

Storm Data and Unusual Weather Phenomena - March 2011

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

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

03/07/11 08:26 PST	1.25M	High Wind (MAX 66 kt)
03/07/11 22:00 PST	0	

On the 6th and 7th, a low pressure trough brought some rain and mountain snow to the area, but the main threat was strong and damaging winds in much of Kern County, including the desert and mountain areas. On the 6th, Bakersfield experienced gusty winds up to 35 mph as the cold front passed over the area. Wind gusts reached over 80 mph at some locations in the desert on the 7th. On this day, the winds were strongest during the morning and afternoon hours, when pressure gradients and upper level winds were most favorable. at 1130 AM a roof blew off a house just south of Weldon. A total of 5 semi truck trailers were blown over near Mojave and the intersection of Highways 58 and 14. At Edwards AFB, high winds caused damages to a house, car, and a garage. Also just to the west of Rosamond, several power poles were snapped and toppled due to the high winds.

Winds subsided during the evening hours, but a few locations in the desert saw gusts continuing at 50-70 mph. By the 8th, temperatures remained several degrees cooler before then next ridge of high pressure strengthened over the area.



Wind damage from high winds up to 80 mph on March 7th in the Kern County desert. Images courtesy So Cal Edison.

(CA-Z095) KERN CTY MTNS

03/19/11 20:39 PST	0	High Wind (MAX 52 kt)
03/20/11 16:52 PST	0	

(CA-Z093) S SIERRA FOOTHILLS, (CA-Z095) KERN CTY MTNS, (CA-Z096) S SIERRA MTNS, (CA-Z097) TULARE CTY MTNS

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Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
	03/20/11 01:00 PST		4.05M	Winter Storm
	03/25/11 16:00 PST		0	
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KERN COUNTY --- 9.2 ENE GRAPE VINE [34.97, -118.77], 5.1 W GRAPE VINE [34.91, -119.01], 2.6 NE FRAZIER PARK [34.84, -118.91], 4.0 NE LEBEC [34.86, -118.81]				
	03/20/11 06:24 PST		5K	Flood (due to Heavy Rain)
	03/20/11 09:24 PST		0	Source: Law Enforcement
The CHP reported flooding on interstate 5 just north of Fort Tejon.				
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FRESNO COUNTY --- 3.2 SSW WESTHAVEN [36.19, -120.03], 1.8 W HURON [36.20, -120.13], 2.2 ENE HURON [36.21, -120.06], 1.5 SW WESTHAVEN [36.21, -120.02]				
	03/20/11 06:53 PST		1K	Flood (due to Heavy Rain)
	03/20/11 10:00 PST		0	Source: Law Enforcement
The CHP reported flooding on Lassen Avenue at the Fresno-Kings County line.				
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FRESNO COUNTY --- 2.6 NW CLOVIS [36.85, -119.73], 1.9 WNW CLOVIS [36.83, -119.73], 1.1 NE CLOVIS [36.83, -119.69], 0.8 W GLORIETTA [36.85, -119.68]				
	03/21/11 10:21 PST		3K	Flood (due to Heavy Rain)
	03/21/11 12:21 PST		0	Source: Law Enforcement
The California highway patrol reported flooding on Freeway 168 at Herndon Avenue. Spotter previously reported a thunderstorm producing small hail at Herndon avenue and Willow.				
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FRESNO COUNTY --- REEDLEY [36.60, -119.45], 1.6 SSW REEDLEY [36.58, -119.46], 1.7 SE REEDLEY [36.58, -119.43], 0.6 E REEDLEY [36.60, -119.44]				
	03/21/11 15:00 PST		5K	Flood (due to Heavy Rain)
	03/21/11 17:00 PST		0	Source: Newspaper
Flooding reported on Huntsman at Del Altair. 24-hour rainfall reports between Hanford and Fresno were between 1.50 to 2.00 inches.				
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MADERA COUNTY --- 1.8 NW BONITA [36.97, -120.22]				
	03/23/11 15:30 PST		0	Funnel Cloud
	03/23/11 15:30 PST		0	Source: Public
A motorist on State Route 99 reported a funnel cloud west of the City of Madera. A line of thunderstorms was moving through the area at the time.				
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FRESNO COUNTY --- 0.6 E KERMAN [36.72, -120.06]				
	03/23/11 16:15 PST		0	Funnel Cloud
	03/23/11 16:15 PST		0	Source: Broadcast Media
Local TV broadcasters reported a funnel cloud observed from the town of Kerman.				
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FRESNO COUNTY --- 2.9 ENE BELMONT AVENUE [36.78, -119.40], 1.3 N BELMONT AVENUE [36.79, -119.45], 2.6 W PIEDRA [36.82, -119.43], 1.4 ESE PIEDRA [36.82, -119.36]				
	03/23/11 16:31 PST		1K	Flood (due to Heavy Rain)
	03/23/11 18:31 PST		0	Source: Law Enforcement
The CHP reported flooding on Trimmer Springs Road and Piedra Road.				
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TULARE COUNTY --- 3.9 WSW POPLAR [36.02, -119.21], 2.6 S OCTOL [36.08, -119.26], 2.1 ENE COLTON CENTER [36.08, -119.12], 0.6 NE PORTERVILLE MUNI ARP [36.04, -119.06]				
	03/23/11 16:38 PST		3K	Flood (due to Heavy Rain)
	03/23/11 18:38 PST		0	Source: Law Enforcement
The CHP reported flooding on State Route 190 at Road 152.				
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KERN COUNTY --- 1.5 WNW RIBIER [35.26, -118.89], 1.8 ENE LAMONT [35.28, -118.89], 2.0 NNE RIBIER [35.28, -118.86], 0.9 NE RIBIER [35.26, -118.86]				
	03/23/11 17:17 PST		2K	Flood (due to Heavy Rain)
	03/23/11 19:17 PST		0	Source: Law Enforcement
The CHP reported flooding on East Panama Lane at Edison Road.				

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FRESNO COUNTY --- CLOVIS [36.82, -119.70]				
	03/23/11 17:20 PST		0	Funnel Cloud
	03/23/11 17:20 PST		0	Source: Trained Spotter
A funnel cloud was observed by a trained weather spotter from the northwest part of Clovis.				
FRESNO COUNTY --- 1.7 NNW (FCH) CHANDLER AF [36.75, -119.84], 2.4 NNW (FCH) CHANDLER AF [36.76, -119.84], 2.3 NNW (FCH) CHANDLER AF [36.76, -119.83], 1.6 N (FCH) CHANDLER AF [36.75, -119.82]				
	03/23/11 18:22 PST		4K	Flood (due to Heavy Rain)
	03/23/11 20:22 PST		0	Source: Law Enforcement
The CHP reported flooding on Highway 99 at the Olive Ave offramp.				
KERN COUNTY --- 2.6 ESE KERN JCT [35.34, -118.94], 1.6 WSW EDISON [35.34, -118.90], 2.5 SW EDISON [35.32, -118.90], 3.1 N LAMONT [35.31, -118.92]				
	03/23/11 18:27 PST		2K	Flood (due to Heavy Rain)
	03/23/11 20:27 PST		0	Source: Law Enforcement
The CHP reported flooding on State Route 184 at Muller.				
MERCED COUNTY --- 2.1 S CREGAN [37.27, -120.48], 1.8 ESE MERCED ARPT [37.27, -120.49], 1.5 E MERCED ARPT [37.28, -120.49], 1.6 S CREGAN [37.28, -120.48]				
	03/24/11 17:17 PST		2K	Flood (due to Heavy Rain)
	03/24/11 19:17 PST		0	Source: Law Enforcement
The CHP reported flooding on Route 59 just south of Mission Ave.				
MERCED COUNTY --- 2.9 S ATWATER MUNI ARPT [37.29, -120.61], 1.6 SSW ATWATER MUNI ARPT [37.31, -120.61], 1.8 SSE ATWATER MUNI ARPT [37.31, -120.58], 2.8 SSE ATWATER MUNI ARPT [37.29, -120.58]				
	03/24/11 17:25 PST		2K	Flood (due to Heavy Rain)
	03/24/11 19:25 PST		0	Source: Law Enforcement
The CHP reported flooding on State Route 140 just east of North Applegate Road.				
MADERA COUNTY --- 4.0 WNW ONEALS [37.15, -119.77], 4.4 NW ONEALS [37.18, -119.75], 4.0 N ONEALS [37.19, -119.70], 0.8 NNE ONEALS [37.14, -119.69]				
	03/24/11 17:47 PST		3K	Flood (due to Heavy Rain)
	03/24/11 19:47 PST		0	Source: Law Enforcement
The CHP reported flooding on Route 41 just north of Oneals Turnoff.				
MERCED COUNTY --- 1.1 W CREGAN [37.30, -120.50], 0.9 WNW CREGAN [37.30, -120.50], 0.6 WNW CREGAN [37.30, -120.49], 0.8 WSW CREGAN [37.30, -120.49]				
	03/24/11 18:14 PST		1K	Flood (due to Heavy Rain)
	03/24/11 20:14 PST		0	Source: Law Enforcement
The CHP reported flooding at 99 and R Street.				
MARIPOSA COUNTY --- 4.3 NNW BRICEBURG [37.66, -119.99], 2.3 SSW SOUTH FORK [37.62, -119.89], 1.4 S INCLINE [37.65, -119.85], 1.7 WNW INCLINE [37.68, -119.88]				
	03/24/11 18:34 PST		10K	Flood (due to Heavy Rain)
	03/24/11 20:34 PST		0	Source: Law Enforcement
The CHP reported a mud and rock slide on State Highway 140 at Foresta Road just east of Briceburg.				
MARIPOSA COUNTY --- 1.1 W FISH CAMP [37.48, -119.65], 1.8 SW FISH CAMP [37.46, -119.66], 1.5 S FISH CAMP [37.46, -119.63], 0.5 NE FISH CAMP [37.49, -119.63]				
	03/24/11 18:53 PST		5K	Flood (due to Heavy Rain)
	03/24/11 20:53 PST		0	Source: Law Enforcement
The CHP reported a mud and rock slide on Highway 41 just north of Broken Bit.				

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MERCED COUNTY --- 3.8 NE (MER)CASTLE AFB [37.41, -120.52], 3.5 ENE (MER)CASTLE AFB [37.40, -120.52], 4.7 ENE (MER)CASTLE AFB [37.40, -120.49], 4.5 SSE HOPETON [37.42, -120.50]				
	03/24/11 19:11 PST		2K	Flood (due to Heavy Rain)
	03/24/11 21:11 PST		0	Source: Law Enforcement
The CHP reported flooding on Highway 59 just south of Oakdale Road.				

MERCED COUNTY --- 2.6 SE CREGAN [37.27, -120.45], 2.5 W LINGARD [37.25, -120.44], 1.9 WNW LINGARD [37.26, -120.43], 2.5 SE CREGAN [37.28, -120.44]				
	03/24/11 19:29 PST		2K	Flood (due to Heavy Rain)
	03/24/11 21:29 PST		0	Source: Law Enforcement
The CHP reported flooding on East Childs Avenue.				

MERCED COUNTY --- 4.5 NNE CREGAN [37.36, -120.44], 5.3 NNE CREGAN [37.37, -120.43], 4.7 NNW TUTTLE [37.36, -120.42], 4.6 NW TUTTLE [37.35, -120.43]				
	03/24/11 19:40 PST		2K	Flood (due to Heavy Rain)
	03/24/11 21:40 PST		0	Source: NWS Employee
Off duty meteorologist reported flooding near the University of California - Merced Campus.				

MADERA COUNTY --- 5.4 SW INDIAN SPGS [37.00, -119.80], 4.7 WSW INDIAN SPGS [37.01, -119.80], 3.4 SW INDIAN SPGS [37.02, -119.78], 4.5 SW INDIAN SPGS [37.00, -119.78]				
	03/24/11 19:48 PST		2K	Flood (due to Heavy Rain)
	03/24/11 21:48 PST		0	Source: Law Enforcement
The CHP reported flooding on State route 41 at Road 416.				

Dry conditions prevailed over the area through March 15th, with gusts of 45-60 mph at times in the mountain and desert areas of Kern County. The weather pattern then changed sharply, transitioning to a 12-day period which saw periods of heavy precipitation and below normal temperatures.

From the evening of the 15th until the afternoon of the 16th, a storm system passed over the area, bringing precipitation mainly to the mountains and foothills, but light amounts did fall on the San Joaquin Valley floor. Most of the precipitation fell mainly as rain over the Southern Sierra Nevada in the northern part of WFO San Joaquin Valley-Hanford's forecast/warning area. The highest amounts, which occurred in Yosemite National Park, ranged from about 1.5 to 3 inches; this was the most precipitation that had occurred in the region for the month thus far. However, this was just the harbinger of what was to come only 4 days later.

While the rain was focused toward the north, winds were the main concern over the southern part of the region. The Kern County deserts saw gusts of 45-55 mph, and gusts as high as 66 mph were recorded in the Kern County mountains. The winds pushed clouds over the San Joaquin Valley into the Tehachapi Mountains, creating areas of dense fog. Visibilities as low as 100 feet were reported near Tehachapi.

The next storm arrived two days later. This was a two-part system, with the first part bringing between a tenth and a third of an inch of rain to the central and southern San Joaquin Valley. The first wave also brought a very cold airmass to the region. A foot of snow fell at Hetch Hetchy, and 10 inches of snow fell as far south as Lodgepole in Sequoia National Park. Snow even fell in the foothills, with 5 inches falling at Mid Pines at an elevation of 2400 feet. The main part of the storm arrived on the 20th, bringing record rain to both Bakersfield and Fresno, the latter city recording 1.82 inch of rain. In the Southern Sierra Nevada, there was no break in the snow, as upslope showers continued through the 19th until the second wave arrived.

Another foot of snow fell as far south as Fresno County on the 19th, and 4-5 inches in Tulare County.

Strong winds developed ahead of the main storm, with gusts up to 84 mph in the hills above the Grapevine during the night of March 19th-20th, and gusts up to 60 mph at the lower elevations from Frazier Park to the base of the Grapevine.

The winds spread as far north as Bakersfield during the early morning of the 20th, and continued spreading north through the day. The heavy rains caused some road flooding on the San Joaquin Valley floor, as well as on Interstate 5 north of Fort Tejon before the mountain rain turned to snow. Up to 4 feet of snow fell at Frazier Park; the strong winds created drifts as high as 6 feet deep. Snow caused the closure of Interstate 5 over the Grapevine, and snow even fell on the Temblors and Diablo Range along the west side of the San Joaquin Valley. In Yosemite National Park and the surrounding area, winds toppled trees and downed power lines, and the combination of heavy snow and rock slides closed roads into the Park. This was the first time since the floods of January, 1997, that Yosemite National Park was closed due to weather. Heavy snow and downed oak trees also plagued the El Portal and Wawona areas. Due to the

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power outages, Yosemite park officials evacuated some visitors to the park for a period of time due to the extensive impacts from this storm.

The morning of March 21st saw hail falling on the San Joaquin Valley floor, including near Rio Bravo and later over the Fresno-Clovis metro area. By the afternoon, hail was reported in Selma and Visalia, with ½-inch hail reported in the latter city. In the Tehachapi Mountains, up to a foot of new snow was reported.

The trough moved into the Great Basin, but a trailing short-wave brought light showers to the Kern County mountains and the far south end of the San Joaquin Valley during the early morning hours of March 22nd. Isolated showers were reported over parts of downtown Bakersfield, but stayed just south of Meadows Field.

Yet another storm reached the central California interior on March 23rd-24th. A line of thunderstorms developed on the 23rd over Merced County, then moved eastward into Madera and Mariposa Counties. Thunderstorms at the south end of the line propagated southward into Fresno County, ultimately reaching parts of Fresno and near Hanford. In fact, Fresno reported over a half inch of rain that day, with 0.38 inch falling in an hour at Fresno-Yosemite International Airport during the afternoon. Small hail, frequent lightning, and brief heavy rainfall were the main impacts of these storm cells. Funnel clouds were reported west of Madera, and near Clovis and Kerman; none touched down. The heavy rains caused flooding in the Southern Sierra Nevada foothills east of Fresno, as well as in downtown Fresno and southeast of Bakersfield. Convective cooling lowered the snow level down to 2200 feet in Mariposa and Madera Counties.

The last major storm of the month arrived on March 24th. This storm brought gusts to 45 mph to the west side of the San Joaquin Valley, and gusts to 65 mph in the Kern County mountains and deserts. Convective activity was limited to near Merced, with several reports of road flooding due to the already saturated ground. Thunderstorms and showers moved east into the foothills of Madera and Mariposa Counties, where the heavy rains triggered rock and mud slides. Mainly light showers occurred southward. The trough moved east of the region on the 25th, with residual light showers in its wake. Additional light snow fell in the Southern Sierra Nevada measuring around 5 inches or less. Local media reported that the roof of a vacant store at Shaver Lake collapsed on March 26th due to 6 feet of snow accumulation on the roof.

MERCED COUNTY --- 2.8 NE (MER)CASTLE AFB [37.40, -120.53], 2.9 S HOPETON [37.44, -120.54], 3.9 ESE HOPETON [37.46, -120.47], 5.2 ENE (MER)CASTLE AFB [37.40, -120.48]

03/24/11 20:31 PST	5K	Flash Flood (due to Heavy Rain)
03/24/11 22:31 PST	0	Source: Law Enforcement

The CHP reported flash flooding at Highway 59 just north of the Trout Farm. One foot of water was flowing across the roadway.

MADERA COUNTY --- 2.8 NNE STOREY [37.02, -120.01], 1.2 NNE STOREY [37.00, -120.01], 2.8 ENE STOREY [36.99, -119.97], 3.0 NNE STOREY [37.02, -119.99]

03/24/11 20:42 PST	3K	Flood (due to Heavy Rain)
03/24/11 22:42 PST	0	Source: Law Enforcement

The CHP reported roadway flooding on State highway 145 at Bonnie Way.

(CA-Z096) S SIERRA MTNS

03/26/11 04:00 PST	0.25M	Winter Weather
03/26/11 16:00 PST	0	

MERCED COUNTY --- 5.0 N GUSTINE ARPT [37.34, -120.98], 3.5 N GUSTINE ARPT [37.32, -120.97], 4.7 NNE GUSTINE ARPT [37.33, -120.94], 5.4 WNW STEVINSON [37.36, -120.94]

03/27/11 00:00 PST	0.50M	Flood (due to Heavy Rain)
03/29/11 00:00 PST	0	Source: Law Enforcement

During the frequently stormy period that began on the 18th and ended on the 28th, as much as 7 inches of rain fell in the San Joaquin Valley and up to 10 inches of rain drenched the adjacent foothills while the higher elevations of the Sierra (above 7000 feet) received snow accumulations of up to 15 feet. Excessive runoff, combined with an increase in reservoir releases at the major dams caused higher than normal flows along rivers and streams through the end of the month. The Merced River at Stevinson peaked a half of a foot below flood stage at 4:30 pm on the 21st but otherwise remained well above monitor stage during the last two weeks of the month. Water levels along the San Joaquin River approached levels that had not been observed since January, 1997. At Newman, the river first rose above monitor stage on the morning of the 23rd and remained above monitor stage for the remainder of the month. Water flowed into the Fisherman's Bend trailer park along the San Joaquin River near Newman by the 28th where voluntary evacuations were conducted. In Merced County, several water swollen creeks briefly flowed out of their banks on the morning of the 20th and caused minor flooding.

The last major storm of the month arrived on March 24th. This storm brought gusts to 45 mph to the west side of the San Joaquin Valley, and gusts to 65 mph in the Kern County mountains and deserts. Convective activity was limited to near Merced, with several reports of road flooding due to the already saturated ground. Thunderstorms and showers moved east into the foothills of Madera and Mariposa Counties, where the heavy rains triggered rock and mud slides. Mainly light showers occurred southward. The trough moved

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east of the region on the 25th, with residual light showers in its wake. Additional light snow fell in the Southern Sierra Nevada measuring around 5 inches or less. Local media reported that the roof of a vacant store at Shaver Lake collapsed on March 26th due to 6 feet of snow accumulation on the roof.

A weak frontal system reached the area on the 26th-27th, bringing cooler temperatures but only light precipitation and a few gusty winds. This storm moved east of the central California interior on the 28th, with an upper-level ridge building into the state behind it to bring a strong warming trend.

High temperatures in the central and southern San Joaquin Valley warmed into the lower 80s on the last day of the month. This was the first day of 2011 that either Bakersfield or Fresno reached 80 degrees, with highs of 82 and 81 degrees, respectively. The last day Fresno had reached 80 degrees was November 5th, 2010, when Fresno had a high of 90 degrees. Bakersfield last saw an 80-degree day on November 6th, 2010, with a high of 85 degrees.

In summary, March was mainly dry during the first half of the month, followed by wet weather from the 15th until around the 27th. Temperatures generally remained near or below average until the last day of the month.



River flooding along the San Joaquin River near Newman. Photos courtesy of the National Weather Service California Nevada River Forecast Center.