San Francisco Public Utilities Commission
Hydrological Conditions Report
December 2018

J.Chester, C.Graham, N.Waelty R.Walters January 6, 2019

Lake Eleanor elevation 4657 ft. As of January 6, about 1 foot of snow was measured at the Lake Eleanor Dam.

System Storage

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

Table 1
Current System Storage
As of January 1, 2019

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]	245,720		340,830		95,110		72%
Cherry[2]	210,047		268,810		58,763		78%
Eleanor[3]	18,157		21,495		3,338		84%
Water Bank	561,968		570,000		8,032		99%
Tuolumne Storage	1,035,892		1,201,135		165,243		86%
Local Bay Area Storage							
Calaveras[4]	24,703	8,049	96,824	31,550	72,121	23,501	26%
San Antonio	45,869	14,947	50,496	16,454	4,626	1,508	91%
Crystal Springs	51,804	16,880	58,377	19,022	6,573	2,142	89%
San Andreas	16,640	5,422	18,996	6,190	2,356	768	88%
Pilarcitos	2,342	763	2,995	976	652	213	78%
Total Local Storage	141,358	46,062	227,688	74,192	86,329	28,130	62%
Total System	1,177,250		1,428,822		251,572		82%

[1] Maximum Hetch Hetchy Reservoir storage with drum gates deactivated.
[2] Maximum Cherry Reservoir storage with flash-boards removed.
[3] Maximum Lake Eleanor storage with flash-boards removed.
[4] Available capacity does not take into account current DSOD storage restrictions.

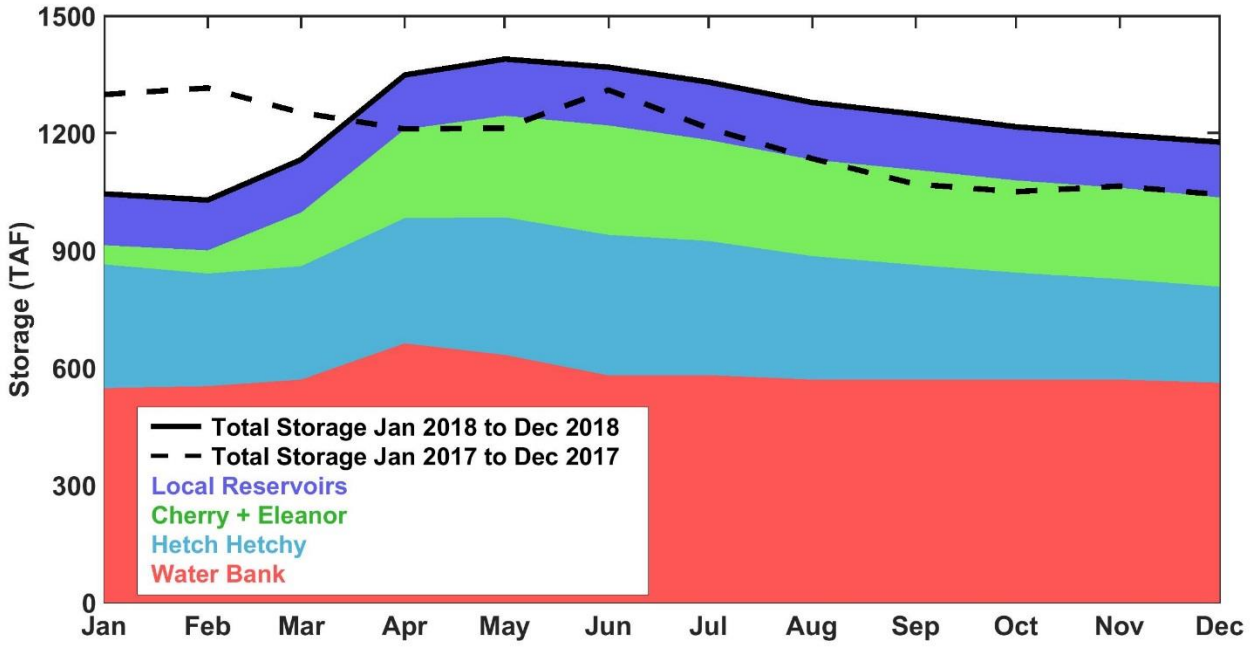

Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index

Current Month: The December 2018 six-station precipitation index was 2.18 inches, or 39% 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.

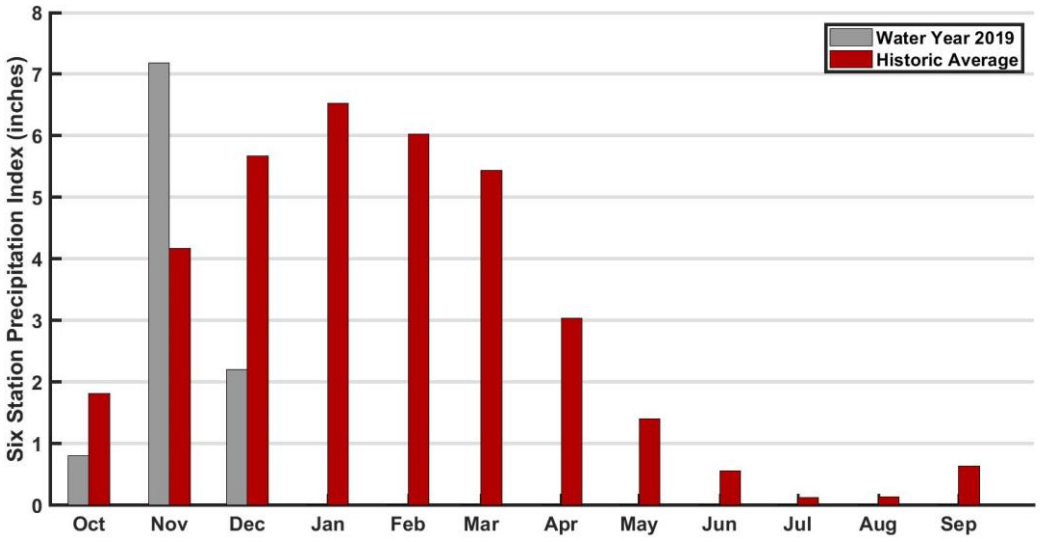

Figure 2: Monthly distribution of the six-station precipitation index as compared to the annual average precipitation for December 2018. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

Cumulative Precipitation to Date: As of January 1st, the six-station precipitation index for Water Year 2019 was 10.15 inches, which is 28.5% of the average annual water year total. Hetch Hetchy received 1.98 inches of precipitation in December, for a total of 9.65 inches for Water Year 2019. The cumulative Hetch Hetchy precipitation is shown in Figure 3 in red.

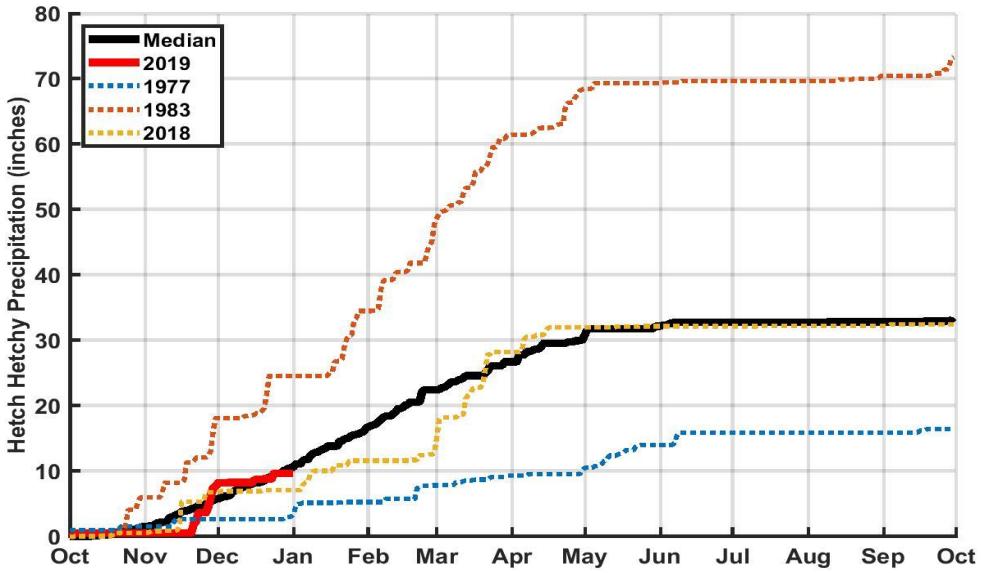

Figure 3: Water Year 2019 cumulative precipitation measured at Hetch Hetchy Reservoir. Median cumulative precipitation at Hetch Hetchy and example wet and dry years are included with WY 2019 for comparison purposes.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange for December 2018 is summarized below in Table 2.

Calculated reservoir inflows and Water Available to City								
* All flows are in acre-feet	December 2018				October 1, 2018 through December 31, 2018			
	Observed Flow	Median[n]	Mean[n]	Percent of Mean	Observed Flow	Median[n]	Mean[n]	Percent of Mean
Inflow to Hetch Hetchy Reservoir	11,756	11,810	20,869	56%	18,863	28,667	40,835	46%
Inflow to Cherry Lake and Lake Eleanor	12,407	13,949	23,803	52%	17,229	31,552	45,136	38%
Tuolumne River at LaGrange	37,373	48,032	87,941	42%	68,631	95,724	150,449	46%
Water Available to City	0	1,165	37,201	0%	3,372	5,372	52,504	6%

[5]Hydrologic Record: 1919-2015

Hetch Hetchy System Operations

Power draft and stream releases from Hetch Hetchy Reservoir during the month of December totaled 23,268 acre-feet. Precipitation thus far in Water Year 2019 result in a Water Year Type A (normal to wet conditions) for Hetch Hetchy Reservoir, which will be maintained through at least February 1st, 2019. Hetch Hetchy minimum instream release requirements for the month of December were 50 cfs. Instream release requirements for January 2019 will remain at 50 cfs. Current Hetch Hetchy total releases are equal to minimum environmental releases and SFPUC water deliveries.

Cherry Reservoir power generation and valve releases totaled 17,268 acre-feet for the month and were used to maintain seasonal target elevations. The required minimum instream release from Cherry Reservoir was 5 cfs for December and will remain at this rate through June 30. Required minimum release from Lake Eleanor was 5 cfs for December and will remain at 5 cfs through March 1. There were 9 days of transfers of water from Eleanor to Cherry in December for total of 3,570 ac-ft.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for December was 31 MGD. The Sunol Valley Water Treatment Plant production rate for the month was 3 MGD.

Local System Water Delivery

The average December delivery rate was 149 MGD which is a 19% decrease below the November delivery rate of 185 MGD.

Local Precipitation

December precipitation totals were below normal for the month. The rainfall summary for December 2018 is presented in Table 3.

Table 3
December Precipitation Totals at Three Local Area Reservoirs

Reservoir	December		Water Year 2019	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos	3.62	48 %	11.46	82 %
Lower Crystal Springs	2.44	47 %	7.10	73 %
Calaveras	2.66	69 %	6.23	83 %

Snowmelt and Water Supply

The January 1st snow pack is currently 38% of the April 1st median and 105% of normal to date. A series of storm events through the first 2 weeks of January is expected to add to the snowpack, keeping at or above the seasonal accumulation curve. The first snow surveys of 2019 are scheduled for the last week of January.

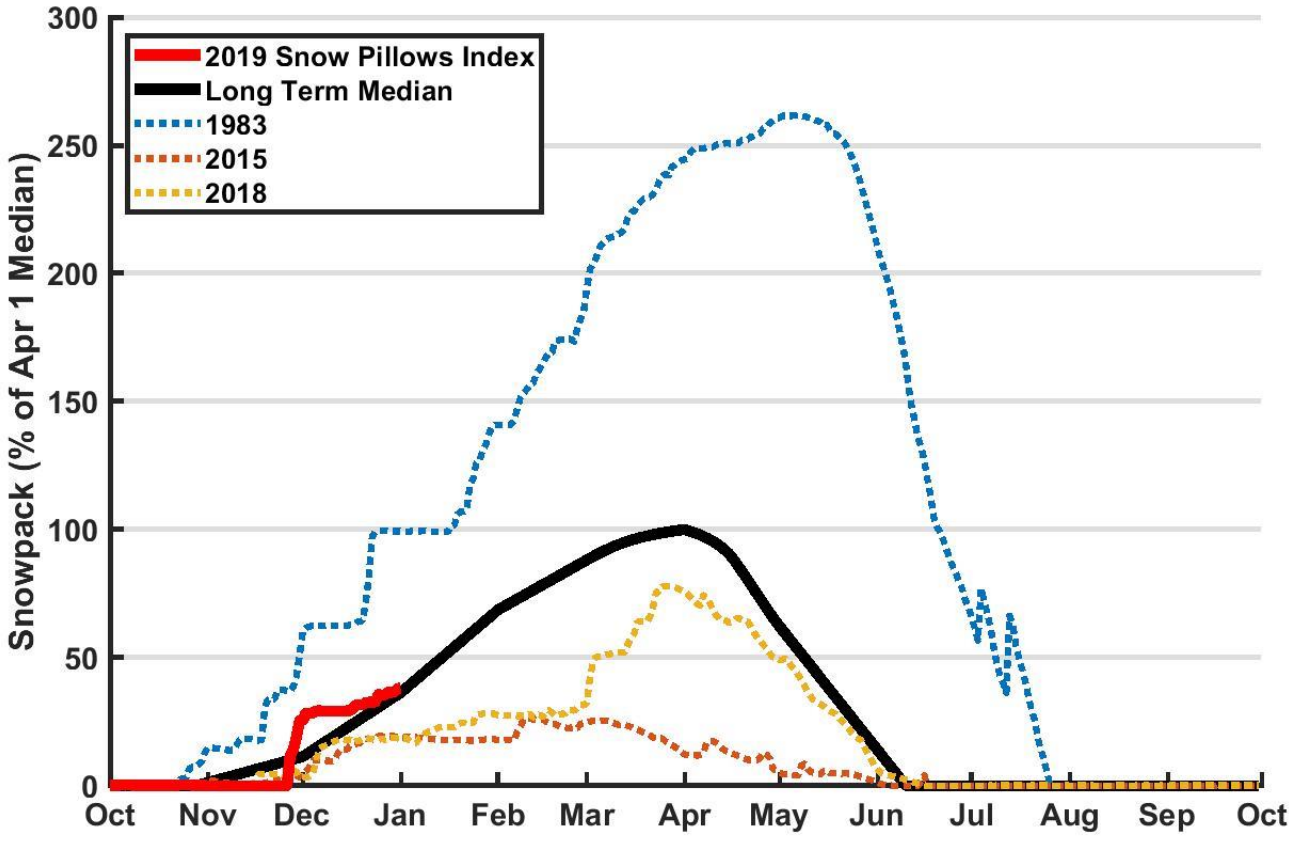

Figure 4: Tuolumne River Basin 10 Station Snow Index, based on real time snow pillow SWE measurements in the Tuolumne Basin. The late November storm delivered significant snowpack, which has been added to in a series of smaller storm events in December.

Hetch Hetchy Reservoir storage remains below the seasonal target and is being drafted to meet instream release requirements and water delivery demands. Cherry Reservoir is being operated to remain at the seasonal storage target of 210 TAF through the end of runoff. Increased inflows due to storms or snow melt will result in elevated Holm Powerhouse power draft. Total Tuolumne system storage is at 86%. Instream releases from Cherry, Eleanor and Hetch Hetchy reservoirs exceeded unimpaired flows at LaGrange maintaining the Water Bank at or near capacity throughout the month of December.

Priest Reservoir is currently in service and is being drawn down to accommodate the January 8-March 9 SJPL shutdown and Mountain Tunnel inspections and repairs. The drawdown began the last week of December, and Priest Reservoir went on the bypass January 5th. Moccasin Reservoir has been refilled according to DSOD guidance to an elevation of 905 ft and will remain there through the shutdown.

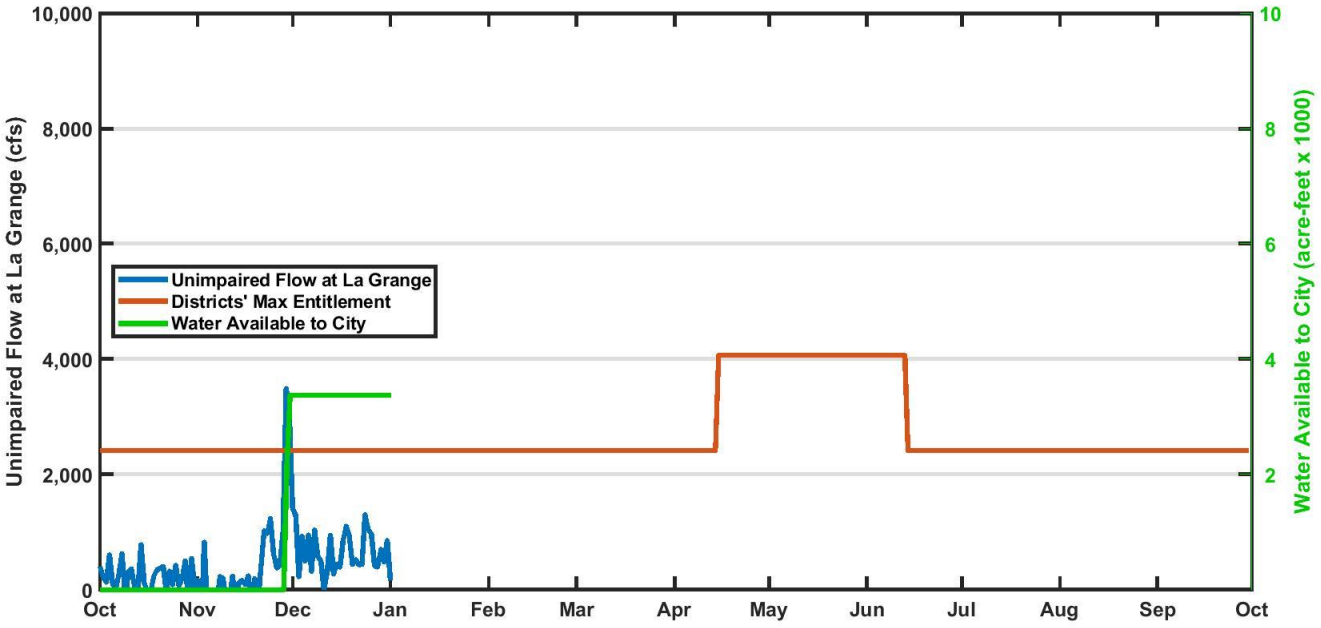

Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City. Current Water Available to the City is 3,372 ac-ft available to the city in Water Year 2019.