

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

CALIFORNIA SECTION.

G. H. WILLSON, District Forecaster.

VOL. XX.

SAN FRANCISCO, JULY, 1916.

No. 7.

GENERAL SUMMARY.

July, 1916, was abnormally cool in California. Taking the State as a whole, the mean temperature was 3.7° below normal, while the average precipitation was 0.31 inch, or 0.27 inch more than the usual amount. A total of 118 stations reported no precipitation whatever, while 22 other stations reported only a trace. Unlike the three preceding months, July was not characterized by excessive wind movement. Long delayed warm weather was experienced in the interior valleys during the month. Along the coast the weather was unusually pleasant, there being less fog and fewer occurrences of cold west winds than are normally recorded during July. At San Francisco the percentage of the possible sunshine received, 88 per cent, was the greatest ever recorded during July in a record covering 26 years, while at Eureka it was also much above the average, and the greatest in 8 years. Damage from frost was negligible for the State as a whole, though killing frosts occurred in the mountain regions on the mornings of the 27th, 28th and 29th. No damage from floods occurred during the month.

The northern half of the State received moderately heavy rain on the 1st and 2d, during the eastward passage of an unusual depression. The first decade was cool, the lowest temperatures recorded during the month throughout the greater part of the State occurring between the 1st and 5th. The second decade was moderately warm, and scattered showers fell from the 13th to the 16th. In the desert regions of the south, where rain is of infrequent occurrence, heavy showers fell on the 13th and 14th. The 24-hour rainfall received in the extreme north portion of the State on the 15th-16th was excessive, while along the coast it was unprecedented during the month of July. At Eureka the 24-hour precipitation amounted to 1.18 inches, while at Crescent City it measured 2.46 inches. Thunderstorms occurred at many places on the 16th. The last decade was hot in the interior valleys and moderately warm along the coast, the highest temperatures of the month occurring at most stations between the 22d and 25th. Practically no rain fell during the last 10 days of the month.

From an agricultural point of view the weather of July, like that of the preceding month, was favorable in certain characteristics and unfavorable in others. The continued cool weather has resulted in slow growth, causing the grain to fill and the fruit to become plumper. Crops already harvested are larger than were expected to follow the unfavorable weather of the spring months. Grain and grass crops, while deficient in quantity, are good in quality. In restricted districts showers interfered with the curing of hay and the harvesting of grain, and also damaged ripening fruits and injured berries. As a result of the cool spring the rice fields are not looking their best. In the San Joaquin Valley and along the southern coast mildew has also been an unfavorable result. However, all irrigated crops have progressed favorably, and a normal yield is anticipated. The pleasant weather was well adapted for farm work. Taking all conditions into consideration the agricultural outlook continues favorable. In a region of stable climatic conditions like California the weather conditions are rarely so abnormal as to result in crop failures.

A. H. P.

PRESSURE.

The monthly mean atmospheric pressure for the State, reduced to sea level, was 29.92 inches.

The highest was 30.19 inches at Eureka on the 21st.

The lowest was 29.56 inches at Independence on the 25th, and also at Red Bluff on the 25th.

The range for the State was 0.63 inch.

TEMPERATURE.

The monthly mean temperature for the State was 70.3 degrees, which is 3.7 degrees below the normal.

The highest monthly mean was 102.6 degrees, at Greenland Ranch; and the lowest was 54.0 degrees, at Fordyce Dam and also at Point Reyes.

The highest temperature, 127 degrees, occurred at Greenland Ranch, on the 23rd; and the lowest, 24 degrees, occurred at Cabuilla, on the 1st and 4th, and also at Portola on the 29th.

The range for the State was 103 degrees.

PRECIPITATION.

The average precipitation for the State was 0.31 inch, or 0.27 inch above the normal.

The greatest monthly amount was 4.17 inches, at Crescent City. 118 stations reported no precipitation.

The greatest amount in 24 hours was 2.46 inches at Crescent City, on the 16th.

RELATIVE HUMIDITY.—(Per Cent.)

Stations.	5 a. m.	5 p. m.	Mean.
Eureka.....	92	79	86
Fresno.....	52	14	33
Los Angeles.....	91	66	79
Mount Tamalpais.....	44	38	41
Red Bluff.....	53	17	35
Sacramento.....	79	28	54
San Diego.....	89	78	84
San Francisco.....	89	69	79
San Jose.....	82	47	64
San Luis Obispo.....	92	60	76

SUNSHINE AND CLOUDINESS.

Stations.	Actual hours of sunshine.	Per cent of the possible.
Eureka.....	274	60
Fresno.....	447	99
Los Angeles.....	318	72
Mount Tamalpais.....	435	97
Red Bluff.....	426	94
Sacramento.....	445	98
San Diego.....	257	59
San Francisco.....	395	88
San Jose.....	414	93
San Luis Obispo.....	340	77

WIND MOVEMENT.—(Miles.)

Stations.	Total movement for month.	Average hourly velocity.	Maximum velocity.	Direction.	Date.
Eureka.....	6,053	8.1	33	n.	18
Fresno.....	7,154	9.6	30	n.w.	1
Independence.....	4,456	6.0	27	se.	27
Los Angeles.....	3,985	5.3	15	sw.	1
Mount Tamalpais.....	13,257	17.8	76	n.w.	25
Point Reyes.....	20,709	27.8	78	n.w.	25
Red Bluff.....	3,769	5.1	22	se.	1
Sacramento.....	5,998	8.1	23	sw.	7
San Diego.....	4,450	6.0	18	n.w.	1
San Francisco.....	9,335	12.5	35	sw.	23
San Jose.....	4,302	6.6	25	se.	24
San Luis Obispo.....	3,065	4.0	20	w.	2

The prevailing direction of the wind for the State was west.

Climatological Data for July, 1916.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Snowfall), Number of days (Precipitation .01 inch or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind, Observers.

Climatological Data for July, 1916.—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, in inches.				Number of days.			Prevailing direction of wind.	Observers		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (un-melted).	Precipitation, 0.1 inch or more.	Clear.			Partly cloudy.	Cloudy.
La Porte	Plumas	5,000	22	59.6	-2.8	86	11	34	8	39	1.30	+1.16	0.70	0	2	27	1	3	n.	C. W. Hendel.
Las Plumas	Butte	506	2	79.5		108	22	55	11	43	0.28	0	0.28	0	1	29	1	1	s.	Great Western Power Co.
Le Grand	Merced	255	16								0.00	0	0.00	0	0	0	0	0	n.	Santa Fe Co.
Lemon Cove	Tulare	600	21	84.2	+2.6	100	25	52	1	46	0.00	-0.01	0.00	0	0	30	1	0	e.	Logan Tabler.
Lick Observatory	Santa Clara	4,209	27	65.6	-3.5	88	23	39	2	21	0.12	+0.12	0.12	0	1	30	1	0	n.	The Director.
Lindsay	Tulare	384	2	78.6		112	23	51	13	49	0.00	0.00	0.00	0	0	30	1	0	nw.	Basil Prior.
Livermore	Alameda	485	45																	E. G. Still.
Lompoc (near)	Santa Barbara																			A. R. Poett.
Lone Pine	Inyo	3,728	11	71.5	-3.1	98	121	41	3	55	0.00	-0.09	0.00	0	0	29	2	0	s.	G. F. Marsh.
LOS ANGELES	Los Angeles	293	39	66.8	-0.6	84	31	55	5	24	0.00	-0.02	0.00	0	0	17	14	0	sw.	U. S. Weather Bureau.
Los Gatos	Santa Clara	600	29	68.3	+0.5	104	22	46	15	47	T.	0	0.00	0	0	28	2	1	n.	F. H. McCullagh.
McCloud	Siskiyou	3,270	6	61.8		91	10	35	127	50	1.62		1.00	0	4	26	4	1	s.	F. F. Spencer.
Madeline	Lassen	5,270	7	60.3		91	11	32	118	50	0.34		0.18	0	2	24	1	6	w.	J. H. Williams.
Magalia	Butte	2,321	12	71.4	-2.2	100	119	40	2	44	1.32	+1.30	1.00	0	2	26	0	2	s.	Southern Pacific Co.
Maricopa	Kern	640	5	83.8		106	24	54	1	43	0.00	0.00	0.00	0	0	31	0	0	n.	Producers Trans. Co.
Marysville	Yuba	67	45	75.8	-4.2	108	21	51	31	47	0.00	0	0.00	0	0	29	1	1	s.	Southern Pacific Co.
Mecca	Riverside	-185	10	90.6		112	22	66	1	39	0.85		0.55	0	2	26	4	1	se.	E. A. Palmer.
Merced	Merced	173	42	76.6	-5.1	105	122	53	28	41	0.00	-0.01	0.00	0	0	31	0	0	nw.	Santa Fe Co.
Middlewater	Kern	808	5	87.6		114	12	50	2	42	0.00	0.00	0.00	0	0	31	0	0	w.	Producers Trans. Co.
Mill Creek-1	Amador	2,500	9	65.8		91	23	40	28	40	0.05		0.05	0	1	30	0	1	n.	Pacific Gas & Electric Co.
Milton (near)	Calaveras	660	25																	J. H. Southwick.
Mineral	Telama		1																	U. S. Forest Service.
Mokelumne Hill	Calaveras	1,350	23	75.5	-1.3	102	121	49	17	40	0.00	0	0.00	0	0	31	0	0		C. E. Prindle.
Montague	Siskiyou	2,450	28	67.4	-9.8	102	11	40	27	47	1.08	+0.85	0.60	0	3	22	7	2	n.	J. E. De Boy.
MOUNT TAMALPAIS	Marin	2,375	17	68.5	-2.0	93	22	47	2	25	0.09	+0.08	0.09	0	1	29	1	1	nw.	U. S. Weather Bureau.
Napa City	Napa	20	39																	Thos. Hull.
Noedles	San Bernardino	477	24	91.0	-3.6	110	15	70	12	38	0.30	+0.03	0.30	0	1	20	3	3	sw.	Santa Fe Co.
Nollie	San Diego	5,350	7	72.4		94	122	49	2	35	0.35		0.32	0	1	24	5	2	sw.	Esther P. Hewlett.
Nevada City	Nevada	2,850	24	65.9	-2.9	98	23	38	27	48	0.48	+0.46	0.44	0	2	30	0	1	sw.	S. W. Marsh.
Newman	Stanislaus	91	27	73.9	-8.1	105	23	42	5	54	0.00	0	0.00	0	0	0	0	0		E. S. Wengenheim.
North Bloomfield	Nevada	3,214	19	68.9	-2.6	90	23	40	7	47	0.65	+0.58	0.52	0	2	29	1	1	w.	J. R. McIntosh.
North Fork	Madera	3,000	12	69.6		102	22	42	2	47	T.	-0.09	T.	0	0	30	1	0	sw.	U. S. Forest Service.
Oak Grove	San Diego	2,751	6	65.1		102	31	39	3	45	0.18		0.07	0	3	21	0	10	w.	U. S. Forest Service.
Oakland	Alameda	36	40	64.1	+2.3	91	22	51	17	33	0.08	+0.06	0.08	0	1	23	5	3	w.	Chabot Observatory.
Oceanside	San Diego	60	6	64.6		74	29	55	1	16	T.		T.	0	0	12	5	14	w.	H. D. Brodie.
Ojai Valley	Ventura	900	10	68.2		103	31	42	30	57	0.00		0.00	0	0	31	0	0	sw.	W. H. Duncan.
Orland	Glenn	254	34	80.4	-6.0	110	22	54	8	48	0.61	+0.60	0.61	0	1	29	1	1	n.	U. S. Rec. Service.
Oroville	Humboldt	376	13	69.4	-10.2	97	11	48	9	42	1.55	+1.37	1.36	0	3	28	0	3	n.	F. W. Gent.
Oroville (near)	Butte	250	32	77.1	-3.1	108	21	50	24	46	0.30	+0.28	0.30	0	1	28	2	1	sw.	E. D. Fairchild.
Pacific	El Dorado	3,400	1																	U. S. Forest Service.
Pasadena	Los Angeles	827	26	70.6	-0.8	94	31	50	9	39	0.00	0	0.00	0	0	21	10	0	sw.	Harlan W. Hall.
Paso Robles	San Luis Obispo	800	29	72.0	0	112	23	39	114	62	0.60	0	0.00	0	0	30	1	0	se.	Dr. F. W. Sawyer.
Peachland	Sonoma	190	20	64.9	-0.6	92	110	40	28	46	0.57	+0.55	0.57	0	1	30	0	1	s.	E. H. Farnell.
Petaluma	do		2	65.4		101	22	41	31	51	0.12	+0.11	0.12	0	1	29	2	0	n.	John Landis.
Placerville	El Dorado	1,875	27	71.9	-0.7	100	111	46	29	44	0.20	+0.18	0.14	0	2					A. Baring Gould.
Point Loma	San Diego	302	10	64.8		73	31	58	3	11	T.	-0.07	T.	0	0	10	2	19	nw.	Fred J. Dick.
POINT REYES	Marin	490	24	54.0	+0.5	72	19	47	30	22	0.39	+0.32	0.39	0	1	14	7	10	nw.	U. S. Weather Bureau.
Pomona	Los Angeles	857	2	71.7		103	31	47	11	50	0.00	0.00	0.00	0	0	7	1	23	n.	J. P. Adamson.
Porterville	Tulare	464	27	77.9	-6.9	107	23	48	128	49	0.00	-0.03	0.00	0	0	31	0	0		Leslie McAuliffe.
Portola	Plumas	do	1	64.0		96	12	56	27	50	0.02	-0.06	0.02	0	1	30	0	1	sw.	Western Pacific Co.
Quincy	do	3,400	21	65.8	+0.5	96	12	56	27	50	0.02	-0.06	0.02	0	1	30	0	1	sw.	D. N. Rogers.
RED BLUFF	Tehama	307	39	79.8	-2.3	106	22	54	2	35	0.68	+0.65	0.61	0	3	27	3	1	se.	U. S. Weather Bureau.
Redding	Shasta	552	41	78.7	-3.6	106	22	53	1	39	2.64	+2.55	1.63	0	3	28	2	1	n.	J. H. Buick.
Redlands	San Bernardino	1,352	23	73.4	-4.0	102	31	50	8	42	0.03	+0.01	0.03	0	1	29	1	1	w.	P. W. Moore.
Redley	Fresno	347	16																	Santa Fe Co.
Rialto (near)	San Bernardino	2,250	10	73.0		102	31	49	15	40	0.00		0.00	0	0	26	3	2	sw.	So. Cal. Edison Co.
Riverside	Riverside	851	34	71.8	-4.5	104	31	46	11	52	0.60	-0.02	0.00	0	0	26	4	1	w.	J. H. D. Cox.
Rocklin	Placer	249	45	72.9	-7.1	108	11	42	26	53	0.00	-0.02	0.00	0	0	30	0	1	se.	Southern Pacific Co.
Rohnerville	Humboldt	75	13	61.8		80	18	42	26	31	0.75	+0.64	0.55	0	2	21	7	3	nw.	W. D. Gray.
Ruth	Trinity	2,925	2	65.6		100	11	37	19	59	0.37	0.47	0.47	0	3	28	2	1	n.	U. S. Forest Service.
SACRAMENTO	Sacramento	71	39	74.1	+1.6	105	22	52	2	40	0.07	+0.07	0.07	0	1	30	1	0	s.	U. S. Weather Bureau.
St. Helena	Napa	255	8	72.0		108	22	45	5	55	0.00	0.00	0.00	0	0	30	0	1	n.	W. F. Bornhorst.
Salinas	Monterey	40	42	60.8	-1.9	84	10	43	29	34	0.00	0	0.00	0	0	24	3	4	w.	Miss E. Ruth Abbott.
San Bernardino	San Bernardino	1,054	24	73.8	-1.8	105	31	49	11	47	0.00	-0.04	0.00	0	0	27	4	0	sw.	Dr. A. K. Johnson.
SAN DIEGO	San Diego	87	45	65.0	-1.9	74	31	58	3	12	0.02	+0.01	0.02	0	1	13	12	6	sw.	U. S. Weather Bureau.
SAN FRANCISCO	San Francisco	207	45	60.0	+2.7	84	18	49	28	27	0.03	+0.01	0.03	0	1	26	5	0	sw.	do
San Jacinto	Riverside	1,550	23	78.5	-2.2	109	31	51	1	49	0.02	-0.07	0.02	0	1	27	4	0		E. T. Tanner.
SAN JOSE	Santa Clara	95	41	66.3	-0.6	98	22	45	28	44	T.	0	T.	0	0	30	1	0	nw.	U. S. Weather Bureau.
SAN LUIS OBISPO	San Luis Obispo	201	21</																	

Climatological Data for July, 1916.—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, in inches.				Number of days.				Observers		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (un-melted).	Precipitation .01 inch or more.	Clear.	Partly cloudy.		Cloudy.	Prevailing direction of wind.
Ukiah	Mendocino	620	23	71.4	+0.1	109	22	43	18	56	0.00	-0.02	0.00	0	0	29	0	2	nw.	Dr. George McCowen.
Vacaville	Solano	175	28	73.0	-2.5	107	23	40	1	57	0.00	0	0.00	0	0	31	0	0	w.	J. E. Bassford.
Valyermo	Los Angeles	3,750	28	56.6	.....	102	12	41	3	51	0.00	.....	0.00	0	0	25	3	3	s.	U. S. Forest Service.
Visalia	Tulare	334	28	79.6	-0.4	105	12	58	17	36	0.00	-0.02	0.00	0	0	31	0	0	nw.	Santa Fe Co.
Walnut Creek	Contra Costa	149	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	R. L. Nougaret.
Warner Springs	San Diego	3,165	8	74.4	.....	102	31	44	13	47	0.45	.....	0.43	.....	2	28	3	0	.....	J. A. Ream.
Wasco	Kern	336	16	79.0	.....	103	23	53	3	41	0.00	0	0.00	0	0	30	0	1	nw.	Santa Fe Co.
Watsonville	Santa Cruz	23	20	61.4	-1.0	88	10	42	43	45	0.03	+0.03	0.03	0	1	6	23	2	s.	Spreckels Sugar Co.
Weaverville	Trinity	2,162	4	68.0	.....	103	11	40	11	55	0.20	+0.07	0.10	0	2	28	1	2	.....	U. S. Forest Service.
Weitchpec	Humboldt	1,700	6	63.0	.....	92	11	41	1	40	2.14	.....	1.61	0	5	26	2	3	nw.	G. S. Garnett.
West Branch	Butte	3,216	2	65.8	.....	102	22	40	3	51	1.48	.....	1.48	0	1	28	2	1	s.	Pacific Gas & Electric Co.
Wheatland	Yuba	84	29	76.2	-0.5	105	22	53	13	41	0.31	+0.30	0.23	0	2	30	0	1	s.	Wm. Lumbard.
Willows	Glenn	136	37	82.0	-0.9	111	22	51	2	48	0.27	+0.27	0.27	0	1	30	0	1	n.	F. E. Barnhouse.
Yorba Linda	Orange	405	2	69.2	.....	94	31	49	3	41	0.00	.....	0.00	0	0	24	6	1	w.	S. J. Walker.
Yosemite	Mariposa	3,960	12	77.8	.....	98	12	42	1	40	T.	-0.20	T.	0	0	29	0	2	s.	Supt. National Park.
Yreka	Siskiyou	2,625	27	65.1	.....	100	11	37	27	48	0.55	.....	0.35	0	2	21	7	3	nw.	U. S. Forest Service.
Means and Extremes				70.3	-3.7	127	23	24	11	64	0.31	+0.27	2.46	0	1	28	2	1	w.	

The departures from the normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete reports are used in determining section or division means.

** 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.

a, b, c, etc., indicate respectively, 1, 2, 3, etc., days missing from the record.

COMPARATIVE DATA FOR JULY.

MEAN MONTHLY TEMPERATURE FOR THE STATE.

1897	74.5	1907	73.1
1898	81.4	1908	76.4
1899	77.9	1909	71.2
1900	75.9	1910	75.5
1901	76.0	1911	74.1
1902	72.8	1912	71.0
1903	71.2	1913	73.1
1904	72.2	1914	72.4
1905	74.8	1915	72.7
1906	76.8	1916	70.3

AVERAGE PRECIPITATION FOR THE STATE.

1897	0.01	1907	0.03
1898	T.	1908	0.04
1899	T.	1909	0.05
1900	T.	1910	0.10
1901	0.01	1911	0.10
1902	0.07	1912	0.06
1903	0.03	1913	0.46
1904	0.09	1914	0.06
1905	0.01	1915	0.06
1906	0.04	1916	0.81

DATES OF MISCELLANEOUS PHENOMENA.

Thunderstorms.—Bonita, Campo, 14; Converse Nursery, 13, 14, 22, 23; Cuyamaca, 11, 12, 13, 23; Downieville, 1; Holcomb Valley, 23; Independence, 14; Kennett, 1; McCloud, 1, 17; Montague, Monte Vista, 1; Nellie, 13, 14; Oak Grove, 13, 14, 31; Redding, 2; San Diego, 14; Seven Oaks, 13, 14, 23; Stanwood, 1.

Earthquakes.—San Jose, 1; Eureka, Rohnerville, Shively, 4; Barstow, Beaumont, Holcomb Valley, Los Angeles, Mount Wilson, Nellie, Redlands, Rialto, Riverside, San Bernardino, Seven Oaks, Squirrel Inn, 16; Redlands, 27; Riverside, 28.

DELAYED REPORTS.

Stations.	Month.	Temperature.					Total precipitation
		Mean	Max.	Date	Min.	Date	
Kennedy Mine	February.	52.9	74	17	33	1	4.43
Twin Valley	March.	49.8	88	9	22	24	4.67
Auburn	April.	60.4	81	10	43	111	0.35
Gold Run	.....	57.3	78	30	36	19	0.06
Arrowhead Springs	May.	63.8	85	3	40	23	0.65
Bishop Creek	.....	43.6	65	4	14	24	0.50
Fort Ross	.....	.....	.....	.....	.....	.....	0.00
Glenn Ranch	.....	.....	.....	.....	.....	.....	0.16
Parkfield	.....	.....	.....	.....	.....	.....	0.09
West Point	.....	.....	.....	.....	.....	.....	0.81
Abbotts	June.	.....	.....	.....	.....	.....	0.00
Arrowhead Springs	.....	67.2	88	17	48	6	0.00
Bishop Creek	.....	56.0	79	15	29	1	0.00
Brawley	.....	83.6	114	15	54	23	0.00
Dinuba	.....	.....	.....	.....	.....	.....	0.00
Dunsmuir	.....	65.7	98	16	38	28	.....
Glenn Ranch	.....	.....	.....	.....	.....	.....	0.00
Goffs	.....	79.2	110	15	49	1	0.00
Julian	.....	.....	.....	.....	.....	.....	0.00
La Jolla	.....	.....	.....	.....	.....	.....	0.00
Le Grand	.....	.....	.....	.....	.....	.....	0.00
Mineral	.....	59.8	85	14	29	20	2.24
Priest Valley	.....	.....	.....	.....	.....	.....	0.00
Walnut Creek	.....	66.2	95	16	45	2	0.00

ERRATA. APRIL, 1916.

Warner Springs, page 48, mean temperature, 37.4°, should be 57.4°.

MAY, 1916.

Bonita, page 58, minimum temperature, 45°, on 14th, should be 43° on 26th.

Chester, page 61, total precipitation, 1.68, should be 1.88.

Independence, page 57, average hourly wind velocity, 7.4, should be 7.3; page 58, mean temperature, 59.9°, should be 59.8°.

North Bloomfield, page 59, mean temperature, 59.0°, should be 54.0°.

JUNE, 1916.

Bishop, page 70, mean temperature, 64.0°, should be 63.4°.

Independence, page 70, mean temperature, 69.6°, should be 69.5°; greatest daily range 48, should be 44.

North Lakeport, page 74, total precipitation, 0.00, should be 0.27.

Daily Temperature for July, 1916.

Table with columns for Stations, 1-31, and Mean. Rows list various California locations such as Alturas, Bakersfield, Barstow, etc., with their corresponding temperature data for each day of the month.