

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

CALIFORNIA SECTION.

EDWARD A. BEALS, District Forecaster.

VOL. XXIII. SAN FRANCISCO, JANUARY, 1919. No. 1.

GENERAL SUMMARY.

Seasonable temperature prevailed in California during January, but the precipitation was only about 50 per cent of the normal. In the extreme northwestern portion of the State the precipitation was heavy, exceeding 20 inches at several stations. In the central portion it was moderate, while in the southern portion it was light, several stations receiving no measurable precipitation. Snowfall in the mountains was deficient, and the average for the State as a whole was less than 25 per cent of the normal January amount. Cloudless skies were more common than is usual during a month which marks the middle of the rainy season, and the percentage of sunshine received was above the normal. Severe frosts occurred on many mornings in the agricultural portions of the State. The number of days on which frost was recorded at certain stations follows: Fresno, 22; Red Bluff, 17; San Jose, 16; Sacramento, 15, and San Francisco, 11. Except in the northwestern portion of the State, streams maintained low stages throughout the month. The wind movement was about normal, and no destructive winds were reported.

No precipitation occurred during the first decade, which was a clear and cold period. The lowest temperatures of the month were recorded at most stations on the 1st or 2d. Light showers fell in the central and northern portions of the State between the 10th and 12th. During the following three days the weather was fair. Unsettled and showery weather prevailed from the 16th to the 23d. The precipitation in the northwestern portion of the State was excessive from the 16th to the 18th. During these three days 12.30 inches of rain fell at Branscomb, Mendocino County. Following these heavy rains the Eel River reached a flood stage, submerging more than 5,000 acres of farm land and doing damage estimated at about \$8,000. Fair weather prevailed during the last ten days, except on the 31st, which marked the beginning of a series of storms which brought copious precipitation.

The progress of winter growing grains was retarded because of deficient rainfall, following a dry December. Green feed on the ranges was not as abundant as is usual in January. Frequent frosts, especially those of the first decade, did considerable damage to unharvested citrus fruit. The Bureau of Crop Estimates is authority for the statement that about 17 per cent of the orange crop on the trees on January 1st will be unmarketable, and that a much higher percentage of the crop was more or less frost-bitten. The same authority estimates the damage to lemons at not less than 25 per cent of the maturing crop. However, the cold was not sufficiently severe or long continued to injure citrus trees. The fine, dry weather was well adapted for field work, and horticulturists were busy spraying and pruning fruit trees.

A. H. P.

PRESSURE.

The mean sea level pressure, determined from the records of twelve regular Weather Bureau stations, was 30.15 inches. The highest was 30.59 inches at Independence on the 3d; the lowest was 29.37 inches at Independence on the 31st; the range for the State was 1.22 inches.

TEMPERATURE.

The monthly mean temperature for the State, as shown by the records of 100 stations, was 46.4°, which is 0.6° above the normal.

The highest monthly mean was 60.2°, at Los Angeles; and the lowest was 25.6°, at Modesto.

The highest temperature, 87°, occurred at Indio on the 22d; and the lowest, -18°, occurred at Alturas on the 1st.

The range for the State was 105°.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 252 stations, was 2.69 inches, or 2.72 inches below the normal.

The greatest monthly amount was 22.92 inches, at Upper Mattole. Five stations reported no precipitation.

The greatest amount in 24 hours was 6.00 inches at Branscomb on the 18th.

RELATIVE HUMIDITY, SUNSHINE AND CLOUDINESS.

Stations.	Relative humidity. (Per cent.)			Sunshine.
	5 a.m.	5 p.m.	Mean.	Actual No. of hours Percent of possible.
Eureka.....	87	83	85	23:
Fresno.....	82	49	68	234
Independence.....	45	26	36	256
Los Angeles.....	50	42	46	259
Mount Tamalpais.....	68	63	66	195
Red Bluff.....	83	56	70	156
Sacramento.....	90	69	80	191
San Diego.....	62	58	60	236
San Francisco.....	82	64	73	224
San Jose.....	80	60	73	224
San Luis Obispo.....	70	48	59	233
				74

WIND MOVEMENT.—(Miles.)

Stations.	Total mov. for month	Ave. hr. velocity.	Maximum velocity.	Direction.		Date.	Prev. dir.
				Ave.	Dir.		
Eureka.....	5,536	7.4	43	sw.	15	se.	
Fresno.....	3,443	4.6	23	nw.	25	nw.	
Independence.....	3,999	5.4	24	nw.	1	nw.	
Los Angeles.....	4,503	6.1	28	uw.	25	ne.	
Mount Tamalpais.....	13,448	18.1	62	s.	19	nw.	
Point Reyes.....	12,898	17.3	80	nw.	31	se.	
Red Bluff.....	4,162	5.6	27	n.	31	nw.	
Sacramento.....	4,321	5.8	24	sw.	19	se.	
San Diego.....	3,371	4.5	25	w.	31	nw.	
San Francisco.....	3,925	5.3	26	sw.	20	n.	
San Jose.....	3,668	4.9	24	se.	19	se.	
San Luis Obispo.....	2,770	3.7	22	ne.	13	n.	

COMPARATIVE DATA FOR JANUARY.

Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.
1897.....	45.5	2.69	1903.....	46.6	4.56	1909.....	47.8	16.17	1915.....	44.2	7.58
1898.....	41.0	1.08	1904.....	45.8	1.38	1910.....	41.9	4.86	1916.....	39.8	15.61
1899.....	46.4	3.52	1905.....	48.3	4.37	1911.....	45.7	13.20	1917.....	39.2	2.71
1900.....	47.9	3.30	1906.....	47.5	7.86	1912.....	47.7	3.58	1918.....	46.8	1.14
1901.....	43.9	5.21	1907.....	43.9	7.46	1913.....	41.6	5.06	1919.....	46.4	2.69
1902.....	44.5	1.38	1908.....	46.7	4.63	1914.....	46.9	13.09			

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.

† Also on other dates. a, b, c, etc., indicate respectively, 1, 2, 3, etc., days missing from the record.

Daily evaporation (inches) and wind movement (miles) for January, 1919.

Stations.	Data.	Day of Month.																													Monthly.				
		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	31			
Chula Vista**1.....	Evaporation.....	.112	.092	.140	.103	.126	.085	.116	.401	.246	.129	.083	.090	.158	.120	.111	.089	.080	.072	.087	.036	.098	.120	.126	.077	.143	.119	.209	.381	.209	.091	.095	4.144		
	Windmovement.....	.71	.59	.60	.50	.58	.54	.59	.158	.100	.58	.71	.64	.68	.65	.61	.61	.69	.71	.67	.49	.76	.63	.56	.93	.105	.70	.92	.131	.99	.101	.176	2.435		
Dodgeland**2.....	Evaporation.....	†	†	†	†	†	†	†	1.407	†	0.48	0.036	0.010	0.16	0.047	0.026	0.015	0.011	0.048	0.017	0.013	0.072	0.104	0.042	0.036	0.040	0.066	0.027	0.056	0.047	0.039	0.049	0.036	0.049	1.357
	Windmovement.....	.58	.53	.31	.32	.30	.31	.20	16	14	.41	.78	.89	.32	.52	*104	125	120	49	71	.92	.29	.36	.35	14	34	18	24	1,658						
Oakdale (near)**3.....	Evaporation.....	†	.141	.069	.029	.058	.054	.094	.038	.034	.062	.058	.051	.041	.031	.098	.056	.084	.035	.033	.000	.078	.097	.023	.031	.046	.055	.052	.067	.043	.100	.038	1.622		
	Windmovement.....	.83	.83	.61	.52	.83	.50	.62	.39	.30	.114	.89	.02	.99	.107	.108	.103	.101	.96	.115	.169	.121	.69	.78	.65	.66	.54	.56	.50	.42	.61	.63	.44	2.164	
Tahoe**4.....	Evaporation.....	.020	.099	.045	.060	.075	.075	.050	.030	.015	.035	.045	.095	.055	.075	.040	.015	†	.030	†	.055	.085	.095	.075	.110	.075	.050	.050	.035	.045	.045	2.093			
	Windmovement.....	.81	.65	.84	.119	.13	.86	.76	.117	.51	.54	.125	7	.123	.52	.41	.67	.56	.46	.135	.81	.52	.72	.112	.51	.42	.61	.63	.44	2.164					

* Observation taken at 7 a. m.; ** at 8 a. m. † Included in next following entry.

1 Ele. 9 ft.; 10 miles SE of San Diego. 2 Ele. 125 ft.; 16 miles SW of Chico. 3 Ele. 215 ft.; Woodward Reservoir, 8 miles N of Oakdale. 4 Ele. 6230 feet; flat in Lake Tahoe.

Climatological Data for January, 1919.

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.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (un-melted).	Precipitation, 0.1 inch or more.	Partly cloudy.	Cloudy.	Prevailing direction of wind.		
Alturas.....	Modoc.....	4,400	15	29.8	+0.8	60	28	-18	1	50	0.57	-1.64	0.13	2.8	8	14	s.	Prof. C. B. Towle.
Antioch.....	Contra Costa.....	46	40	44.4	-2.1	59	23	24	1	54	0.57	-1.53	0.70	0	3	11	e.	C. G. McDaniel.
Atascadero.....	San Luis Obispo.....	837	3	43.0	.....	73	28	11	1	41	0.95	-2.96	0.91	0	2	22	n.	Colony Holding Corp.
Azusa.....	Los Angeles.....	30	17	58.0	-5.0	84	26	29	1	41	0.95	-2.96	0.91	0	2	22	w.	C. C. Hillis.
Bakersfield.....	Kern.....	404	30	43.8	-3.6	73	24	23	1	42	0.18	-1.53	0.10	0	2	23	n.	Santa Fe Co.
Barstow.....	San Bernardino.....	2,105	16	42.2	-5.6	65	25	15	1	40	0.10	-0.52	0.10	0	1	29	w.	E. L. White.
Berkeley.....	Alameda.....	317	32	51.0	+3.5	67	30	30	1	25	2.09	-3.29	1.27	0	7	20	ne.	State University.
Betteravia.....	Santa Barbara.....	155	6	50.2	.....	70	10	26	1	22	0.54	0.53	0.58	0	2	28	2	Union Sugar Co.
Blue Canon.....	Placer.....	4,695	20	39.1	+0.8	56	7	18	1	23	3.75	-12.82	1.00	21.0	9	11	12	Southern Pacific Co.
Blythe.....	Riverside.....	268	10	51.5	.....	73	24	19	1	48	0.35	0.35	0.23	0	1	26	2	C. L. Suits.
Bonita.....	San Diego.....	110	3	53.4	.....	80	23	24	1	40	0.25	0.25	0.23	0	2	19	3	R. M. Allen.
Branscomb.....	Mendocino.....	2,000	19	48.2	+5.3	72	44	26	1	41	21.24	+2.08	6.00	0	9	17	13	A. J. Haun.
Brawley.....	Imperial.....	-105	9	52.8	.....	79	22	23	1	46	0.10	0.10	0.08	0	1	26	1	M. D. Witter.
Calexico.....	Imperial.....	0	14	51.6	-2.1	82	23	21	1	44	0.08	-0.20	0.08	0	1	24	4	H. M. Rouse.
Camptonville (near).....	Yuba.....	3,500	12	42.0	.....	65	43	22	1	32	6.62	2.65	T.	10	15	3	13	Pacific Gas & Electric Co.
Chico.....	Butte.....	189	49	45.8	-1.1	67	9	19	2	42	3.38	-1.82	0.75	0	8	18	11	U. S. Bureau Plant Ind.
Claremont.....	Los Angeles.....	1,200	27	54.4	+3.4	82	23	26	2	41	0.83	-3.09	0.22	0	2	24	2	Prof. F. P. Brackett.
Cloverdale.....	Sonoma.....	340	17	47.8	+0.4	69	29	22	3	40	6.41	-5.42	1.45	0	11	18	12	John O. Ozle.
Colfax.....	Placer.....	2,421	48	47.6	+3.2	70	55	22	1	38	4.25	-5.76	2.52	0	6	19	2	Southern Pacific Co.
Corona.....	Riverside.....	615	5	55.0	.....	79	22	24	1	38	0.48	0.39	0.32	0	3	21	4	T. C. Sias.
Crescent City.....	Del Norte.....	125	5	47.3	+0.5	66	22	26	3	28	16.92	+5.24	3.26	0	16	13	2	ne.
Davis.....	Yolo.....	51	47	44.4	-3.2	62	18	19	1	39	2.49	-1.64	1.18	0	7	21	3	Thos. E. Peacock.
Downieville.....	Sierra.....	3,150	28	39.6	.....	67	3	15	1	40	5.75	3.5	8	0	16	7	8	S. H. Beckett.
Durham.....	Butte.....	160	24	48.6	+3.3	72	1	19	1	58	3.00	-3.17	1.47	0	6	21	3	J. T. Mason.
El Cajon.....	San Diego.....	482	20	53.8	+0.5	84	23	24	15	51	0.33	-2.10	0.38	0	1	25	4	R. W. Durham.
Elsinore.....	Riverside.....	1,300	3	53.2	.....	83	24	22	1	48	0.11	0.11	0.09	0	1	16	11	Eugene P. Kessler.
Escendido.....	San Diego.....	657	25	53.4	+3.9	80	23	24	1	45	0.19	-3.67	0.12	0	3	23	5	W. L. Wilhite.
EUREKA.....	Humboldt.....	64	33	49.0	+2.1	70	9	31	1	24	7.84	+0.21	3.37	0	17	9	6	H. L. Harlow.
Folsom.....	Sacramento.....	252	46	48.0	+0.9	68	22	26	1	30	2.20	-3.22	1.35	0	6	20	2	U. S. Weather Bureau.
Fontana.....	San Bernardino.....	1,325	7	56.2	.....	79	23	25	1	38	0.69	0.50	0.50	0	1	26	2	G. I. Marvin.
Fort Bidwell.....	Modoc.....	4,375	20	26.9	-2.9	53	22	9	1	30	1.51	-2.55	4.8	0	5	19	8	Fontana Land Co.
FRESNO.....	Fresno.....	293	32	48.2	+2.8	66	15	26	1	34	0.40	-1.20	0.36	0	9	18	2	C. R. Deacon.
Grass Valley.....	Nevada.....	2,690	47	45.8	.....	68	4	22	1	32	5.54	-5.88	1.99	0	9	18	2	U. S. Weather Bureau.
Greenland Ranch.....	Inyo.....	-178	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	11	se.	Mrs. L. M. Wentworth.	
Halford.....	Kings.....	249	19	45.5	-0.9	66	10	20	1	38	0.39	-1.62	0.18	0	3	19	0	O. A. Denton.
Healdsburg.....	Sonoma.....	110	26	46.0	0	71	26	23	2	39	6.50	-3.55	1.69	0	10	13	2	Santa Fe Co.
Hollister.....	San Benito.....	284	45	45.6	-3.2	67	29	20	1	40	0.64	-2.07	0.51	0	4	20	4	Dr. F. J. Kinley.
INDEPENDENCE.....	Inyo.....	3,957	23	42.0	+1.5	66	22	16	1	37	0.00	-0.91	0.00	0	0	19	8	Grangers' Union.
Indio.....	Riverside.....	-20	41	53.8	+0.9	87	22	18	2	48	0.10	-0.66	0.10	0	1	22	5	U. S. Weather Bureau.
Inskip.....	Shasta.....	4,975	12	40.0	.....	60	14	22	1	20	11.56	2.25	27.0	12	1	15	sw.	U. S. Bureau Plant Ind.
Kennett.....	Monterey.....	730	7	47.7	.....	73	4	27	2	40	10.41	2.60	0	13	11	5	A. J. Reef.	
King City.....	Plumas.....	333	32	50.4	+2.5	85	12	18	1	45	0.19	-2.06	0.34	0	1	19	5	Southern Pacific Co.
La Porte.....	Tulare.....	5,000	25	30.7	-2.8	60	5	12	31	41	7.21	-10.59	1.56	32.2	11	19	3	C. W. Hendel.
Lemon Cove.....	Santa Clara.....	600	24	47.0	-1.4	66	11	25	1	30	2.20	-3.22	0.43	0	1	20	2	T. E. Bence.
Lick Observatory.....	Tulare.....	4,209	30	44.8	+4.9	60	14	26	1	20	1.74	-3.82	0.78	0	8	18	6	The Director.
Lindsay.....	Plumas.....	384	45	46.5	.....	70	17	21	2	43	0.35	0.27	0.24	0	2	16	9	Basil Prior.
Lone Pine.....	Inyo.....	3,728	14	41.0	+1.3	64	18	6	1	49	0.49	-0.95	T.	0	0	25	6	G. F. Marsh.
Los ANGELES.....	Los Angeles.....	293	42	60.2	+5.9	79	24	36	2	34	0.96	-1.88	0.87	0	4	19	5	U. S. Weather Bureau.
McCloud.....	Siskiyou.....	3,270	27	36.1	.....	61	15	10	1	41	9.29	1.92	10.0	14	2	15	sw.	McCloud River Lbr. Co.
Madelaine.....	Lassen.....	5,270	10	25.6	.....	51	28	-11	1	50	0.57	0.35	7.0	4	14	6	J. H. Williams.	
Marysville.....	Riverside.....	67	48	44.8	-3.6	62	23	21	1	36	2.84	-1.35	1.18	0	7	19	9	Southern Pacific Co.
Mecca.....	Merced.....	-185	13	52.8	+0.7	78	26	21	1	47	T.	-1.03	T.	0	0	18	4	E. A. Palmer.
MERCED.....	Merced.....	173	45	44.2	-2.8	64	10	20	1	38	0.59	-1.63	0.55	0	3	18	1	Santa Fe Co.
MOUNT TAMALPAIS.....	Marin.....	2,375	20	46.3	+0.4	62	28	30	31	22	3.54	-2.41	2.20	0	10	14	9	U. S. Weather Bureau.
Mount Wilson.....	Los Angeles.....	5,704	24	45.8	.....	66	23	20	1	21	1.12	-2.09	0.57	0	6	16	5	Wendell F. Hoge.
Napa.....	Napa.....	20	42	39.6	-7.3	58	6	22	2	29	3.75	-1.39	1.31	0	2	18	9	State Hospital.
Needles.....	San Bernardino.....	477	27	51.4	-1.4	73	23	23	1	37	0.18	-0.27	0.18	0	1	18	3	Santa Fe Co.
Nevada City.....	Nevada.....	2,850	27	42.1	+0.6	74	4	10	1	51	5.31	-2.87	0.49	0	3	27	2	B. H. Preston.
Newman.....	Stanislaus.....	91	30	43.6	-4.1	64	17	19	1	39	0.28	-0.82	0.28	0	1	20	6	E. S. Wangenheim.
Oakland.....	Alameda.....	36	43	49.6	+2.0	61	30	32	1	18	2.13	-2.92	1.12	0	7	20	4	Chabot Observatory.
Orland.....	Glenn.....	254	37	45.7	-1.9	66	7	23	2	40	1.82	-2.09	0.57	0	6	16	5	U. S. Rec. Service.
Oroville (near).....	Butte.....	250	35	46.5	-0.3	64	29	21	1	35	3.05	-3.17	0.93	0	7	25	6	E. D. Fairchild.
Pasadena.....	Los Angeles.....	1,085	29	54.1	+1.4	81	23	25	1	44	1.34	-2.79	1.22	0	2	22	7	R. P. Hamlin.
Paso Robles.....	San Luis Obispo.....	800	32	45.0	-0.4	74	29	16	1	51	0.61	-2.87	0.49	0	3	27	2	E. J. Nye.
Petaluma.....	Sonoma.....	9	5	43.4	.....	66	26	18	1	38	2.78	-1.45	1.70	0	10	14	11	John Landis.
Placerville.....	El Dorado.....	1,925	30	43.6	+2.0	73	8	16	1	49	3.86	-4.87	1.87	T.	5	19	12	O. E. Bailey.
PONIT REYES.....	Marin.....	490	27	51.5	+2.0	68	8	40	1	21	2.78	-2.24	1.32	0	11	16	10	U. S. Weather Bureau.
Pomona.....	Los Angeles.....	857	5	51.4	.....	80	23	24	1	51	0.48	-0.42	0.25	0	2	18	5	J. E. Adamson.
Porterville.....	Plumas.....	464	30	47.0	-1.0	67	10	25	2	37	0.25	-1.60	0.20	0	2	22	5	Leslie McAuliffe.
Portola.....	Plumas.....	4,832	4	33.0	.....	60	19	-4	1	49	0.66	-0.50	0.30	0	5	25	6	Western Pacific Co.
RED BLUFF.....	Teheana.....	307	42	47.0	+1.6	70	4	24	1	40	2.74	-1.20						

Daily Precipitation for January, 1919.

Stations.	Watersheds.	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	31								
Alturas.....	Sacramento.....										.08	.13	.03					.08		.11	.08	.07		.05									.02	0.57						
Antioch.....	San Joaquin.....										.08	.07						.18			.70														.06	0.96				
Atascadero.....	Coast.....											.07																								.05	0.57			
Azusa ***.....	do.....											.1																									.91	0.95		
Bakersfield ***.....	San Joaquin.....											.08	.10																								.18	0.18		
Barstow.....	Desert.....											.23	.04							.18	.01	.01	.27	.35		T.	T.										.10	0.10		
Berkeley.....	Coast.....																																					.20	2.09	
Bettaravia.....	do.....												.20	.30						.20	.50	.25		1.00		.60		.50									.01	0.54		
Blue Canon ***.....	Sacramento.....																																					.20	3.75	
Blythe ***.....	Colorado.....																																						.35	0.35
Bonita.....	Coast.....																																						.23	0.25
Branscomb.....	do.....																																						.21	2.24
Brawley ***.....	Imperial Valley.....																																						.10	0.10
Calexico ***.....	Imperial Valley.....																																						.08	0.08
Camptonville.....	San Joaquin.....																																						.62	6.62
Chico.....	Sacramento.....																																						.33	3.38
Claremont ***.....	Coast.....																																						.75	0.83
Cloverdale.....	do.....																																						.64	6.41
Colfax ***.....	Sacramento.....																																						.42	4.25
Corona.....	Coast.....																																						.39	0.48
Crescent City.....	do.....																																						.16	16.92
Davis.....	Sacramento.....																																						.57	5.75
Downieville.....	do.....																																						.30	3.00
Durham.....	do.....																																						.33	3.33
El Cajon.....	Coast.....																																						.75	0.83
Elsinore ***.....	do.....																																						.12	12.19
Escondido.....	do.....																																						.74	7.84
EUREKA ***.....	do.....																																						.20	2.20
Folsom ***.....	Sacramento.....																																						.50	0.69
Fontana.....	Coast.....																																						.02	1.51
Fort Bidwell.....	Mountain Lakes.....																																						.02	0.40
FRESNO***.....	San Joaquin.....																																						.54	5.54
Grass Valley.....	Sacramento.....																																						.34	3.44
Greenland Ranch.....	Desert.....																																						.05	0.39
Hanford ***.....	San Joaquin.....																																						.05	0.50
Healdsburg ***.....	Coast.....																																						.05	0.50
Hollister ***.....	do.....																																						.06	0.64
INDEPENDENCE***.....	Owens.....																																						.00	0.00
Indio.....	Coachella Val.....																																						.10	10.10
Inskip.....	Sacramento.....																																						.98	11.56
Kennett.....	do.....																																						.80	10.41
King City.....	Coast.....																																						.34	3.44
La Porte.....	Sacramento.....																																						.21	2.21
Lemon Cove ***.....	San Joaquin.....																																						.43	4.33
Lick Observatory.....	Coast.....																																						.17	1.74
Lindsay.....	San Joaquin.....																																						.35	0.35
Lone Pine ***.....	Coast.....																																						.08	0.96
LOS ANGELES***.....	Coast.....																																						.92	9.29
McCloud.....	Sacramento.....																																						.57	5.57
Madelaine.....	Mountain Lakes.....																																						.05	2.84
Marysville ***.....	Sacramento.....																																						.05	0.59
Mecca.....	Coachella Val.....																																						.54	3.54
Merced ***.....	San Joaquin.....																																						.81	1.12
MT. TAMALPAIS***.....	Coast.....																																						.47	3.75
Mount Wilson.....	do.....																																						.18	1.88
Napa.....	do.....				</td																																			

Daily Temperature for January, 1919.

Stations.	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	31	Mean.	
Bakersfield.....	48	37	40	40	48	47	50	54	60	50	59	50	61	46	71	56	55	67	56	48	66	50	50	73	48	61	48	59	71	62	59	54.5	
	27	23	23	24	25	27	28	30	32	43	48	36	39	28	37	40	32	32	36	41	38	34	36	44	34	31	30	28	29	31	43	33.2	
Calexico	56	59	59	65	59	59	59	65	69	55.2
	24	25	27	29	32	29	30	30	31	41	37	38	35	32	29	28	32	35	34	36	45	44	48	35	37	41	41	36	41	41	44	35.2	
Chico	48	54	52	58	55	59	60	62	67	55	56	57	57	55	50	55	52	55	55	54	58	58	60	58	54	63	62	60	65	65	57.5		
	21	19	23	24	24	27	28	27	25	30	43	45	45	45	30	40	40	45	47	37	48	46	43	43	34	30	30	33	33	30	34.0		
Escondido	57	62	72	77	76	72	75	76	74	70	67	65	73	70	71	69	72	73	61	56	67	76	80	75	65	75	76	71	75	77.0			
	24	24	25	35	36	32	30	45	45	48	33	34	35	45	31	31	32	34	34	45	44	45	40	35	40	33	37	43	44	36	42	36.7	
Eureka.....	47	48	44	43	44	50	60	63	70	55	52	55	54	59	56	59	60	62	58	53	60	65	55	49	55	56	58	53	48	54	55.2		
	31	31	37	32	37	38	38	39	45	44	44	46	41	45	51	55	55	56	55	45	45	45	43	39	41	48	40	36	37	40	42.8		
Fresno	48	50	54	56	56	56	62	63	65	65	59	54	59	60	66	64	65	63	62	60	59	53	59	62	64	60	59	59	63	60	59.9		
	26	29	30	28	34	34	32	33	35	48	39	32	40	37	41	45	42	35	40	45	39	39	40	37	37	31	33	38	37	31	33.6		
Independence	40	54	63	58	56	58	58	54	58	55	50	55	49	45	46	57	61	59	57	60	66	62	61	56	62	63	60	57	55	51	56.3		
	16	17	32	36	28	22	31	25	23	36	29	23	27	21	23	28	25	36	27	36	30	30	28	29	35	32	30	25	23	31	27.8		
Los Angeles.....	57	59	70	77	79	74	78	76	77	69	67	74	72	71	69	69	69	59	60	67	75	77	79	70	72	77	78	76	68	57	70.9		
	37	36	41	43	55	52	51	55	58	57	51	47	49	44	49	47	46	49	53	51	47	51	55	51	49	49	52	52	56	48	49.5		
Merced.....	47	50	54	56	56	56	59	59	57	64	58	60	59	51	49	58	61	62	61	63	62	64	62	62	63	62	65	62	63	60	58.0		
	20	23	23	22	26	26	27	27	27	28	41	27	28	28	26	35	34	33	37	42	35	34	36	37	35	35	33	32	38	30	30.5		
Mount Tamalpais	42	46	54	61	58	57	54	58	54	48	45	48	45	49	47	47	47	47	47	45	47	47	45	47	45	49	54	57	62	51	51.7		
	31	34	38	42	49	42	44	47	44	39	37	40	40	40	42	41	41	41	45	49	40	41	47	37	37	39	43	44	43	46	45	40.9	
Oakland.....	48	47	53	56	57	56	59	59	57	58	53	56	53	52	57	58	57	53	53	55	57	59	51	55	53	60	58	59	58	61	55.7		
	32	34	35	39	40	41	45	45	46	52	45	45	41	50	49	44	48	50	47	45	47	40	43	45	44	42	52	52	53	54	43.5		
Orland	51	50	60	65	67	60	66	62	66	56	56	58	53	53	53	52	52	50	53	53	55	56	59	61	52	59	62	62	54	56.4			
	25	25	25	25	25	27	31	32	34	41	37	38	33	38	41	44	42	43	42	43	42	43	47	37	36	33	32	30	32	35	35.0		
Oroville.....	56	60	55	56	58	60	61	63	55	56	56	57	55	50	56	55	54	51	53	55	55	60	60	57	62	60	62	64	64	61	57.6		
	21	26	23	20	29	30	25	30	30	43	44	48	29	29	41	45	47	47	48	45	45	41	34	30	37	33	32	34	31	36	35.4		
Paso Robles	49	49	53	57	66	64	64	70	68	69	61	58	62	55	66	68	62	69	63	61	67	62	61	60	62	74	74	70	70	68	62.2		
	16	18	20	21	29	20	20	22	23	39	41	28	28	23	29	35	27	26	31	44	33	30	41	35	32	29	24	23	27	34	27.9		
Point Reyes	51	54	54	54	54	54	65	68	63	64	55	52	53	52	52	52	52	53	53	54	60	60	52	52	52	52	52	52	53	54	56.1		
	40	45	48	44	45	44	44	47	53	50	47	46	46	45	49	49	48	48	47	45	50	50	46	46	46	48	54	51	46	49	46.9		
Pomona.....	56	59	70	75	73	77	78	73	69	71	68	72	70	72	67	73	73	61	68	69	78	80	78	70	74	78	72	70	75	70.6			
	24	25	25	28	30	26	26	26	35	44	38	31	29	27	32	29	45	46	37	35	33	31	41	21	31	32	32	42	32.2				
Porterville	48	53	52	53	53	60	64	65	60	67	64	65	67	63	65	65	63	63	65	67	65	67	64	63	61	65	57	58	61	60.5			
	26	25	26	26	27	28	29	28	32	45	45	45	35	33	33	32	40	37	35	38	34	35	36	39	38	32	31	32	33	33.5			
Red Bluff.....	52	54	69	70	58	64	70	66	55	47	51	50	54	45	48	52	52	52	51	56	55	59	51	61	67	64	63	63	57	53.3			
	24	25	30	30	27	29	28	32	34	40	40	40	40	34	33	42	45	45	43	48	46	45	45	33	34	42	37	34	33	33	36.8		
Redlands.....	54	58	66	73	73	74	75	73	68	64	66	68	65	68	63	71	66	73	74	57	52	70	80	80	77	77	74	72	73	68.9			
	27	25	32	35	35	35	36	33	36	48	43	37	36	31	34	39	36	31	41	39	36	46	41	41	45	37	33	39	34	40	37.5		
Sacramento.....	52	49	51	53	47	58	57	60	52	53	58	56	48	47	56	56	51	52	53	56	58	60	56	56	58	58	53	55	52	56.2			
	24	29	30	27	30	33	33	34	34	42	41	42	35	31	42	46	44	38	47	44	42	41	43	40	36	39	40	34	37	36.1			
San Bernardino	54	61	67	74	75	76	77	73	72	68	71	71	69	71	73	70	75	77	61	54	70	79	83	83	70	75	79	76	79	71.1			
	22	24	34	40	33	27	30	30	33	42	38	34	33	38	26	31	35	40	47	41	42	36	36	38	35	39	33	35	35	36.0			
San Diego.....	58	58	71	71	70	66	68	76	77	63	61	65	66	67	64	61	62	68	69	65	69	75	75	69	67	65	67	65	65	66.5			
	35	35	41	45	49	45	45	48	45	52	50	46	46	45	44	46	45	44	46	53	52	47	45	40	45	50	46	50	54	46.7			
San Francisco	51	49	55	56	57	57	60	61	56	50	57	54	56	54	60	59	57	57	54	60	62	60	57	62	62	63	62	58	50	58.0			
	37	38	39	40	41	43	43	45	45	47	46	44	41	43	49	48	46	45	46	46	47	44	46	46	44	47	44	46	45	44.5			
San Jose	52	52	56	62	61	59	65	62	56	55	58	59	60	60	66	62	64	65	63	65	66	64	65	66	63	64	66	64	65	66	60.7		
	22	25	24	26	27	28	29	33	46	37	36	32	36	46	44	38	42	47	39	40	32	34	36	34	32	33	33	34	35	34.5			
San Luis Obispo	53	59	65	73	73	73	74	77	64	67	64	62	71	66	68	68	64	62	65	67	66	62	66	65	67	67	65	67	67.2				
	28	27	29	34	37	31	30	32	38	49	48	46	44	33	37	41	41	43	48	45	47	52	45	48	47	44	44	43	39	39.9			

SUPPLEMENTAL PRECIPITATION TABLE.

Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.
Abbotts.....	Coast.....	0.84	Dobbins (near).....	Sacramento.....	4.47	Livermore.....	Coast.....	0.15	Reedley.....	San Joaquin.....	0.40
Aguanga.....	do.....	0.05	Dodgeland.....	do.....	2.85	Llano.....	do.....	0.63	Represa.....	Sacramento.....	2.18
Angiola.....	San Joaquin.....	0.42	Dudley.....	San Joaquin.....	0.00	Lompoc.....	do.....	0.63	Rio Vista.....	do.....	1.18
Antelope Valley.....	do.....	0.00	Dudleys.....	do.....	1.73	Lordsburg.....	do.....	0.46	Rosamond.....	Desert.....	14.82
Arrowhead Springs.....	Coast.....	0.00	East Park.....	Sacramento.....	2.04	Los Alamos.....	do.....	0.46	Ruth.....	Coast.....	0.75
Auburn.....	Sacramento.....	3.65	Edison.....	San Joaquin.....	0.93	Los Gatos.....	do.....	2.48	San Miguel Island.....	Ocean.....	1.33
Avalon.....	Ocean.....	do.....	Electra.....	do.....	1.77	Lytle Creek.....	do.....	1.20	San Pedro.....	Coast.....	1.46
Bagdad.....	Desert.....	0.06	Emigrant Gap.....	Sacramento.....	3.35	Maricopa.....	San Joaquin.....	T.	Santa Ana River.....	do.....	1.18
Barrett Dam.....	Coast.....	0.36	Fairmont.....	Coast.....	0.17	Marietta.....	do.....	1.38	Santa Clara.....	do.....	1.18
Beaumont.....	do.....	0.71	Firebaugh.....	San Joaquin.....	0.25	Melones.....	do.....	1.73	Santa Maria.....	do.....	0.68
Beaumont (near).....	do.....	0.31	Fordyce Dam.....	Sacramento.....	4.80	Merced Falls.....	do.....	1.05	Santa Monica.....	do.....	1.15
Bellota.....	San Joaquin.....	1.31	Fort Bragg.....	Coast.....	9.29	Mesa Grande.....	Coast.....	0.20	Seven Oaks.....	do.....	0.13
Big Bar.....	Sacramento.....	10.17	Fort Ross.....	do.....	11.47	Middlewater.....	San Joaquin.....	T.	Shively.....	do.....	10.15
Big Sur.....	Coast.....	1.98	Friant.....	San Joaquin.....	do.....	Mill Creek-1.....	do.....	2.72	Sierra Madre.....	do.....	1.08
Bishop.....	Owens.....	do.....	Georgetown.....	Sacramento.....	4.48	Mill Creek-2.....	Coast.....	0.56	Siserville.....	Mountain Lakes.....	0.90
Bishop Creek.....	do.....	0.04	Glenville.....	San Joaquin.....	0.44	Milo.....	do.....	1.50	Sonora.....	San Joaquin.....	1.67
Cahuilla.....	Coast.....	do.....	Goffs.....	Desert.....	0.89	Milton (near).....	do.....	1.30	Springville (near).....	do.....	1.84
Calaveras R. S.....	San Joaquin.....	2.09	Gold Run.....	Sacramento.....	3.00	Mokelumne Hill.....	do.....	1.69	Standish.....	Mountain Lakes.....	0.28
Campbell.....	Coast.....	1.29	Gray Mountain.....	Desert.....	T.	Monroeville.....	Sacramento.....	2.29	Stanwood.....	Coast.....	7.98
Campo.....	do.....	0.75	Happy Camp.....	Klamath.....	10.71	Montague.....	Klamath.....	1.48	Stephenson Creek.....	San Joaquin.....	0.12
Canon Dam.....	Sacramento.....	4.72	Hayfork.....	Coast.....	6.66	Montgomery Creek.....	Sacramento.....	10.30	Storey.....	do.....	T.
Cascada.....	San Joaquin.....	1.23	Head Dam.....	Sacramento.....	5.07	Nellie.....	Coast.....	0.54	Tahoe.....	Mountain Lakes.....	2.15
Cedarville.....	Mountain Lakes.....	0.42	Helen Mine.....	Coast.....	12.51	Nicolaus.....	Sacramento.....	2.72	Tamarack.....	Sacramento.....	2.21
Centerville.....	Sacramento.....	5.03	Hetch Hetchy.....	San Joaquin.....	1.44	Niles.....	Coast.....	1.33	Tejon Rancho.....	San Joaquin.....	0.35
Chester.....	do.....	3.94	Hullville (near).....	Coast.....	13.02	North Bloomfield.....	Sacramento.....	4.66	Three Rivers.....	do.....	0.53
China Flat.....	Coast.....	8.95	Huntington Lake.....	San Joaquin.....	1.96	North Fork.....	San Joaquin.....	1.65	Truckee.....	Sacramento.....	5.31
Chula Vista.....	do.....	0.61	Idria.....	do.....	0.31	North Lakeport.....	Coast.....	4.45	Twin Lakes.....	Mountain Lakes.....	1.70
Churn Creek.....	Sacramento.....	3.39	Indio.....	Desert.....	0.10	Oakdale (near).....	San Joaquin.....	0.83	Tustin (near).....	Coast.....	0.51
Clovis.....	San Joaquin.....	1.00	Jolon.....	Coast.....	0.45	Oak Grove.....	Coast.....	1.00	Twin Valley.....	Mountain Lakes.....	0.95
Coalinga.....	do.....	do.....	Julian.....	do.....	0.46	Oceanside.....	do.....	0.86	Upper Mattole.....	Sacramento.....	9.05
Colgate.....	Sacramento.....	3.67	Kennedy Mine.....	San Joaquin.....	1.89	Ojai Valley.....	do.....	1.58	Coast.....	do.....	22.92
Colusa.....	do.....	2.04	Kentfield.....	Coast.....	6.72	Orleans.....	Klamath.....	9.54	Visalia.....	San Joaquin.....	0.34
Covelo.....	Coast.....	do.....	Kernville.....	San Joaquin.....	0.28	Ozona.....	Coast.....	0.80	Walnut Creek.....	Coast.....	1.74
Crockett.....	do.....	1.44	Knights Landing.....	Sacramento.....	2.74	Parkfield.....	do.....	0.49	Warner Springs.....	do.....	0.19
Cuyamaca.....	do.....	0.67	La Jolla.....	Coast.....	0.54	Pattitway.....	San Joaquin.....	T.	Wasco.....	San Joaquin.....	0.25
Deer Creek.....	Sacramento.....	5.88	Lake Eleanor.....	San Joaquin.....	1.52	Peachland.....	Coast.....	6.50	Wasjoria.....	Coast.....	0.48
Del Monte.....	Coast.....	1.45	Lake Spaulding.....	Sacramento.....	5.35	Piedra.....	San Joaquin.....	0.73	West Branch.....	Sacramento.....	10.02
Denair.....	San Joaquin.....	0.79	Las Plumas.....	do.....	5.03	Point Loma.....	Coast.....	0.30	West Point.....	San Joaquin.....	2.25
De Sabla.....	Sacramento.....	9.53	Lathrop.....	San Joaquin.....	0.59	Priest Valley.....	do.....	0.78	Wrights.....	Coast.....	3.86
Dinuba.....	San Joaquin.....	1.07	Le Grand.....	do.....	1.40	Quincy.....	Sacramento.....	4.00	Yorba Linda.....	do.....	1.39

SNOWFALL IN THE MOUNTAINS.

On January 1st there was little snow in the mountains of California, except in the higher portions of the Sierra Nevada, where the amount on the ground was about 25 per cent of the normal for that time of the year. The greatest amount at any of the 300 stations from which reports were received was 32 inches, at Tamarack, Alpine County, altitude 8,000 feet.

As in the preceding month, the precipitation during January was deficient throughout California, and the snowfall in the mountains was relatively light. The snowfall was below normal at all stations, and the average for the State as a whole was less than 25 per cent of the normal January amount. The greatest snowfall reported was 48 inches, which occurred at Summit, Placer County, altitude 7,017 feet.

While no snow fell during the first decade of January, that which was on the ground melted very slowly because of the abnormally low temperatures which prevailed. Light snow fell in the high Sierras on the 11th and 12th. The period from the 16th to the 23d was one of unsettled weather. The higher portions of the Coast Ranges and the mountains of southern California were snow-covered on several occasions during this period. Moderately heavy snow fell above the 5,000-foot level of the Sierra Nevada on the 19th and 20th, when precipitation was general throughout central and northern California. No snow fell between the 24th and 30th, but clouded skies and low temperatures prevented that on the ground from disappearing. On the last day of the month light snow fell in the Sierras, and moderately heavy snow fell in the mountains of southern California. This marked the beginning of a series of storms which continued into February, and gave heavy precipitation throughout the State, with abundant snowfall in the mountains. At the close of January, however, there was a marked deficiency in the amount of snow at all mountain stations. The greatest reported was 44 inches, at Fordyce Dam, Nevada County, altitude 6,500 feet. Densely packed snow of the kind which usually forms the principal source of summer water supply for irrigation and for hydroelectric power was everywhere deficient up to the 30th, but the storms which began on the last day of January and continued into February brought sufficient snow to greatly alleviate the danger of a water shortage during the coming summer.

A. H. P.

COMPARATIVE SNOWFALL DATA FOR JANUARY.

(Amount on the Ground.)

	FORDYCE DAM.			SUMMIT.			TAMARACK.		
	1st.	15th.	End of mo.	1st.	15th.	End of mo.	1st.	15th.	End of mo.
1907.....	58	106	94	45	142	148	125	175	180
1908.....	69	63	68	87	72	87	75	94	104
1909.....	25	68	107	28	90	172	35	150	190
1910.....	60	78	67	54	87	68	72	96	106
1911.....	0	99	124	4	136	218	24	130	310
1912.....	49	39	59	60	46	41	44	50	55
1913.....	28	73	78	17	79	88	40	98	118
1914.....	63	95	107	80	132	192	116	178	274
1915.....	30	59	67	24	56	80	26	50	116
1916.....	54	140	161	44	178	215	62	158	203
1917.....	37	68	73	79	74	85	87	82	65
1918.....	0	15	8	0	26	2	8	25	20
1919.....	22	24	44	16	10	42	90	22	35

T. means trace.

Snowfall Data. [In inches.]

WATERSHED, COUNTY, STATION.	Eleva- tion, feet.	Total snow- fall.	Compr'd with normal.	Am't on ground 15th.	Am't on ground end mo.
Klamath Watershed.					
Siskiyou County. Yreka.....	2,625	0	.....	0	0
Trinity County. Hayfork.....	2,300	T. 2	.....	0	0
Ruth.....	2,925	0	.....	0	0
Weaverville.....	2,162	0	.....	0	0
Mountain Lakes.					
Modoc County. Alturas.....	4,400	3	-11	1	T.
Cedaryville.....	4,675	2	-13	0	2
Fort Bidwell.....	4,375	5	.....	2	T.
Lassen County. Eagle Lake.....	5,000	8	-45	1	0
Madeline.....	5,270	7	-15	5	T.
Nevada County. Grass Valley.....	2,690	0	.....	0	0
Nevada City.....	2,850	0	-9	0	0
North Bloomfield.....	3,214	0	-15	0	0
Truckee.....	5,817	17	.....	3	3
Placer County. Gold Run.....	3,222	T. 23	-23	0	0
Tahoe.....	6,230	23	.....	12	23
Inyo County. Bishop.....	4,450	.....	.....	3	1
Bishop Creek.....	8,390	1	-51	0	0
Lone Pine.....	3,728	0	.....	0	0
Wells Meadow.....	5,280	.....	.....	.....	.....
Sacramento Watershed.					
Siskiyou County. McCloud.....	3,270	10	-52	3	0
Sisson.....	3,555	24	-13	7	0
Plumas County. Bucks.....	5,515	23	-102	24	39
Cañon Dam.....	4,570	17	.....	10	19
Chester.....	4,550	22	-62	7	17
Clover Valley.....	5,700	12	-42	5	5
La Porte.....	5,000	32	-31	5	18
Portola.....	4,832	13	.....	0	5
Quincy.....	3,400	2	-27	0	0
Butte County. De Sable.....	2,500	0	-18	0	0
Inskip.....	4,975	27	-51	13	20
West Branch.....	3,216	0	-46	0	0
Yuba County. Camptownville.....	3,500	T.	-32	0	0
Sierra County. Downieville.....	3,150	4	-31	0	0
Sieraville.....	5,000	4	-46	0	0
Nevada County. Deer Creek.....	3,700	5	-49	0	0
Fordyce Dam.....	6,500	39	-59	24	44
Lake Spaulding.....	4,600	28	-30	6	11
Placer County. Blue Canon.....	4,695	21	-33	4	8
Emigrant Gap.....	5,230	25	-29	3	T.
Summit.....	7,017	48	-31	10	42
San Joaquin Watershed.					
Alpine County. Tamarack.....	8,000	28	.....	22	35
Twin Lakes.....	7,970	.....	.....	.....	.....
Tuolumne County. Hetch Hetchy.....	3,665	4	.....	0	1
Lake Eleanor.....	4,700	8	-48	T.	1
Kern County. Glenville.....	8,300	0	-4	0	0
Mariposa County. Yosemite.....	8,945	4	-35	T.	T.
Fresno County. Camp Seven.....	6,980	8	.....	17	20
Cascada.....	4,900	6	.....	0	4
Hume.....	5,300	5	.....	0	0
Huntington Lake.....	6,950	19	.....	14	21
Stevenson Creek.....	4,250	1	.....	0	0
Tulare County. Hot Springs.....	8,800	0	-2	0	0
Springville.....	4,000	0	-15	0	0
Mountains of Southern California.					
Cuyamaca.....	4,677	3	-5	0	0
Julian.....	4,222	0	.....	T.	5
Mount Wilson.....	5,704	7	.....	0	T.
Nellie.....	5,850	T.	.....	0	0
Seven Oaks.....	5,000	T.	-14	0	0
Squirrel Inn.....	5,280	2	-7	0	2