

California Monthly Climate Summary
June 2013

Weather Highlights

June 2013 was another warm month for California. According to the Western Region Climate Center's [California Climate Tracker](#), the monthly average temperature was 69.7°F which is 3.0°F higher than the long-term average of 66.7°F. This was the 9th warmest June since 1895. With a statewide average of 0.45 inches, precipitation in June was 128% of average. Even with the above average precipitation, this is the driest January to June on record with a total of 4.34 inches of precipitation. The mean for this period is 14.01 inches. The previous record low was in 1924 when 5.94 inches was recorded. Regional maximum and minimum temperature and precipitation plots for June and for the January through June time period are shown at the end of the document.

June started with the active weather system that closed out May. Rainfall accumulated north of Modesto and cooler temperatures were felt to the south. High pressure built in behind the system warming temperatures across the State with a few Central Valley locations topping 100°F. The second week saw a weak upper-level, cut-off low cool southern California. A deep marine layer also contributed to lower temperatures in the region. High pressure again built over the State in the latter part of the week with 100°F readings again showing up in the Central Valley. The cut-off low moved onshore at the beginning of the third week with a broad-area trough behind it that kept temperatures in check. As the trough exited, northerly winds kicked up prompting red-flag warnings in parts of the State. The latter part of the month saw an atmospheric river event pass over the northern part of the State. Moisture readings from the 21st century extreme precipitation observing network recorded water vapor values in excess of 4 cm which were larger than the readings recorded in December's big storms. The difference in this event was warmer weather and weaker dynamics which limited the amount of precipitation that resulted. The month closed out with a very strong heat wave causing temperatures to soar over 100°F for most of the State and parts of the State to exceed 110°F.

Preliminary records, reported on the National Weather Service Record Event Report, show that statewide there were 131 temperature records tied or broken and 15 precipitation records set for the month. Of the 131 temperature records set, 71 were for new high maximum temperatures and 55 were for new high minimum temperatures. Records were set over 22 days of the month. Fresno continues its streak of 133 years with no precipitation falling on June 21. Death Valley set a new all-time June record with an average temperature of 101.3°F. The previous warmest June was in 1960 with an average of 100.4°F. The average minimum temperature in June for Death Valley was 87.1°F which broke the old record of 86.8°F set in 1977. Finally, on June 30th, Furnace Creek in Death Valley recorded a high temperature of 129°F which is the new all-time high temperature for June in Death Valley. It also ties the all-time high temperature in June for the United States. Volcano, a former town near the Salton Sea, recorded 129°F on June 23, 1902. This is the 100th anniversary

of the all-time high temperature of 134°F recorded at Greenland Ranch in Death Valley on July 10.

For the California Data Exchange Center's (CDEC) network of temperature gages used in this report, 63 stations recorded a minimum temperature below freezing during the month while 112 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 stations is also shown at the end of the summary.

Precipitation in June was wet in the north and dry in the south. For the CDEC precipitation gages, the largest amount of precipitation recorded for the month was at Blue Canyon in the Sacramento region with 3.54 inches. This is 402% of the average precipitation for this station for the month. At the other end of the spectrum, 46 stations recorded no precipitation for the month. For the CIMIS network, Sisquoc in Santa Barbara County topped the precipitation charts with 5.31 inches for the month and 80 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.

The 8-Station Index for northern California precipitation recorded 1.8 inches in June. On average, 1.0 inches of precipitation is recorded for the month. For the combined January to June total, the 8-Station Index is 11.10 inches which is the lowest Jan-June total in the period of record which dates back to water year 1921. The previous record was 11.18 inches set in 1924. Statewide, the average precipitation for the month was 109% 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

June 2013 continues California's fifth 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. A map from June 26, 2013 is shown at the end of the document. As of the end of June, California has 1033 volunteers signed up spanning 53 of California's 58 counties. The counties without volunteers are Alpine, Colusa, Glenn, Modoc, and Tuolumne. The county with the most volunteers at the end of June is Sonoma with 98 volunteers. San Diego County is close behind with 90 volunteers. For the month of June, 9,865 reports were recorded for California. The largest daily rain total for CoCoRaHS- CA in June was in Sonoma County where 1.84 inches was recorded on 6/26/2013. There were no snowfall reports recorded and no total snow for June. One hail report was submitted in June in Tehama County on 6/18/2013. The largest stone size reported was 3/8". To join CoCoRaHS or find more information, please visit <http://www.cocorahs.org>.

Snowpack and Water Supply Conditions

At the end of June the Northern, Central and Southern region snowpack held 0 inches of snow water equivalent (SWE) as measured by the automated snow pillows. The last nonzero reading for the regional snow pillow report was on 5/28/2013. The Water Supply Index (WSI) for WY2012 for the Sacramento Basin fell into the below normal category and the San Joaquin fell into the dry category. The median forecast for the WSI for the Sacramento Basin is dry and critical for the San Joaquin Basin. Further information 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 for May 28, 2013 and June 25, 2013 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 June 25th depiction, 92.61% of California is depicted in the D2 or severe drought category, 5.6% of California is depicted in the D1 or moderate drought category. An additional 1.79% of the state is depicted as D0 or abnormally dry. Maps are updated weekly.

The U.S. Seasonal Drought Outlook for July through September from NOAA depicts California in persisting or developing drought throughout the state. This forecast is based primarily on climatology and forecast models. Maps and information can be found at

http://www.cpc.noaa.gov/products/expert_assessment/seasonal_drought.html.

Updates are provided twice per month.

For more information on water conditions in California, visit

<http://www.water.ca.gov/waterconditions/>. A table showing end-of-month reservoir storage by hydrologic region is shown at the end of this document. Statewide, reservoir storage at the end of June was 82% of average.

ENSO Conditions and Long-Range Outlooks

The El Niño/Southern Oscillation (ENSO) is currently in neutral conditions. Equatorial sea surface temperature anomalies for the tropical Pacific have been near normal with values of -0.4°C in the Niño 3.4 at the end of June. The April through June 3-month running mean of the Ocean Niño Index (ONI) is -0.2. Five consecutive ONI values need to be below the threshold of -0.5 for conditions to be classified as a La Niña event (five consecutive values above the 0.5 threshold need to be observed for classification as an El Niño event). Most forecast models have the tropical sea surface remaining near neutral conditions for the rest of the calendar year. 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 (July through September) from NOAA indicates a higher probability of above normal temperatures for everywhere but coastal regions which have equal chances of above or below normal temperatures. For precipitation, a higher probability of below normal conditions is forecast for the far northern parts of the State and equal chances elsewhere. 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

June 2013 saw further crop planting and development and some harvests. Winter wheat was being harvested with 95% rated good to excellent. Rice fields continued to develop with conditions rated 95% good to excellent. Emerging plants were developing quickly due to warm weather. Cotton development slowed due to fluctuating temperatures with 80% rated good to excellent. Alfalfa continued to be cut and baled. Vineyards were irrigated and weeded. Apricots, cherries, nectarines, plums, and peaches were continuing to be harvested. Blueberries and strawberries were picked and packaged with blueberry harvest slowing. Pomegranates were developing and fruit was growing on apple and pear trees. Almond, walnut, and pistachio orchards were irrigated and treated for pests. Early Roma tomatoes were showing color in Stanislaus County. Squash, bell peppers, chili peppers, cucumbers beans, onion, watermelon, and eggplant were being harvested. Carrots were irrigated while water was pulled from onion fields. Range conditions deteriorated in the warm weather and were reported to be in fair to very poor condition. Supplemental feeding continued. 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 – 121°F (Rice Valley, Colorado River Desert)

Low Temperature – 2°F (Casa Vieja Meadows, Tulare)

High Precipitation – 3.54 inches (Blue Canyon, Sacramento)

Low Precipitation – 0 inches (46 stations)

Statewide Extremes (CIMIS)

High Average Maximum Temperature – 107.2°F (Salton Sea East, Imperial County)

Low Average Minimum Temperature – 38.7°F (Big Bear Lake, San Bernardino County)

High Precipitation – 5.31 inches (Sisquoc, Santa Barbara County)*

Low Precipitation – 0 inches (80 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	Jun	Oct-Jun	Stations	Jun	Oct-Jun	Jun	Oct-Jun
North Coast	0.27	5	4	4	17	9	8	128.4%	85%
SF Bay	0.03	2	2	2	6	4	3	258.6%	84%
Central Coast	0.06	3	3	3	11	5	4	17.8%	54%
South Coast	0.06	3	3	3	14	13	12	9.5%	49%
Sacramento River	0.26	5	5	5	41	25	23	185.4%	85%
San Joaquin River	0.12	6	6	6	24	15	13	97.3%	70%
Tulare Lake	0.07	5	5	5	28	26	25	40.1%	59%
North Lahontan	0.04	3	3	3	13	9	9	60.8%	75%
South Lahontan	0.06	3	2	2	15	13	12	4.1%	52%
Colorado River	0.03	1	1	1	6	5	4	0.0%	62%
Statewide Weighted Average	1	36	35	35	175	124	113	109%	74%

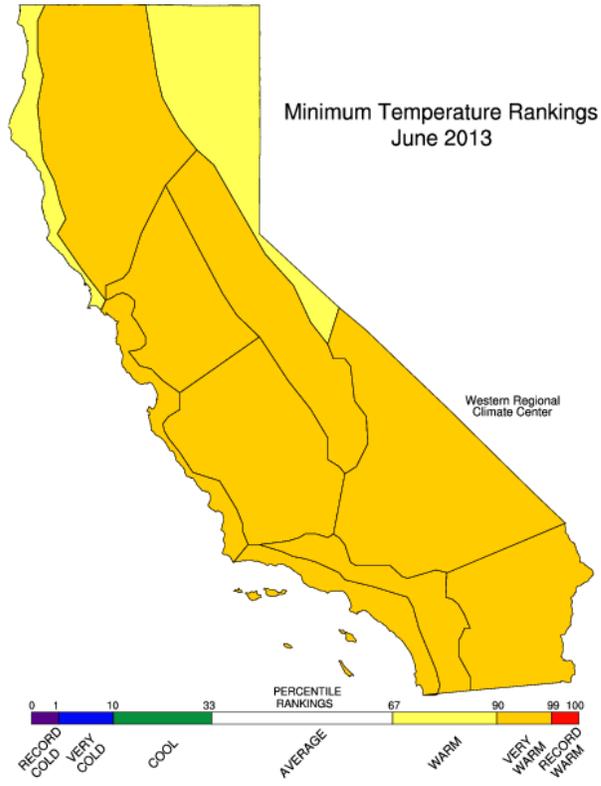
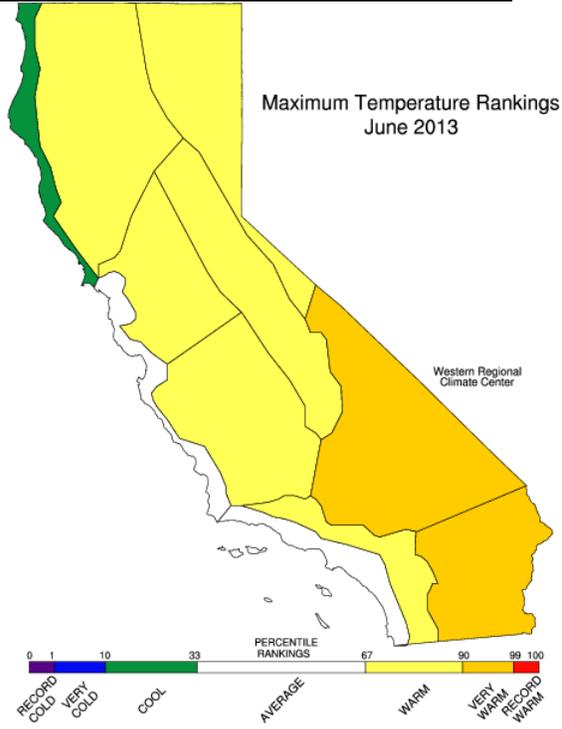
Statewide Mean Temperature Data by Hydrologic Region (degrees F)

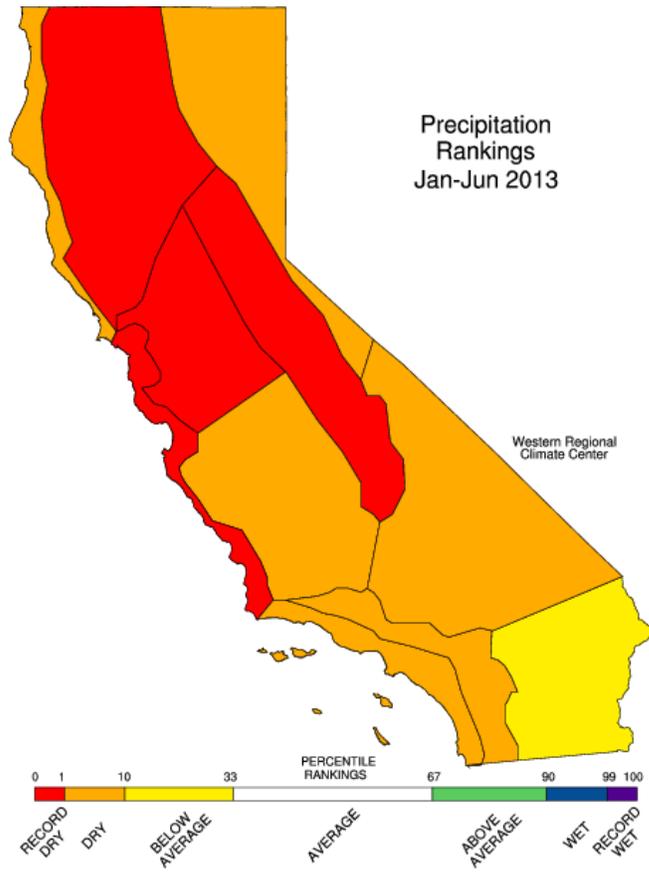
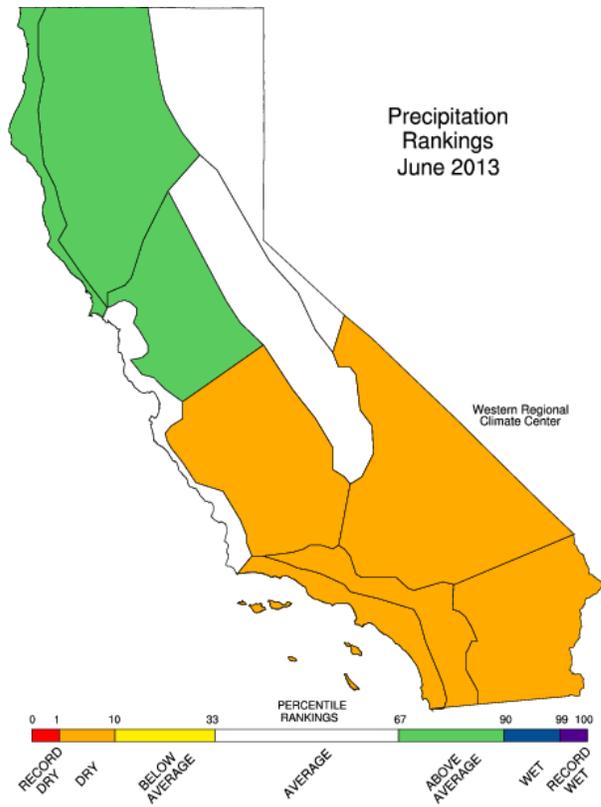
Hydrologic Region	No. Stations	Minimum	Average	Maximum
North Coast	19	38.5	62.5	95.8
SF Bay	9	45.7	66.8	99.2
Central Coast	10	43.4	68.6	102.2
South Coast	39	50.2	70.0	101.0
Sacramento	73	40.5	67.4	99.1
San Joaquin	40	38.8	64.5	93.6
Tulare Lake	19	34.8	57.9	83.5
North Lahontan	24	31.2	55.7	82.0
South Lahontan	14	39.6	64.3	91.4
Colorado River Desert	6	66.2	89.8	117.0
Statewide Weighted Average	253	40.6	65.3	96.1

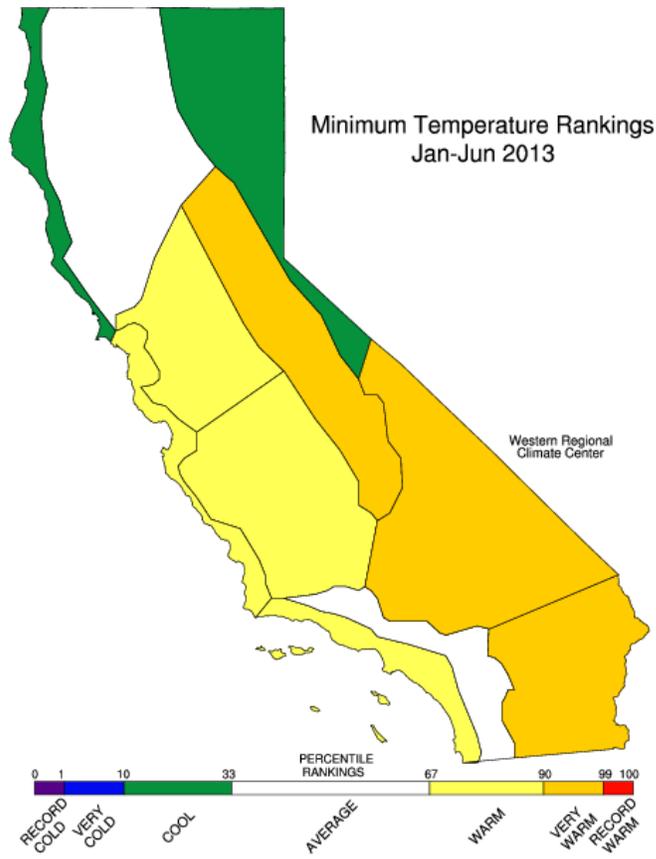
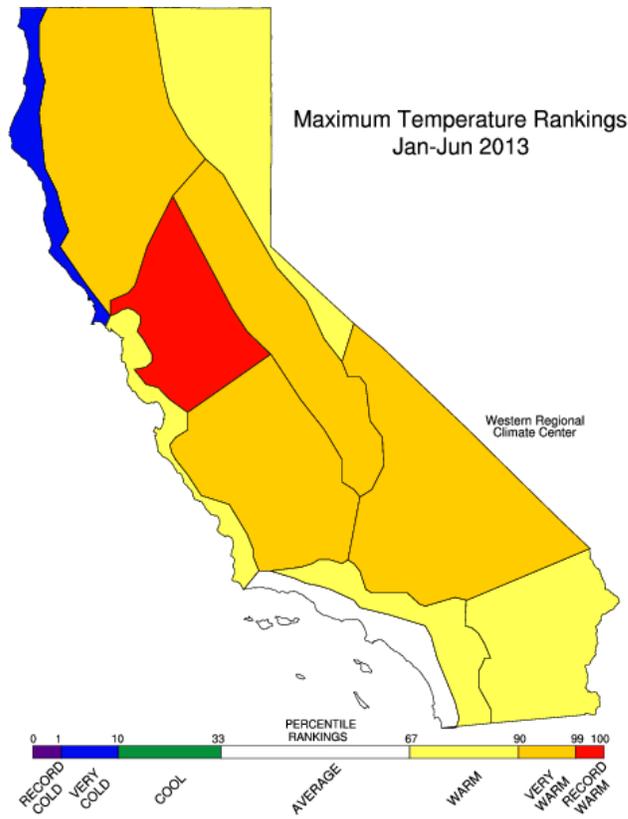
End-of-May Reservoir Storage by Hydrologic Region
Storage in Thousand Acre-Feet (taf)

End-of-May Reservoir Storage	Number of Reservoirs	Average Storage (taf)	2013 Storage (taf)	% of Average
North Coast	6	2,500	2,153	86%
San Francisco Bay	17	494	431	87%
Central Coast	6	662	410	62%
South Coast	29	1,473	1,126	76%
Sacramento	43	13,059	11,349	87%
San Joaquin	34	8,300	6,525	79%
Tulare	6	1,360	679	50%
North Lahontan	5	683	578	85%
South Lahontan	8	297	260	88%
Total	154	28,832	23,514	82%

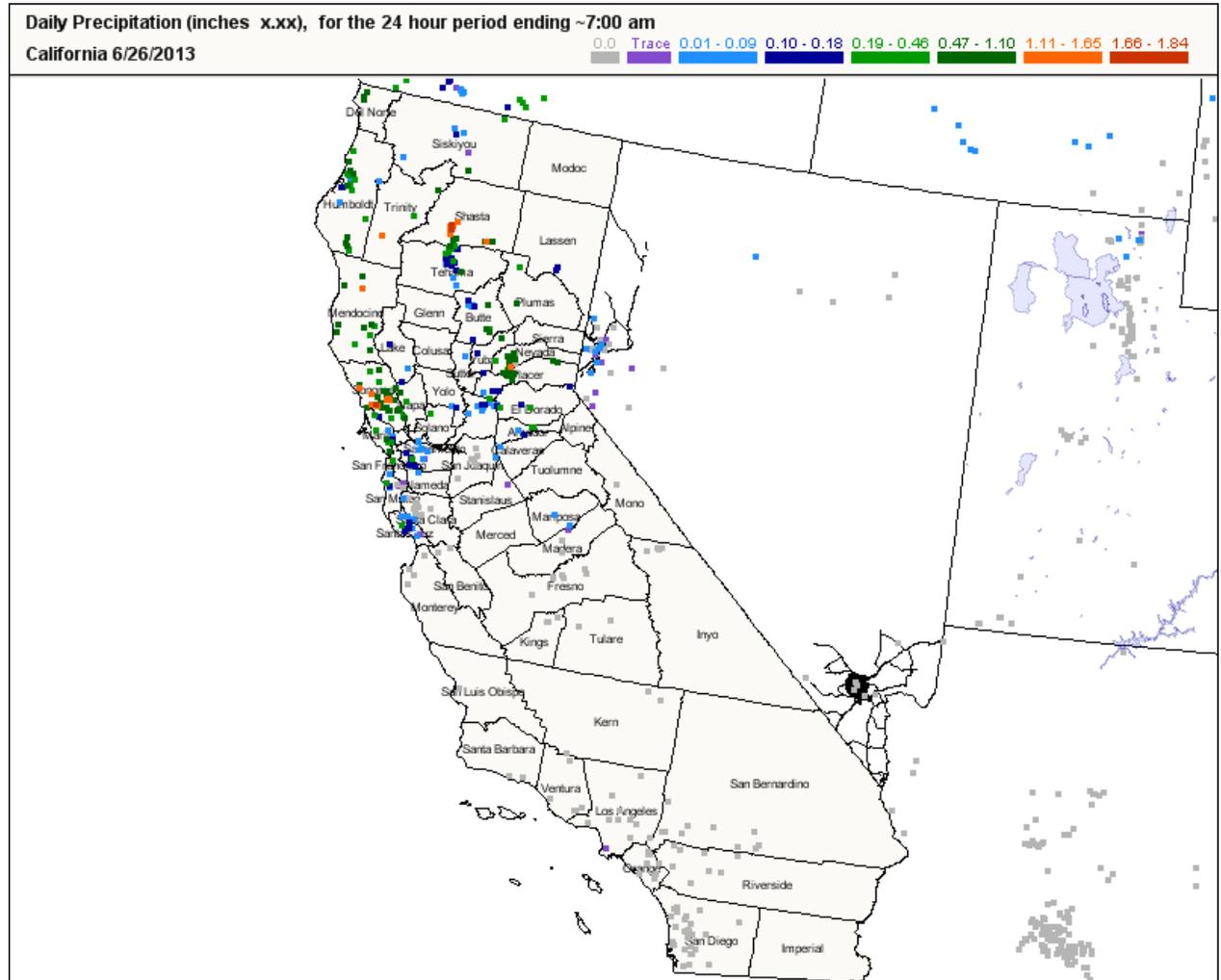
California Climate Tracker Images







CoCoRaHS Map



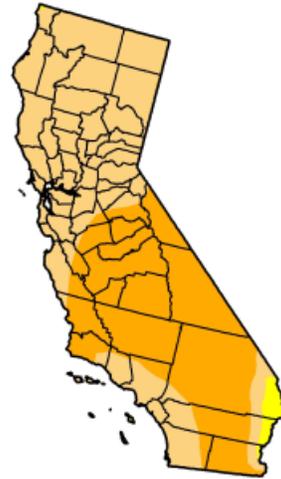
U.S. Drought Monitor

California

May 28, 2013
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.16	46.25	0.00	0.00
Last Week (05/21/2013 map)	0.00	100.00	98.16	46.25	0.00	0.00
3 Months Ago (02/26/2013 map)	0.02	99.98	47.13	26.96	0.00	0.00
Start of Calendar Year (01/01/2013 map)	31.75	68.25	55.32	22.50	0.00	0.00
Start of Water Year (09/25/2012 map)	11.95	88.05	69.41	22.27	1.14	0.00
One Year Ago (05/22/2012 map)	15.89	84.11	58.89	22.60	0.00	0.00



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://droughtmonitor.unl.edu>



Released Thursday, May 30, 2013
Brad Rippey, U.S. Department of Agriculture

U.S. Drought Monitor

California

June 25, 2013
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.21	92.61	0.00	0.00
Last Week (06/18/2013 map)	0.00	100.00	98.21	67.07	0.00	0.00
3 Months Ago (03/26/2013 map)	0.00	100.00	48.38	24.22	0.00	0.00
Start of Calendar Year (01/01/2013 map)	31.75	68.25	55.32	22.50	0.00	0.00
Start of Water Year (09/25/2012 map)	11.95	88.05	69.41	22.27	1.14	0.00
One Year Ago (06/19/2012 map)	15.89	84.11	59.51	22.60	0.00	0.00



Intensity:

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- 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://droughtmonitor.unl.edu>



Released Thursday, June 27, 2013
Mark Svoboda, National Drought Mitigation Center