

California Monthly Climate Summary March 2010

Weather Highlights

March 2010 was a cooler than average, drier than average month for California. According to the Western Region Climate Center's [California Climate Tracker](#), the monthly average temperature was 47.4°F which is 0.5°F lower than the long-term average. With a statewide average of 1.97 inches, precipitation for March was 63% of the long term average.

March 2010 started with a high pressure system moving in behind the storms that closed out February. However, this was short-lived as a system moved over the state from north to south bringing rain to most of the state. The unsettled weather continued in the second week with cooler than average temperatures and precipitation for most of the state. Extreme Southern California remained mild and dry during this time however. Spring arrived in week three with warmer temperatures to show for it. Some parts of the state made it into the 80s and 90s for high temperatures. March closed out with a few weak systems hitting the northern part of the state, but the south remained dry and warm.

Preliminary records, reported on the National Weather Service Record Event Report, shows that statewide there were 30 temperature records tied or broken and 4 precipitation records tied or broken for the month. Of the 30 temperature records set in March, 11 were for new high maximum temperatures while 12 were for new low minimum temperatures. Records were set over 10 days of the month. On March 4th, Sacramento Executive Airport broke a 1944 record for daily precipitation with a reading of 0.88 inches. The old record was 0.85 inches. On March 16th UCLA, Camarillo, and Oxnard broke 1959 records for high temperatures. UCLA reached 87°F beating the old record of 84°F, Camarillo tied the 1959 mark of 85°F and Oxnard reached 86°F breaking the old record of 85°F. On March 19th, downtown San Francisco tied a 1914 record with a high temperature of 80°F.

For the California Data Exchange Center's (CDEC) network of temperature gages used in this report, 213 stations recorded a minimum temperature below freezing in March while no stations reached or exceeded 100°F at least once during the month. Statewide extremes from the CDEC network of temperature gages are shown below. Also shown are the monthly average extremes from the CIMIS network. A table of regional average minimum, mean, and maximum temperatures from the CDEC and CIMIS networks is also shown at the end of the summary.

Precipitation in March ranged from below normal in the northern part of the state and Sierra to slightly above average in the southeast part of the state. The south coast and southern mountains were drier than average. For the CDEC precipitation gages for March 2010, the largest amount of precipitation recorded was the Gasquet Ranger Station in the Smith River Basin on the North Coast with 12.79 inches. This is 115% of the average precipitation for this station for March. At the other end of the

spectrum, five stations reported zero inches of precipitation for the month. For the CIMIS network, Monrovia in Los Angeles County topped the precipitation charts with 7.93 inches for the month and 6 stations recorded no precipitation. Some CIMIS gages may show large precipitation totals if the gages are not covered during irrigation activities so care should be given to review precipitation data used from this network. This is normally not an issue in the winter. The 8-Station Index for northern California precipitation recorded 6.4 inches in March with 18 days showing precipitation. On average, 6.9 inches of precipitation is recorded for the 8-Station index in March. Statewide, the average precipitation for March was 78% of the long-term average based on the California Data Exchange Center (CDEC) gages. Precipitation percentages by region from the CDEC gages are shown in a table at the end of this document.

CoCoRaHS Update

March 2010 continues California's second year with CoCoRaHS – the Community Collaborative Rain, Hail and Snow Network. This group uses citizen volunteers to record rain, hail and snow data. The users enter the data online at the CoCoRaHS web site. The web site provides the opportunity to see spatial detail of rain and snow patterns in participating states. As of the end of March 2010, California has 657 volunteers signed up spanning 51 of California's 58 counties. The county with the most volunteers at the end of March is Sonoma with 84 volunteers. For the month of March 9,417 reports were recorded for California. The largest daily rain total for CoCoRaHS- CA in March was in Monterey County with 2.39 inches recorded on 3/3/10. There were 39 hail reports submitted in March from 16 Counties. Reports were for pea-size hail or smaller. One hundred nineteen snow reports were included with the precipitation reports with a 28 inch depth being the largest new snow total from Placer County on the 31st. The largest total snow depth reported was 99 inches in Placer County from the second through the 31st. To join CoCoRaHS or find more information, please visit <http://www.cocorahs.org>.

Snowpack and Water Supply Conditions

From the April 1st Bulletin 120, the statewide snowpack is estimated to be 105% of average. April 1 is considered to be the traditional peak of snowpack accumulation in California. As of April 1st, the northern region (from the Trinity to the Feather and Truckee Basins) shows 35.7 inches of snow water equivalent which is 125% of average. The central region (the Yuba Basin to the Merced/Walker Basins) shows 26.9 inches of snow water equivalent which is 91% of average. The southern region (the San Joaquin Basin to the Kern Basin) shows 27.6 inches of snow water equivalent which is 104% of average. The latest water supply index forecast for 2010 has the Sacramento Basin in the dry category and the San Joaquin Basin in the Below Normal category. Water year 2009 resulted in a dry category for the Sacramento Basin and below normal for the San Joaquin Basin. Water supply information for California can be found at http://cdec.water.ca.gov/water_supply.html. A historical listing of water year categories for both basins can be found at <http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST>.

Drought Monitor and Seasonal Outlook

The maps for California's depiction by the Drought Monitor for March 2, 2010 and March 30, 2010 are shown below. The Drought Monitor maps can be found on the National Drought Mitigation Center's (NDMC) website <http://drought.unl.edu/dm/>. These maps are largely a reflection of precipitation and soil moisture deficit estimates. As of the March 30 depiction, California is depicted in either D0 (abnormally dry), D1 (moderate drought) conditions, or D2 (severe drought) conditions. The coastal regions and the Sierra region are considered drought free. The D2 category is now limited to the northeast corner of the state on the lee side of the Cascades and Sierra. Drought free area in California was 63.2% for the depiction on March 30. Maps are updated weekly.

The U.S. Seasonal Drought Outlook for March through May from NOAA depicts California with persisting drought conditions in the remaining drought areas as depicted by the Drought Monitor. This forecast is based on climatology. Updates are provided twice per month. Maps and information can be found at http://www.cpc.noaa.gov/products/expert_assessment/seasonal_drought.html.

The California Nevada River Forecast Center has produced some drought monitoring tools for California. These tools look at the frequency associated with precipitation deficits for the Northern California Eight Station Index and the San Joaquin Five Station Index. Another tool looks at the frequency of end-of-month storage for select reservoirs in California. The frequencies of the observations are related to the Drought Monitor's drought categories D0 through D4. These tools can be found at <http://www.cnrfc.noaa.gov/climate.php>. For March, the Eight Station Index is in drought free conditions for both the 12-month period and for the 24 month period. The Five Station Index is drought free for both periods as well. For the reservoirs for end-of-March storage, Oroville is at aD3 storage, Lake Tahoe is at aD2 storage, and Trinity, San Luis and Casitas are at a D1 level. The Nacimiento/San Antonio reservoir pair and Folsom reservoir are at a D0 level and all other reservoirs on the graphic are considered to be drought-free.

ENSO Conditions and Long-Range Outlooks

The El Niño/Southern Oscillation (ENSO) is being classified as an El Niño pattern. Equatorial sea surface temperature anomalies for the tropical Pacific have been positive with values of 0.9°C in the Niño 3.4 at the end of March. The January through March 3-month running mean of the Ocean Niño Index (ONI) is 1.5 which is the ninth ONI value above the threshold to qualify for an El Niño event. Five consecutive ONI values need to be above the threshold value of 0.5 for conditions to be classified as an El Niño event. Most forecast models have the tropical sea surface temperatures cooling through the spring of 2010. More information can be found at the Climate Prediction Center's web site:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/
Updates are posted weekly. The latest three month outlook (April through June) from NOAA indicates equal chances for above or below normal temperatures for the

southern coastal part of the state of California and a higher probability of above normal temperatures for the rest of the state. For precipitation, the state has equal chances for above or below normal precipitation. Outlook plots and discussions can be found at <http://www.wrcc.dri.edu/longrang/>. General weather information of interest can be found at <http://www.noaawatch.gov/>. For anomaly information please see http://www.wrcc.dri.edu/anom/cal_anom.html.

Agricultural Data

March 2010 saw spring planting preparations swing into full gear. Winter grain crops were harvested and alfalfa, and early spring crops were growing well. Rice fields were drained and pre-planting herbicides applied. Plum, prune, peach, cherry and other stone fruits were in full bloom in March. Tangerine, navel orange, grapefruit and lemon crops continued to be harvested. Strawberry and blueberry plantings began blooming and bearing fruit. Grape vines began to show bud swelling. Almond bloom was in full swing in March with some concern for brown rot due to the earlier wet weather. Walnut orchards were being prepared for the upcoming walnut bloom. Foothill rangeland showed more improvement with the continued rainfall. The need for supplemental feeding continued to diminish during March with weight gains reported to be improving. Dairy and feedlots began to dry out due to the mild weather. Bees were working in the almond orchards and being moved to the stone fruit orchards. For further crop information see <http://www.nass.usda.gov/index.asp>.

Other Climate Summaries

[California Climate Tracker](#) (new product of Western Region Climate Center)
[Golden Gate Weather Service Climate Summary](#)
[NOAA Monthly State of the Climate Report](#)

Statewide Extremes (CDEC)

High Temperature – 94°F (Buttercup, Colorado River Desert)
Low Temperature – -10°F (Horse Meadow, San Joaquin)
High Precipitation – 12.79 inches (Gasquet Ranger Station, North Coast)
Low Precipitation – 0 inches (5 stations)

Statewide Extremes (CIMIS)

High Average Maximum Temperature – 86.3°F (UC San Luis, Imperial County)
Low Average Minimum Temperature – 21°F (Big Bear Lake, San Bernardino County)
High Precipitation – 7.93 inches (Monrovia, Los Angeles County)*
Low Precipitation – 0 inches (6 stations)

*Sometimes irrigation water from sprinklers gets counted as precipitation if the gage is not covered.

Statewide Precipitation Statistics

Hydrologic Region	Region Weight	Basin Reporting			Stations Reporting			% of Historic Average	
		Basins	Mar	Oct-Mar	Stations	Mar	Oct-Mar	Mar	Oct-Mar
North Coast	0.27	5	5	5	17	11	9	97.5%	88%
SF Bay	0.03	3	3	3	6	6	6	96.9%	109%
Central Coast	0.06	5	4	4	10	7	7	66.8%	118%
South Coast	0.06	5	5	5	15	13	13	18.7%	106%
Sacramento River	0.26	10	10	10	43	36	35	85.7%	97%
San Joaquin River	0.12	8	7	7	27	25	24	72.5%	100%
Tulare Lake	0.07	5	5	5	27	26	24	57.7%	109%
North Lahontan	0.04	6	6	5	14	11	10	84.9%	90%
South Lahontan	0.06	5	5	5	14	11	10	24.3%	146%
Colorado River	0.03	2	2	2	6	5	5	118.1%	178%
Statewide Weighted Average	1	54	52	51	179	151	143	77.78%	103%

Statewide Mean Temperature Data by Hydrologic Region (degrees F)

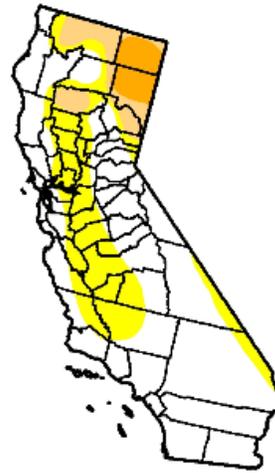
Hydrologic Region	No. Stations	Minimum	Average	Maximum
North Coast	30	26.7	43.9	70.3
SF Bay	18	36.4	50.8	68.8
Central Coast	37	39.1	52.9	70.9
South Coast	51	35.1	54.1	79.0
Sacramento	93	24.6	44.2	70.5
San Joaquin	74	26.6	45.1	66.9
Tulare Lake	18	12.2	36.9	64.3
North Lahontan	31	10.1	33.1	56.9
South Lahontan	19	21.8	42.5	64.4
Colorado River Desert	22	44.1	62.1	81.1
Statewide Weighted Average	393	26.2	45.0	69.5

U.S. Drought Monitor

California

March 2, 2010
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	64.6	35.4	10.7	4.3	0.0	0.0
Last Week (02/23/2010 map)	64.6	35.4	10.7	4.3	0.0	0.0
3 Months Ago (12/08/2009 map)	7.7	92.3	74.0	17.3	0.0	0.0
Start of Calendar Year (01/05/2010 map)	6.6	93.4	72.8	9.0	0.0	0.0
Start of Water Year (10/06/2009 map)	0.0	100.0	73.4	45.8	0.0	0.0
One Year Ago (03/03/2009 map)	5.2	94.8	70.7	41.8	4.4	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, March 4, 2010

Author: R. Tinker, CPC/NOAA

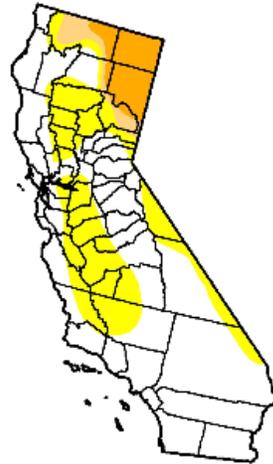
March 30, 2010

Valid 7 a.m. EST

U.S. Drought Monitor

California

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.2	36.8	9.9	7.1	0.0	0.0
Last Week (03/23/2010 map)	64.3	35.7	9.9	7.1	0.0	0.0
3 Months Ago (01/05/2010 map)	6.6	93.4	72.8	9.0	0.0	0.0
Start of Calendar Year (01/05/2010 map)	6.6	93.4	72.8	9.0	0.0	0.0
Start of Water Year (10/06/2009 map)	0.0	100.0	73.4	45.8	0.0	0.0
One Year Ago (03/31/2009 map)	5.2	94.8	63.8	22.5	0.0	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, April 1, 2010

Author: M. Rosencrans, CPC/NOAA