MARCH 2018 WEATHER SUMMARY
FOR THE CENTRAL CALIFORNIA INTERIOR

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Active weather occurred during the first four days of the month, and several inches of rain fell in the Sierra Nevada foothills and lower elevations of the Sierra Nevada during this time. Many locations in the San Joaquin Valley exceeded an inch of rain, and a few areas in Merced County and along the east side of the valley from Mariposa to Tulare Counties even exceeded two inches. About three to four feet of snow accumulated in the higher elevations of the Sierra Nevada, especially above 7,000 feet. This was the most precipitation in Central California for most areas in over a year, or since early 2017. A cold low pressure system lingered along the west coast and brought periods of rain and mountain snow to much of Central California. Snow levels began around 5,000 feet at the onset of this system during the 1st and lowered to as low as 1,500 feet in the Sierra Nevada foothills by the night of the 3rd, mainly over Mariposa and Madera Counties. Snow levels were otherwise around 3,000 feet in areas to the south. The snow levels began to lower significantly in the afternoon of the 3rd, especially north of Kern County, so the air was sufficiently unstable for isolated thunderstorms with brief heavy rain and small hail. A couple of cold air funnels were sighted in the San Joaquin Valley that afternoon, including near Tulare and Coalinga. The system brought lesser amounts of precipitation to Kern County as most of the moisture passed to the north, although there were light amounts of snow accumulation (less than one inch) on Interstate 5 on and just below the summit of the Grapevine (or Tejon Pass to Lebec) during the morning of the 4th. During this period below average temperatures prevailed, although low temperatures for locations in the San Joaquin Valley were above freezing during the nights and mornings.

Afterward, the nights were cooler in the San Joaquin Valley, but daytime highs warmed closer to average, including on the 5th and 6th. Above average temperatures prevailed on the 7th through the 9th due to a ridge of high pressure over the region. Low temperatures during this period were also mild due to mid and high-level clouds at times. On the morning of the 9th, some mid-level clouds ahead of the next low pressure system that arrived by the following morning brought sprinkles to areas along the west side of the San Joaquin Valley. However, temperatures were similar or only slightly lower on this day.

On the 10th, showers began to arrive from the southwest, including over Kern County. Rain spread north and eastward by the afternoon to elevations up to around 8,000 feet. Most of the precipitation occurred mainly south of Fresno County. The highest amounts fell in Tulare and Kern Counties, especially from the afternoon through the evening hours. About one quarter to

one half inch of rain fell in the Kern County desert areas, and around 0.50 to 0.75 inch fell in the Tehachapi Mountains. Even locations in the south end of the San Joaquin Valley reported as much as one half inch, such as in Taft. The highest amount that fell from this particular system was nine tenths of an inch that fell in the Sierra Nevada foothills in Tulare County, specifically California Hot Springs, or east of Porterville. The storm cleared much of the area by the late night hours of the 10th, and patchy dense fog developed in the San Joaquin Valley through the morning hours of the following day. Afterward, low clouds lingered over the region during the afternoon of the 11th.

On the 12th through the 14th, the next low pressure system brought periods of rain to the region with snow over the mountains above 5,000 feet, including in Kern County. The 13th was the most active in terms of weather, as scattered thunderstorms developed over the San Joaquin Valley, Tehachapi Mountains, and parts of the southern Sierra Nevada over Tulare and Kern Counties. An isolated strong thunderstorm developed in the Sierra Nevada foothills in Tulare County and produced heavy rain that caused mud slides near the Pier Fire burn scar to the east of Springville and East Porterville during the early evening hours. Rain rates associated with this storm were in excess of an inch per hour.

After a brief break between systems, another low pressure system brought plenty of precipitation on the 16th and 17th. Most of the rain and snow fell during the 16th. Locations in the San Joaquin Valley received around a quarter to half an inch, while the Sierra Nevada foothills received up to an inch. Several inches to a foot of snow fell in the Sierra Nevada, mainly above 6,000 feet. Thunderstorms developed during the afternoon of the 17th due to a colder, more unstable airmass over the region, including over the higher terrain along the west side of the San Joaquin Valley, parts of the San Joaquin Valley, and the Sierra Nevada foothills. Brief heavy rain and small hail were the primary impacts due to the thunderstorms.

Very active weather occurred over a three day period during the 20th through the 22nd, due to a warm plume of air that brought a large amount of subtropical moisture. On the 20th, mainly light showers occurred during the daytime. By the evening hours, steady rain fell over much of the Central Valley and into the Sierra Nevada; this rain persisted during much of the nighttime into the morning of the 21st. Rain shifted into much of Kern County by this time, and minor street flooding was reported in Bakersfield. This city set a record rainfall for the day (0.83 inch, which broke the old record for March 21st of 0.68 inch set back in 1958). Rain continued in much of Central California during the night of the 21st and the morning of the 22nd; the focus of the heaviest rainfall gradually shifted back towards the northeast. By the 22nd, several inches of rain fell in much of Central California, including along the east side of the San Joaquin Valley, as well as the Sierra Nevada foothills and elevations up to around 8,000 feet. The highest amount was 11.50 inches, which occurred at a remote site in the central Sierra Nevada; otherwise, rainfall amounts were generally around six to nine inches over the three day period in the Sierra

Nevada and foothills. In the Central Valley, rainfall amounts were as high as three to five inches along the east side of the San Joaquin Valley and around one to three inches elsewhere, including in the higher terrain along the west side. The main impacts were high river and creek rises, flooding, mudslides and ponding on roadways due to heavy rainfall. During this period, much above average precipitation, mild temperatures with Sierra Nevada snow above 8,000 feet, and thunderstorms occurred during this period. The 22nd was the most active day of these three days. On the afternoon of the 22nd, there were numerous reports of a funnel cloud over northwestern Tulare County that was visible from Visalia and nearby communities, such as Dinuba and Traver. In fact, this funnel cloud was actually a tornado, since it briefly touched the ground about nine miles to the east of Dinuba. This was reported as an EF0 tornado, as it did not cause any significant damage. Severe flooding occurred in Mariposa and in eastern Merced County near Snelling, La Grande, and Planada due to very heavy rainfall, including rain rates that reached over two inches per hour, from strong thunderstorms that developed as a colder airmass was approaching from the north that interacted with the warmer, subtropical air over this area. A large burn scar from last summer's Detwiler Fire also contributed to the runoff of this heavy rainfall that brought flash flooding to Mariposa and caused evacuations of thousands of residents, including those in nearby communities. There were also numerous road closures due to flooding. At elevations above 8,000 feet, anywhere from three to around 30 inches of snow fell. Tuolumne Meadows in Yosemite National Park reported 31 inches over this three day period (with a single day total as high as 14 inches on the 22nd).

Another low pressure system brought mainly light rainfall during the 24th to the region, although this system was colder with much less moisture. Some brief heavy rain occurred in a few locales in the San Joaquin Valley during that afternoon, although rainfall amounts were generally around a tenth of an inch or less. Bakersfield reported a trace and with that would finish as the 8th wettest March on record with 2.41 inches, while Fresno reported another 0.01 inch to end the month precipitation-wise with a monthly total of 4.19 inches, and that would be sufficient for that location to tie for the 10th wettest March on record (A monthly precipitation total of 4.19 inches also occurred in 1918). On the 25th, a decent trough behind the low brought gusty winds to the Kern County mountain and desert areas through the evening hours with gusts around 50 mph in the favored passes and canyons. Breezy conditions prevailed in quite a few locations even in the San Joaquin Valley, with local gusts as high as 30 to 35 mph at times.

High pressure then returned for the last four days of the month, and temperatures warmed to around ten degrees above average.

Much above normal precipitation occurred during this month with mainly near average temperatures in the Central California interior (See also Table 1 and Figures 1-2 below). One tornado was reported for the month (i.e., the EF0 reported east of Dinuba in northwestern Tulare County on the 22nd) in the Central California interior.

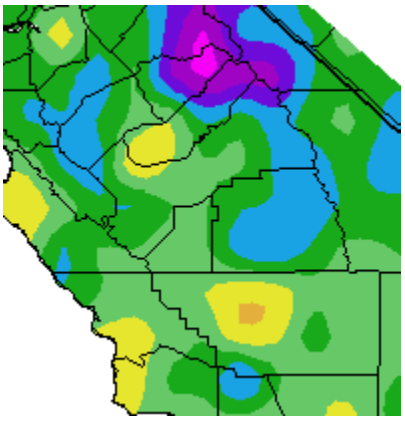
Table 1 – March 2018 Summary Statistics for ASOS locations

Location	Monthly Average Temp (deg F)	Departure From Average (deg F)	Total Monthly Precipitation (inches)	Departure From Normal (inches)
Bakersfield	58.8	1.2	2.41	1.20
Fresno	56.8	0.2	4.19	2.16
Hanford	55.7	0.3	2.33	0.70
Madera	55.0	0.8	4.75	2.95
Merced	53.6	0.0	3.08	1.01

Temperature/Precipitation Rankings for March

Bakersfield – 36th warmest March on record; 8th wettest March on record.
Fresno – Tied for 43rd warmest March on record (tied with 1988, 1925, 1923, 1921); Tied for 10th wettest March on record (tied with 1918).

Figure 1 – Departure from Average Temperature for March 2018



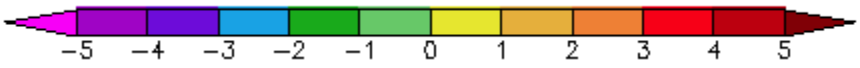
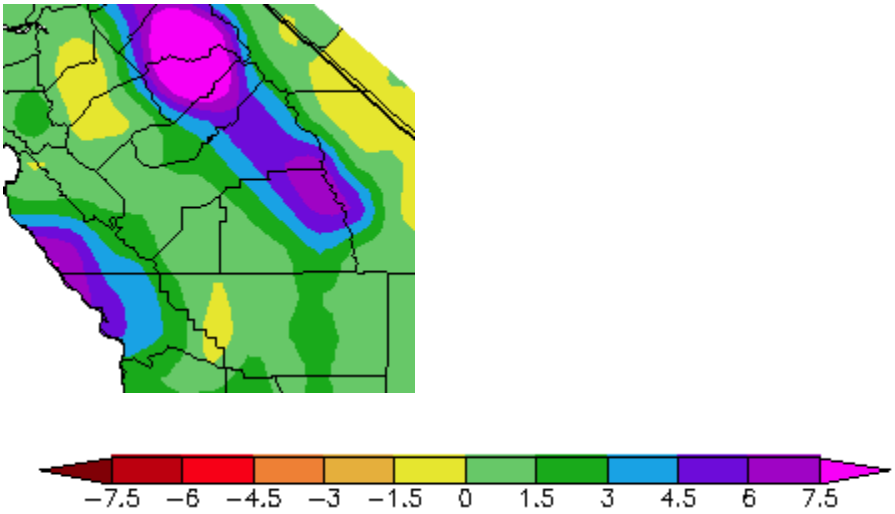


Figure 2 – Percent of Average Precipitation for March 2018



*Images above (i.e., Figures 1-2) courtesy of Western Region Climate Center