San Francisco Public Utilities Commission
Hydrological Conditions Report
April 2019

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Hetch Hetchy as seen from the top of the Grand Canyon of the Tuolumne

System Storage

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

Table 1
Current System Storage
as of May 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 Reservoir[1]	279,633		340,830		61,197		82%
Cherry Reservoir[2]	203,212		273,340		70,128		74%
Lake Eleanor[3]	24,286		21,495		0		113%
Water Bank	570,000		570,000		0		100%
Tuolumne Storage	1,077,131		1,205,665		131,325		89%
Local Bay Area Storage							
Calaveras Reservoir[4]	67,166	21,886	96,824	31,550	29,658	9,664	69%
San Antonio Reservoir	47,660	15,530	50,496	16,454	2,836	924	94%
Crystal Springs Reservoir	48,972	15,958	58,377	19,022	9,404	3,064	84%
San Andreas Reservoir	16,781	5,468	18,996	6,190	2,216	722	88%
Pilarcitos Reservoir	2,872	936	2,995	976	122	40	96%
Total Local Storage	183,451	59,777	227,688	74,192	44,236	14,414	81%
Total System	1,260,582		1,433,353		175,561		88%

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

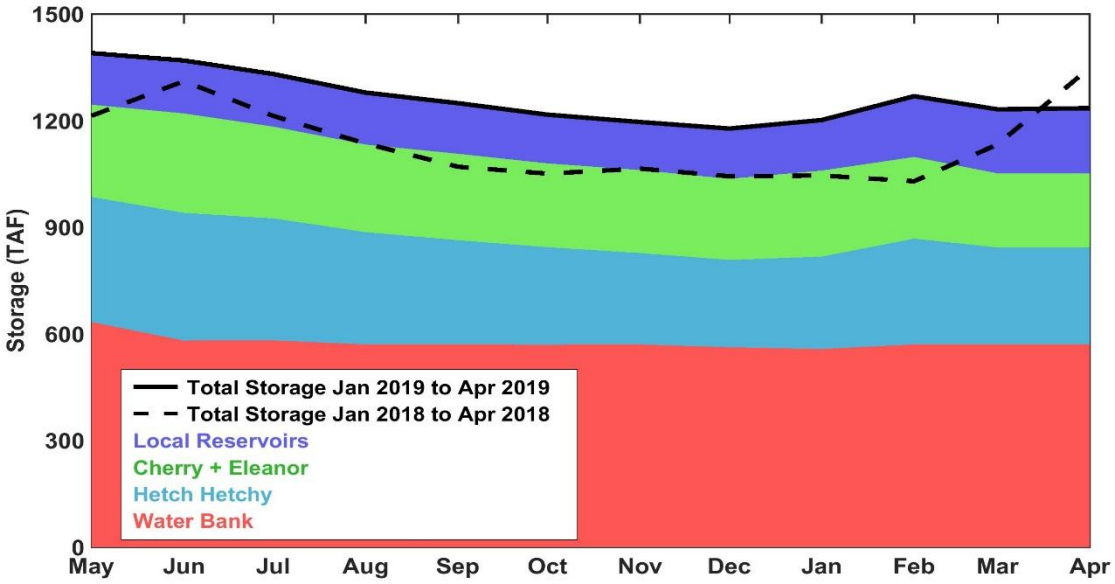

Figure 1: Monthly system storage for past 12 months in thousand acre-feet (TAF). Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index

Current Month: The April 2019 six-station precipitation index was 1.36 inches, or 44% 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.

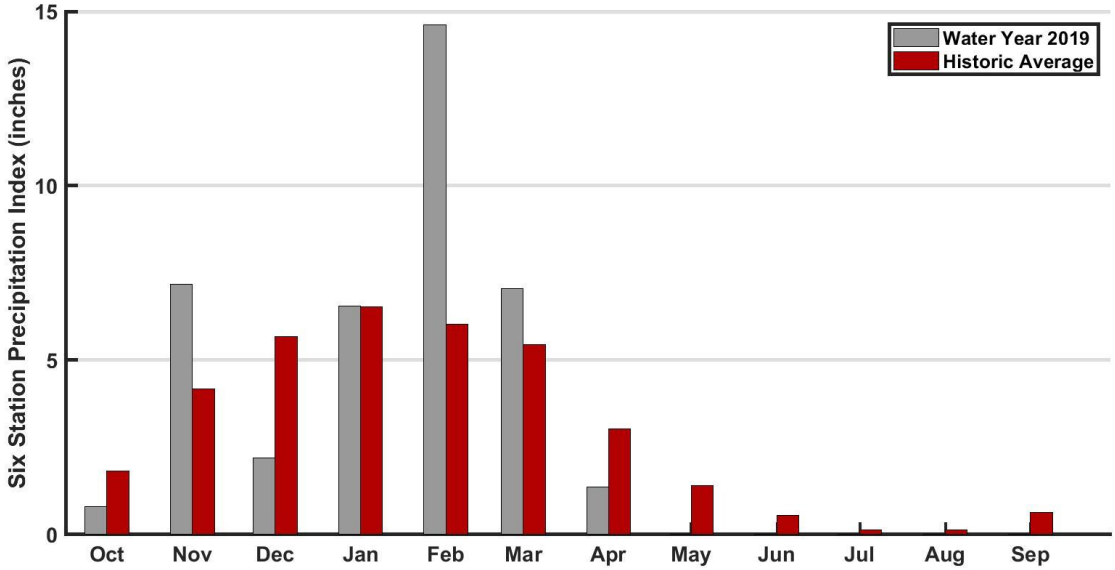

Figure 2: Monthly distribution of the six-station precipitation index as compared to the annual average precipitation for April 2019. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

Cumulative Precipitation to Date: As of May 1st, the six-station precipitation index for Water Year 2019 was 39.74 inches, which is 112% of the average annual water year total. Hetch Hetchy Weather Station received 1.60 inches of precipitation in April, for a total of 36.37 inches for Water Year 2019. The cumulative Hetch Hetchy Weather Station precipitation is shown in Figure 3 in red.

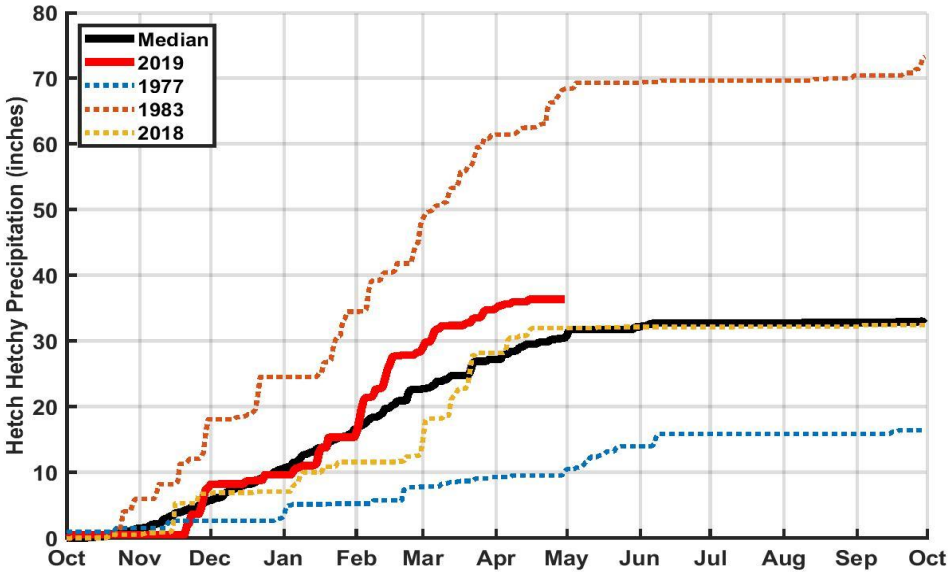

Figure 3: Water Year 2019 cumulative precipitation measured at Hetch Hetchy Weather Station. Median cumulative precipitation measured at Hetch Hetchy Weather Station and example wet and dry years are included with WY 2019 for comparison purposes.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange for April 2019 is summarized below in Table 2.

Calculated reservoir inflows and Water Available to City								
* All flows are in acre-feet	April 2019				October 1, 2018 through April 30, 2019			
	Observed Flow	Median[1]	Mean[1]	Percent of Mean	Observed Flow	Median[1]	Mean[1]	Percent of Mean
Inflow to Hetch Hetchy Reservoir	135,971	216,444	218,549	62%	268,701	441,643	439,312	61%
Inflow to Cherry Reservoir and Lake Eleanor	123,794	120,476	122,263	101%	282,062	326,141	334,049	84%
Tuolumne River at La Grange	449,157	447,773	443,131	101%	1,348,193	1,184,419	1,317,161	102%
Water Available to City	253,032	198,767	207,995	122%	710,619	433,036	527,586	135%

[1]Hydrologic Record: 1919-2015

Hetch Hetchy System Operations

Water delivery via the Hetch Hetchy Aqueduct, increased from 89 MGD to 160 MGD on April 2nd and to 247 MGD on the 16th.

Hetch Hetchy Reservoir power draft and stream releases during the month totaled 124,798 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 the rest of the calendar year. Hetch Hetchy Reservoir minimum instream release requirements for the month of April were 75 cfs plus an additional 64 cfs anytime Kirkwood Powerhouse draft was greater to 920 cfs. Instream release requirements for May are 100 cfs plus an additional 64 cfs anytime Kirkwood Powerhouse draft is greater to 920 cfs. Supply forecasts show that there is water available to generate at full capacity at Kirkwood Powerhouse through the end of runoff. Hetch Hetchy Reservoir inflows are currently being managed via power draft and instream releases.

Cherry Reservoir power generation and valve releases totaled 61,398 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 April and will remain at this rate through June 30. Required minimum release from Lake Eleanor was 10 cfs for April until April 15th when it increased to 20 cfs and will remain at this rate until the end of September. Water transfer from Lake Eleanor to Cherry Reservoir was not utilized in April due to high inflow forecasts into Cherry Reservoir. The forecasts predict sufficient inflows to Cherry Reservoir to support filling of Cherry Reservoir and full generation at Holm without the transfer.

Priest Reservoir was returned to service on April 19th. Moccasin Reservoir was filled to capacity on April 16th with DSOD approval but remained out of service and bypassed for the month of April.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for April was 43 MGD. The Sunol Valley Water Treatment Plant production rate for the month was 13 MGD.

Local System Water Delivery

The average April delivery rate was 188 MGD which is an 18% increase above March delivery rate of 160 MGD.

Local Precipitation

April total precipitation was below average, after above average January through March. The rainfall summary for April 2019 is presented in Table 3.

Table 3
Precipitation Totals at Three Local Area Reservoirs

Weather Station Location	April		Water Year 2019	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos Reservoir	1.80	70 %	42.40	119 %
Lower Crystal Springs Reservoir	0.99	55 %	26.12	104 %
Calaveras Reservoir	0.76	46 %	20.69	102 %

Snowmelt and Water Supply

Based on the snow pillows, May 1st snow pack is currently 125% of the annual peak snowpack (Figure 4). Snowpack is highly correlated with future inflows in the Tuolumne Basin, suggesting that this will be a high runoff year.

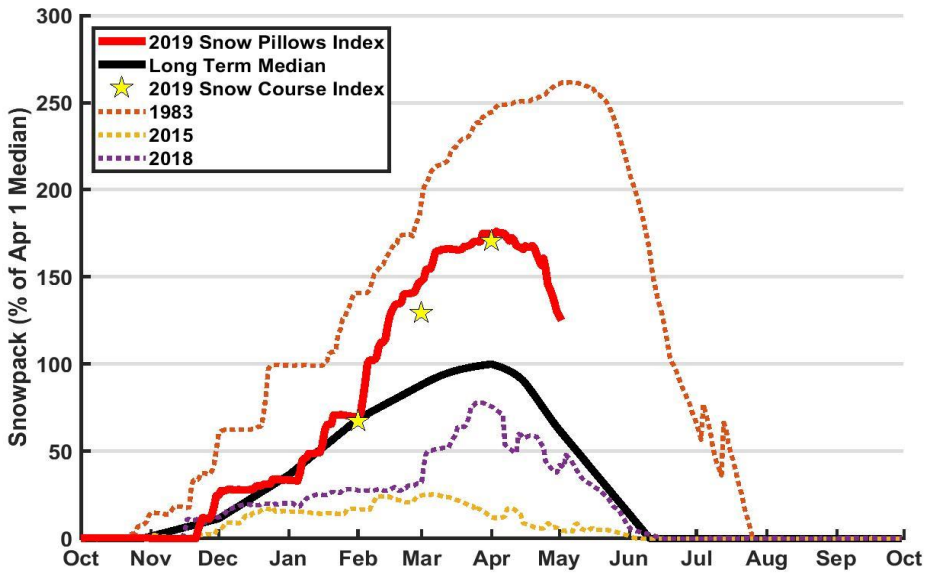

Figure 4: Tuolumne River Basin 10 Station Snow Index (lines), based on real time snow pillow SWE measurements in the Tuolumne Basin. Stars are an average of the snow survey sites in the basin.

A below average April resulted in a small decrease in the seasonal forecasts (Figure 6). The extensive snowpack, combined with upcountry reservoirs at or above seasonal storage targets, results in forecasts of sufficient future inflows to accommodate full available generation at all powerhouses throughout runoff and refilling of the Tuolumne River system by the end of runoff. Deep snowpack at elevation and slowly warming weather indicate the possibility of an extended runoff season, expected to last through July. This will result in high water availability throughout the spring and summer. The expected spill from Hetch Hetchy Reservoir will be managed through valve releases via the Upper Tuolumne River Ecosystem Program (UTREP). UTREP releases started April 27th and are expected to continue through the end of runoff. Cherry Reservoir is expected to fill with some valve releases required. Lake Eleanor will remain near full throughout the spring, as inflows will exceed our ability to transfer to Cherry Reservoir for power generation at Holm Powerhouse.

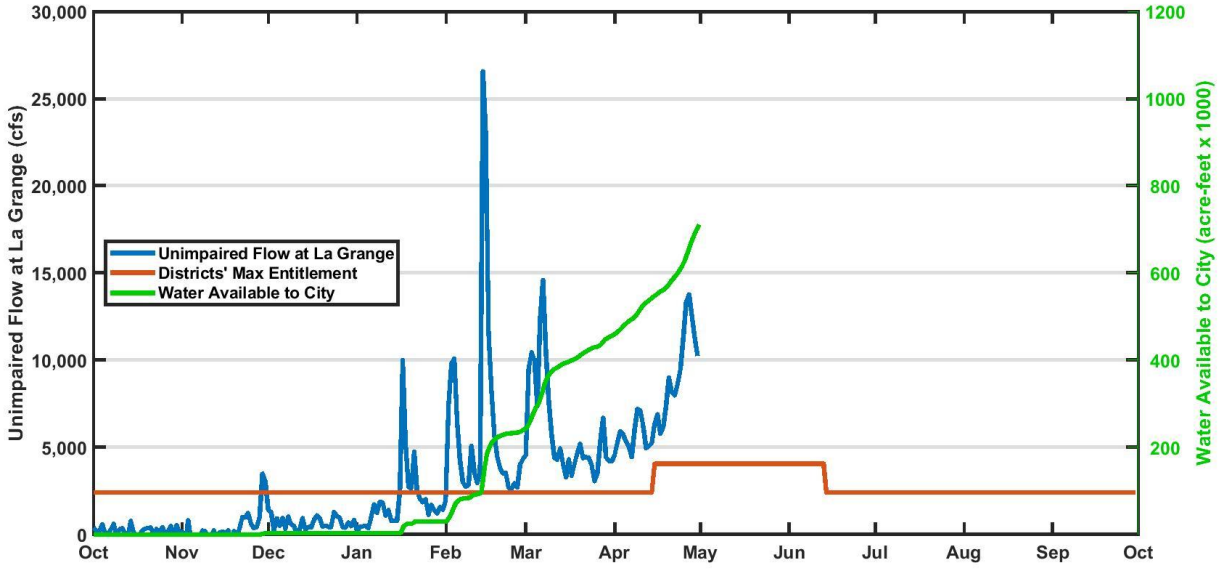

Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City. To date there has been 710,619 ac-ft available to the city in Water Year 2019.

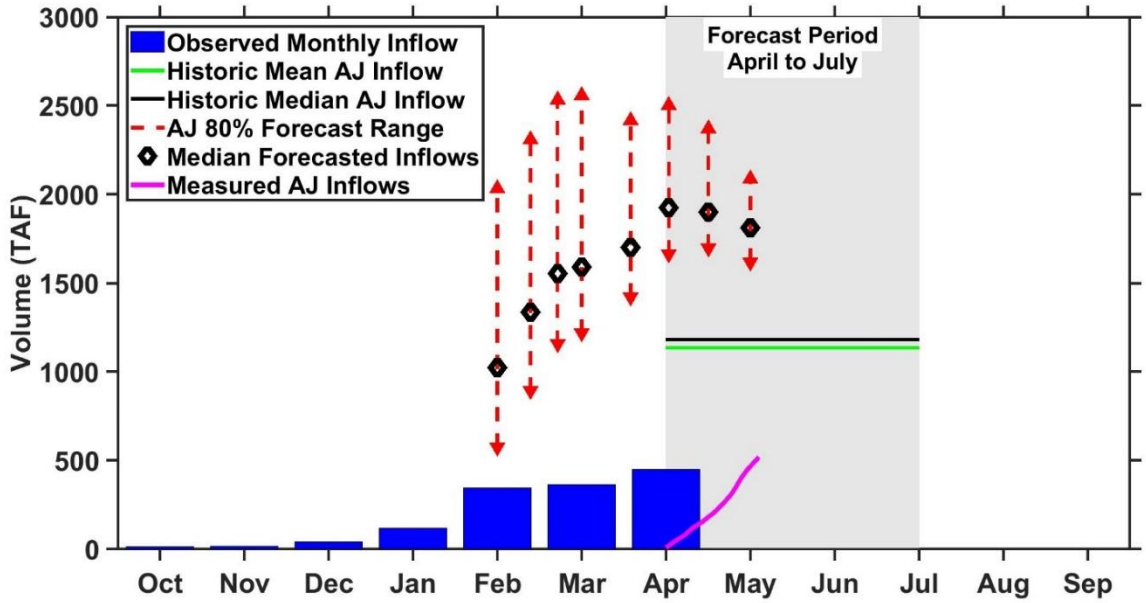

Figure 6: The Water Supply Forecast Model (WSFM) median forecast at La Grange rose above the long term average, due to significant snowpack and precipitation in through the winter. The May 1st WSFM forecast predicts sufficient inflows to refill the Tuolumne River System by the end of runoff.