San Francisco Public Utilities Commission
Hydrological Conditions Report
April 2018

J. Chester, C. Graham, & N. Waelty, May 9, 2018

Tuolumne Meadows and the Cathedral Range

System Storage

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

Table 1
Current Storage
As of May 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]	320,168		340,000		19,832		94%
Cherry[2]	204,839		268,810		63,971		76%
Eleanor[3]	22,332		26,416		4,084		85%
Water Bank	662,610		666,965		4,355		99%
Tuolumne Storage	1,209,949		1,302,191		92,242		93%
Local Bay Area Storage							
Calaveras[4]	25,924	8,447	96,824	31,550	70,900	23,103	27%
San Antonio	42,483	13,843	50,496	16,454	8,013	2,611	84%
Crystal Springs	50,374	16,414	58,377	19,022	8,003	2,608	86%
San Andreas	17,344	5,652	18,996	6,190	1,652	538	91%
Pilarcitos	2,826	921	2,995	976	168	55	94%
Total Local Storage	138,951	45,277	227,688	74,192	88,736	28,915	61%
Total System	1,348,900		1,529,878		180,978		88%

[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.

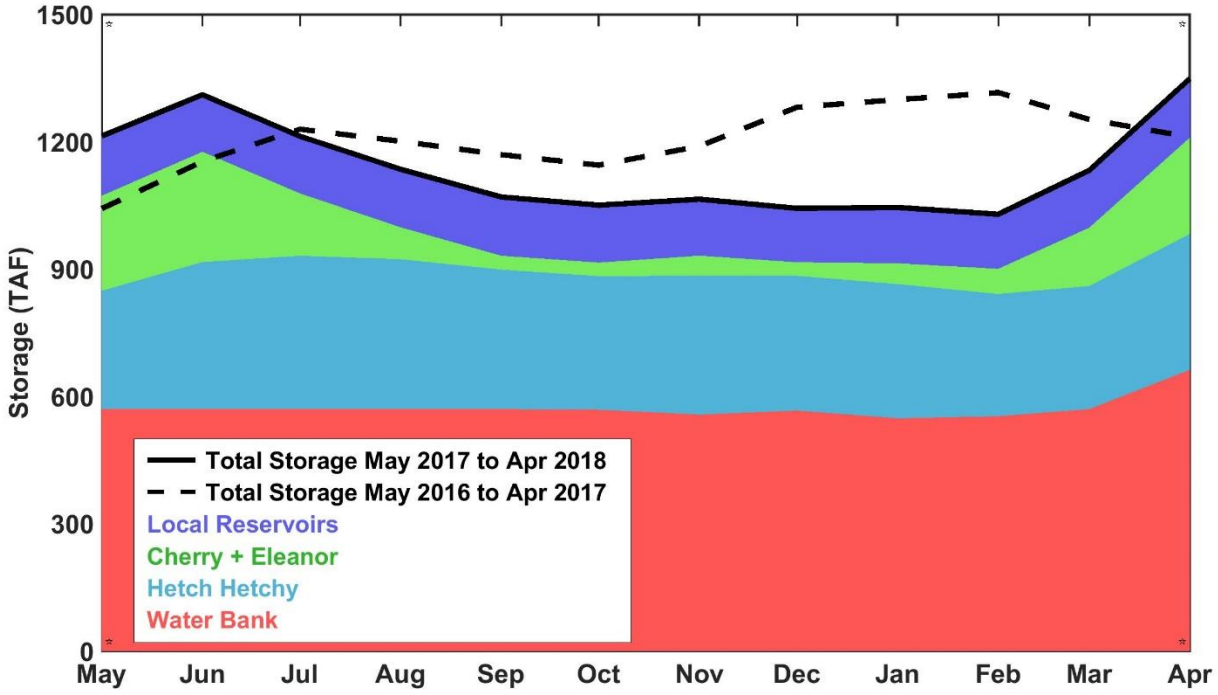

Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show relative contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index [5/]

Current Month: The April 2018 six-station precipitation index was 3.34 inches, or 110% of the average index for the month.

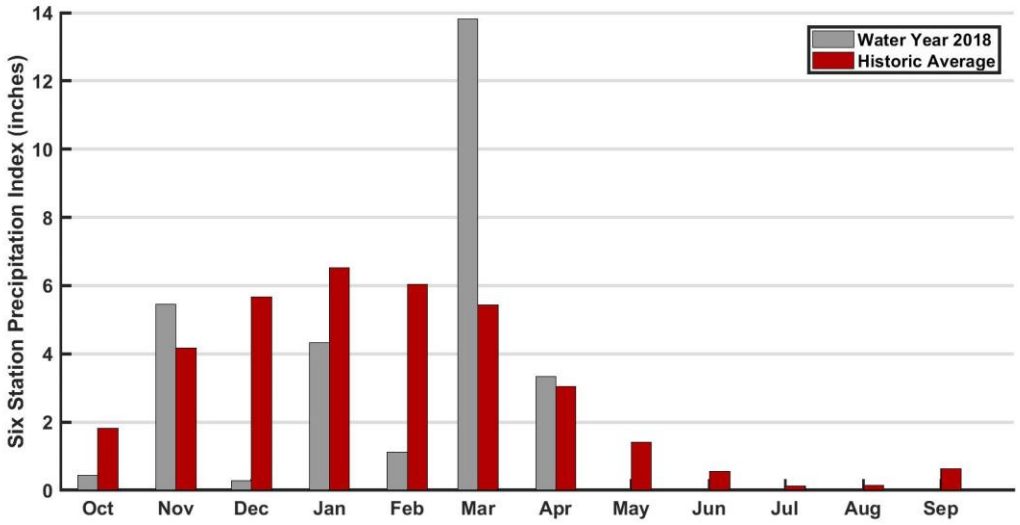

Figure 2: Monthly distribution of the Hetch Hetchy six-station precipitation index as percent of the annual average precipitation, as of April 1, 2018.

Cumulative Precipitation to Date: As of May 1, the six-station precipitation index for water year 2018 was 28.44 inches, which is 80% of the average annual water year total. Hetch Hetchy received 3.75 inches precipitation in April, for a total of 31.78 inches for Water Year 2018. The cumulative Hetch Hetchy precipitation is shown in Figure 3 in red.

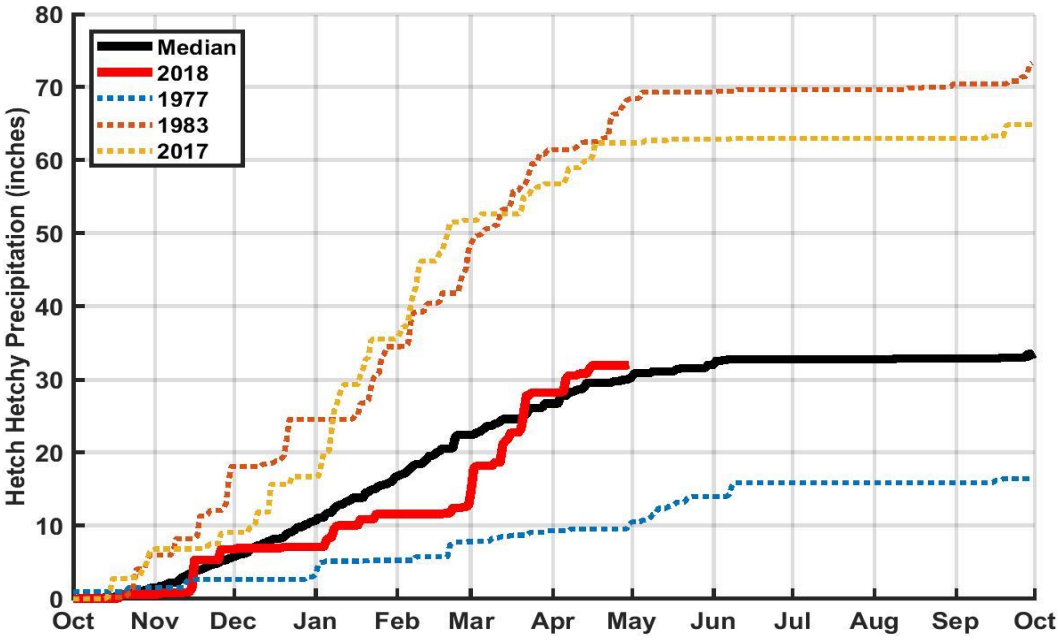

Figure 3: Water year 2018 cumulative precipitation measured at Hetch Hetchy Reservoir through May 1, 2018. Precipitation at the Hetch Hetchy gauge for wet, dry, median, and WY 2017 are included for comparison purposes.

[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 May 1, 2018 is summarized below in Table 2.

Table 2
WY 2018 Calculated reservoir inflows and Water Available to City
As of May 1, 2018

*All flows are in acre feet	April 2018				October 1, 2017 through April 30,2018			
	Observed Flow	Median[6]	Mean[6]	Percent of Mean	Observed Flow	Median[6]	Mean[6]	Percent of Mean
Inflow to Hetch Hetchy Reservoir	188,830	88,140	90,415	209%	327,558	204,241	220,781	148%
Inflow to Cherry Lake and Lake Eleanor	129,832	72,413	73,287	177%	293,696	197,337	211,960	139%
Tuolumne River at La Grange	477,604	262,613	273,556	175%	1,102,804	775,189	874,089	126%
Water Available to City	284,074	82,697	96,413	295%	558,652	231,180	319,913	175%

[6] Hydrologic Record: 1919 – 2015

Hetch Hetchy System Operations

Power draft and releases from Hetch Hetchy Reservoir during the month of April totaled 151,930 acre-feet. Precipitation as of May 1st results in a water year Type A for Hetch Hetchy Reservoir through June 1st, 2018. Hetch Hetchy minimum instream release requirements for April were 75 cfs, and for May are 100 cfs. The latest water supply forecasts show that water from Hetch Hetchy will be available for power generation through the end of runoff. Hetch Hetchy inflows are currently being managed via power draft and valve releases.

Power draft and valve releases from Cherry Lake totaled 13,289 acre-feet during the month of April. The required minimum instream release from Cherry Lake is 5 cfs through June 30th, 2018. Required minimum release from Lake Eleanor (due to pumping) is 20 cfs through September 15th. Transfer from Lake Eleanor to Cherry Lake will occur on and off throughout the runoff season.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for April was 37 MGD. The Sunol Valley Water Treatment Plant production for the month was 44 MGD.

Local System Water Delivery

The average April delivery rate was 184 MGD which is a 4% increase over the March delivery rate of 176 MGD.

Local Precipitation

Early month precipitation contributed to higher than average rainfall totals for the month. The rainfall summary for April is presented in Table 3.

Table 3
Precipitation Totals at Three Local Area Reservoirs for April 2018

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	4.32	169 %	28.70	80 %
Lower Crystal Springs	2.54	141 %	19.62	78 %
Calaveras	2.23	134 %	14.03	69 %

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

Snowmelt and Water Supply

The May snow survey indicates that the Tuolumne average snow water equivalent is 40% of long term average. On April 23, the Airborne Snow Observatory flew the Tuolumne Basin, and estimated that the basin SWE was 397 TAF above Hetchy Hetchy, and 147 TAF above Cherry / Eleanor. Based on previous years experience, it is likely we will see 100% of the measured Airborne Snow observation as inflow to Hetch Hetchy Reservoir.

Inflows have increased at all upcountry reservoirs as warm weather has begun melting the snowpack. Hetch Hetchy Reservoir storage remains within seasonal targets. The current seasonal inflow forecast projects Hetch Hetchy Reservoir will fill, with additional water available for power generation through the runoff season. At Cherry Lake, storage has reached our seasonal targets, and we have begun drafting water for power generation. This draft is expected to continue through the month of May and into June as we maintain Cherry Lake at seasonal storage targets. Lake Eleanor is full and is expected to stay near spilling conditions through May. Total system storage is near 88% as the upcountry reservoirs are maintained at the seasonal targets. Water Bank is full and projected to debit throughout May as the reservoirs fill.

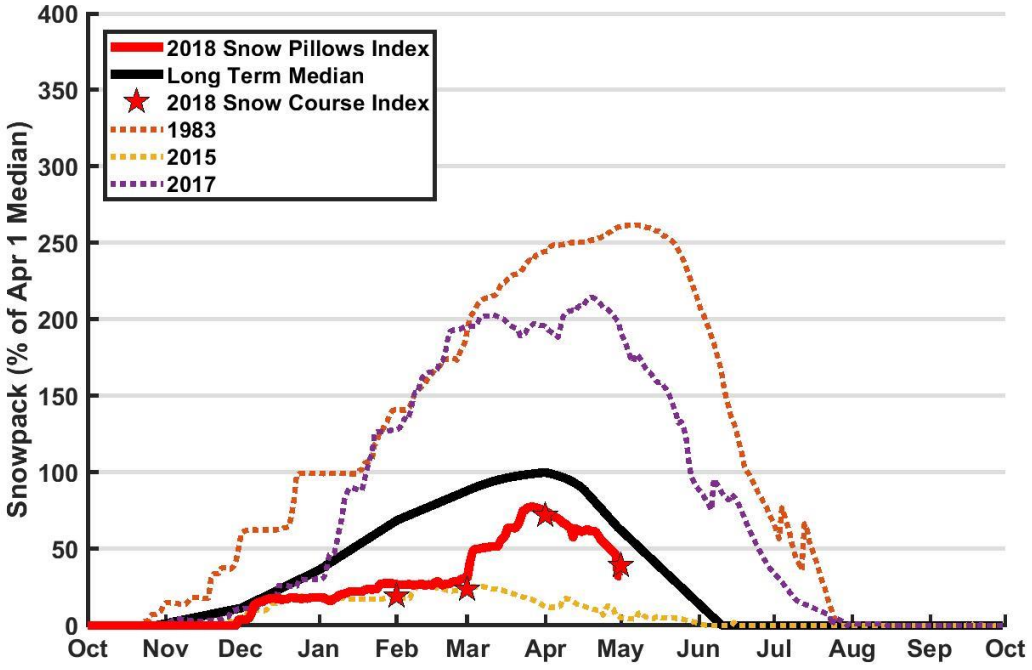

Figure 4: Tuolumne Snow Pillow and Snow Course Indices. Snowmelt is in full swing.

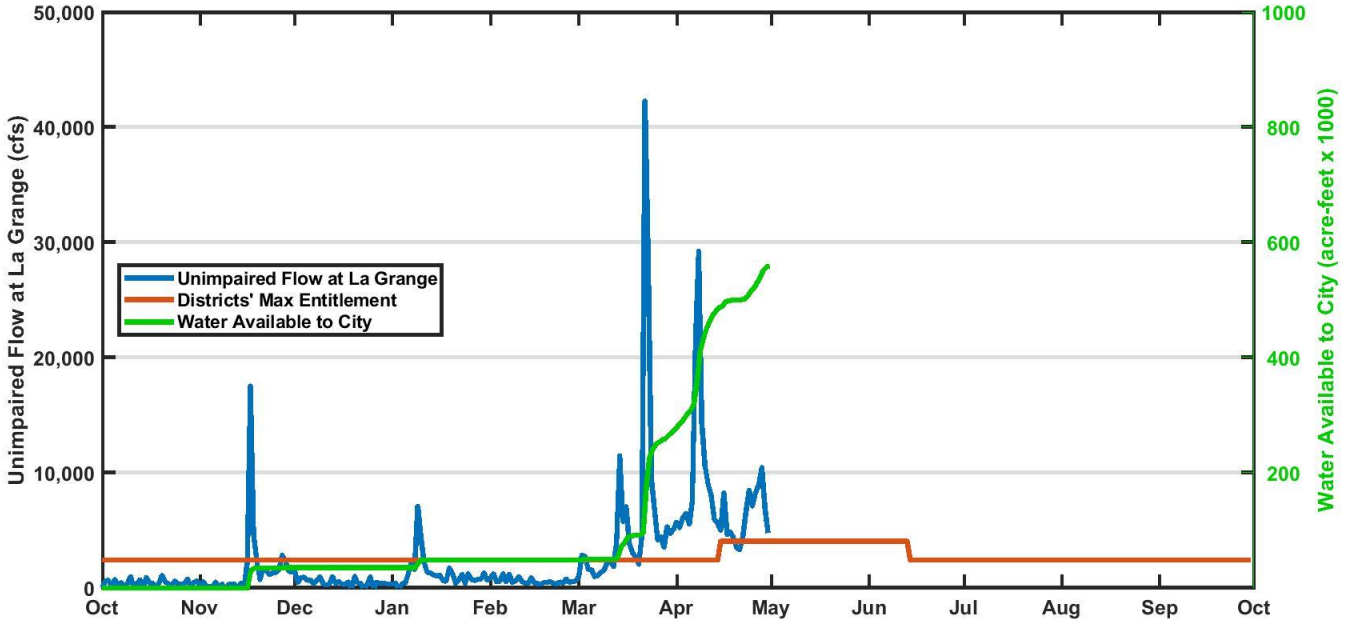

Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City. Current Water Available to the City is 558,652 acre feet in WY2018.

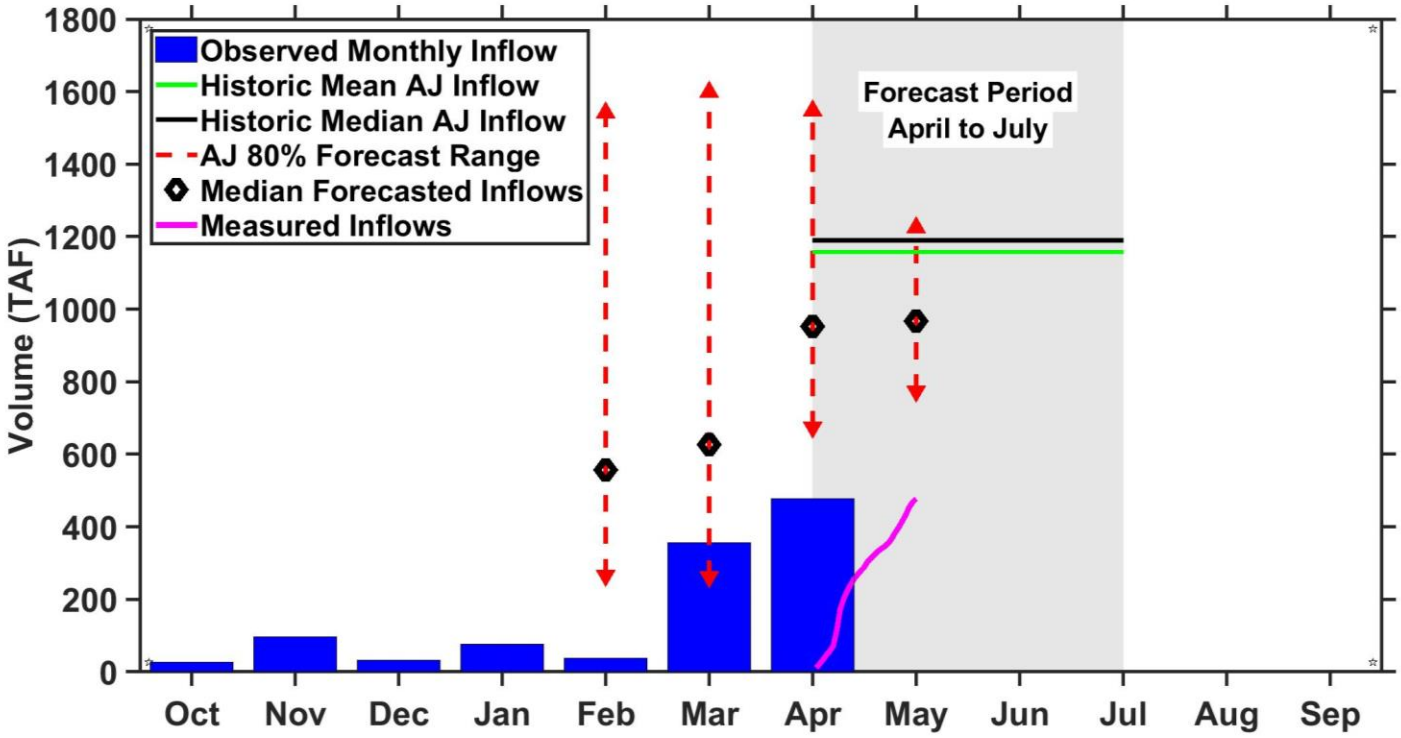

Figure 6: Water year 2018 conditions for the Tuolumne River at La Grange and for the 80% water supply forecast range (triangles represent the 90% and 10% forecasts, the open diamond represents the median forecast). An average April, precipitation wise, leads to little change in the median forecast, and a tightening of the forecast range.