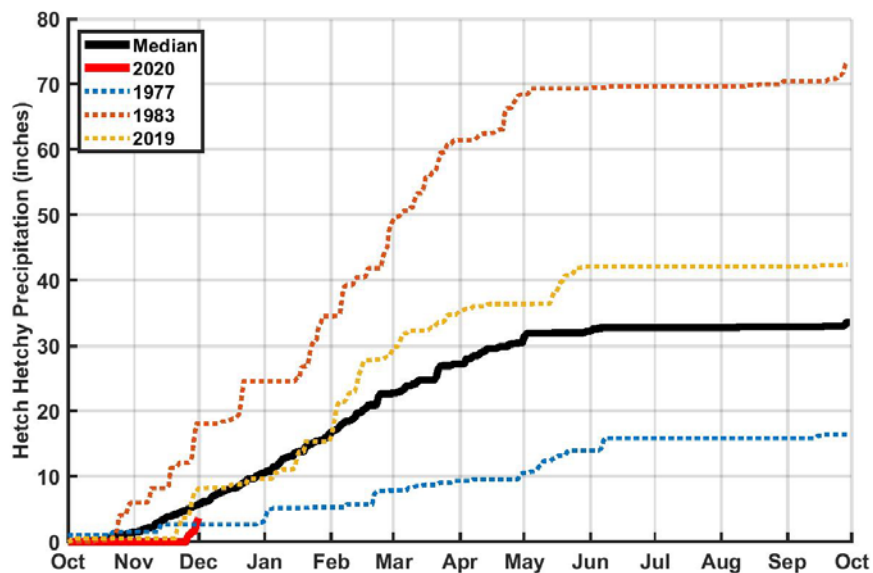


Figure 3: Water Year 2020 cumulative precipitation measured at Hetch Hetchy Weather Station. Median cumulative precipitation measured at Hetch Hetchy Weather Station and example wet and dry years are included with WY 2020 for comparison purposes.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange for November 2019 is summarized below in Table 2.

Table 2 Calculated Reservoir Inflows and Water Available to City								
* All flows are in acre-feet	November 2019				October 1, 2019 through November 30, 2019			
	Observed Flow	Median ¹	Mean ¹	Percent of Mean	Observed Flow	Median ¹	Mean ¹	Percent of Mean
Inflow to Hetch Hetchy Reservoir	1,761	6,038	13,528	13%	2,616	10,442	19,966	13%
Inflow to Cherry Reservoir and Lake Eleanor	336	7,413	15,616	2%	336	11,983	21,190	1%
Tuolumne River at La Grange	13,303	20,372	44,836	30%	38,176	39,873	62,508	61%
Water Available to City	0	0	12,751	0%	0	0	15,303	0%

¹Hydrologic Record: 1919-2015

Hetch Hetchy System Operations

Water delivery via the Hetch Hetchy Aqueduct averaged 240 MGD for the month of November.

Hetch Hetchy Reservoir power draft and stream releases during the month totaled 27,699 acre-feet. Total precipitation in Calendar Year 2019 results in a Water Year Type A (normal to wet conditions) for Hetch Hetchy Reservoir, which will be maintained through the rest of the year. Hetch Hetchy Reservoir minimum instream release requirements for November were 60 cfs. Instream release requirements for December are 50 cfs.

Cherry Reservoir valve releases totaled 367 acre-feet for the month and were used to maintain seasonal target elevations. There was no Holm Powerhouse production or water transferred from Lake Eleanor to Cherry Reservoir via the Cherry / Eleanor Diversion in November. The required minimum instream release from Cherry Reservoir was 5 cfs for November and remains 5 cfs for December.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for November was 41 MGD. The Sunol Valley Water Treatment Plant was in standby for the month with no production.

Local System Water Delivery

The average November delivery rate was 201 MGD which is a 10% decrease below the October delivery rate of 224 MGD.

Local Precipitation

An end of month weather system ushered in the rainy season. The rainfall summary for November 2019 is presented in Table 3.

Weather Station Location	November		Water Year 2020	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos Reservoir	2.18	50 %	2.23	34 %
Lower Crystal Springs Reservoir	1.45	46 %	1.45	32 %
Calaveras Reservoir	1.32	51 %	1.33	36 %

Snowmelt and Water Supply

Based on the snow pillows, December 1st snowpack is currently 17% of the annual April 1st peak snowpack (Figure 4).

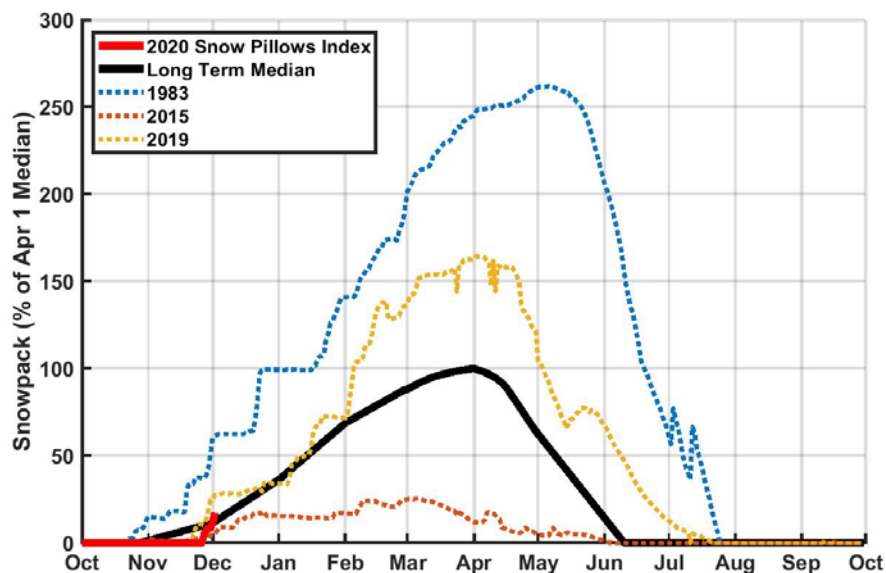


Figure 4: Tuolumne River Basin 10 Station Snow Index (lines), based on real time snow pillow SWE measurements in the Tuolumne Basin.

Upcountry Water Supply

Total system storage is at 89% full as reservoirs have been managed to maximize storage for the fall season and the beginning of Water Year 2020. As of December 1st, no water has been available to the City (Figure 5).

Hetch Hetchy Reservoir is drafting via SJPL deliveries and instream releases. Cherry Reservoir reached its winter storage target of 215,000 acre-feet at the end of October. Holm Powerhouse generation stopped for the month of November and restarted in early December when inflows exceeded required minimum instream releases. Lake Eleanor is drafting with instream releases. Water Bank is full and projected to remain full as the winter season begins.

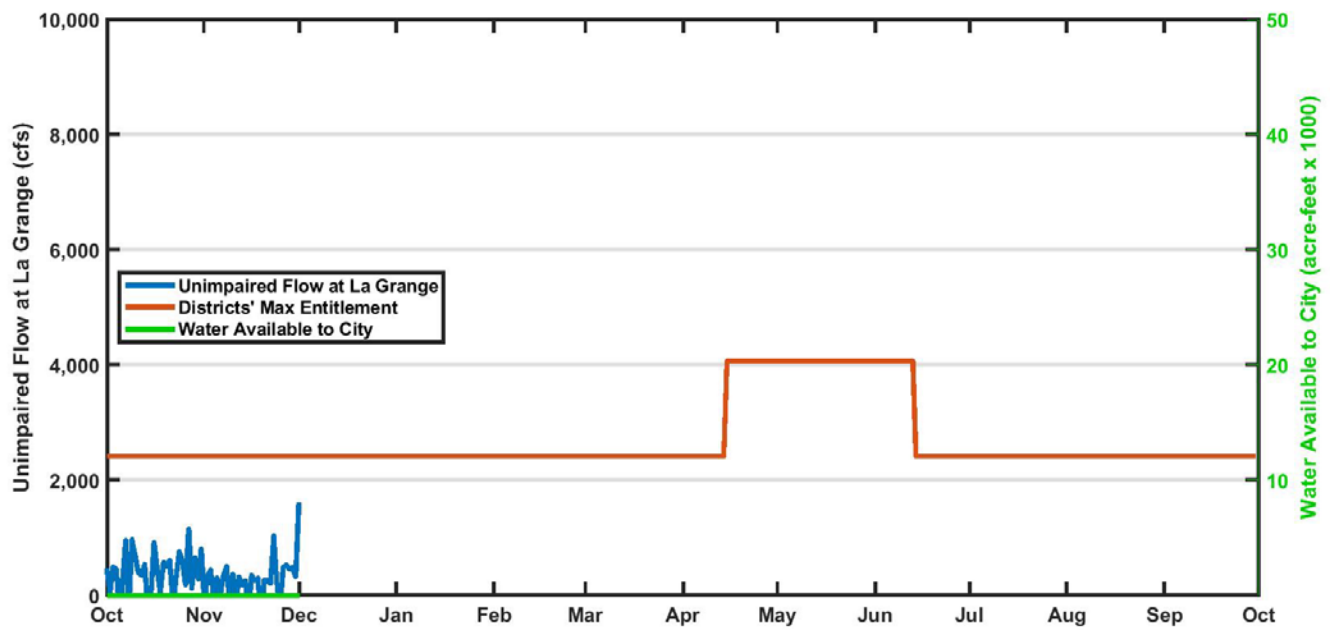


Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City. To date there has been 0 acre-feet available to the City in Water Year 2020.