NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE HYDROLOGIC SERVICE AREA:
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE **SAN JOAQUIN VALLEY - HANFORD , CA**

REPORT FOR:

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

MONTH: **FEBRUARY** YEAR: **2017**

TO: Hydrometeorological Information Center, W/OH12x1
National Weather Service/Office of Hydrology
1325 East-West Highway #7116
Silver Spring, MD 20910

SIGNATURE:
Kevin Durfee
(In Charge of Hydrologic Service Area)

DATE: March 3, 2017

When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts and hydrologic products issued (WSOM E-41).

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¦ **X** ¦ An **X** inside this box indicates that no flooding occurred for the month
+---+ within this hydrologic service area.

February, 2017 delivered another wet wallop to the central California interior thanks to a very active atmospheric river pattern that persisted for much of the first three weeks of the month. There were two periods when back to back Pacific storms, each carrying an abundance of tropical moisture, tracked through the HSA…February 2nd through the 11th and February 16th through the 21st . Nearly 95 percent of the month's precipitation fell during these periods with total accumulations ranging from 1 to 2 inches on the west side of the San Joaquin Valley and the Kern County desert to as much as 10 to 20 inches in the Sierra. (A map of the month's total precipitation has been included at the end of this summary.) Although ultimately beneficial, the precipitation brought into the region by moisture-laden Pacific storms was so abundant that it produced "water overload" throughout the HSA. February, 2017 was also the third consecutive month of well above normal precipitation in central California, and it was enough to substantially mitigate the 5 year long drought. By historical accounts, this is California's wettest water year so far, with records dating back to the late 19th century. (See accompanying graph below.) This is also the 8th wettest season so far for the 5 station precipitation index for the San Joaquin Basin, and to date falls shy of the 1977-78 rain season. This is also the first time in 20 years that many rivers and streams filled or overtopped their banks and several of the major reservoirs had to release large volumes of water just to make room for additional rainfall. By the middle of February, all ponding basins in the San Joaquin Valley were full or nearly full and excess water was being diverted by way of weirs and bifurcations and channeled through the bypasses. Abnormally large water releases from the dams produced high flows on most of the rivers below those dams which in turn also tested the integrity of the entire levee system in the San Joaquin Valley. By the third week of February, several acres of agricultural land flooded near Firebaugh. The Fresno Slough was so overtaxed with water that the local Irrigation District worked 24/7 to fortify the levees along it in fear that they could breach and potentially flood about 80 homes near the city of Tranquility on the valley's west side. In Madera county, an earthen dam along Lewis Creek threatened to fail on the evening of the 7th. Fortunately for residents downstream this did not happen, but it was a very close call. Likewise, increased flows along the Berenda Slough in Madera county on the 7th put emergency officials on high alert out of concern that rising water levels would flood parts of Chowchilla. Luckily, this did not happen.

There were other areas of the HSA that were not so fortunate and experienced significant flooding. Merced county was hit particularly hard with many rural roads in that county ending up under water. Rain swollen waters of Mariposa Creek overtopped a bridge along Highway 59 and closed that section of the road for many days. This was a section of highway that closed in January because of high water. Overflows from Mariposa Creek Dam also produced extensive flooding in the vicinity of Le Grand and Planada in Merced county. In the Madera county foothills, residents had to be evacuated from the Bass Lake mobile home park and along Church Street in the town of North Fork as Willow Creek below Crane Valley reservoir overflowed its banks. This was the second time in nearly a month that these areas had to be evacuated due to repeated flooding. Heavy rain and rising water levels along the Fresno river also produced flooding in the Sierra foothills on the 7th and 8th. Two homes were reportedly inundated by water in Oakhurst. Excess runoff flooded a shopping center in Mariposa adjacent to highway 49. Nuisance flooding occurred along highway

41 near Coarsegold as well. Farther south, minor flooding occurred along a portion of Highway 198 near Three Rivers as waters from the north fork of the Kaweah River spilled over that road. One particularly strong storm system in the parade of storms that tracked through central California during mid February produced wind gusts to 108 mph over the Grapevine on the 17th. The last in a series of storms washed out a portion of Highway 41 near Fish Camp the day after Presidents' Day and left a gaping hole in the road that was nearly five feet wide. Highway 41 is the only road leading into the south entrance of Yosemite National Park. As of this writing, this section of Highway 41 still remains closed. The upper Merced River briefly rose just above Flood Stage in Yosemite National Park from February 8th into February 9th. Park rangers reported only minor flooding at the west end of Yosemite Valley, however, the main road through the park flooded in places and had to close for a short time. Although there were many other roads within the HSA that ended up with some sort of mud, water and debris over them, they remained passable and were therefore not included in this report

Moderately high water levels continued along all of the mainstem rivers this month. The Merced River at Pohono Bridge briefly rose to nearly a foot above its respective Flood Stage from the afternoon of the 8th into the early morning hours of the 9th. The Merced River at Stevinson rose to Monitor Stage on the 5th with continued rises to near Flood Stage on the 11th. The water level at Stevinson briefly rose to Flood Stage on the 14th,16th and 19th then rose nearly a foot above Flood Stage on the 24th where it remained through the end of the month. The San Joaquin River at Newman was at Monitor stage at the beginning of February, then receded slightly below Monitor Stage on the 2nd. The stage at Newman rose above Monitor Stage on the 8th and remained above Monitor Stage for the remainder of the month. Bear Creek at McKee Road in the city of Merced briefly rose just above its respective Monitor Stage from the afternoon of the 7th into the afternoon of the 8th. This forecast point again rose slightly above Monitor Stage during the evening of the 9th then receded below Monitor Stage on the 11th and remained below Monitor Stage through the end of February.

Temperature-wise, February 2017 averaged well above normal. Minimum temperatures in the San Joaquin Valley remained considerably milder than normal during the first 3 weeks of the month. However, a change in the overall pattern that brought colder air masses into the state during the last 6 days of February brought a return of frosty overnight temperatures to the San Joaquin Valley. The storm system that brought the first invasion of cold air into the district on the 23rd was accompanied by light precipitation over the foothills and mountains with snow showers as low as 2,000 feet by that evening. Thermometer readings dropped just below freezing in several valley locations on the morning of the 24th while minimum temperatures over the high Sierra fell below zero making it the coldest morning throughout the HSA since late January. Two cold frontal passages, one on the evening of the 25th and the other on the 27th produced generally light precipitation over the mountains and desert. A light dusting of snow fell at pass level in Kern County on the 25th. The second cold front brought at most a few hundredths of an inch of rain to the San Joaquin Valley with up to a third of an inch over the mountains. Meanwhile, up to 6 inches of snow fell over the Sierra while elevations as low as 3,000 feet received a dusting to a couple of inches of snow.

Storms that frequented the central California interior this month maintained a deep snowpack over the high Sierra. By March 2nd, the snowpack over the southern Sierra averaged around 200 percent of normal. Not surprisingly, reservoirs throughout the central California interior saw a substantial increase in water this month. Although most of the dams were conducting water releases, their respective water capacities remained much higher than normal. As of March 2nd, Pine Flat, Friant, Buchanan and Exchequer dams were at or above 77 percent of their normal water capacity. San Luis reservoir was nearly 100 percent full for most of February.

HYDROLOGIC PRODUCTS ISSUED THIS MONTH

Flash Flood Warnings

Mariposa County Foothills	1938Z	3-FEB
East side of San Joaquin Valley, foothills & mountains north of Kern County	1956Z	7-FEB
East side of San Joaquin Valley, foothills north of Kern County	2149Z	7-FEB
Lewis Creek Dam (Madera County)	2244Z	7-FEB
Tulare County foothills	0008Z	8-FEB
Mariposa Creek Dam near Le Grand (Merced County)	0618Z	8-FEB
Kern County desert	2208Z	11-FEB
The city of Le Grand (Merced County)	1012Z	12-FEB
Tehachapi mountains	2151Z	17-FEB
Kern County desert	2333Z	17-FEB
Kern County desert	0016Z	18-FEB
Kern County desert	0303Z	18-FEB

Flood Warnings

San Joaquin Valley, foothills (Madera County, Fresno County)	2242Z	3-FEB
Foothills and higher elevations of the Sierra	0145Z	7-FEB
Merced River @Pohono Bridge	2315Z	8-FEB
Foothills and higher elevations of the Sierra (Madera County, Mariposa County)	0647Z	9-FEB
Foothills and higher elevations of the Sierra (Madera County, Mariposa County)	1856Z	10-FEB
Merced River @Stevinson	2350Z	10-FEB
San Joaquin River below Friant Dam	1452Z	11-FEB
San Joaquin River below Friant Dam	1443Z	12-FEB
Merced River @Stevinson	0438Z	13-FEB
San Joaquin River below Friant Dam	1439Z	14-FEB
Merced River @Stevinson	1730Z	17-FEB

Flood Advisories

Urban/Small Stream (Sierra Nevada)	0127Z	4-FEB
Urban/Small Stream (Sierra foothills)	1828Z	7-FEB
Urban/Small Stream (Tulare County mountains)	2031Z	7-FEB
Urban/Small Stream (Tulare County foothills and mountains)	2132Z	7-FEB
San Joaquin River below Friant Dam	2238Z	9-FEB
Urban/Small Stream (northern San Joaquin Valley, foothills)	0123Z	9-FEB
Urban/Small Stream (northern San Joaquin Valley, foothills)	2010Z	10-FEB
Urban/Small Stream (northern San Joaquin Valley, foothills)	2131Z	10-FEB
Urban/Small Stream (Tehachapi mountains)	2151Z	10-FEB
San Joaquin River below Friant Dam	2201Z	10-FEB
Urban/Small Stream (San Joaquin Valley, foothills)	0009Z	11-FEB
San Joaquin River below Friant Dam	1247Z	17-FEB
Urban/Small Stream (western Kern County)	1907Z	17-FEB
Kern County mountains	2021Z	17-FEB
Urban/Small Stream (western Kern County)	0003Z	18-FEB
Urban/Small Stream (southern San Joaquin Valley)	0022Z	18-FEB
Urban/Small Stream (Kern County portion of San Joaquin Valley)	0108Z	18-FEB
Kern County mountains	0216Z	18-FEB
San Joaquin Valley and mountains (Kern County)	0250Z	18-FEB
Kern County desert	0520Z	18-FEB
Urban/Small Stream (Sierra foothills)	2013Z	20-FEB
San Joaquin River below Friant Dam	1529Z	22-FEB
San Joaquin River below Friant Dam	0340Z	24-FEB

Flood/Flash Flood Watches

San Joaquin Valley, foothills (Fresno County northward)	1423Z	6-FEB
Entire HSA except the Kern County desert	2046Z	8-FEB
Entire HSA	2145Z	15-FEB
Entire HSA except the Kern County mountains and desert	2302Z	18-FEB

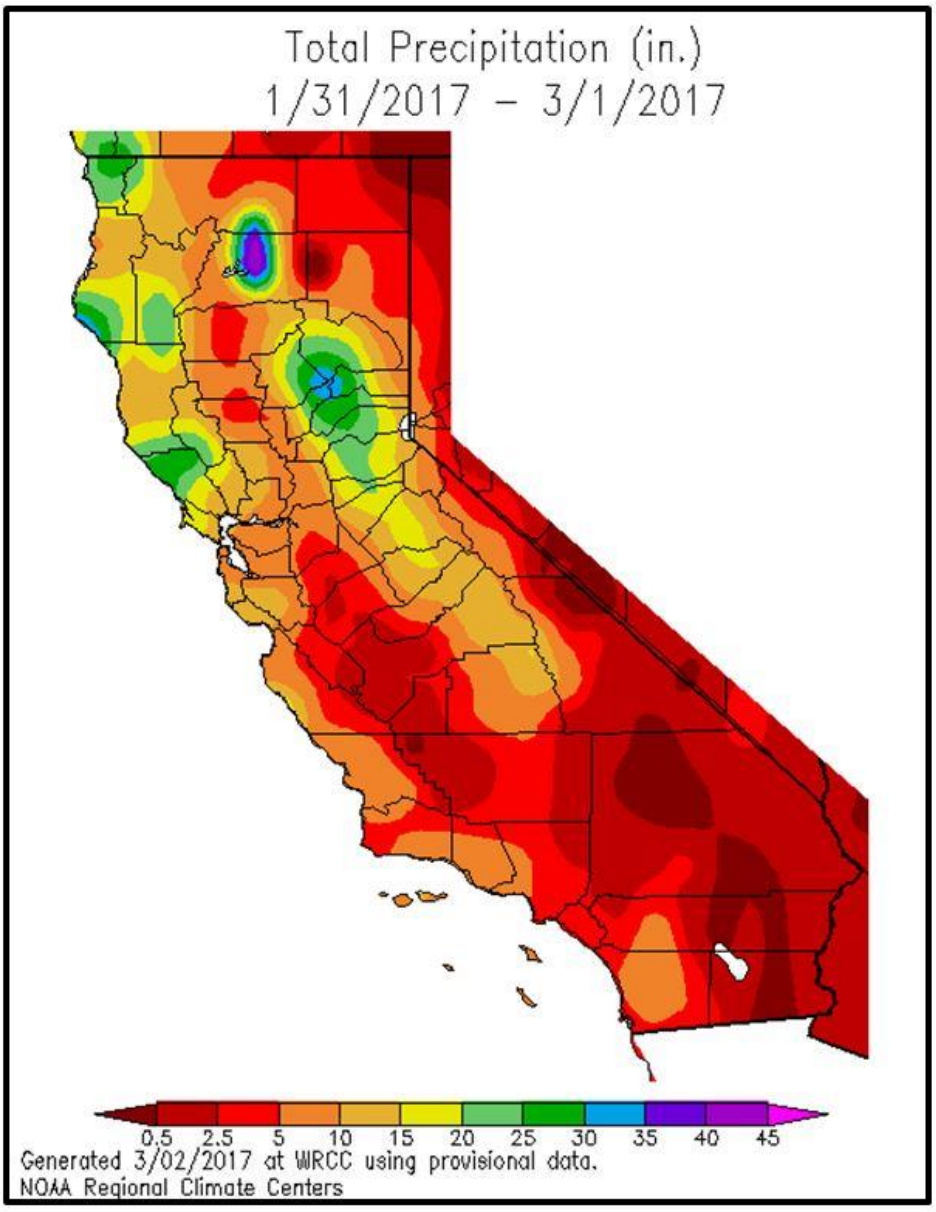
Hydrologic Statements

San Joaquin R @Newman, Merced R @Stevinson	2154Z	1-FEB
San Joaquin R @Newman, Merced R @Stevinson	1652Z	2-FEB
Merced R @Stevinson	1846Z	3-FEB
Merced R @Stevinson	2240Z	3-FEB
Merced R @Stevinson	1731Z	4-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1712Z	5-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2142Z	5-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1701Z	6-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1908Z	6-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2253Z	6-FEB

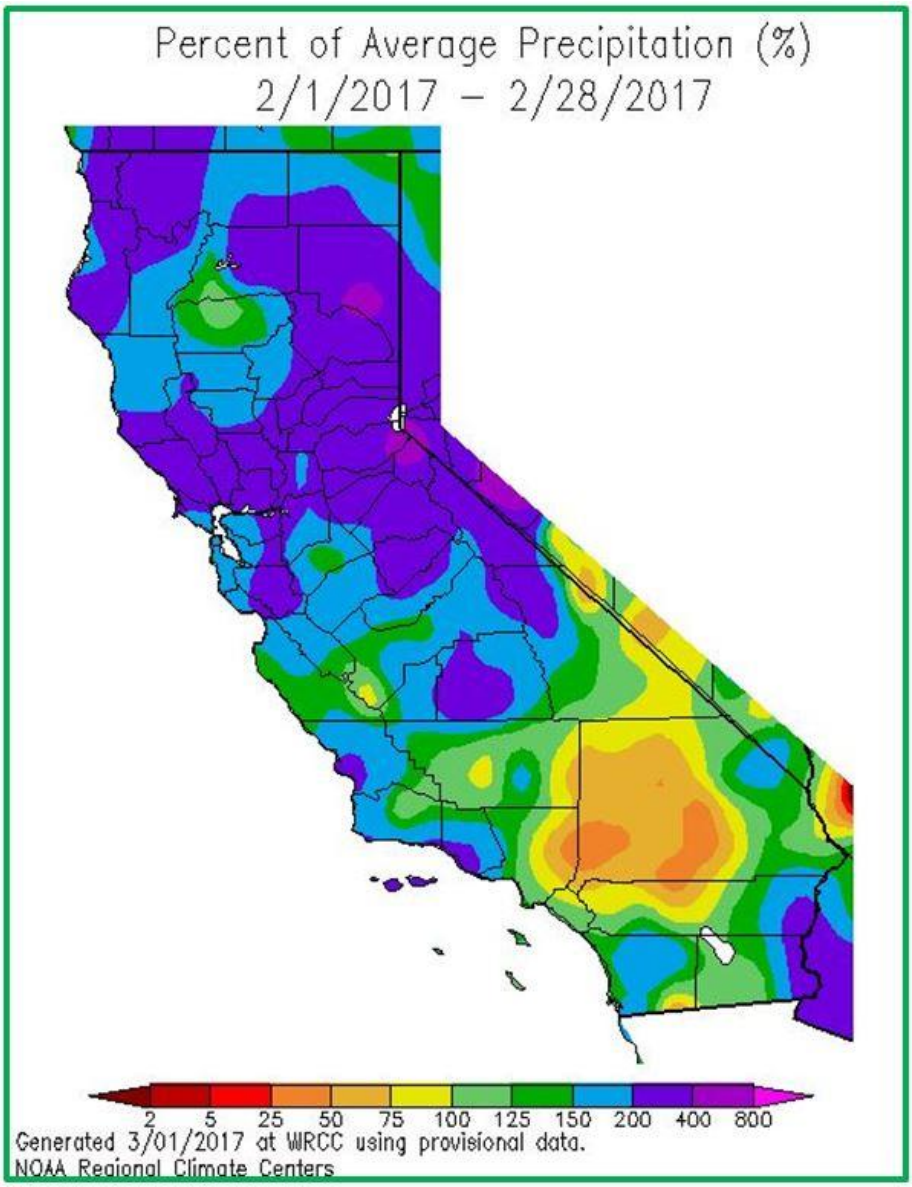
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	0457Z	7-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1104Z	7-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1706Z	7-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2201Z	7-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1256Z	8-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1732Z	8-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	0621Z	9-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1703Z	11-FEB
San Joaquin R @Newman, Merced R @Stevinson	1003Z	12-FEB
Merced R @Stevinson	1731Z	12-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1719Z	13-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2222Z	15-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1703Z	16-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2153Z	16-FEB
San Joaquin R @Newman, Merced R @Stevinson	0518Z	17-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	1011Z	17-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	2304Z	18-FEB
San Joaquin R @Newman, Merced R @Stevinson, Bear Creek @McKee Road	0402Z	21-FEB
San Joaquin R @Newman, Merced R @Stevinson	1111Z	21-FEB
San Joaquin R @Newman, Merced R @Stevinson	1801Z	21-FEB
San Joaquin R @Newman, Merced R @Stevinson	2302Z	21-FEB
San Joaquin R @Newman, Merced R @Stevinson	0404Z	22-FEB
San Joaquin R @Newman, Merced R @Stevinson	0942Z	22-FEB
San Joaquin R @Newman, Merced R @Stevinson	1648Z	22-FEB
San Joaquin R @Newman, Merced R @Stevinson	2218Z	22-FEB
San Joaquin R @Newman, Merced R @Stevinson	0330Z	23-FEB
San Joaquin R @Newman, Merced R @Stevinson	1625Z	23-FEB
San Joaquin R @Newman, Merced R @Stevinson	2154Z	23-FEB
San Joaquin R @Newman, Merced R @Stevinson	1753Z	24-FEB
San Joaquin R @Newman, Merced R @Stevinson	2141Z	24-FEB
San Joaquin R @Newman, Merced R @Stevinson	1633Z	25-FEB
San Joaquin R @Newman, Merced R @Stevinson	2214Z	25-FEB
San Joaquin R @Newman, Merced R @Stevinson	1606Z	26-FEB
San Joaquin R @Newman, Merced R @Stevinson	2103Z	26-FEB
San Joaquin R @Newman, Merced R @Stevinson	1613Z	27-FEB
San Joaquin R @Newman, Merced R @Stevinson	2146Z	27-FEB
San Joaquin R @Newman, Merced R @Stevinson	1801Z	28-FEB
San Joaquin R @Newman, Merced R @Stevinson	2116Z	28-FEB

Note…Numerous Flood/Flash Flood Statements were issued as follow up products to the Flood/Flash Flood Warnings

The maps on the following pages depict the amount of precipitation that fell (in inches) and the percentage of normal precipitation throughout California for February, 2017. The pages that follow include a graphical statewide historical representation of precipitation for the period from October through February and tables showing the San Joaquin 5 Station and Tulare Lake 6 Station Precipitation Index for the period from November through April and seasonal values to date.

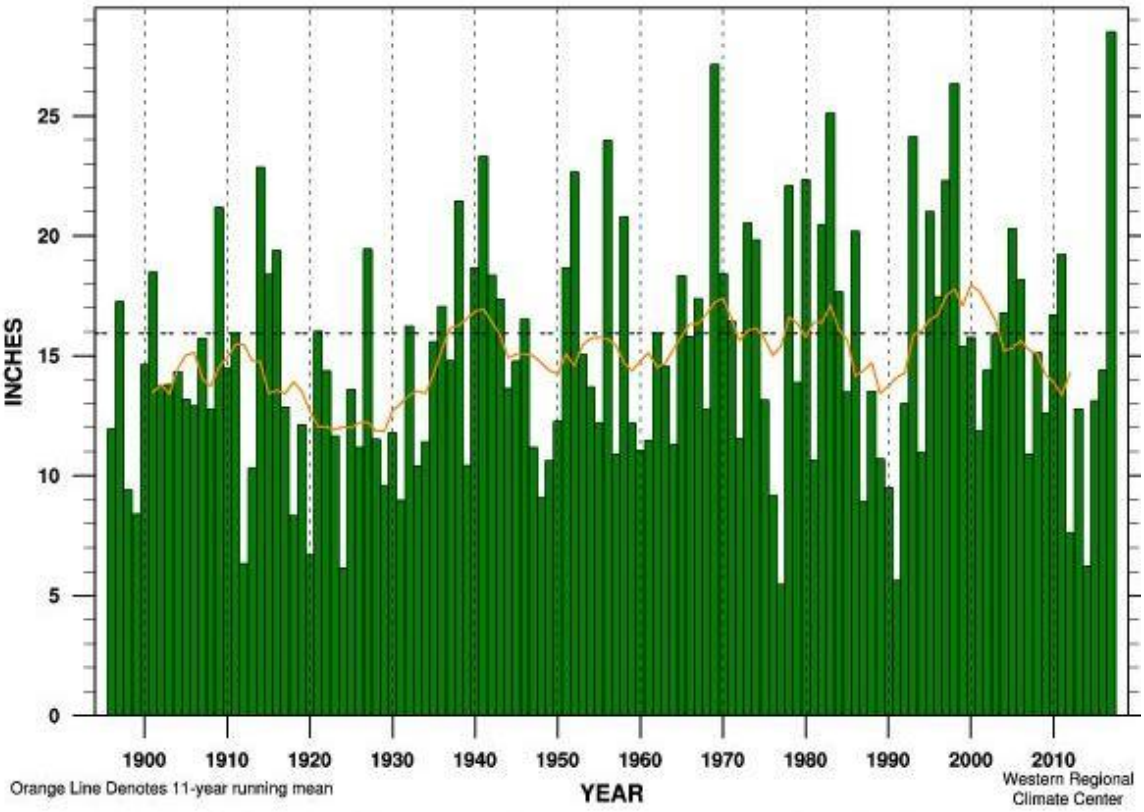


Total precipitation (in inches) that fell across California in February, 2017



Percentage of normal precipitation across California in February, 2017

California Statewide
Precipitation Oct-Feb



Linear Trend 1895-present	+ 2.20 ± 2.43 in.	(+ 13 ± 15%) per 100 yr	
Linear Trend 1949-present	- 0.71 ± 6.48 in.	(- 4 ± 40%) per 100 yr	
Linear Trend 1975-present	+ 0.98 ± 14.81 in.	(+ 6 ± 92%) per 100 yr	
Wettest Year	28.51 in. (178%)	in 2017	MEAN 15.94 in.
Driest Year	5.46 in. (34%)	in 1977	STDEV 5.08 in.
Oct-Feb 2017	28.51 in. (178%)		RANK 122 of 122

HISTORICAL CLIMATE RECORDS FOR THE SJ5SI							
Top 12 Driest Rainfall Season		Driest 6 Months; Nov-Apr		Wettest 6 Months; Nov-Apr		Top 12 Wettest Rainfall Season	
17.03	1923-1924	9.22	1976-1977	66.26	1982-1983	78.71	1982-1983
18.67	1976-1977	12.71	1923-1924	62.86	1968-1969	70.90	1994-1995
18.86	2014-2015	13.67	1975-1976	60.65	1977-1978	68.16	1968-1969
19.52	2013-2014	15.90	2014-2015	60.36	1994-1995	64.37	2010-2011
22.80	1975-1976	17.35	2013-2014	56.35	1937-1938	64.07	1997-1998
23.09	1993-1994	17.57	1930-1931	56.25	1981-1982	63.55	1981-1982
23.10	1930-1931	18.31	1938-1939	54.32	2016-2017	61.62	1977-1978
23.37	1986-1987	18.45	1986-1987	53.15	1966-1967	60.69	2016-2017
23.43	1960-1961	18.59	1989-1990	53.05	1997-1998	59.03	1937-1938
24.44	1967-1968	19.29	1933-1934	53.03	2005-2006	57.75	1985-1986
24.55	1933-1934	19.54	1993-1994	52.32	1955-1956	56.63	1955-1956
24.63	2006-2007	20.31	1960-1961	51.83	1985-1986	56.38	2005-2006

San Joaquin 5 station Precipitation Index

HISTORICAL CLIMATE RECORDS FOR THE TL6SI							
Top 12 Driest Rainfall Season		Driest 6 Months; Nov-Apr		Wettest 6 Months; Nov-Apr		Top 12 Wettest Rainfall Season	
13.04	2014-2015	5.97	1976-1977	51.54	1968-1969	58.31	1982-1983
13.65	1923-1924	10.40	2014-2015	48.82	1982-1983	55.86	1968-1969
14.31	1958-1959	10.44	1923-1924	47.83	1966-1967	53.59	1997-1998
14.70	2013-2014	11.20	1975-1976	45.52	1937-1938	49.04	1966-1967
15.15	1960-1961	11.78	1958-1959	45.19	1977-1978	47.11	1937-1938
15.45	2012-2013	12.26	2013-2014	42.59	1951-1952	46.59	1977-1978
15.87	1933-1934	12.48	1933-1934	42.48	1997-1998	45.83	1994-1995
16.10	1976-1977	13.12	1960-1961	41.57	1942-1943	44.72	2010-2011
16.24	1975-1976	13.65	2012-2013	39.87	1985-1986	44.30	1951-1952
16.30	1971-1972	13.69	1971-1972	39.33	2016-2017	42.69	1985-1986
16.77	2006-2007	13.94	1989-1990	38.57	1936-1937	42.49	1942-1943
18.06	1967-1968	14.92	1986-1987	38.55	2010-2011	42.20	1940-1941

Tulare Lake 6 station Precipitation Index

CC:

W/OH12x1
W/WR2
CNRFC
WFO HNX
WFO STO