



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7

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ORIGINATING SECTION: INTEGRATED PLANNING
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AGENDA DATE: January 16, 2019

ITEM NO. 16c

SUBJECT: Water Inventory and Water Budget Update

SUMMARY:

This staff report summarizes Zone 7's water supply, usage and storage conditions as of the end of December 2018. The report takes into account the various sources of supply and storage available to Zone 7 locally and in State Water Project facilities, as well as in remote groundwater storage banks. Water supplies are used to meet treated water demands from municipal and industrial customers (retailers and direct retail) and untreated water demands from agricultural customers. The report also includes calculated watershed outflow as an indication of local hydrologic conditions. A monthly summary of treated water demands is included, with comparisons to previous years' conditions. Finally, to provide a state-level perspective on water supply conditions, this report also presents the precipitation conditions in the Northern Sierras, as well as the storage levels in key State Water Project (SWP) reservoirs.

December 2018 Highlights:

In December 2018, treated demand decreased by 40%. Zone 7's overall conservation in December 2018 was 20% relative to December 2013; treated water demand was 21% lower relative to 2013, and untreated water demand was 9% lower. Treated water sources in December were 74% surface water and 26% groundwater. Remaining supplies and total water storage are estimated at 230,000 AF.

In calendar year 2018, drier than average hydrologic conditions prevailed in California for metrics including cumulative precipitation, runoff, and snowpack levels. This condition also applied locally. In 2018, the local watershed's total surface water outflow was 14,000 AF, as compared to 170,000 AF in 2017. Local precipitation was at 65% of 2017 (13 inches versus 20 inches). Treated water production in 2018 generally tracked the 2017 pattern, except for the months of February and November. About 10% more water was supplied by Zone 7 in 2018 relative to 2017.

Looking ahead to the winter of 2019, DWR will be maintaining lower-than-average levels in Oroville to provide operational flexibility while meeting flood protection, water delivery, and environmental requirements; this is not expected to have a significant impact on the Table A allocation for 2019. Locally, Zone 7 is entering 2019 with a nearly full (97%) groundwater basin, which will support higher levels of groundwater pumping in 2019 if the Table A allocation remains at the low initial allocation of 10%.

DECEMBER 2018

Zone 7 Water Inventory and Water Budget

Supply and Demand

(See Tables 1 and 2, Figures 1 and 2)

- December totals: 1,770 AF delivered to customers (1,670 AF treated, 100 AF untreated)
- Treated water production in December was 40% lower than in November.
- Treated water sources in December were 74% surface water and 26% groundwater.
 - DVWTP and PPWTP combined average production was 13.0 MGD
 - Wellfield production was 4.5 MGD

Water Conservation

(See Table 1)

- Zone 7 total conservation in December 2018 was 20% relative to December 2013 (21% treated, 9% untreated).

Table 1: December water demand and conservation

	Treated Production	Untreated Delivery	Total
December 2018 (AF)	1,670	100	1,770
December 2013 (AF)	2,110	110	2,220
Percent Conservation	21%	9%	20%

Imported Water

(See Table 2)

- Zone 7 withdrew 1,650 AF of Table A supply in December (7,110 AF remain to be carried over into 2019).
- The final SWP allocation for 2018 was 35%.
- Non-local groundwater bank storage remained at 104,100 AF this year; no withdrawals were made.
- Supplies from SWP Carryover, Yuba Accord, and River Garden Farms were fully consumed in Quarter 3.
- Remaining incoming supplies and total water storage are estimated at 230,000 AF.

Groundwater

(See Table 2 and Figure 3)

- Wellfield pumping in December made up 430 AF of treated supply delivered to retailers.
- Artificial recharge in December along the Arroyo Valle added 300 AF back into the Main Basin.
- Groundwater basin overflow in December was estimated at 73 AF; this water is a component of surface overflow from the watershed recorded at the ADLLV stream gauge. The total estimated groundwater basin overflow in 2018 is 690 AF.
- The Main Groundwater Basin is at an estimated 97% of total capacity (246,000 AF out of 254,000 AF).
 - 118,000 AF are operational storage (i.e. above historical groundwater lows).
 - The remaining 128,000 AF are emergency storage.

Local Surface Water*(See Table 2 and Figure 4)*

- Zone 7 has about 1,200 AF of water in Lake Del Valle available for use.
 - Zone 7 began 2018 with 0 AF of available water.
 - An additional 1,350 AF of local rainfall runoff have been captured this year in the winter of 2018.
 - Approximately 100 AF have evaporated.

Stream Outflow*(See Table 2)*

- Surface runoff in December was 1,600 AF above baseflow at the ADLLV stream gauge.
- As of the end of December, cumulative surface runoff in 2018 was 13,850 AF above baseflow.
- Note: some surface flows out of the Tri-Valley are mandated for other downstream purposes.

Sierra Precipitation*(See Figure 5)*

- 5.0 inches of precipitation were recorded in the North Sierra in December (cumulative 12.9 inches as of January 2).
- Cumulative precipitation was at 67% of average conditions as of the end of December for the water year (October 1-September 30).

Sierra Snowpack*(See Figure 6)*

- There were 6.7 inches of snow-water equivalent recorded in the North Sierra basins as of January 2.
- Snowpack was at 61% of normal conditions for January 2.

Lake Oroville*(See Figure 7)*

- Lake Oroville was at 29% capacity (47% of average) as of January 1.
 - Total storage: 1,032,300 AF (336,380 MG)
 - Storage increased by 0.2% of total capacity since last month (7,500 AF increase).

San Luis Reservoir*(See Figure 8)*

- San Luis Reservoir was at 74% capacity (108% of average) as of January 1.
 - Total storage: 1,509,500 AF (491,870 MG)
 - Storage increased by 16% of total capacity since last month (316,700 AF increase).

NOTE: Numbers presented are estimates only and subject to adjustment over the course of the year.

Table 2: Quarterly water inventory

Note: Values Are Rounded. All Units in AF Unless Noted Otherwise

	2017 Jan-Dec	2018 - Q1 Jan-Mar	2018 - Q2 Apr-Jun	2018 - Q3 Jul-Sept	2018 - Q4 Oct-Dec	2018 - YTD Jan-Dec
Supply						
Surface Water Sources Used						
SWP Table A	58,460	0	6,530	7,060	7,500	21,090
SWP Carryover	2,940	5,730	4,370	5,600	0	15,700
Local Surface Water (Lake Del Valle)	9,520	0	0	0	0	0
Yuba Accord and River Garden Farms	710	0	0	2,700	0	2,700
Subtotal	71,630	5,730	10,900	15,360	7,500	39,490
Withdrawals from Groundwater Storage						
Zone 7 Groundwater Basin	4,610	710	1,250	1,420	1,880	5,260
Non-Local Groundwater Banks	0	0	0	0	0	0
Subtotal	4,610	710	1,250	1,420	1,880	5,260
Total Supply	76,240	6,440	12,150	16,780	9,380	44,750
Demand / Water Use						
Delivered to Customers						
Municipal Water ¹	32,630	5,200	9,610	12,520	8,020	35,350
Untreated Water	4,560	300	1,680	2,660	750	5,390
Subtotal	37,190	5,500	11,290	15,180	8,770	40,740
Recharging Groundwater Storage						
Zone 7 Groundwater Basin	9,050	940	860	1,600	600	4,000
Non-Local Groundwater Banks	30,000	0	0	0	0	0
Subtotal	39,050	940	860	1,600	600	4,000
Total Demand	76,240	6,440	12,150	16,780	9,370	44,740
Available Water Supplies						
	Starting Bal.	End-of-Quarter Balances				
Available from Incoming Supplies in 2018						
2018 Table A Allocation (%)	20%	20%	35%	35%	35%	
2018 Table A Allocation Remaining (AF)	16,100	16,100	21,670	14,610	7,110	
Yuba Accord and River Garden Farms	2,700	2,700	2,700	0	0	
Subtotal	18,800	18,800	24,370	14,610	7,110	
Available from Storage in 2018						
SWP Carryover Balance ²	15,700	9,970	5,600	0	0	
Lake Del Valle	0	1,200	1,300	1,200	1,200	
Local GW Basin (Above Historical Low) ³	120,000	122,000	122,000	120,000	118,000	
Non-Local Groundwater Banks	104,100	104,100	104,100	104,100	104,100	
Subtotal	239,800	237,270	233,000	225,300	223,300	
Total Available Water	258,600	256,070	257,370	239,910	230,410	
Watershed Conditions						
	End-of-2017					
Precipitation at Livermore Station (in)	20.3	8.2	1.7	0.0	3.1	13.0
Lake Del Valle Net Yield		1,200	100	-100	0	1,200
Groundwater Net Recharge (est.)		2,000	0	-2,000	-1,000	-1,000
Surface Water Outflow ⁴	169,750	7,980	2,550	0	3,300	13,830

¹ Includes a small amount of unaccounted-for water

² SWP Carryover balance includes Article 56 water in San Luis Reservoir.

³ Groundwater estimate based on most recent groundwater level data. Additional emergency storage is 128,000 AF.

⁴ Surface Water Outflow is estimated based on flow at USGS gage Arroyo De La Laguna at Verona. This includes any groundwater basin overflow.

Figure 1: Monthly treated water production in acre-feet (AF)

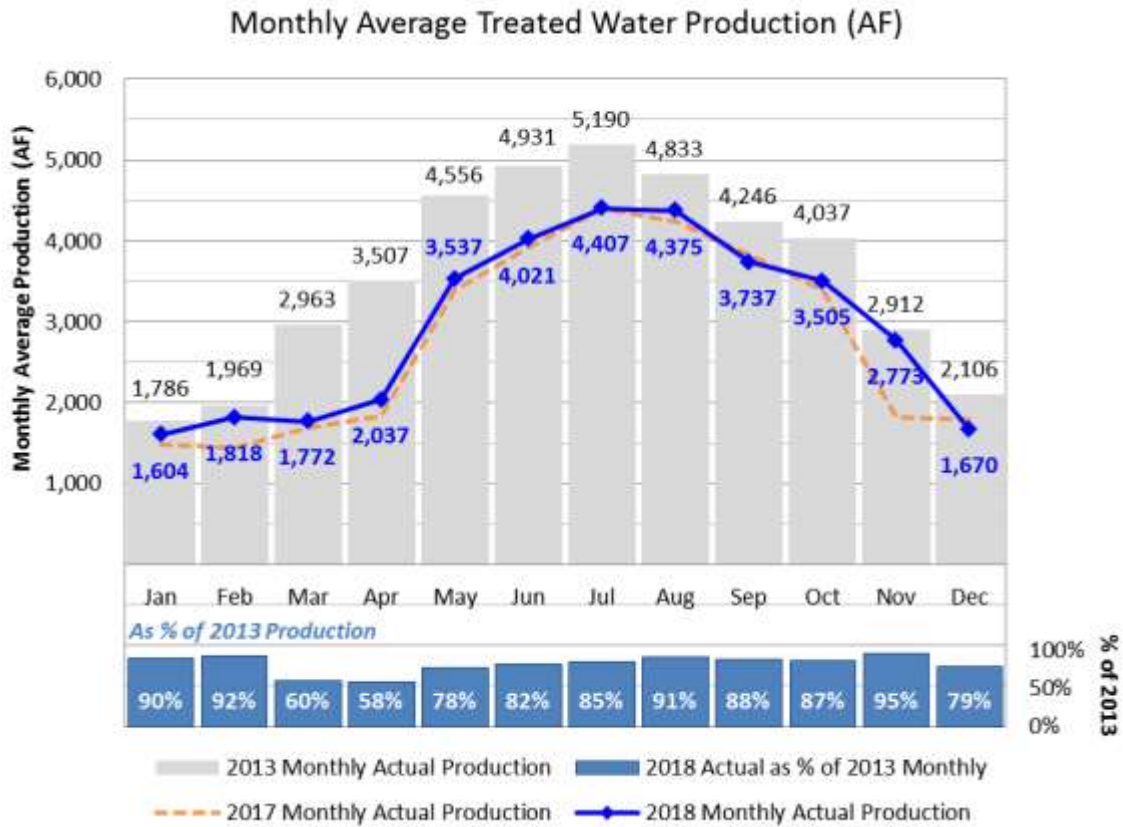


Figure 2: Monthly treated water production in average million gallons per day (MGD)

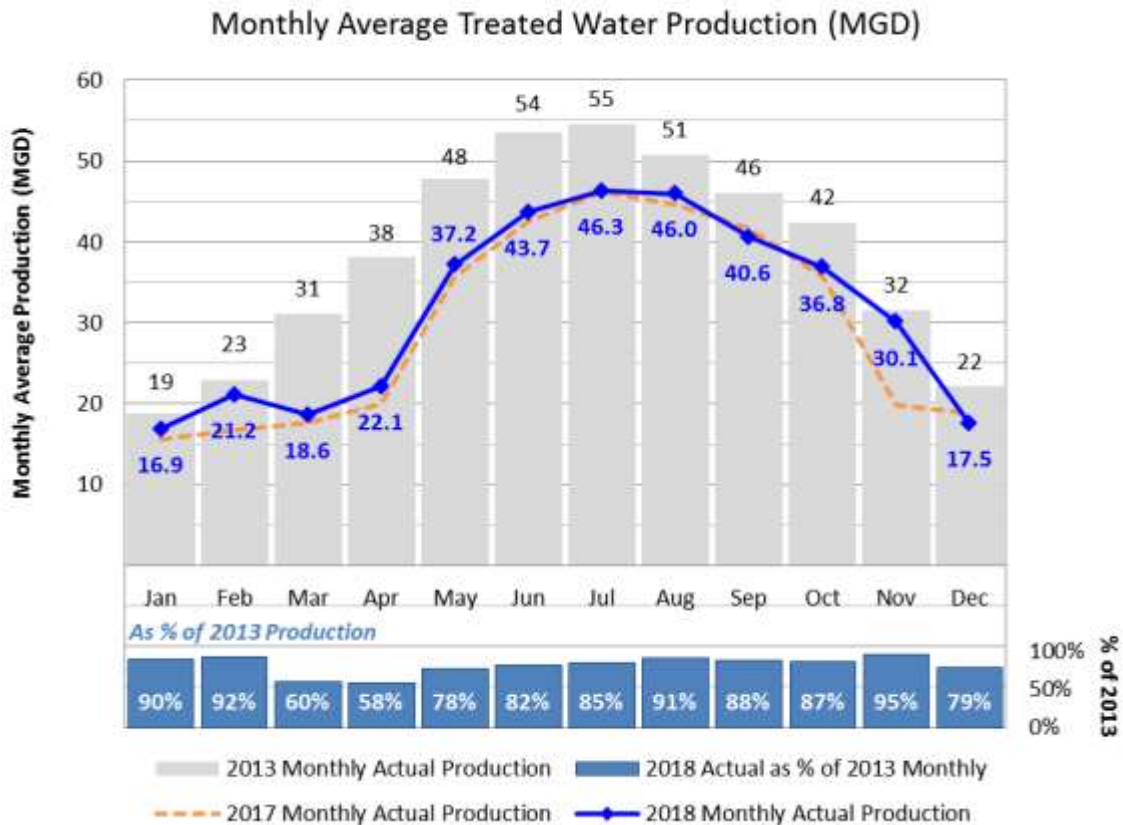


Figure 3: Main Groundwater Basin storage

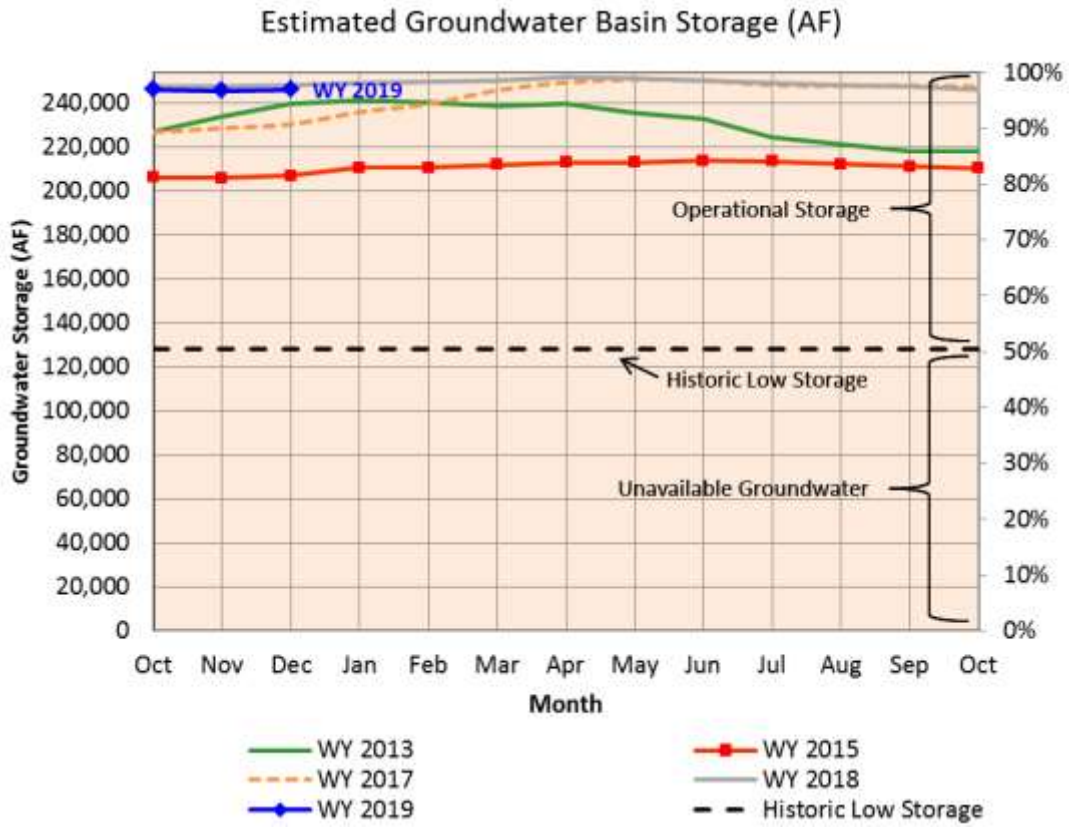
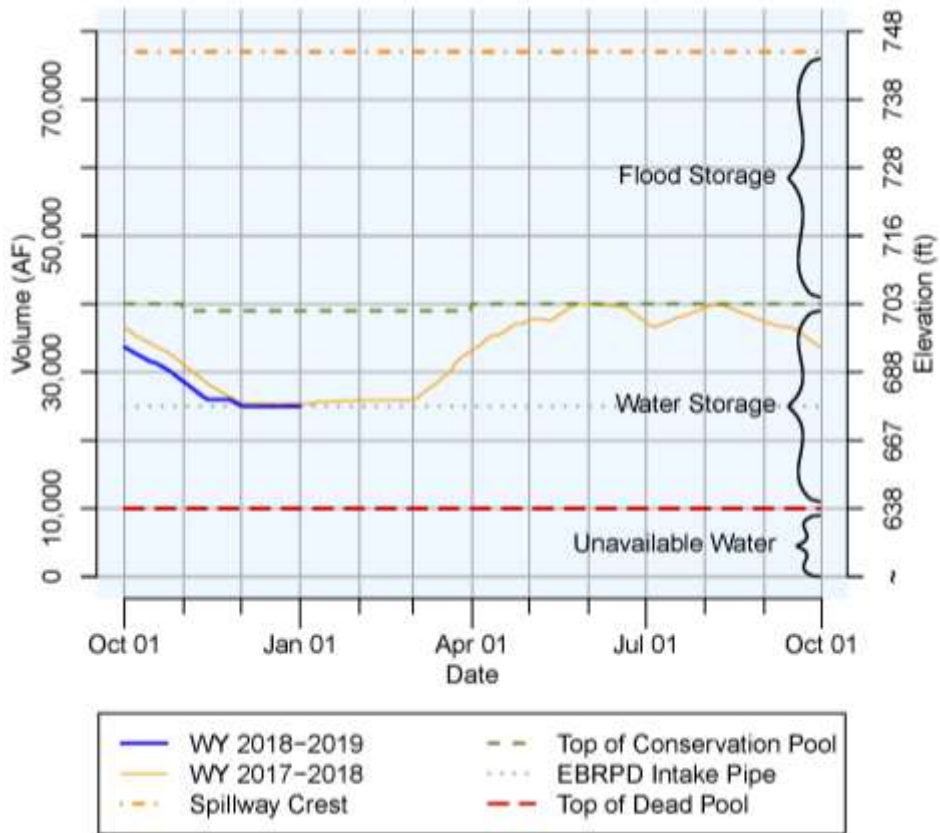
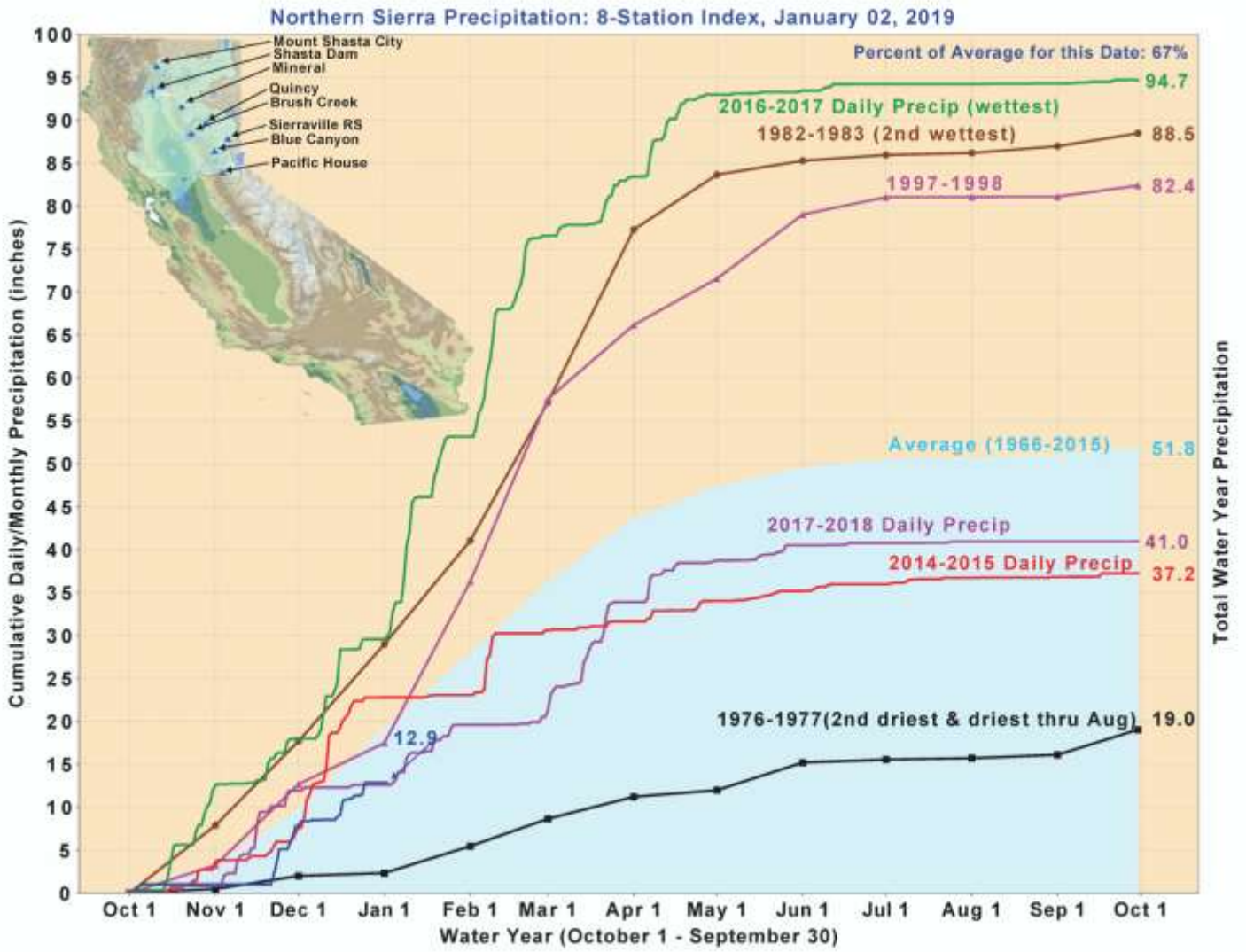


Figure 4: Lake Del Valle storage



(Source: <http://cdec.water.ca.gov/dynamicapp/QueryDaily?s=DLV>)

Figure 5: Cumulative precipitation in the North Sierra



(Source: http://cdec.water.ca.gov/cgi-progs/products/PLOT_ESI.pdf)

Figure 6: Sierra Snowpack

Note: The Northern Sierra/Trinity snowpack was at 61% of normal for January 2.

% of April 1 Average / % of Normal for This Date



NORTH	
Data as of January 2, 2019	
Number of Stations Reporting	31
Average snow water equivalent (Inches)	6.7
Percent of April 1 Average (%)	23
Percent of normal for this date (%)	61

CENTRAL	
Data as of January 2, 2019	
Number of Stations Reporting	45
Average snow water equivalent (Inches)	7.9
Percent of April 1 Average (%)	26
Percent of normal for this date (%)	69

SOUTH	
Data as of January 2, 2019	
Number of Stations Reporting	28
Average snow water equivalent (Inches)	6.1
Percent of April 1 Average (%)	24
Percent of normal for this date (%)	72

STATE	
Data as of January 2, 2019	
Number of Stations Reporting	104
Average snow water equivalent (Inches)	7.1
Percent of April 1 Average (%)	25
Percent of normal for this date (%)	68

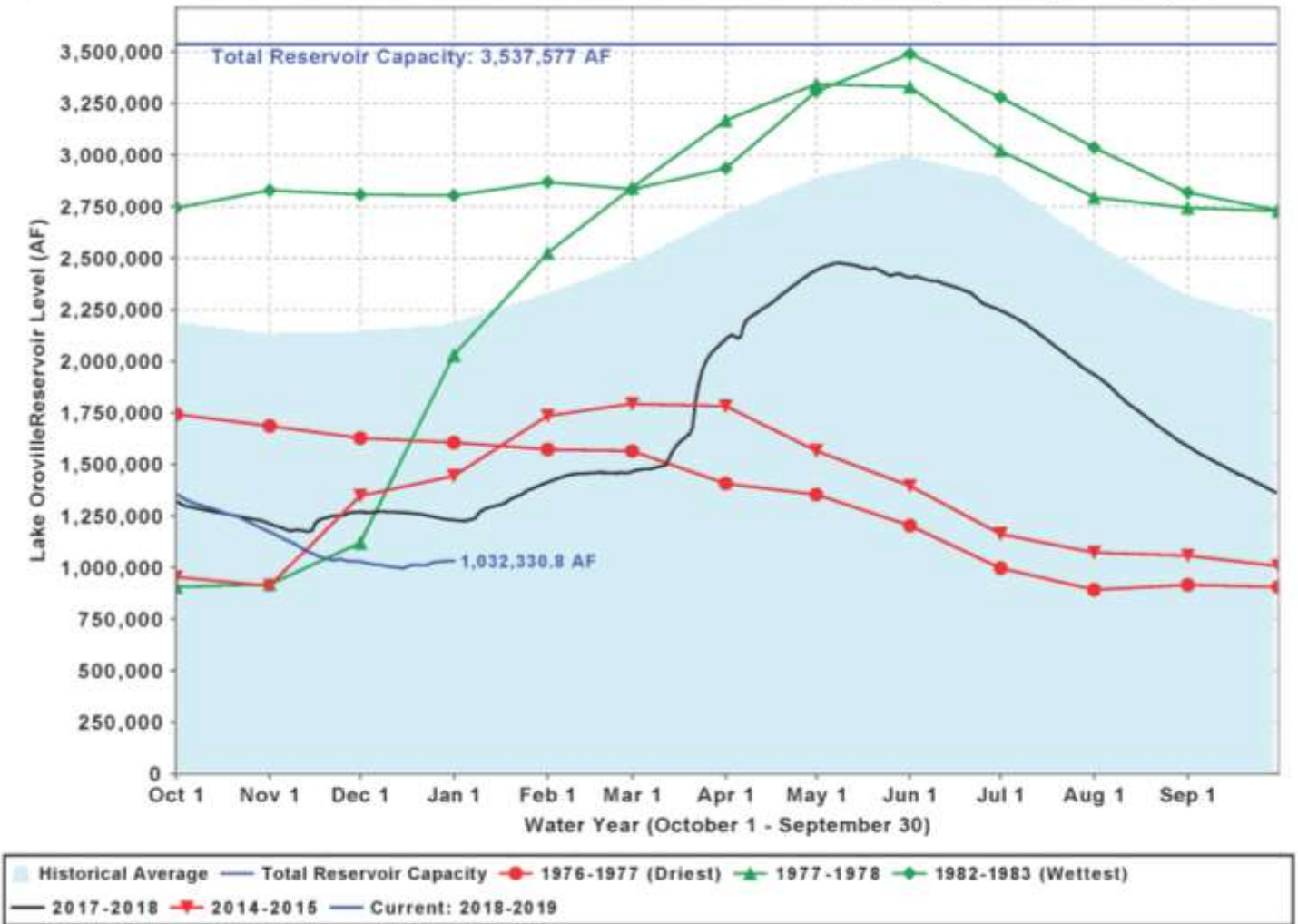
Statewide Average: 25% / 68%

(Source: <https://cdec.water.ca.gov/resapp/ResDetail.action?resid=ORO>)

Figure 7: Lake Oroville storage compared with past water years

Note: As of January 2, the reservoir was at 47% of its historical average, and 29% of its total capacity.

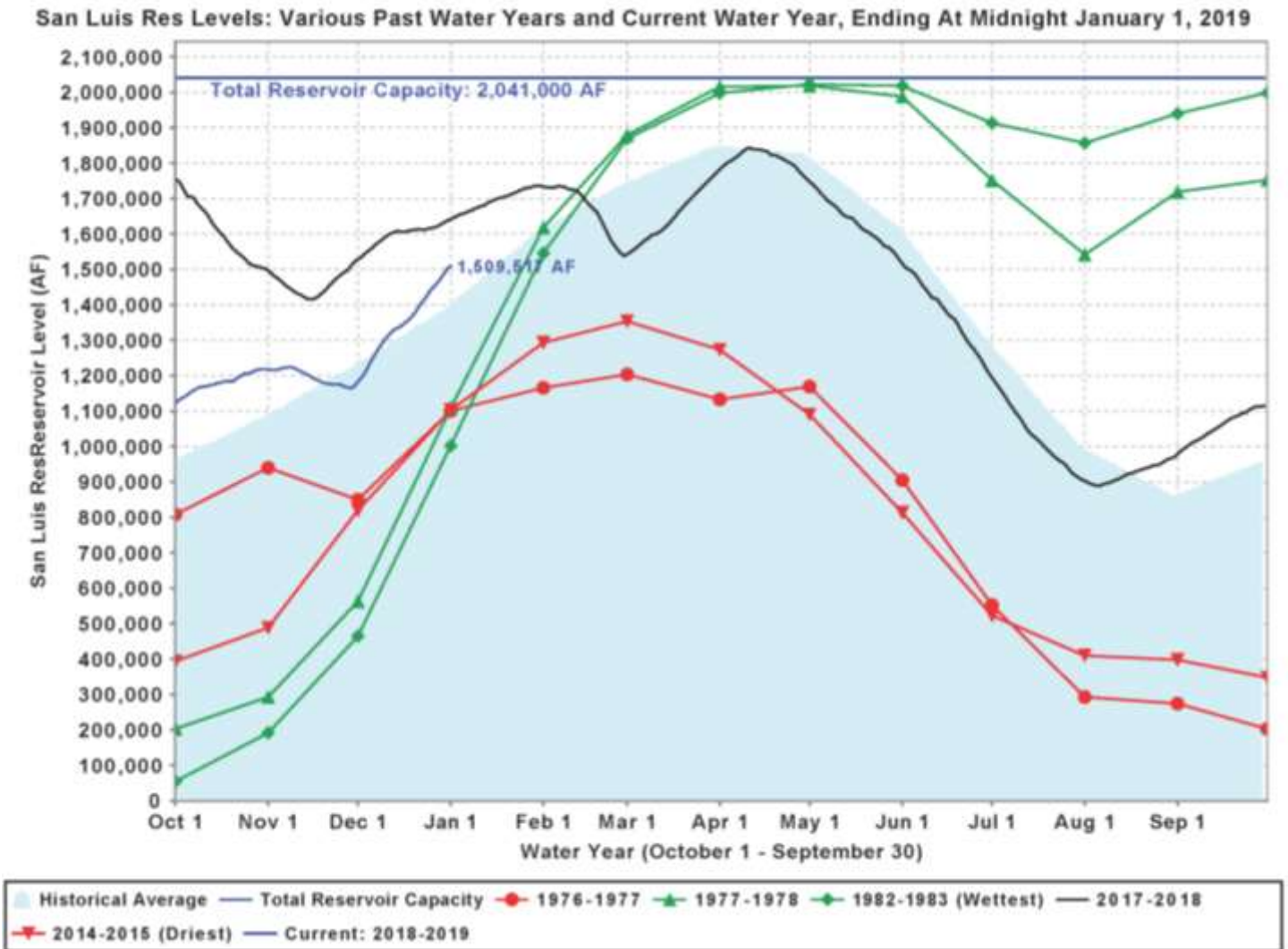
Lake Oroville Levels: Various Past Water Years and Current Water Year, Ending At Midnight January 1, 2019



(Source: <https://cdec.water.ca.gov/resapp/ResDetail.action?resid=ORO>)

Figure 8: San Luis Reservoir storage compared with past water years

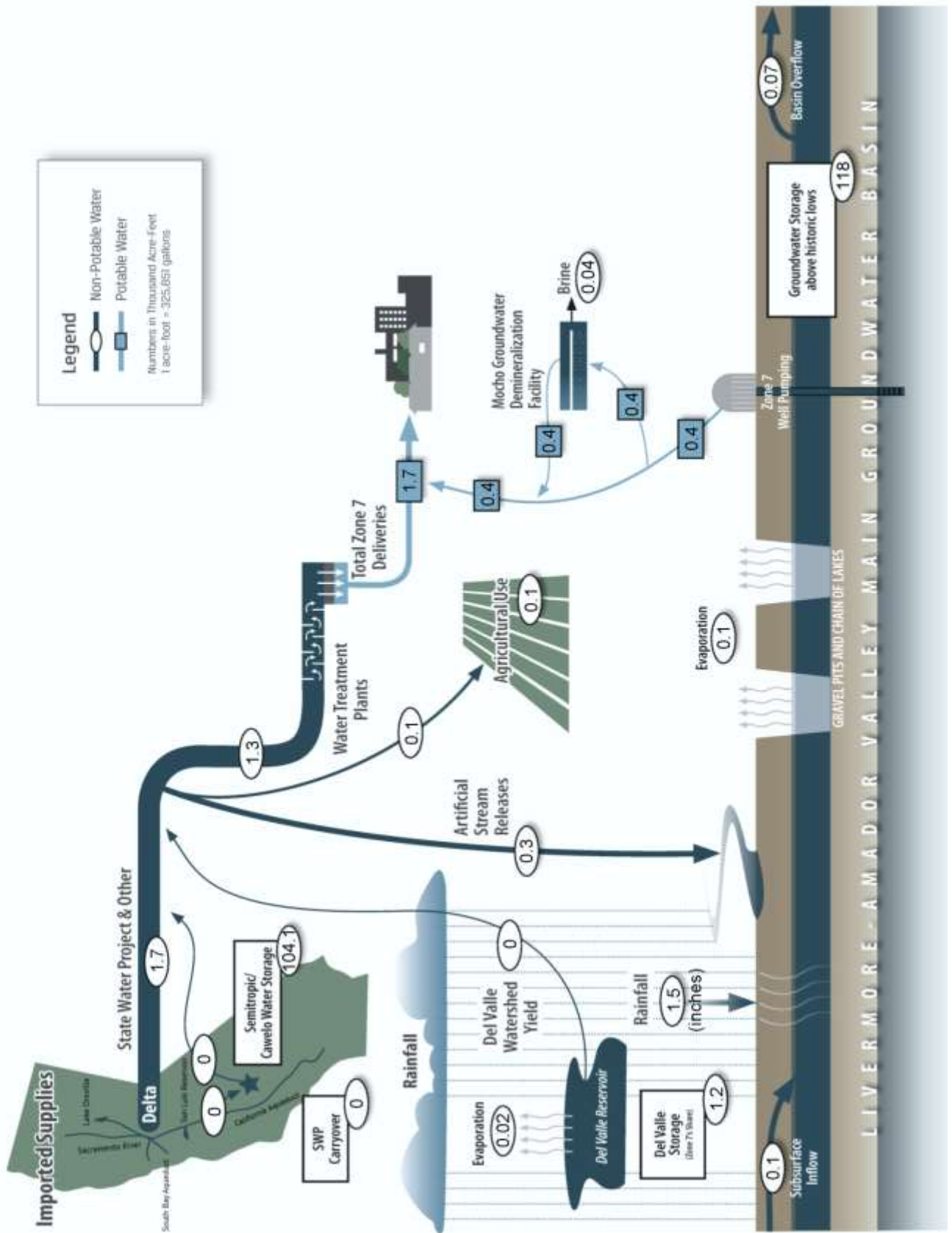
Note: As of January 2, the reservoir was at 108% of its historical average, and 74% of its total capacity.



(Source: <https://cdec.water.ca.gov/resapp/ResDetail.action?resid=SNL>)

Figure 9: Zone 7 Water Agency water supply and water use

Zone 7 Water Agency Water Supply & Use (in thousands of acre-feet)
December 2018



(Note: numbers may not sum to total due to rounding)