

## Storm Data and Unusual Weather Phenomena - December 2011

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
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### CALIFORNIA, South Central

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**(CA-Z093) S SIERRA FOOTHILLS, (CA-Z096) S SIERRA MTNS**

	12/01/11 00:00 PST		2.50M	High Wind (MAX 60 kt)
	12/02/11 03:40 PST		0	

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**(CA-Z095) KERN CTY MTNS, (CA-Z097) TULARE CTY MTNS, (CA-Z099) SE KERN CTY DESERT**

	12/01/11 00:00 PST		6K	Strong Wind (MAX 48 kt)
	12/02/11 07:50 PST		0	

This is the continuation of the Mono wind event from November 30th. This continued through December 2nd.

December began with an upper-level trough over the region and a low pressure center over the Desert Southwest. Northeast winds flowed around the low and knocked over numerous power line poles and trees throughout the central San Joaquin Valley, the Sierra Nevada foothills and Yosemite National Park. Fresno was also hit hard by power outages due to downed poles; this prompted a local emergency in the city during the afternoon of the 1st. Fresno County reported about \$2 million in damages due to the strong winds. Mariposa County and especially near the town of Mariposa, numerous large trees were toppled by the high winds. Numerous large trees were downed in Yosemite National Park, with power outages and blocked roads in Yosemite Valley.

Winds gusted to 45 mph at Fresno-Yosemite International Airport on December 1st, just shy of the record gust for December of 48 mph—on December 28th, 1991. Winds gusted to 60 mph at Tioga Pass, and over 50 mph at Coalinga. Trees were blown down at several locations, including Clovis and Mariposa. An automated station at the summit of Mammoth Mountain recorded a sustained wind speed of 140 mph, and gusts in excess of 150 mph (the limit of the anemometer).

Yet despite the strong winds, the southeastern part of the San Joaquin Valley remained relatively wind sheltered and areas of dense fog developed during the night of November 30th-December 1st.

This high wind event was known as a Mono Wind event; winds flow over the Sierra Nevada and down into the foothills from the east instead of the typical westerly direction. These winds allow the air to warm adiabatically; temperatures rose dramatically in much of the San Joaquin Valley compared to the previous day.

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*Mono Wind event Devils Postpile National Monument November 30-December 1 2012. Images courtesy of National Park Service.*

(CA-Z089) W CENTRAL S.J. VALLEY, (CA-Z090) E CENTRAL S.J. VALLEY, (CA-Z091) SW S.J. VALLEY, (CA-Z092) SE S.J. VALLEY

12/02/11 03:00 PST	0	Frost/Freeze
12/07/11 09:00 PST	0	

After the winds calmed down, overnight low temperatures began to fall by the morning of the 2nd. San Joaquin Valley fog was generally limited once the cooler, drier air set up over the central California Interior. The eastern, or cool, side of the upper-level ridge remained anchored over the area for the next several days, allowing cool polar air to move from Canada into the region. Basically, the region was sandwiched between an upper-level trough over the Great Basin and upper-level ridge that was centered off the coast; this is a typical pattern that ushers in cooler, generally dry, polar air from the north. Low temperatures fell as low as the lower 20s in Hanford and Lemoore during the first week of the month, including the 7th and 8th. In addition, the Kern County mountain and desert areas had lows in the teens during this period (i.e., Tehachapi, Glennville, Edwards AFB, and China Lake). The airmass began to gradually moderate on the 9th until the 11th, and valley fog returned to the region.

(CA-Z089) W CENTRAL S.J. VALLEY, (CA-Z090) E CENTRAL S.J. VALLEY, (CA-Z091) SW S.J. VALLEY, (CA-Z092) SE S.J. VALLEY

12/08/11 00:00 PST	0	Frost/Freeze
12/08/11 09:00 PST	0.30B	

Widespread freezing temperatures continued into December 8th across the San Joaquin Valley. Seven consecutive days of freezing temperatures took it's toll on the citrus crop in the San Joaquin Valley.

According to Citrus Growers' Association California Citrus Mutual, about 35 percent of the mandarin orange crop was lost to frost and freeze damage. The news was a little better for the navel crop, about 15 percent were not expected to make it. Initial estimates were not expected to be severe, however after several weeks of inspecting the citrus crop, it was determined that damages were much worse than first expected.

87 million dollars was spent to protect crops from the extended frost and freeze.

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<b>(CA-Z095) KERN CTY MTNS</b>				
	12/12/11 12:49 PST		0	Winter Storm
	12/13/11 08:48 PST		0	

On the 12th and 13th, an upper-level trough moved over the state. This was a cold system that originated from the Gulf of Alaska that was associated with relatively low snow levels; however, the deeper moisture remained to the north of central California. As a result, little or no precipitation fell over much of the region; locations generally received a trace to a few hundredths of an inch of precipitation, including much of the southern Sierra Nevada. However, some snow flurries fell on the Grapevine during the 12th. Shortly after noon, the Tehachapi-Willow Springs Road was closed due to snow and ice, while about an inch of snow accumulated around Frazier Park during the late night hours of the 12th and into the following morning.

Southeast winds funneled through the Tejon Pass, producing gusts up to 40 mph in the far south end of the San Joaquin Valley at the base of the Grapevine.

<b>(CA-Z089) W CENTRAL S.J. VALLEY, (CA-Z090) E CENTRAL S.J. VALLEY, (CA-Z091) SW S.J. VALLEY, (CA-Z092) SE S.J. VALLEY</b>				
	12/16/11 00:00 PST		0	Dense Fog
	12/20/11 09:00 PST		0	

The next storm moved into California on December 15th. Rain fell as far south as Madera on the east side of the San Joaquin Valley, but fell along the length of the west side of the Valley with light rain falling as far south as Bakersfield. This case of rain shadowing resulted in Fresno remaining dry while measurable rain fell to the north, west and south of the city. The trace of rain that fell at Meadows Field on December 15th-16th was the only rain for Bakersfield for the month of December, tying for the third driest December on record.

Showers continued over the Kern County deserts into the 17th. A couple of evening showers drifted northwest across the Tehachapi Mountains, bringing light rain as far north as Wheeler Ridge. Another system dropped south along the California coast the next day, moving inland on December 19th. Although this system only brought some clouds to the state, it was the ridge that developed behind the trough that brought extreme cold to the central and southern San Joaquin Valley.

The Tule fog returned to the San Joaquin Valley after the trough pushed east of the state. Fog development occurred for the next several days over the San Joaquin Valley; while the higher elevations, including the Sierra Nevada, nearby foothills, and the desert areas, generally had plenty of sunshine. An inside-slider trough moved over the Great Basin and allowed the upper-level ridge to weaken by the 21st of the month.

<b>(CA-Z089) W CENTRAL S.J. VALLEY, (CA-Z090) E CENTRAL S.J. VALLEY, (CA-Z091) SW S.J. VALLEY, (CA-Z092) SE S.J. VALLEY</b>				
	12/24/11 00:00 PST		0	Frost/Freeze
	12/28/11 09:00 PST		0	

Another reinforcing shot of cool, dry air arrived from the north during the 22nd and persisted for the next five days. This was a similar pattern to what occurred early in the month. Low temperatures reached the 20s in many locations in the San Joaquin Valley, and low- to mid-20s occurred once again in Hanford and Lemoore during Christmas weekend and into the next couple of days after Christmas Day. Some locations in the Kern County desert experienced minimum temperatures in the lower teens during the period. Fog development was generally limited and localized during this time due to a lack of surface moisture.

Bakersfield had a low of 28 degrees on 4 consecutive days (December 24th-27th), tying the coldest day of the month. Yet the high at Bakersfield on Christmas Day was 64, and reached 65 the next day for the warmest day of the month. This was a diurnal swing of 37 degrees for December 26th.

By the 28th, temperatures began to moderate so that nighttime lows were milder until the end of the month. More lower-level moisture moved in from the coast and also contributed to the moderation of the airmass over the San Joaquin Valley. In addition, high clouds moved over the area as weak upper level impulses moved over the region. The upper-level ridge set up over the area on the 30th, allowing the return of San Joaquin Valley fog by the morning of the 31st.

December was a very dry month for much of the forecast area. Little or no snow fell in the Sierra Nevada or any of the mountain areas, and no measureable rain fell in either Fresno or Bakersfield. Fresno had no precipitation measured during this month, while Bakersfield had a trace of rain on the 12th and 13th. Fresno tied December 1989 for the driest December on record; Bakersfield tied for third driest (5 other Decembers since record keeping began in 1887 have recorded a trace, while two had no rainfall). High pressure was persistent along the coast of California for much of the month, and storm systems generally traversed over the Pacific Northwest.

Cooler than average temperatures were realized throughout the region, especially in terms of daily minimum temperatures. Fog development was generally limited over the San Joaquin Valley, so daytime high temperatures reached above average. However, plenty of cooling took place during many of the nights due to generally clear skies, so low temperatures were well below normal for the month. Bakersfield was around 2 degrees below the monthly average temperature, while Fresno was just shy of 1 degree below the average. In summary, this month was cooler and much drier than average.

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