JULY 2015 WEATHER SUMMARY
FOR THE CENTRAL CALIFORNIA INTERIOR

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The first day of July 2015 began with stormy weather over much of the central California interior. Monsoonal moisture continued to impact the region, and high pressure continued to bring very warm daytime high temperatures. During the early morning hours, a cluster of thunderstorms brought mainly light rain and frequent lightning, along with strong and gusty winds to the Kern County mountains and desert, around 4:00-5:00 AM. A few locations in these areas reached just above 60 mph. Showers then developed over quite a few locations in the southern San Joaquin Valley, mainly over Kern County, by later in the morning. Some more showers developed further north towards Fresno and Merced by the evening. In fact, rainfall records were set for July 1st at all of the automated airport surface observation stations (specifically the ASOS sites owned by the National Weather Service) in the San Joaquin Valley. Even at Bakersfield no rain had fallen on this date since 1889, and no measurable rain (i.e., amounts higher than a trace) had fallen in Fresno on this date.

Shower and thunderstorm activity continued overnight in the San Joaquin Valley into the early morning hours of the 2nd. Therefore, Fresno had measurable rain on both the 1st and 2nd and also set a new daily record high precipitation for the 2nd. Record high minimum temperatures were reached as cloud cover remained over the area during the overnight hours, after the very warm temperatures that occurred during the daytime.

On July 3rd - 5th, monsoonal moisture lingered over the southern Sierra Nevada; however, shower and thunderstorm activity was confined to mainly the higher elevations along the crest. Marine air began to spill through Pacheco Pass during the early morning hours of the 5th, so temperatures began to trend down, at least in the central part of the San Joaquin Valley. Also, winds gusted to around 40 mph during the morning hours. An upper-level low pressure system was several hundred miles to the west of central California, and southwest flow aloft ahead of this low began to bring the marine air into the region and eventually suppressed thunderstorm development over the mountains.

On the 6th and 7th, the upper-level low gradually moved eastward, or closer to the coast of central California, so marine air continued to flow into the San Joaquin Valley during this period. Also there was some cooling in other areas, besides the San Joaquin Valley, just due to the proximity of the upper-level low in other areas. Gusty winds continued at times along the west side of the San Joaquin Valley.

The upper-level low was relatively close to the coast on July 8th, and it was near enough to cause shower/thunderstorm activity to tick back up. Gusty winds around 35-40 mph returned during that afternoon. Thunderstorms were forming along the Sierra Nevada crest; there was enough cold air to produce snow in the higher elevations of the Sierra, or just below elevation 10,000 feet. In fact, Yosemite National Park reported 3 inches of snow that evening at Tioga Pass. This snow was enough to shut down Highway 120 for about 2 hours. Also, during the evening hours, thunderstorms developed over the west side of the San Joaquin Valley and produced locally heavy rain; storm activity continued overnight and into the morning hours of the 9th. There were quite a few showers and thunderstorms that brought heavy rain to the southern Sierra Nevada and over parts of the San Joaquin Valley. A thunderstorm dumped 0.41 inch at the airport in Hanford that morning. Other locations received nearly an inch of rain, especially over the southern Sierra Nevada. Temperatures did not exceed the 80s in most locations, especially the San Joaquin Valley.

During the 10th, a few showers fell over the Sierra Nevada, while there were sprinkles in parts of the San Joaquin Valley in Merced and Madera Counties. Well below average temperatures continued; once again, many San Joaquin Valley locations only reached the 80s for daytime high temperatures.

On July 11th-15th, shower activity over the Sierra Nevada was suppressed, and the region was mainly dry as a southwest flow and weak upper-level trough persisted over the region. High temperatures remained moderately warm, or mainly in the lower to mid-90s (slightly below the 30 year averages) in the lower elevations during this period.

On the 16th-17th, dry weather continued with warming temperatures across the region although temperatures were slightly above the average for mid-July as weak high pressure ridging was over California. However, this ridge eventually gave way to a source of abundant tropical moisture.

During July 18th and for the next several days, tropical moisture associated with the remnants of Hurricane Delores brought showers and thunderstorms to much of the area. On the afternoon of the first day of this period (i.e., the 18th), flash flooding and debris flows occurred in the Kern County desert around Randsburg (where 2.90 inches of rain fell) and locations to the south, including Jawbone Canyon, California City, and along rural roads to the east that are typically prone to flash flooding (such as Redrock-Randsburg and Garlock Roads). Also, there was flooding reported in Rosamond, south of Mojave, along Highway 14. During the evening of this period, thunderstorms that produced heavy rain and flash flooding developed over Frazier Park and just to the west towards Lake of the Woods and Pine Mountain Club. These thunderstorms produced very heavy rainfall in a short period of time, or one inch or higher per hour. Also, thunderstorms developed over the San Joaquin Valley and into the Sierra Nevada foothills east of

Porterville during much of the afternoon and into the evening. Over one third of an inch (0.36 inch) fell in Fresno during the evening; most of this fell in around a half hour. This amount alone broke the record for the wettest monthly rainfall for July (previous record was 0.33 inch of rain in July 1913). Thunderstorms continued well into the late evening hours, and had moved as far north as Merced and Mariposa Counties.

On the following day, or the 19th, plenty of tropical moisture remained over the region and continued flowing from the south into central California. Thunderstorms formed over mainly the higher terrain, especially over the Kern County mountains. Once again, thunderstorms brought heavy rain to an already saturated ground at Frazier Park and nearby locations in Kern County along Interstate 5, such as Lebec during the afternoon and early evening. Also during this time, heavy rain fell near Lake Isabella and in Tehachapi. Several Flash Flood Warnings and Flood Advisories were issued for these areas during the afternoon and evening.

On July 20th, thunderstorms brought heavy rain to much of the Sierra Nevada. The heaviest amounts were reported at and around Bass Lake. One station at Bass Lake reported 2.35 inches; most of this fell in about 1 hour (almost an inch of this fell in 15 minutes)! This was certainly another day that involved multiple Flood Advisories and Flash Flood Warnings. A thunderstorm also developed over Bakersfield during the evening hours, although no rain fell at the airport. However, some stations reported over a tenth of an inch in town.

On the 21st, there were reports of heavy rain and debris flows in Yosemite National Park, especially in the vicinity of the Rim Fire burn scar (the large fire that occurred during summer 2013). Scattered thunderstorms formed over much of the Sierra Nevada; there was also some report of flooding near another burn scar just south of Yosemite (i.e., the French Fire, which occurred about one year prior to this month). Also some thunderstorms developed along the west side of the San Joaquin Valley, including at Santa Rita peak, or north of Coalinga. Over an inch of rain fell in this area. Several Flash Flood Warnings and Flood Advisories were also issued this day.

Thunderstorms developed mainly over the higher elevations of the Sierra Nevada during the afternoon of July 22nd; there were also some isolated showers and a thunderstorm during the late morning and early afternoon hours along the west side of the San Joaquin Valley. Some of the tropical moisture moved eastward; however, there was still sufficient moisture to produce showers and thunderstorms in the higher elevations of the Sierra Nevada. Surface moisture decreased as marine air began to spill into the region by the morning hours and to a lesser extent during the previous evening.

On July 23rd, marine air continued to infiltrate the San Joaquin Valley and caused gusty winds during the afternoon and evening while temperatures trended down that day and remained near to slightly below average for the next few days.

By the 29th, a strong ridge of high pressure brought much warmer than average temperatures to the region. The month ended with warmer than average temperatures, although the 29th was the warmest day of the month in most locations (Fresno had a high of 108 degrees, while Bakersfield reached 107 degrees). Scattered showers and thunderstorms developed on the 30th and 31st in the Sierra Nevada and Kern County mountains as monsoonal moisture once again returned to central California. This time, there were no direct impacts from remnants of former tropical systems.

Overall, precipitation during the month of July was well above average in most of the central California interior (see Fig 1 on the next page). However, there were a few areas that received no rain this month due to the localized nature of showers and thunderstorms. In terms of temperature, July was generally near to below average (including in the desert areas of Kern County and the mountain areas throughout central California), although some locations in the San Joaquin Valley realized slightly above average (see Fig 2 on next page).

Some records for daily and monthly rainfall were reached this month. Fresno set a new record high precipitation total of 0.43 inch for the month; most of this amount fell during the July 18th storm (or the daily record high precipitation of 0.36 inch that was set on that date). On average, Fresno receives 0.01 inch in July. Bakersfield received 0.04 inch of rain, while this location receives a trace of rainfall (i.e., an amount that does not measure) for the month on average.

In terms of high temperatures, Fresno reached 100 degrees or warmer 11 times this month (compared to 18 days in 2014). Bakersfield only reached 100 degrees or warmer on 8 days in July 2015 (compared to 19 days in 2014). On only two of these days (the 29th and 31st), both of these locations reached 105 degrees or warmer.

Fig 1 - Percent of average precipitation for July 2015 (from Western Region Climate Center):

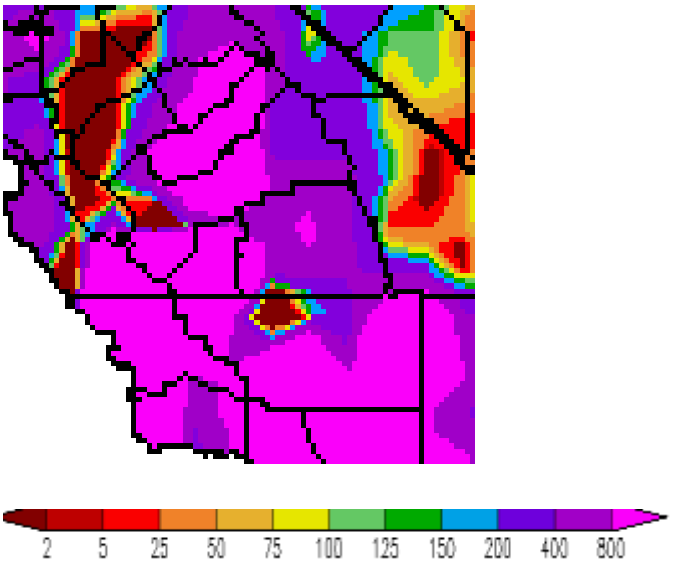

Fig 2 - Departure from average temperature for July 2015 (from Western Region Climate Center):