

# **San Francisco Public Utilities Commission**

## **Hydrological Conditions Report**

### **November 2018**

J.Chester, C.Graham, N.Waelty R.Walters December 4, 2018



The view from the Priest Grade looking West towards Moccasin Campus and the Central Valley.

## System Storage

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

<b>Table 1 Current System Storage As of December 1, 2018</b>							
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	
<b>Tuolumne System</b>							
Hetch Hetchy <sup>1</sup>	257,134		340,830		83,696		75%
Cherry <sup>2</sup>	217,046		268,810		51,764		81%
Eleanor <sup>3</sup>	16,382		21,495		5,113		76%
Water Bank	570,000		570,000		0		100%
Tuolumne Storage	1,060,562		1,201,135		140,573		88%
<b>Local Bay Area Storage</b>							
Calaveras <sup>4</sup>	23,577	7,683	96,824	31,550	73,247	23,867	24%
San Antonio	42,403	13,817	50,496	16,454	8,093	2,637	84%
Crystal Springs	50,609	16,491	58,377	19,022	7,768	2,531	87%
San Andreas	16,177	5,271	18,996	6,190	2,819	919	85%
Pilarcitos	2,335	761	2,995	976	660	215	78%
Total Local Storage	135,101	44,023	227,688	74,192	92,586	30,169	59%
<b>Total System</b>	<b>1,195,663</b>		<b>1,428,822</b>		<b>233,159</b>		<b>84%</b>

<sup>1</sup> Maximum Hetch Hetchy Reservoir storage with drum gates deactivated.

<sup>2</sup> Maximum Cherry Reservoir storage with flash-boards removed.

<sup>3</sup> Maximum Lake Eleanor storage with flash-boards removed.

<sup>4</sup> Available capacity does not take into account current DSOD storage restrictions.

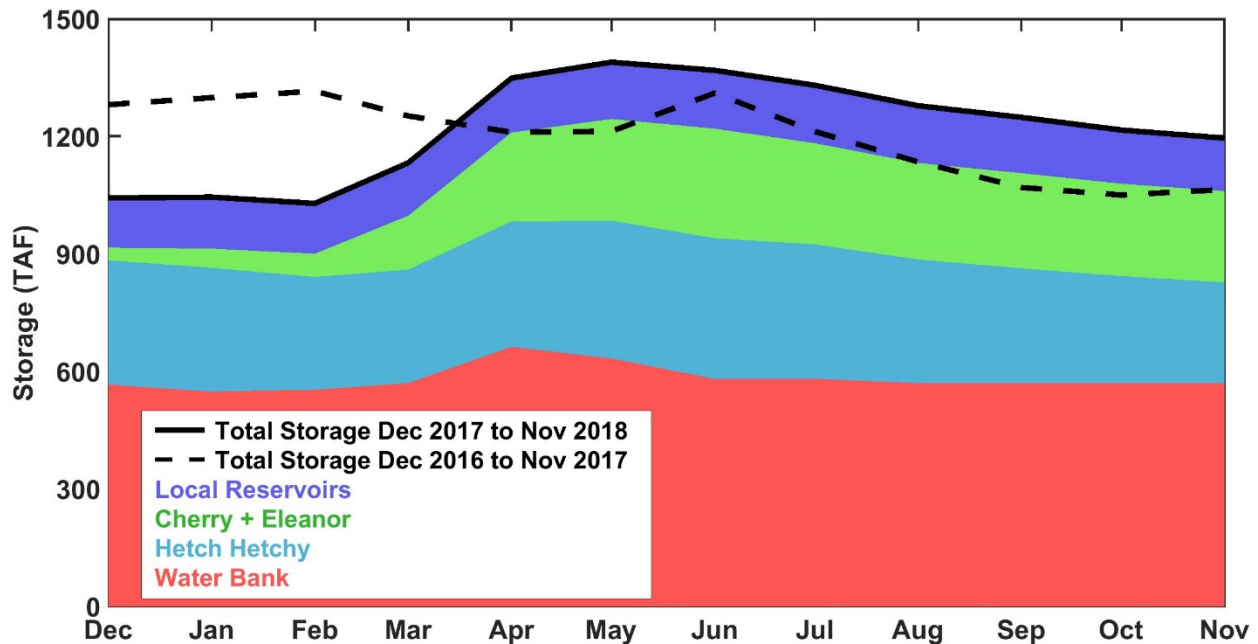
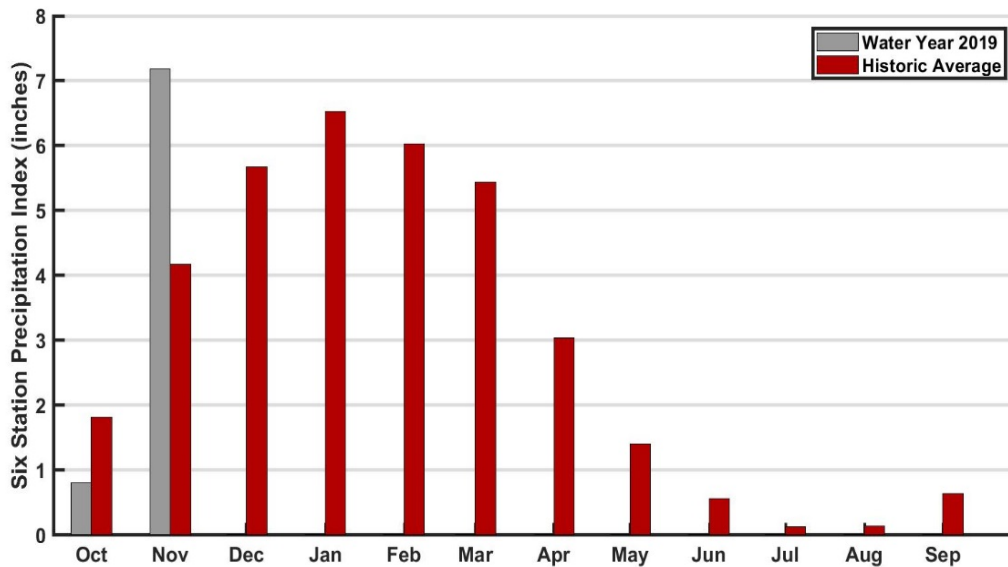


Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

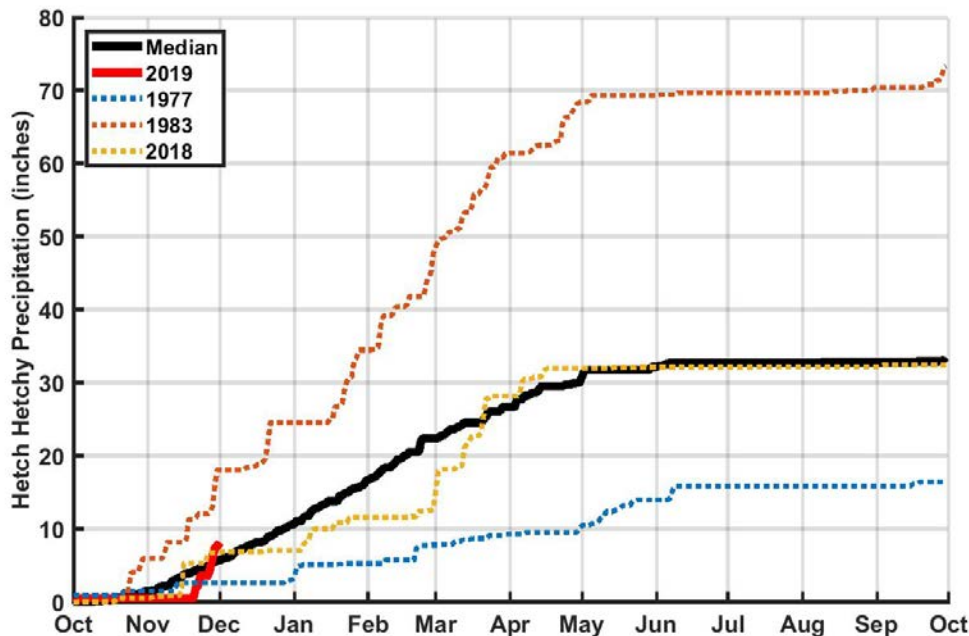
## Hetch Hetchy System Precipitation Index

*Current Month:* The November 2018 six-station precipitation index was 7.17 inches, or 170% 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 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 December 1<sup>st</sup>, the six-station precipitation index for Water Year 2019 was 7.97 inches, which is 22% of the average annual water year total. Hetch Hetchy received 7.11 inches of precipitation in September, for a total of 7.67 inches for Water Year 2018. 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 2018 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	November 2018				October 1, 2018 through November 30, 2018			
	Observed Flow	Median <sup>5</sup>	Mean <sup>5</sup>	Percent of Mean	Observed Flow	Median <sup>5</sup>	Mean <sup>5</sup>	Percent of Mean
Inflow to Hetch Hetchy Reservoir	4,854	6,038	13,528	36%	7,107	10,442	19,966	36%
Inflow to Cherry Lake and Lake Eleanor	4,661	7,413	15,616	30%	4,822	11,983	21,190	23%
Tuolumne River at LaGrange	16,923	20,372	44,836	38%	31,258	39,873	62,508	50%
Water Available to City	3,372	0	12,751	26%	3,372	0	15,303	22%

<sup>5</sup>Hydrologic Record: 1919-2015

## Hetch Hetchy System Operations

Power draft and stream releases from Hetch Hetchy Reservoir during the month of November totaled 21,596 acre-feet. Inflows Water Year 2018 resulted in a Water Year Type A (normal to wet conditions) for Hetch Hetchy Reservoir, which will be maintained through January 1<sup>st</sup>, 2019. Hetch Hetchy minimum instream release requirements for the month of November were 60 cfs. Instream release requirements for December are 50 cfs. Current Hetch Hetchy releases are equal to minimum environmental releases and SFPUC water deliveries.

Cherry Reservoir power generation and valve releases totaled 6,659 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 November and will remain at this rate through June 30. Required minimum release from Lake Eleanor was 5 cfs for the month of November and will remain at 5 cfs through January 1<sup>st</sup>, 2019. There were no transfers of water from Eleanor to Cherry in November.

## Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for November was 43 MGD. The Sunol Valley Water Treatment Plant production rate for the month was 30 MGD.

## Local System Water Delivery

The average November delivery rate was 185 MGD which is an 11% decrease below the October delivery rate of 208 MGD.

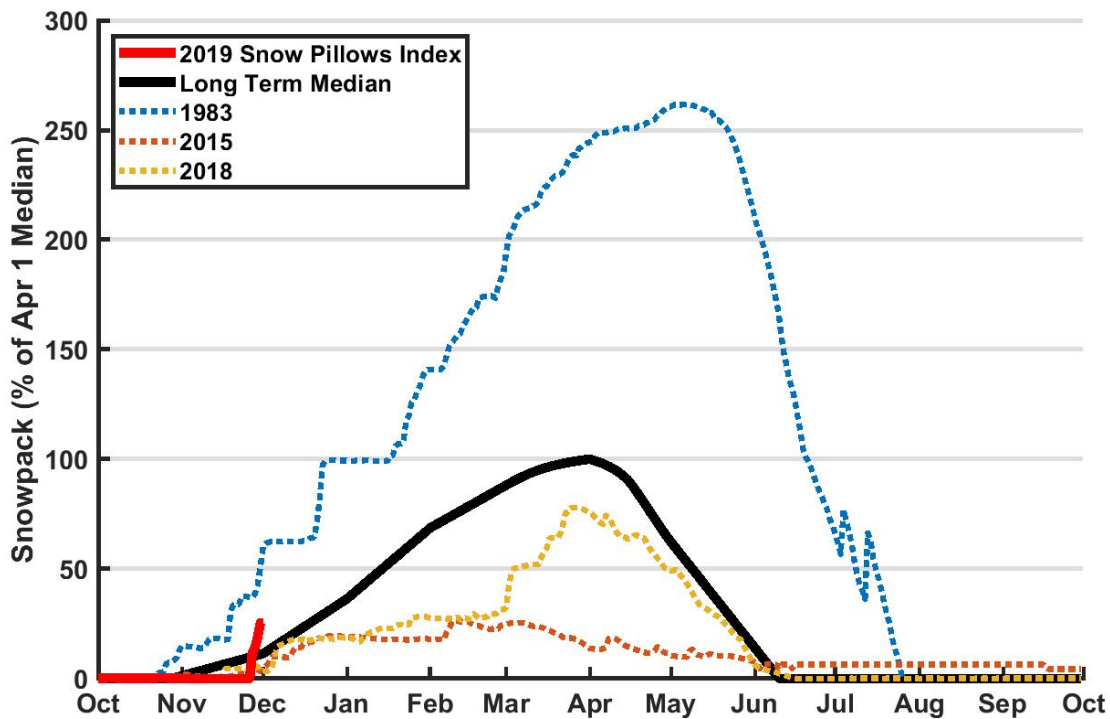
## Local Precipitation

Late in the month precipitation brought a wet end to our dry season. The rainfall summary for November 2018 is presented in Table 3.

Reservoir	November		Water Year 2019	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos	7.61	170 %	7.83	121 %
Lower Crystal Springs	4.42	142 %	4.46	99 %
Calaveras	3.57	137 %	3.57	97 %

## Snowmelt and Water Supply

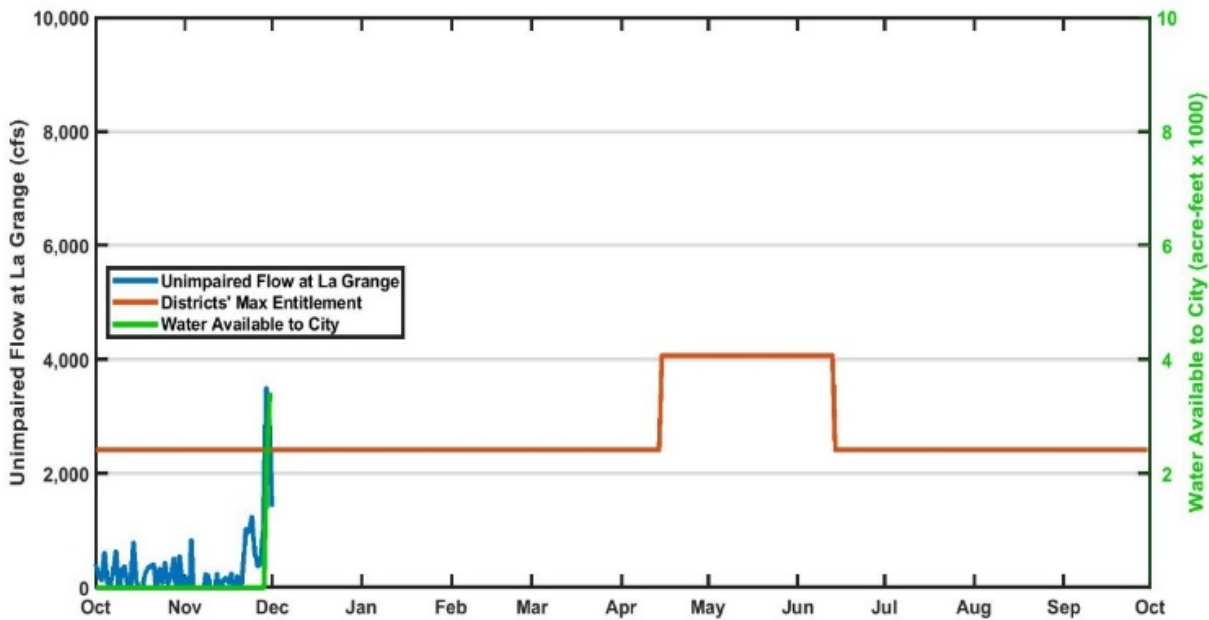
The December 1<sup>st</sup> snow pack is currently 26% of the April 1<sup>st</sup> median and 117% of normal to date.



**Figure 4:** Tuolumne River Basin Snow Pillow and Snow Course Indices.

Hetch Hetchy Reservoir storage remains within seasonal targets and is being drafted to meet instream release requirements and water delivery demands. Seasonal storage targets for Cherry Reservoir and Lake Eleanor are 210 TAF and 15 TAF, respectively. Increased inflows due to storms or snow melt will result in elevated Holm Powerhouse power draft. Total Tuolumne system storage is at 88%. Instream releases from Cherry, Eleanor and Hetch Hetchy reservoirs exceeded unimpaired flows at LaGrange maintaining the Water Bank at capacity throughout the month of November.

Priest Reservoir is currently in service and will be drawn down to accommodate the January 8-March 9 SJPL shutdown and Mountain Tunnel inspections and repairs. The drawdown is expected to begin the last week of December, and Priest Reservoir will go on the bypass no later than January 5<sup>th</sup>. Moccasin Reservoir repairs are going well, and a partial return to service is anticipated prior to the shutdown. Refill of Moccasin Reservoir may begin as early as December 23<sup>rd</sup>.



**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.