

U. S. DEPARTMENT OF AGRICULTURE  
WEATHER BUREAU

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# CLIMATOLOGICAL SERVICE

DISTRICT No. 11, CALIFORNIA

PROF. ALEXANDER G. McADIE  
DISTRICT EDITOR

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REPORT FOR JUNE, 1913

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Prepared under direction of HENRY E. WILLIAMS, Acting Chief U. S. Weather Bureau



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# CLIMATOLOGICAL DATA FOR JUNE, 1913.

## DISTRICT NO. 11, CALIFORNIA.

Prof. ALEXANDER G. McADIE, District Editor.

### GENERAL SUMMARY.

June, 1913, was the coolest June since 1897. The precipitation was above the average. On the whole the month was favorable for agriculture, although a heavier rainfall would have been beneficial. There were comparatively few periods of strong north wind, which was advantageous, for owing to the generally dry character of the season and the small supply of water the existence of such winds would have resulted in considerable loss. The snow in the mountains disappeared early, nearly two weeks earlier than during the preceding year, which itself was one of early disappearance. The supply of water is not abundant and the outlook for the long, dry summer is not favorable. In the mountains the season opened early, and passes not usually accessible until the middle of June were open for travel before the beginning of the month.

The month began with pressure distribution favorable for fair weather. There were, however, sporadic thunderstorms in the San Joaquin Valley and the Sierra foothills. A somewhat unsettled condition continued for 5 days and while there were no rains of consequence, there was considerable cloudiness with passing showers. From June 4th to 9th thunderstorms were frequent in the Sierra and eastward over the Great Basin. From the 10th to the 17th conditions were normal. Beginning with the 18th a well marked change in pressure distribution over the western half of the country took place. Unsettled weather prevailed on the Pacific slope, and there were light rains in northern California. This condition lasted for about 10 days. Light rains were frequent and there were no high afternoon temperatures. The winds were mostly south and the temperatures much below normal.

The month was without any feature of special interest.

### TEMPERATURE.

The temperature for the State was 3° below the normal. The following table gives the mean temperature for California for each June during the time records have been kept:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	°F.	°F.		°F.	°F.
1897.....	69.8	+0.8	1906.....	66.7	-2.3
1898.....	71.3	+2.3	1907.....	66.1	-2.9
1899.....	71.5	+2.5	1908.....	66.0	-3.0
1900.....	71.4	+2.4	1909.....	68.1	-0.9
1901.....	70.5	+1.5	1910.....	67.3	-1.7
1902.....	70.2	+1.2	1911.....	66.7	-2.3
1903.....	70.9	+1.9	1912.....	68.0	-1.0
1904.....	71.1	+2.1	1913.....	65.8	-3.2
1905.....	67.5	-1.5			

The highest temperature recorded was 119° at Greenland Ranch on the 22d, which was 1° lower than the highest temperature recorded during the previous year

at the same station. Greenland Ranch is located in Death Valley, and temperatures may reasonably be expected to reach as high a degree here as at any point in the United States. The lowest temperature was 22° at Yosemite on the 10th.

### PRECIPITATION.

The average precipitation for California for June with departures from the normal is as follows:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	Inches.	Inches.		Inches.	Inches.
1897.....	0.46	+0.15	1906.....	1.05	+0.74
1898.....	.25	- .06	1907.....	1.02	+ .71
1899.....	.57	+ .26	1908.....	.17	- .14
1900.....	.19	- .12	1909.....	.19	- .12
1901.....	.01	- .30	1910.....	.05	- .26
1902.....	.10	- .20	1911.....	.15	- .16
1903.....	.07	- .24	1912.....	.49	+ .18
1904.....	.04	- .27	1913.....	.58	+ .27
1905.....	.07	- .24			

The greatest monthly precipitation was 7.44 inches at Tamarack, which was 4.64 inches greater than the heaviest monthly rainfall reported during June, 1912, and more than 6 inches greater than the heaviest monthly rainfall reported during June, 1911. At 34 stations there was no rainfall.

### SNOWFALL IN THE MOUNTAINS.

The snow was unusually light during the month. The ground was bare at an elevation of 7,000 feet two weeks earlier than during the preceding June. There is very little snow left at the higher elevations, and the outlook for water from this source is poor.

The following table gives the total hours of sunshine and percentages of possible:

Stations.	Hours.	Per cent of possible.	Stations.	Hours.	Per cent of possible.
Eureka.....	220	.49	Sacramento.....	374	84
Fresno.....	390	89	San Diego.....	238	55
Los Angeles.....	245	57	San Francisco.....	279	63
Mount Tamalpais.....	368	83	San Jose.....	349	79
Red Bluff.....	323	72	San Luis Obispo.....	288	66

### NOTES ON THE RIVERS OF THE SACRAMENTO AND LOWER SAN JOAQUIN WATERSHEDS DURING THE MONTH OF JUNE, 1913.

By N. R. TAYLOR, Local Forecaster.

*Sacramento watershed.*—Rainfall along the immediate course of the Sacramento River and in parts of the Feather-Yuba watershed exceeded the normal for the month. It was relatively heavy during the second decade in some of the upper reaches of the Sacramento and resulted in a slight swell in this stream which was felt as far down as the mouth of the American.

From Kennett to Tehama the Sacramento showed little departure from the usual June stages. South of Colusa, however, the river averaged from 2 to over 6 feet below the normal for the month and was the lowest on record, except the extreme low-water stages of June, 1910.

The American River fell slowly but steadily during the entire month, with a range of over 3 feet between the highest on the 1st and the lowest on the 30th. It averaged nearly 2 feet below the usual June stage and only 0.7 of a foot above the previous lowest water for the month, which was in 1910.

At Oroville on the Feather and Marysville on the Yuba River the averages were 1.5 and 2.1 feet, respectively, below the June normal. Stages at both points were slightly above those of June, 1910.

Conditions now indicate that all streams in this watershed will be unusually low during the late summer and early fall; that the Sacramento River itself will reach unprecedentedly low stages.

*Lower San Joaquin watershed.*—The snow in the high ranges east of the San Joaquin Valley practically disappeared during the last decade of May, and the effect of snow water on the run-off of the mountain streams was barely noticeable even during the first warm days of June.

Excepting the Tuolumne, which rose over 2 feet during the 24 hours ending at 7 a. m. of the 27th, as a result of heavy local rains, all streams fell steadily during the greater part of the month and averaged much below the June normal. The extreme low-water stages will be reached much earlier than usual in all streams in the San Joaquin Valley.

#### NOTES ON STREAMS OF THE UPPER SAN JOAQUIN WATERSHED.

By JAMES H. GORDON, Observer.

The past month has been one of low water, with almost an entire absence of high stages. A rather scanty snow cover is largely responsible for this condition, but the moderate temperatures of the month contributed. For Firebaugh and Friant on the San Joaquin River the stages for June were the lowest in 7 years' record. Ten years' record for the Kings River shows but one year with lower flow, 1908, while the Merced River gave lower stages both in 1908 and 1910.

Low water in the Kings River, from which most of the irrigating canals of Fresno County draw their supply, has

resulted in much litigation between the various water users. The loss in crops will not be nearly so severe as might be expected, for the past dry years have shown the need of a reliable water supply and ranchers generally have wells and pumping plants. The supply of ground water seems to be plentiful in spite of the two dry seasons.

#### RELATIVE HUMIDITY IN DEATH VALLEY.

By ALEXANDER G. McADIE.

Hydrographic records from Greenland ranch, Death Valley, Cal., have been maintained for a year. The instrument, a Friez hygograph, has been twice carefully checked at the Weather Bureau office, San Francisco. The readings are also under control at Greenland ranch by the use of a sling psychrometer. Mr. Fred Corkhill, superintendent at the ranch, formerly called Furnace Creek ranch, has given special attention to the keeping of these records, and Mr. W. L. Locke, of the Pacific Coast Borax Co., has from time to time studied the humidity records in connection with other climatic factors.

It may be stated that while humidities are low, as might be expected, there are periods when a high degree of saturation prevails. A notable instance of this was from the forenoon of October 2 until the forenoon of October 18, 1912, when during the night hours the relative humidity frequently exceeded 90 per cent, while during the midday and afternoon hours the humidity did not fall below 50 per cent during most of the period.

Taking the year's record as a whole it appears that the humidity is not much below that of the Great Valley of California and closely resembles conditions in the San Gabriel Valley. These records would appear to uphold the belief that the dreaded terrors of heat and dryness in Death Valley have been somewhat exaggerated; and that it is quite possible if proper care be taken in the matter of supplies and provision for physical comfort, to live and work in this section.

The highest temperature recorded in California during June, 1913, was 119° on the 22d at Greenland ranch. Mr. Locke states that the maxima during the month ranged from 105° to 119°. During the first week of June the humidity was not high and the weather not oppressive. The lowest humidity reported during the month was 16 per cent. He adds that on July 3 and 4 the Weather Bureau thermometer registered 125°.



TABLE 1.—Climatological data for June, 1913. District No. 11—Continued.

Table with columns: Stations., Counties., Elevation, feet., Length of record, years., Temperature, in degrees Fahrenheit. (Mean, Departure from the normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation, in inches. (Total, Departure from the normal, Greatest in 24 hours, Total snowfall, unmeasured, Number of rainy days, 0.01 inch or more, Number of clear days, Number of partly cloudy days, Number of clear or cloudy days), Sky. (Prevalving wind direction), Observers.

TABLE 1.—Climatological data for June, 1913. District No. 11—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.				Sky.				Prevailing wind direction.	Observers.	
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.			Number of cloudy days.
California—Continued.																				
Santa Monica.....	Los Angeles.....	110	28	59.4	- 5.7	80	29	47	11	28	0.63	+ 0.63	0.63	0	1	14	9	7	w.	F. E. Hill.
Santa Rosa.....	Sonoma.....	181	24	61.0	- 4.2	93	30	35	20	54	0.05	- 0.20	0.05	0	1	14	6	10	s.	Southern Pacific Co.
Selma**.....	Fresno.....	311	27	66.2	-12.0	97	30	45	7	.....	0.00	- 0.04	0.00	0	0	28	0	2	.....	Do.
Seven Oaks.....	San Bernardino.....	5,000	3	55.4	.....	80	22†	31	27	37	0.11	.....	0.11	0	1	16	5	9	w.	M. Lewis.
Sierra Madre.....	Los Angeles.....	1,400	16	65.4	- 1.6	92	21	48	11	36	1.48	+ 1.23	1.03	0	2	10	13	7	s.	Mrs. A. E. Gregory.
Sierraville.....	Sierra.....	5,000	3	51.6	.....	79	3	28	20	39	0.51	.....	0.35	0	3	10	13	7	sw.	C. D. Johnson.
Sisson.....	Siskiyou.....	3,555	24	56.6	- 5.9	81	1	31	13	35	2.20	+ 1.56	0.94	0	5	18	6	6	n.	Southern Pacific Co.
Soledad**.....	Monterey.....	188	39	66.1	+ 0.6	83	10†	51	18	.....	0.10	- 0.05	0.10	0	1	19	0	11	n.	Do.
Sonora.....	Tuolumne.....	1,825	2	66.4	.....	89	21	46	27	37	0.18	- 0.13	0.18	0	1	19	11	0	w.	Chas. P. Jones.
Southeast Farallon.....	San Francisco.....	30	10	54.6	+ 2.3	62	23	49	6	10	0.02	- 0.14	0.02	0	1	14	7	9	nw.	U. S. Weather Bureau.
Springville.....	Tulare.....	4,000	6	59.3	.....	85	30	34	10	37	0.85	.....	0.30	0	5	23	1	6	.....	D. L. Wishon.
Squirrel Inn.....	San Bernardino.....	5,280	3	56.8	.....	82	21	35	10	29	1.13	.....	0.73	0	2	23	5	5	sw.	A. D. Frantz.
Stanwood.....	Butte.....	2,140	9	64.6	.....	82	9	40	21	38	1.92	.....	0.78	0	9	20	0	10	n.	Cal. Gas & Electric Co.
Stirling City.....	do.....	3,525	9	64.8	.....	88	19	40	13†	42	0.15	.....	0.10	0	2	15	8	7	.....	Butte County R. R. Co.
Stockton (S. H.).....	San Joaquin.....	23	42	68.0	- 1.9	81	29†	49	10	35	0.00	- 0.12	0.00	0	0	23	6	1†	nw.	State Hospital.
Storey.....	Madera.....	296	13	69.0	- 3.3	87	21	48	20†	43	0.00	- 0.01	0.00	0	0	28	0	2	.....	Santa Fe Co.
Suisun**.....	Solano.....	20	33	71.3	+ 3.0	99	30	45	3†	.....	0.06	- 0.16	0.06	0	1	30	0	0	sw.	Southern Pacific Co.
Sulphur Banks.....	Lake.....	1,350	1	65.9	.....	90	1†	48	9†	35	0.27	.....	0.27	0	1	18	11	1	w.	L. S. Lorenzen.
Summit.....	Placer.....	7,017	40	48.8	- 4.4	67	21	31	27	28	0.05	- 0.59	0.05	0.5	1	8	0	22	s.	Southern Pacific Co.
Susanville.....	Lassen.....	4,175	24	61.9	- 0.5	92	4	36	20	52	2.17	+ 1.67	1.40	0	7	13	8	9	.....	C. M. Benty.
Tamarack.....	Alpine.....	8,000	7	46.6	.....	66	13†	30	5†	35	7.44	+ 6.43	1.30	3.0	11	7	10	13	sw.	Cal. Gas & Electric Co...
Tehachapi**.....	Tehama.....	3,964	26	66.8	- 2.6	80	6†	40	10	.....	0.52	+ 0.44	0.42	0	2	.....	.....	.....	.....	Southern Pacific Co.
Tehama.....	do.....	220	42	74.2	- 3.4	99	1	54	10	.....	0.45	+ 0.18	0.30	0	3	23	3	4	s.	Do.
Tejon Rancho.....	Kern.....	1,500	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	2	8	20	2	sw.	S. E. Bailey.
Three Rivers.....	Tulare.....	870	3	69.9	.....	96	30	48	20	42	0.56	.....	0.37	0	2	8	20	2	sw.	J. H. Pierce.
Towle.....	Placer.....	3,704	27	64.4	+ 1.4	81	22	46	8	26	0.47	- 0.56	0.40	0	4	22	6	2	ne.	Southern Pacific Co.
Tracy**.....	San Joaquin.....	64	33	76.0	+ 0.1	96	30	60	8†	.....	0.00	- 0.17	0.00	0	0	.....	.....	.....	.....	Do.
Ukiah.....	Mendocino.....	620	20	64.4	- 1.0	92	29	39	10	45	0.03	- 0.31	0.03	0	1	18	11	1	nw.	Dr. Geo. McCowen.
Upper Lake.....	Lake.....	1,350	28	64.0	- 2.7	91	29	37	10	44	0.01	- 0.24	0.01	0	1	21	7	2	nw.	C. M. Hammond.
Vacaville.....	Solano.....	175	25	68.4	- 2.6	97	20†	40	10	50	T.	- 0.16	T.	0	0	16	14	0	sw.	G. O. Coburn.
Valley Springs**.....	Calaveras.....	673	24	71.1	- 3.0	97	20	57	10	.....	0.00	- 0.27	0.00	0	0	20	10	0	nw.	Southern Pacific Co.
Visalia.....	Tulare.....	334	25	63.4	- 9.9	85	30	37	1	39	0.28	+ 0.18	0.28	0	1	30	0	0	ne.	Santa Fe Co.
Warner Springs.....	San Diego.....	3,165	5	63.6	.....	92	21	39	10	39	0.13	.....	0.13	0	1	22	8	0	.....	Mrs. F. S. Sandford.
Wasco.....	Kern.....	336	13	78.1	+ 3.1	109	24	54	2	41	0.00	- 0.00	0.00	0	0	30	0	0	nw.	Santa Fe Co.
Watsonville.....	Santa Cruz.....	23	17	60.8	- 1.6	97	22	36	10	50	0.16	+ 0.02	0.07	0	3	11	12	7	w.	Spreckels Sugar Co.
Weaverville.....	Trinity.....	2,162	1	61.0	.....	89	2	37	10†	40	0.93	+ 0.16	0.33	0	8	11	15	4	.....	U. S. Forest Service.
Weitchpec.....	Humboldt.....	1,700	3	59.0	.....	89	1	37	9	38	2.46	.....	0.94	0	9	12	14	4	s.	M. E. Lathrop.
Westley**.....	Stanislaus.....	90	24	75.7	- 1.9	96	21	50	15	.....	0.00	- 0.06	0.00	0	0	28	0	2	n.	Southern Pacific Co.
Wheatland.....	Yuba.....	84	26	69.8	- 1.6	94	30	48	10	37	0.09	- 0.19	0.07	0	2	16	8	6	s.	Wm. Lumbard.
Willows.....	Glenn.....	136	34	73.4	- 3.5	97	12	47	10	44	0.92	+ 0.74	0.87	0	3	27	3	0	s.	E. C. Mills.
Yorba Linda.....	Orange.....	.....	.....	66.4	.....	98	21†	40	19	52	0.10	.....	0.07	0	2	12	11	7	w.	S. J. Walker.
Yosemite.....	Mariposa.....	3,945	9	54.3	.....	87	21†	22	10	59	3.01	.....	0.95	0	9	16	3	11	s.	J. P. Kelly.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from the record.  
 \*\* Temperature extremes are from observed readings of the dry bulb; means are computed from observed readings.  
 † Also on other dates.  
 T. Precipitation is less than 0.01 inch rain or melted snow.









TABLE 2.—Daily precipitation for June, 1913. District No. 11—Continued.

Stations.	Watershed.	Day of month.																													Total.	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30
<i>California—Contd.</i>																																
Upper Mattole.....	Coast.....								.04					.06	.01	T.	T.			.02	.51			.08	.06			.01	.06	.01		
Vacaville.....	Sacramento.....																															
Valley Springs.....	San Joaquin.....																															
Visalia.....	do.....																										T.	.28				
Warner Springs.....	Coast.....																										T.	.13	T.			
Wasco.....	San Joaquin.....																															
Watsonville.....	Coast.....				.03																						.07	.06				
Weaverville.....	do.....	.04		T.				T.	.30								T.	.01	.03	.33		T.	.03	T.			.02	.15				
Weitchpec.....	Klamath.....	T.	.20	.04				T.	.10					.12					.06	.94		.08	.31				.31	.50				
West Branch.....	Sacramento.....																			.35							.04	.86	.04			
Westley.....	San Joaquin.....																															
West Point.....	do.....																															
West Saticoy.....	Coast.....																															
Wheatland.....	Sacramento.....	T.							T.	.07											.02						T.	T.				
Willows.....	do.....	T.							T.												.03						T.	.87	.02			
Yorba Linda.....	Coast.....																								.03			.07				
Yosemite.....	San Joaquin.....	.49	.04	.18	.09	.05	.70			.50														T.		T.	.95	.01				

\* Precipitation included in that of the next measurement.  
 † Separate dates of falls not recorded.  
 ‡ Precipitation for the 24 hours ending on the morning when it is measured.  
 T. Precipitation is less than 0.01 inch rain or melted snow.



# Total Precipitation, June, 1913.



# Departure of the Mean Temperature from the Normal, June, 1913.

