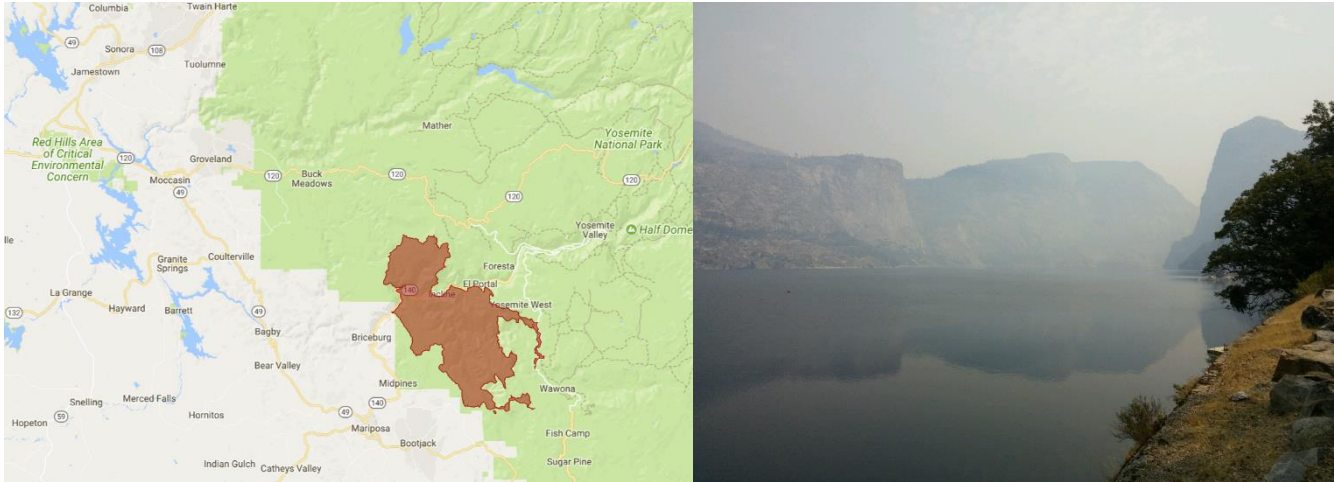


San Francisco Public Utilities Commission

Hydrological Conditions Report

July 2018

J. Chester, C. Graham, N. Waelty, & R. Walters, Aug 2, 2018



Red area indicates extent of Ferguson Fire. Very smoky conditions exist from Moccasin to Hetch Hetchy.

As of August 3rd, the Ferguson Fire is in its 22nd day, at 73,560 acres with 41% containment. The fire is currently limited to the Merced River Drainage, and has resulted in closure of Yosemite Valley and other parts of Yosemite National Park. Due to very smoky conditions, Hetch Hetchy Road has also been closed, though there is currently no danger of the Ferguson Fire reaching the Hetch Hetchy area. As of August 3rd, the fire remains 17 miles from Hetch Hetchy Reservoir and 14 miles from Early Intake, the closest SFPUC facility to the fire. Numerous natural and developed fire breaks lie between SFPUC facilities and the current extent of the Ferguson Fire.

While the access to Hetch Hetchy Reservoir is closed to the public, the area remains accessible to the SFPUC. Routine inspections, water quality checks, security and other operations remain in effect at Hetch Hetchy Reservoir and all other upcountry facilities. Yosemite National Park law enforcement is maintaining security in the area.

The fire extent is expected to remain outside the Tuolumne River Watershed, so no direct impact is expected on Hetch Hetchy Reservoir water quality. The fire has not resulted in significant ash deposits in Hetch Hetchy Reservoir, and no other water quality impacts due to smoke have been observed or are expected. The SFPUC does not anticipate any impairments to water delivery, as all facilities remain well outside the burn area.

System Storage

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

Table 1 Current Storage As of August 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	343,158		360,360		17,202		95%
Cherry ²	234,248		268,810		34,562		87%
Eleanor ³	24,100		27,100		3,000		89%
Water Bank ⁴	581,229		610,825		29,597		95%
Tuolumne Storage	1,182,735		1,267,095		84,361		93%
Local Bay Area Storage							
Calaveras ⁵	23,998	7,820	96,824	31,550	72,826	23,730	25%
San Antonio	48,708	15,872	50,496	16,454	1,787	582	97%
Crystal Springs	54,292	17,691	58,377	19,022	4,085	1,331	93%
San Andreas	18,295	5,961	18,996	6,190	702	229	96%
Pilarcitos	2,646	862	2,995	976	348	113	88%
Total Local Storage	147,939	48,206	227,688	74,192	79,748	25,986	65%
Total System	1,330,674		1,494,783		164,109		89%

¹ Maximum Hetch Hetchy Reservoir storage with drum gates activated.

² Maximum Cherry Lake storage with flash-boards removed.

³ Maximum Lake Eleanor storage with flash-boards installed.

⁴ Additional Water Bank storage is derived from flood storage encroachment in Don Pedro.

⁵ Available capacity does not take into account current DSOD storage restrictions.

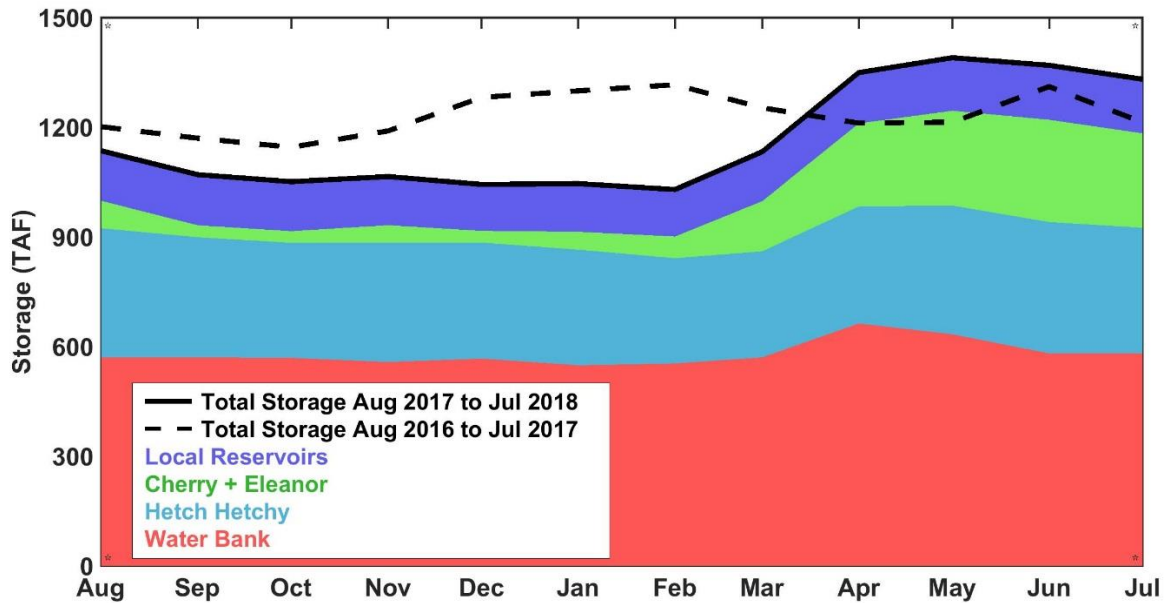


Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show relative contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index⁶

Current Month: The June 2018 six-station precipitation index was 0.03 inches, or 23% of the average index for the month.

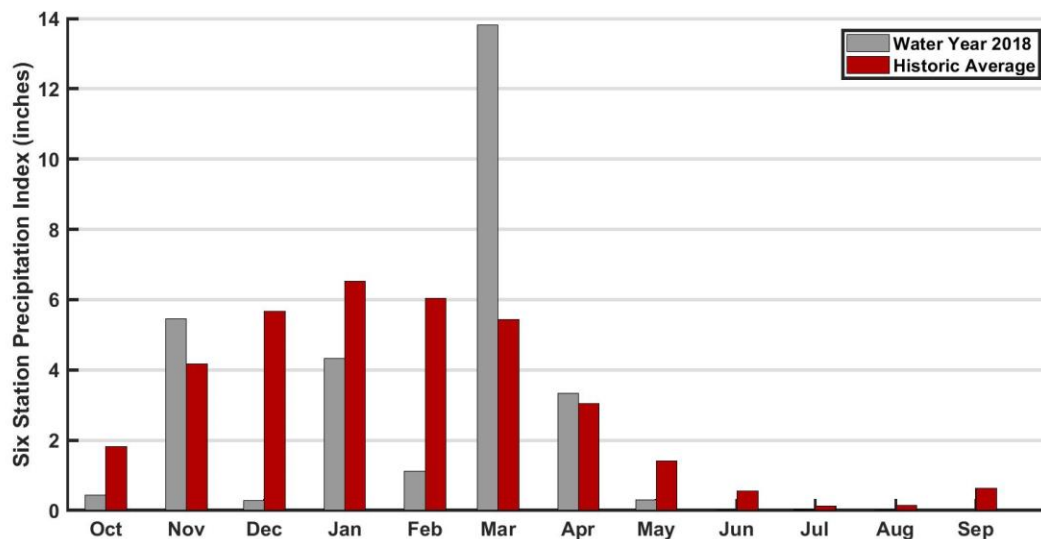


Figure 2: Monthly distribution of the Hetch Hetchy six-station precipitation index as percent of the annual average precipitation, as of August 1, 2018.

Cumulative Precipitation to Date: As of August 1, the six-station precipitation index for Water Year 2018 was 29.10 inches, which is 82% of the average annual water year total, or 84% of the average season-to-date precipitation. Hetch Hetchy received 0.09 inches of precipitation in July, for a total of 32.25 inches for Water Year 2018. The cumulative Hetch Hetchy precipitation is shown in Figure 3 in red.

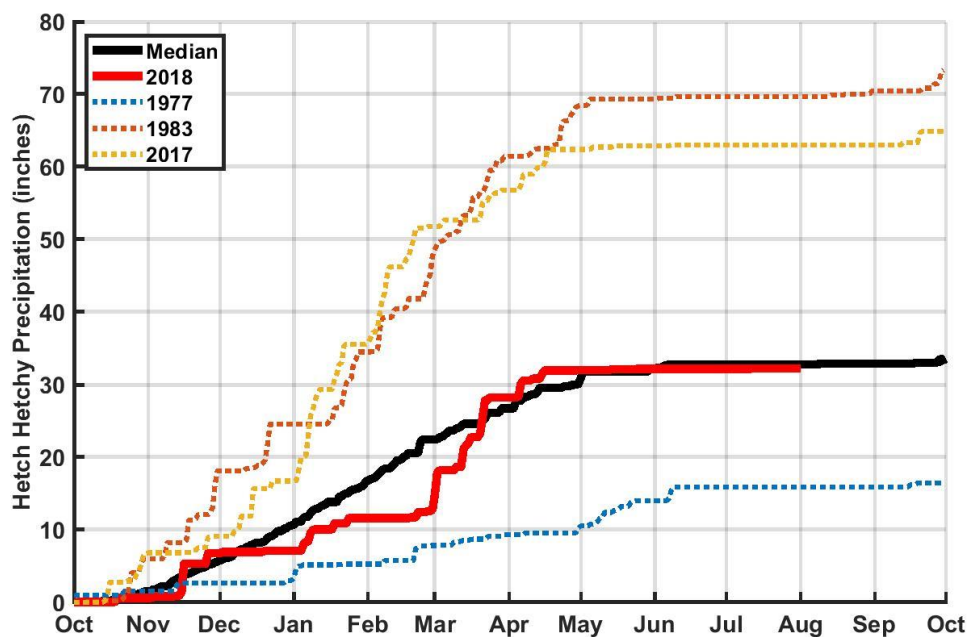


Figure 3: Water year 2018 cumulative precipitation measured at Hetch Hetchy Reservoir through August 1, 2018. Precipitation at the Hetch Hetchy gauge for wet, dry, median, and WY 2017 are included for comparison purposes.

⁶The 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 August 1, 2018 is summarized below in Table 2.

Table 2 WY 2018 Calculated reservoir inflows and Water Available to City As of August 1, 2018								
*All flows are in acre feet	July 2018				October 1, 2017 through July 31, 2018			
	Observed Flow	Median ⁷	Mean ⁷	Percent of Mean	Observed Flow	Median ⁷	Mean ⁷	Percent of Mean
Inflow to Hetch Hetchy Reservoir	16,814	41,332	74,776	22%	642,196	690,063	718,528	89%
Inflow to Cherry Lake and Lake Eleanor	-551 ⁸	11,540	25,516	-2%	409,752	439,143	446,920	92%
Tuolumne River at La Grange	33,949	66,731	119,768	28%	1,639,059	1,653,667	1,778,774	92%
Water Available to City	0	1,193	46,280	0%	666,636	579,119	763,079	87%

⁷ Hydrologic Record: 1919 – 2015

⁸ Negative inflows are due to uncertainties in evaporation, flows and reservoir rating curves

Hetch Hetchy System Operations

Power draft and releases from Hetch Hetchy Reservoir during the month of July totaled 32,844 acre-feet. Total inflows as of August 1st results in a Water Wear Type A for Hetch Hetchy Reservoir through January 1st, 2019. Hetch Hetchy minimum instream release requirements for July were 125 cfs, and for August are 125 cfs. Current Hetch Hetchy releases are at minimum environmental releases and water deliveries to the City.

Power draft and valve releases from Cherry Lake totaled 19,260 acre-feet during the month of July. The required minimum instream release from Cherry Lake is 15 cfs through September 30th, 2018. Required minimum release from Lake Eleanor (due to pumping) is 20 cfs through September 15th. Transfer from Lake Eleanor to Cherry Lake ended on June 25.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for July was 30 MGD. The Sunol Valley Water Treatment Plant was on standby for the month and no water production occurred.

Local System Water Delivery

The average July delivery rate was 238 MGD which is a 5% increase over the June delivery rate of 227 MGD.

Local Precipitation

Dry conditions characterized the month's weather. The rainfall summary for July is presented in Table 3.

Reservoir	Month Total (inches)	Percentage of Average for the Month	Water Year to Date ⁹ (inches)	Percentage of Average for the Year-to-Date ⁹
Pilarcitos	0.00	0 %	29.02	78 %
Lower Crystal Springs	0.00	0 %	19.78	76 %
Calaveras	0.00	0 %	14.03	66 %

⁹ WY 2018: Oct. 2017 through Sep. 2018.

Water Supply

Inflows at all upcountry reservoirs have receded to summer base flow conditions. Hetch Hetchy Reservoir storage remains within seasonal targets and is drafting according to instream and water delivery demands. At Cherry Lake, storage is within seasonal targets, and we have been drafting water for power production and recreation flows through Holm Powerhouse. Lake Eleanor has begun to slowly draft as minimum releases exceed natural inflows. Total Tuolumne system storage is near 93% as the upcountry reservoirs are managed for summer storage recession. Water Bank is near full and projected to credit throughout August due to environmental releases from all reservoirs and recreational releases from Cherry Reservoir.

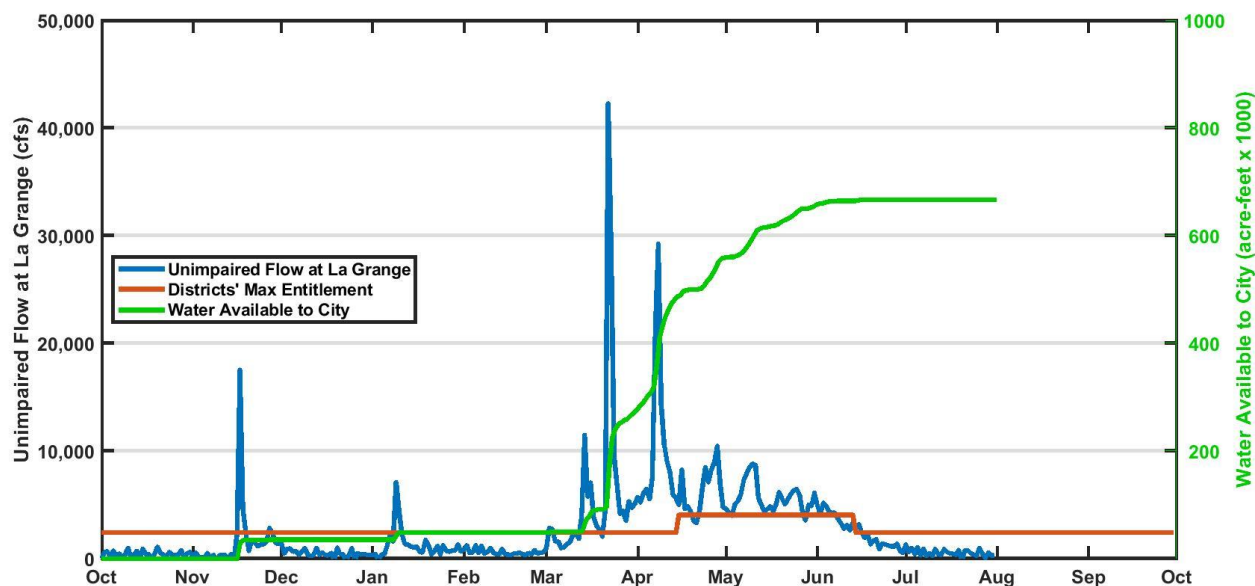


Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City. Current Water Available to the City is 666,636 acre-feet in WY2018.

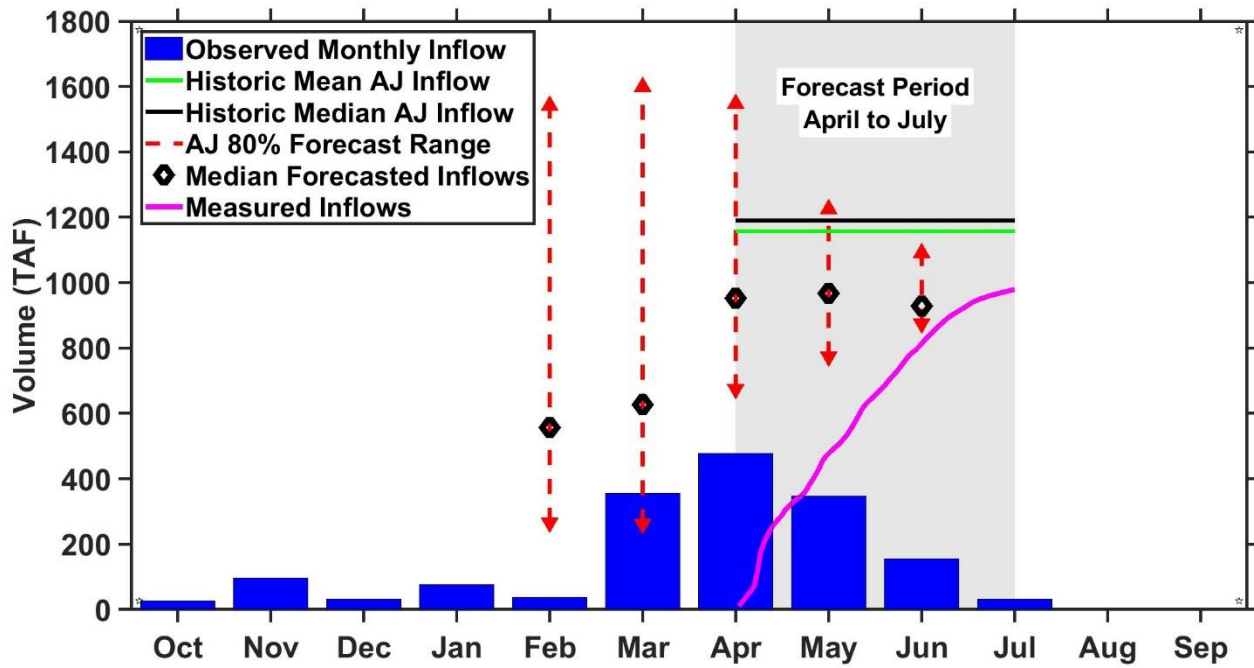


Figure 6: Water year 2018 conditions for the Tuolumne River at La Grange and for the 80% water supply forecast range (triangles represent the 90% and 10% forecasts, the open diamond represents the median forecast). Below average May and June precipitation lead to a minor lowering of the median inflow forecast, and a significant narrowing of the forecast range.