
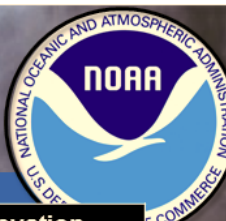


October 2013 Regional Climate Summary For the San Francisco Bay Area and Monterey Bay Area

October 2013 was dry and cool. Most of the San Francisco Bay area received no measurable rainfall during the month. Average temperatures were below normal, mainly because of several cool nights. There were a two wind events during October, one of moderate intensity at the beginning of the month and another more intense wind event near the end of the month.

October Wind Events:

An upper trough settled into the Great Basin on the evening of Thursday, October 3, setting the stage for a typical autumn offshore wind event. Winds were locally strong and gusty from late Thursday night through Friday morning, the 4th. Listed below are some of the stronger wind gusts reported for the event. Winds were strongest in the North and East Bay Hills, where local gusts in excess of 50 mph occurred. But even some lower elevation locations experienced breezy conditions (e.g., a wind gust to 38 mph reported by a weather spotter on Beaver Street in San Francisco). Minor tree damage was reported across portions of the North and East Bay Hills. Red Flag warnings had been issued a day prior to the event, warning of increased fire danger due to gusty dry winds. Several wildfires started late on the 3rd, including a fire of several hundred acres near Lake Berryessa. None of the wildfires threatened any homes or structures.

 Peak Wind Gusts As of 9:00 AM PDT 10/4/13 			
Location	County	Peak Wind Gust (MPH)	Elevation (Ft.)
Los Vaqueros RAWS	Contra Costa	59	1100
Middle Peak RAWS	Marin	54	2339
Oakland N RAWS	Alameda	54	1402
Hawkeye	Sonoma	52	2024
Spring Valley RAWS	San Mateo	38	1075
3 WSW Cupertino	Santa Clara	38	1350
Napa Co. Airport	Napa	37	14
Twin Peaks	San Francisco	36	862
Highlands Peak	Monterey	32	2490
Ben Lomond RAWS	Santa Cruz	31	2598
Santa Rita	San Benito	29	5000

The second wind event in October occurred from the afternoon hours of Sunday, October 27 through the early morning hours of Monday the 28th as a low pressure system rapidly deepened just to the northeast of the San Francisco Bay Area. This wind event was more intense than the one earlier in the month and resulted in more damage. Strongest winds occurred in the East Bay where trees were toppled and big-rigs were overturned on I-580.



Photo courtesy of KGO

A complete summary of the October 27th/28th wind event can be found at the following location:

http://www.wrh.noaa.gov/mtr/stormSummary/Wind_10_27-28_2013/wind_10_27-28_13.php

October Precipitation:

A couple of cool weather systems produced light amounts of rainfall across the southern part of the region during October. But for the most part, October 2013 was a very dry month. Normal October rainfall generally ranges from about one to two inches across the region. But in October 2013, most San Francisco Bay Area climate stations reported no measurable rain.

A weak weather system produced isolated light showers across interior Monterey county and San Benito county during the morning of October 9. The rain fell in mostly remote sparsely-populated areas and totaled less than a tenth of an inch.

The same weather system that generated strong winds on October 27-28 produced the only rainfall of significance during October. The cold front was initially dry as it swept through the San Francisco Bay Area late on the 27th. But by the time the front had reached the Monterey Bay Area early on the 28th, it had tapped into additional moisture and managed to generate light to moderate rainfall.

Greatest rain amounts were near Monterey Bay where totals from 0.25 to 0.50 inches were common.

Monthly rain totals for October ranged from zero percent of normal across most of the San Francisco Bay Area to nearly half of normal around the Monterey Peninsula and in Carmel Valley (see table below).

October Regional Precipitation Summary

Location	October Rainfall	Normal Oct Rain	Percent of Normal
North Bay			
Angwin	0.00	2.19	0
Calistoga	0.00	2.11	0
Cloverdale	M	2.12	M
Kentfield	0.00	2.26	0
Muir Woods	0.00	1.98	0
Napa	0.00	1.48	0
Napa Airport	0.01	0.97	1
Occidental	0.00	2.87	0
Petaluma Airport	0.00	1.43	0
Saint Helena	0.00	1.85	0
San Rafael	0.00	1.49	0
Sonoma County Airport	0.01	2.03	0
Sonoma	M	1.64	M
San Francisco Peninsula			
Half Moon Bay	0.00	1.56	0
Palo Alto	0.00	0.76	0
Redwood City	0.00	1.06	0
San Francisco Airport	0.00	0.95	0
San Francisco Downtown	0.00	1.12	0
Woodside	0.00	1.14	0
East Bay			
Berkeley	0.00	1.37	0
Concord	0.00	0.82	0
Concord Airport	0.01	0.87	1
Fremont	0.00	0.85	0
Hayward Airport	0.00	1.00	0
Livermore	0.00	0.85	0
Livermore Airport	0.00	0.92	0
Martinez	0.00	0.98	0
Mount Diablo Junction	0.00	1.42	0
Newark	0.00	0.81	0
Oakland	0.00	1.37	0
Oakland Airport	0.01	1.20	1
Richmond	0.00	1.44	0

South Bay and Santa Cruz County	October Rainfall	Normal Oct Rain	Percent of Normal
Ben Lomond	0.05	2.35	2
Gilroy	0.00	0.92	0
Los Gatos	M	1.01	M
Moffett Federal Airfield	0.01	0.64	2
Mount Hamilton	0.00	1.42	0
San Jose	0.00	0.80	0
Santa Cruz	0.07	1.45	5
Watsonville	0.05	1.10	5
Watsonville Airport	0.22	0.92	24
Monterey and San Benito Counties			
Big Sur Station	M	2.11	M
Carmel Valley	0.47	0.93	51
Hollister	0.02	0.69	3
King City	0.06	0.63	10
Monterey	0.29	1.06	27
Monterey Airport	0.42	0.93	45
Pinnacles National Park	0.26	0.86	30
Salinas	0.23	0.64	36
Salinas Airport	0.15	0.58	26

Interesting facts about the lack of October rainfall in San Francisco:

An October With No Rain

Is this a sign of another drier than normal rainy season?

San Francisco recorded no measurable rain in October 2013. In 164 years of rainfall records in San Francisco, there have been only 13 years when no rain fell in October (8% of all years).

The last time San Francisco had no rain in October was in 1980 – 33 years ago.

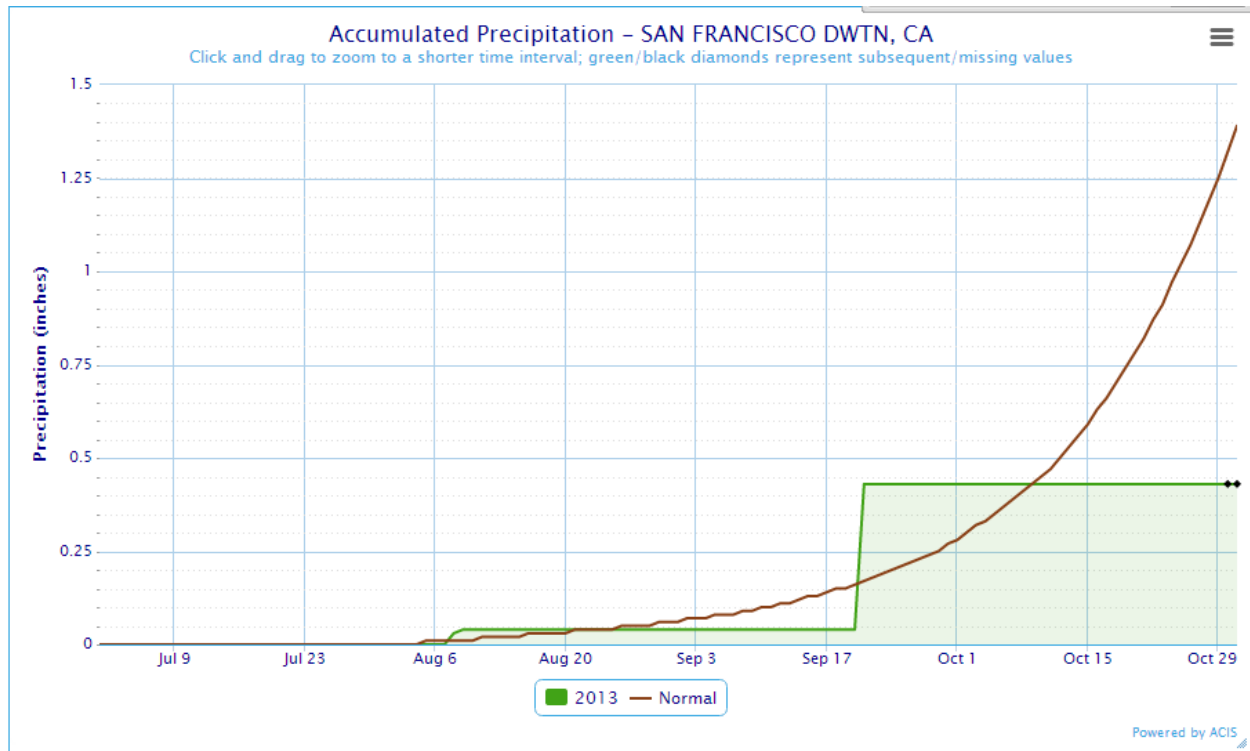
Question: In years when no rain fell in San Francisco during October, did the rain year as a whole turn out to be drier than normal?

Answer: Based on past rainfall records, odds favor a drier than normal year, but any outcome is possible (see below).

Of the 13 years when no rain fell in San Francisco during October, nine of those rain years turned out to be drier than normal (69%), two turned out to be wetter than normal (15%), and two near normal (15%).

Fascinating fact: Both the driest and wettest rain years on record for San Francisco occurred during years in which no rain fell in October (7.42" in 1850-51 and 49.27" in 1861-62).

The graph below shows accumulated precipitation in San Francisco so far this rain year (July 1-October 31). Note how most of the rain that has fallen in the City so far this rain year occurred on a single day (September 21). By October 31st the normal year-to-date rainfall in San Francisco is 1.39 inches, but this year less than a half inch had fallen through October 31st (or about 30 percent of normal). It should be noted that it's still very early in the rain year and the current year-to-date rainfall deficit could be erased with just one significant storm.



October Temperatures:

A couple of offshore wind events in October generated short periods of warm weather. The first occurred from October 4-7th with the warmth peaking on the 5th and 6th when highs were in the 80s across most of the region, including the coast. There were a few lower 90s as well, including a 92 in Salinas on the 6th, which was the only daily record high temperature set during the month. The second period of warm weather occurred over four days near the middle of the month, peaking on the 16th, when 80s were common.

Other than the aforementioned periods of offshore flow and warm weather, most days in October were cooler than normal. The nights were especially cool. The table below shows that average highs for the month were a mix of both slightly warmer and slightly cooler than normal. But average overnight lows were below normal at nearly all climate stations, and significantly cooler-than-normal at many valley locations. Only the higher elevation climate sites of Mount Diablo Junction and Mount Hamilton reported average lows at normal or above.

San Francisco's average low temperature of 51.8 for October 2013 was the eighth coolest average October minimum temperature in 140 years of records for the City. Overnight lows dropped into the 40s in San Francisco on nine October nights. Only in two other years did San Francisco have more

October nights in the 40s (10 in 1949 and 11 in 1919). On average, only 1.5 nights during October cool into the 40s in San Francisco.

The coolest overnight lows for most locations occurred during the early morning hours of Wednesday the 30th when temperatures dipped into the low to mid 30s in the North Bay Valleys.

October Regional Temperature Summary

Location	Average High	Normal High	Departure from Normal	Average Low	Normal Low	Departure from Normal
North Bay						
Angwin	72.3	72.6	-0.3	48.4	49.7	-1.3
Calistoga	79.7	79.3	0.4	37.0	45.4	-8.4
Cloverdale	M	78.6	M	M	49.8	M
Kentfield	74.8	74.1	0.7	46.6	49.6	-3.0
Napa	78.1	76.7	1.4	44.9	49.2	-4.3
Napa Airport	73.6	74.1	-0.5	40.3	43.1	-2.8
Occidental	71.2	72.1	-0.9	48.0	50.9	-2.9
Petaluma Airport	76.0	75.8	0.2	43.6	47.6	-4.0
Saint Helena	78.3	77.5	0.8	44.5	48.2	-3.7
San Rafael	74.3	72.7	1.6	47.6	51.0	-3.4
Sonoma County Airport	77.6	76.4	1.2	40.9	45.0	-4.1
Sonoma	M	77.4	M	M	46.8	M
San Francisco Peninsula						
Half Moon Bay	64.9	65.6	-0.7	45.8	46.9	-1.1
Palo Alto	M	74.0	M	M	48.1	M
Redwood City	73.0	74.2	-1.2	46.6	49.9	-3.3
San Francisco Airport	69.8	70.4	-0.6	51.8	53.2	-1.4
San Francisco Downtown	67.8	69.2	-1.4	51.8	53.7	-1.9
Woodside	80.5	79.4	1.1	43.4	45.7	-2.3
East Bay						
Berkeley	72.5	72.5	0.0	48.8	51.5	-2.7
Concord	76.3	77.0	-0.7	50.2	52.6	-2.4
Concord Airport	75.3	76.7	-1.4	46.7	51.1	-4.4
Fremont	72.9	72.8	0.1	49.1	51.7	-2.6
Hayward Airport	69.3	71.5	-2.2	49.2	53.6	-4.4
Livermore	77.3	76.9	0.4	46.2	50.0	-3.8
Livermore Airport	78.8	76.4	2.4	47.9	49.5	-1.6
Martinez	74.9	75.9	-1.0	40.8	45.8	-5.0
Mount Diablo Junction	71.2	73.5	-2.3	53.3	51.6	1.7
Newark	71.5	72.7	-1.2	51.8	53.7	-1.9
Oakland	72.5	71.7	0.8	52.0	54.4	-2.4
Oakland Airport	70.3	69.7	0.6	49.2	51.3	-2.1
Richmond	73.4	71.8	1.6	51.7	53.6	-1.9

South Bay and Santa Cruz County	Average High	Normal High	Departure from Normal	Average Low	Normal Low	Departure from Normal
Gilroy	77.7	78.9	-1.2	45.3	48.5	-3.2
Los Gatos	M	74.6	M	M	48.8	M
Moffett Federal Airfield	72.5	73.4	-0.9	50.3	53.8	-3.5
Mount Hamilton	64.8	64.6	0.2	51.7	51.7	0.0
San Jose	73.3	74.0	-0.7	49.6	52.5	-2.9
Santa Cruz	73.5	73.2	0.3	46.5	49.5	-3.0
Watsonville	72.1	72.2	-0.1	47.6	48.4	-0.8
Watsonville Airport	71.4	72.3	-0.9	46.5	48.3	-1.8
Monterey and San Benito Counties						
Big Sur Station	M	73.2	M	M	49.7	M
Carmel Valley	74.6	77.4	-2.8	43.1	48.3	-5.2
Hollister	74.2	77.0	-2.8	45.0	47.4	-2.4
King City	77.8	79.8	-2.0	43.2	46.0	-2.8
Monterey	67.4	68.2	-0.8	49.8	50.8	-1.0
Monterey Airport	66.1	67.2	-1.1	48.8	50.1	-1.3
Pinnacles National Park	M	81.3	M	M	42.2	M
Salinas	72.1	72.7	-0.6	46.1	48.3	-2.2
Salinas Airport	71.8	72.7	-0.9	48.1	49.7	-1.6

Daily Temperature Records for October 2013			
Date	Location	Record Max Temp	Previous Record and Year
10/06	Salinas	92	92 in 1996

Monthly Ranks for Downtown San Francisco		
Average High Temperature	67.8 degrees	52 nd coolest out of 140 years
Average Low Temperature	51.8 degrees	8 th coolest out of 140 years
Precipitation	0.00 inches	Tied with 13 other years for driest out of 165 years (most recently, 1980)

Monthly Extremes for Select Locations			
Location	Max Temp: Warmest Day(s)	Min Temp: Coolest Day(s)	Precipitation: Wettest Day(s)
Sonoma County Airport	10/05	10/30	10/27
	87 degrees	34 degrees	0.01 inches
San Francisco	10/05, 10/06	10/19, 10/20	n/a
	83 degrees	47 degrees	
Livermore Airport	10/06	10/30	n/a
	88 degrees	42 degrees	
San Jose	10/05	10/30, 10/31	n/a
	85 degrees	44 degrees	
Salinas Airport	10/06	10/30, 10/31	10/28
	91 degrees	42 degrees	0.13 inches

Other Notable October Weather events:

Dense Fog: During the early morning hours of Saturday the 12th dense fog formed around San Francisco Bay, reducing visibilities to less than one-quarter mile and resulting in flight delays at SFO. Patchy dense fog also formed near the ocean on the morning of the 18th. And finally, dense fog was observed in the North Bay Valleys during the mornings of the 22nd and 23rd. This final fog event of the month occurred in the midst of a prolonged cool and foggy period late in the month, when low overcast persisted for much of the day near the coast.

Ocean Swell: The first long-period northwest swell of the season arrived along our coastline on the 21st and 22nd. These swell generated sets of large breaking waves, waves that were significantly higher than the average waves on those days. This created a situation where beachgoers could easily be caught unaware by the infrequent sets of larger waves. Beach hazard statements were issued to warn of the dangers.



One of the larger breaking waves off Carmel Point in Carmel, CA on October 21st. Photo: Larry Smith.