

San Francisco Public Utilities Commission Hydrological Conditions Report for December 2017

J. Chester, C. Graham, & N. Waelty, January 8, 2018



Environmental releases below O'Shaughnessy dam (circa 2001)

System Storage

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

Table 1 Current Storage As of January 1, 2018							
Reservoir	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 ¹	316,010		340,000		23,990		92.9%
Cherry ²	8,602		268,810		260,208		3.2%
Eleanor ³	25,867		26,416		549		97.9%
Water Bank	562,544		570,000		7,456		98.7%
Tuolumne Storage	931,023		1,205,226		292,203		75.8%
Local Bay Area Storage							
Calaveras ⁴	20,447	6,663	96,824	31,550	76,377	24,887	21.1%
San Antonio	40,881	13,321	50,496	16,454	9,615	3,133	81.0%
Crystal Springs	47,157	15,366	58,377	19,022	11,220	3,656	80.8%
San Andreas	16,640	5,422	18,996	6,190	2,356	768	87.6%
Pilarcitos	1,851	603	2,995	976	1,144	373	61.8%
Total Local Storage	126,977	41,375	227,688	74,192	100,711	32,817	55.8%
Total System	1,058,000		1,432,914		392,914		73.8%

¹ Maximum Hetch Hetchy Reservoir storage with drum gates deactivated.

² Maximum Cherry Lake storage with flash-boards removed.

³ Maximum Lake Eleanor storage with 3 of 4 rows of flash-boards installed.

⁴ Available capacity does not take into account current DSOD storage restrictions.

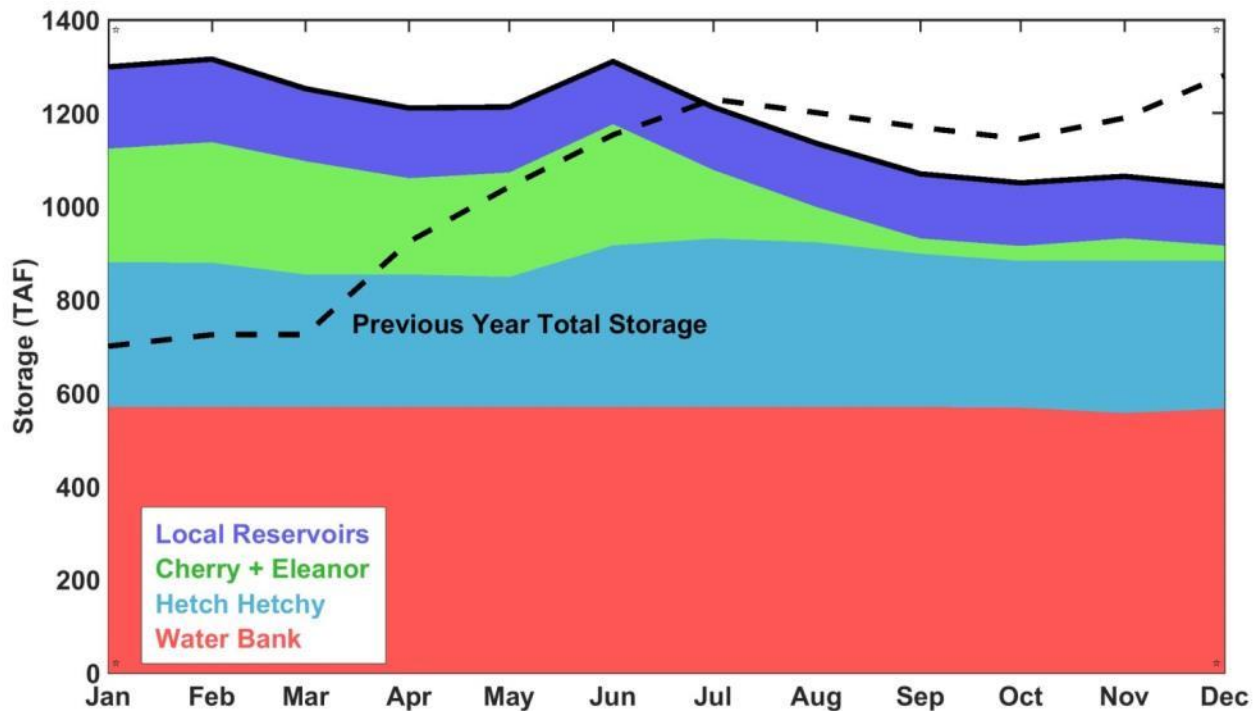


Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show relative contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index ^{5/}

Current Month: The December 2017 six-station precipitation index was 0.28 inches, or 6.1% of the average index for the month.

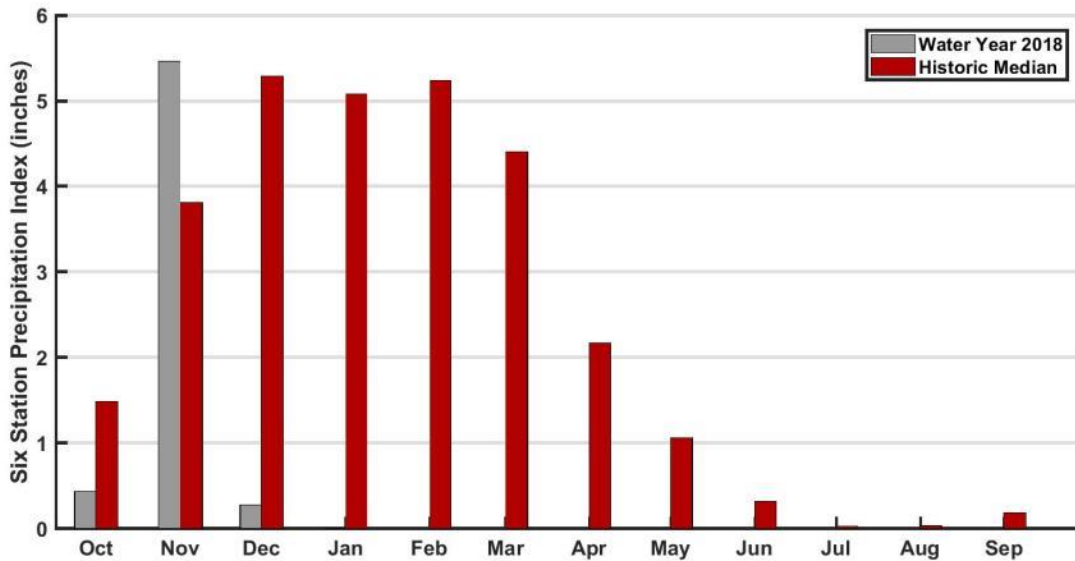


Figure 2: Monthly distribution of the Hetch Hetchy six-station precipitation index as percent of the annual average precipitation, as of January 1.

Cumulative Precipitation to Date: The accumulated six-station precipitation index for water year 2018 is 6.18 inches, which is 17% of the average annual water year total. Hetch Hetchy received 0.35 inches precipitation in December, for a total of 7.11 inches for Water Year 2018. The cumulative Hetch Hetchy precipitation is shown in Figure 3 in red.

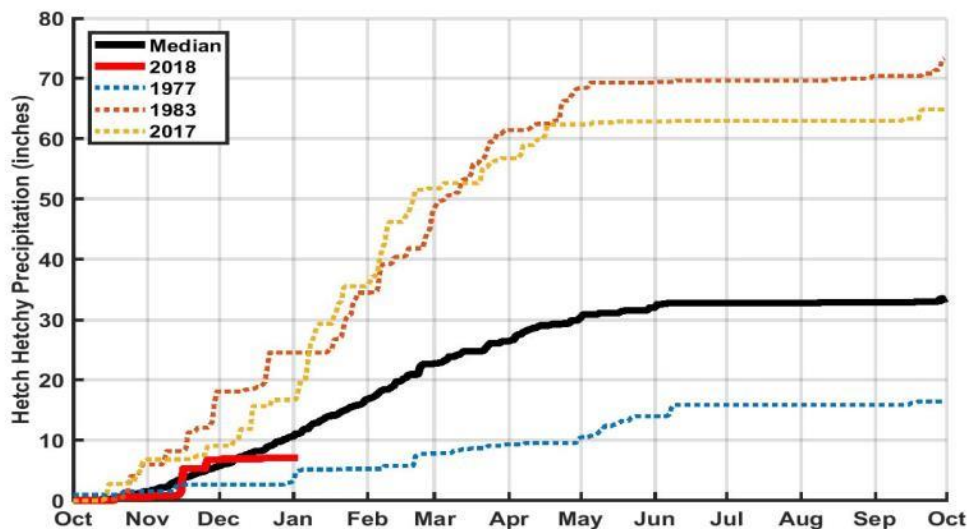


Figure 3: Water year 2018 cumulative precipitation measured at Hetch Hetchy Reservoir through January 1st, 2018. Precipitation at the Hetch Hetchy gauge for wet, dry, median, and WY 2017 are included for comparison purposes.

^{5/}The precipitation index is computed using six Sierra precipitation stations and is an indicator of the wetness of the basin for the water year to date. The index is computed as the average of the six stations and is expressed in inches and in percent.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange as of January 1, 2018 is summarized below in Table 2.

*All flows are in acre feet	December 2017				October 1 through December 31, 2017			
	Observed Flow	Median ⁶	Mean ⁶	Percent of Mean	Observed Flow	Median ⁶	Mean ⁶	Percent of Mean
Inflow to Hetch Hetchy Reservoir	11,004	12,039	20,973	52%	46,086	28,667	40,852	113%
Inflow to Cherry Lake and Lake Eleanor	8,249	14,006	23,946	34%	51,376	31,552	45,136	114%
Tuolumne River at La Grange	31,892	48,166	88,566	36%	154,649	95,724	150,540	103%
Water Available to City	0	1,449	37,212	0%	35,396	5,372	52,576	67%

⁶Hydrologic Record: 1919 – 2015

Hetch Hetchy System Operations

Power draft and releases from Hetch Hetchy Reservoir during the month of December totaled 19,743 acre-feet to meet instream release requirements. Precipitation to date puts Hetch Hetchy Reservoir in Year Type B through February 1, 2018. Hetch Hetchy minimum instream release requirements for December were 50 cfs, and for January is 40 cfs.

Valve releases from Cherry Lake totaled 22,215 acre-feet during the month of December to meet instream release requirements and to lower Cherry Lake back to construction levels for valve work; November inflows to Cherry Lake caused the lake to rise above the necessary construction level. No water was transferred via pumping from Lake Eleanor to Cherry Lake in December. The required minimum instream release from Cherry Lake is 5 cfs through June 30th, 2018. Required minimum release from Lake Eleanor is 5 cfs through March 1st. Lake Eleanor is currently nearly full, with releases targeting minimum instream release requirements.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for December was 29 MGD. The Sunol Valley Water Treatment Plant production for the month was 17 MGD.

Local System Water Delivery

The average December rate was 163 MGD which is a 4% decrease below the November delivery rate of 170 MGD.

Local Precipitation

Lack of rainfall characterized precipitation across the watersheds in December. The rainfall summary for the month is presented in Table 3.

Reservoir	Month Total (inches)	Percentage of Average for the Month	Water Year to Date ⁷ (inches)	Percentage of Average for the Year-to-Date ⁷
Pilarcitos	0.64	9 %	7.29	51 %
Lower Crystal Springs	0.31	7 %	4.68	49 %
Calaveras	0.15	4 %	2.97	40 %

⁷ WY 2018: Oct. 2017 through Sep. 2018.

Snowmelt and Water Supply

Cherry Lake was lowered to 5,000 acre-feet for outlet valve repairs and replacement. Butterfly valve repair work is scheduled to be completed the second week of January, allowing for lake refilling throughout the winter. The hollow jet replacement is scheduled to be completed in February, allowing for return to normal operations at Cherry Lake. Lake Eleanor is being kept at maximum storage. Water from Lake Eleanor will be transferred to Cherry Lake as soon as construction allows, which may be as early as late January.

Hetch Hetchy is currently at 316 TAF, within our seasonal storage target. If Hetch Hetchy storage increases above 330 TAF, some additional power generation will be scheduled to bring Hetch Hetchy back to seasonal storage targets.

No significant snowpack has accumulated to date.

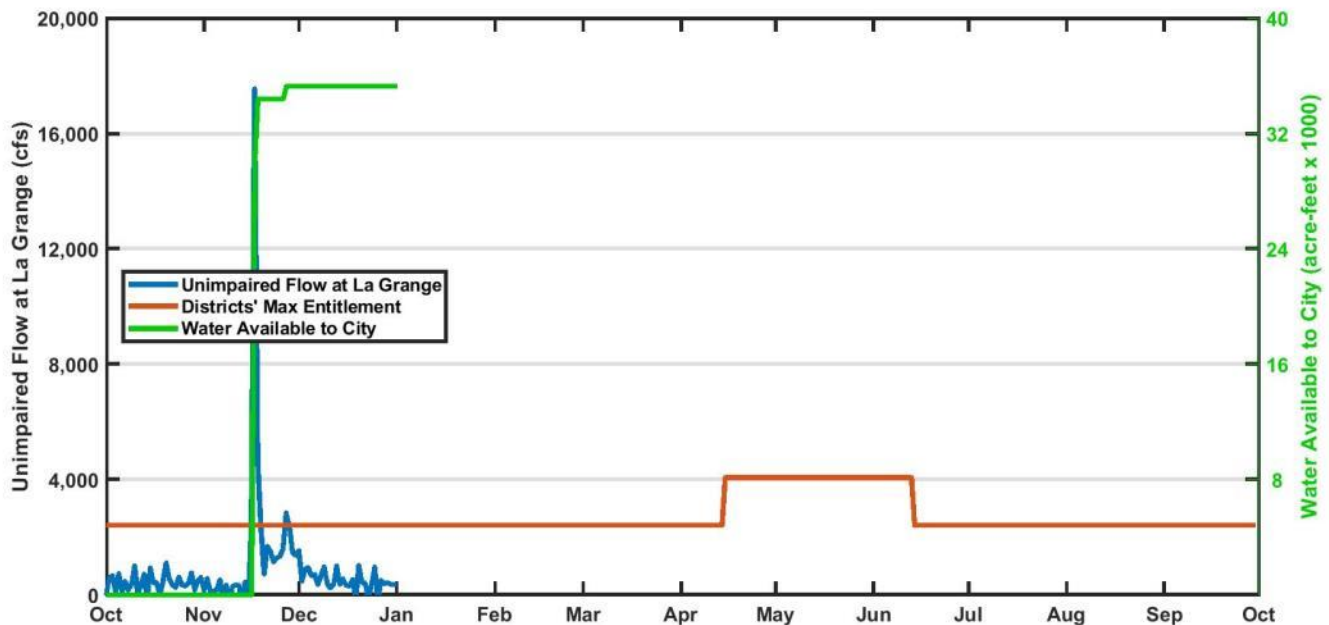


Figure 4: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City.