

JANUARY, 1920.

## CLIMATOLOGICAL DATA: CALIFORNIA SECTION.

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U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

## CALIFORNIA SECTION.

EDWARD A. BEALS, District Forecaster.

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## GENERAL SUMMARY.

The driest January on record in California was that of 1920. At some stations where records of 70 years are available, no January has brought less precipitation. The average rainfall for the State as a whole, based upon the records of 241 stations, was 0.85 inch, or 16 per cent of the normal. It was the fourth consecutive month with deficient precipitation. At the close of January the accumulated seasonal precipitation was about 40 per cent of the normal in northern and central California, and about 50 per cent of the normal in southern California. Snowfall in the mountains was markedly deficient, and at all elevated stations from which reports were received there was less snow on the ground at the close of January than at the close of the preceding month, an extraordinary condition.

Because of the absence of storms, there was much more sunshine received than is usual during January. The days were warm and the nights cold. During a hot spell which occurred about the middle of the month the maximum temperature records for January were broken at several stations in northern California, while temperatures above 90° were recorded in the southern part of the State. As far as personal comfort was concerned, it was a pleasant month. The wind movement was light. Creek beds in many places were dry for the first time during a month of January. Even the largest streams maintained extremely low stages for a month which usually marks the middle of the rainy season.

The outstanding feature of the weather of the month from an agricultural viewpoint was the deficient precipitation. Because of the prolonged drought ranges deteriorated, stock had to be fed, and arrangements were made to ship some cattle to the neighboring states for pasturage. Some orchards had to be irrigated in order to save the trees, an almost unprecedented condition for January. The drought in southern, and frozen ground in northern counties retarded plowing and seeding, but all other farm, orchard and vineyard work progressed. Winter growing grains showed slight growth. Though frost caused some slight injury to citrus fruit in the San Joaquin Valley, there was little or no damage from low temperatures elsewhere. The spring-like weather of the middle and latter portions of the month brought out almond blossoms in profusion. At the close of the month there was everywhere urgent need of more moisture. The deficiency of densely packed snow in the mountains indicated that there would be a serious shortage of water for irrigation and hydroelectric power purposes during the coming summer.

A. H. P.

## PRESSURE.

The mean sea level pressure, determined from the records of twelve regular Weather Bureau stations, was 30.12 inches. The highest was 30.49 inches at Eureka on the 6th; the lowest was 29.65 inches at San Diego on the 3d; the range for the State was 0.84 inch.

## TEMPERATURE.

The monthly mean temperature for the State, as shown by the records of 100 stations, was 48.5°, which is 2.7° above the normal.

The highest monthly mean was 56.8° at Indio; and the lowest was 27.2° at Fordyce Dam.

The highest temperature, 95°, occurred at Tustin on the 17th; and the lowest, -3°, occurred at Portola on the 7th.

The range for the State was 98°.

## PRECIPITATION.

The average precipitation for the State, as shown by the records of 241 stations, was 0.85 inch, or 4.56 inches below the normal.

The greatest monthly amount was 4.18 inches, at Crescent City. No rain fell at four stations.

The greatest amount in 24 hours was 2.70 inches at Santa Cruz on the 21st.

## RELATIVE HUMIDITY, SUNSHINE AND CLOUDINESS.

Stations.	Relative humidity. (Per cent.)			Sunshine.
	5 a.m.	5 p.m.	Mean.	
Eureka.....	92	84	88	156
Fresno.....	80	54	67	178
Independence.....	50	32	41	222
Los Angeles.....	71	66	68	235
Mount Tamalpais.....	58	58	58	216
Red Bluff.....	77	49	63	200
Sacramento.....	86	70	78	164
San Diego.....	77	72	74	155
San Francisco.....	78	62	70	211
San Jose.....	61	.....	.....	69
San Luis Obispo.....	72	56	64	198
				64
				217
				69

## WIND MOVEMENT.—(Miles.)

Stations.	Total mov. for month.	Ave. hr. velocity.	Maximum velocity.	Direction.	Date.	Prev. dir.
Eureka.....	3,487	4.7	37	nw.	5	se.
Fresno.....	3,040	4.1	27	nw.	5	nw.
Independence.....	5,663	7.6	34	nw.	11	nw.
Los Angeles.....	3,967	5.3	28	w.	5	ne.
Mount Tamalpais.....	15,555	20.9	74	n.	7	ne.
Point Reyes.....	10,247	13.8	67	nw.	5	se.
Red Bluff.....	3,835	5.2	35	nw.	7	nw.
Sacramento.....	4,493	6.0	33	n.	7	se.
San Diego.....	3,776	5.1	34	e.	3	nw.
San Francisco.....	5,217	7.0	45	ne.	7	n.
San Jose.....	3,725	5.0	36	n.	7	se.
San Luis Obispo.....	2,195	3.0	17	ne.	16	n.

## COMPARATIVE DATA FOR JANUARY.

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	3.53	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.....	36.8	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	1920.....	48.5	0.85

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, 1920.

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.....	.066	.143	.107	.039	.078	.130	.099	.096	.118	.154	.084	.069	.085	.077	.069	.087	.110	.059	.081	.070	.085	.066	.089	.095	.066	.062	.043	.063	.091	.062	.096	2,689	
	Wind movement.....	.50	.75	.142	.58	.72	.107	.66	.58	.62	.118	.81	.56	.76	.70	.66	.49	.63	.71	.46	.54	.102	.98	.44	.60	.51	.36	.69	.79	.61	.74	2,175		
Dodgeland**2.....	Evaporation.....	.063	.001	.013	.022	.025	.047	.133	.115	.068	.016	.053	.014	.130	.143	.093	.038	.042	.026	.012	.040	.030	.000	.005	.035	.020	.010	.025	.006	.010	.013	.007	1,225	
	Wind movement.....	.20	.30	.30	.20	.66	.38	.166	.120	.95	.91	.46	.68	.37	.76	.45	.47	.4	.6	.12	.20	.10	.20	.20	.20	.30	.20	.20	.30	.20	.30	1,260		
Oakdale (near)**3.....	Evaporation.....	.012	.021	.022	.000	.066	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,469			
	Wind movement.....	.78	.34	.72	.80	.80	.75	.355	.60	.70	.90	.60	.56	.94	.80	.64	.36	.90	.48	.62	.75	.105	.160	.68	.116	.46	.50	.80	.100	.70	.60	2,534		
Tahoe**4.....	Evaporation.....	.060	.160	.090	.060	.060	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.010	0.010	0.010	0.010
	Wind movement.....	.47	.82	.104	.23	.72	.142	.147	.424	.84	.125	.127	.77	.73	.13	.107	.26	.24	.41	.94	.36	.42	.47	.34	.42	.86	.3	.43	0	.60	.38	.25	2,293	

\* 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; float in Lake Tahoe.

## Climatological Data for January, 1920.

Stations.	Counties.	Elevation, feet.	Length of record,	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 (unmeted),	Precipitation, 0.1 inch or more.	Partly cloudy.	Cloudy.	
Antioch.....	Contra Costa.....	46	41	52.6	+6.1	73	19	39	8	24	0.25	-2.24	0.15	0	2	23	4	n.
Atascadero.....	San Luis Obispo.....	837	4	46.0	.....	75	24	15	11	45	0.54	0.53	0	2	2	9	20	sw.
Bakersfield.....	Kern.....	404	31	47.6	+0.2	73	20	24	8	40	0.51	-1.20	0.38	0	2	12	3	se.
Barstow.....	San Bernardino.....	2,105	17	46.2	-1.6	66	18	20	9	35	0.16	-0.46	0.16	0	1	21	10	w.
Berkeley.....	Alameda.....	317	33	50.9	+3.4	76	17	33	14	31	0.83	-4.55	0.56	0	3	22	4	n.
Blue Canon.....	Riverside.....	268	11	53.4	.....	80	29	31	6	39	0.23	.....	0.07	4.0	3	26	1	se.
Bonita.....	San Diego.....	110	4	53.4	.....	87	17	29	48	46	0.59	0.40	0	4	12	13	w.	
Branscomb.....	Meudocino.....	2,000	20	51.2	+8.3	82	18	25	10	47	0.31	-18.85	0.21	0	2	21	8	w.
Brawley.....	Imperial.....	-105	10	55.4	.....	81	29	43	10	40	0.90	0.72	0	2	19	6	sw.	
Calexico.....	Imperial.....	0	15	55.6	+1.9	81	17	33	10	41	0.88	+0.60	0.60	0	2	17	9	w.
Chico.....	Placer.....	4,695	21	42.0	+3.7	62	16	30	6	18	1.99	-14.58	1.07	4.0	3	26	1	se.
Chula Vista.....	Riverside.....	268	9	52.1	.....	77	17	34	9	38	0.58	0.46	0	2	2	15	7	ne.
Claremont.....	Los Angeles.....	1,200	28	52.6	+1.6	86	17	28	9	48	0.72	-3.20	0.51	0	3	22	4	w.
Cloverdale.....	Sonoma.....	340	18	51.0	+3.6	78	17	28	12	44	0.33	-11.50	0.12	0	4	20	9	s.
Colfax.....	Placer.....	2,421	49	50.2	+5.8	83	18	27	8	39	1.48	-8.53	0.76	2.0	2	27	1	3.
Colusa.....	Colusa.....	60	17	48.8	+2.8	74	14	29	10	44	2.23	-3.34	0.13	0	2	22	1	uv.
Corona.....	Riverside.....	615	6	53.6	.....	86	17	32	12	35	0.87	0.60	0	4	14	8	9.	
Crescent City.....	Del Norte.....	125	6	48.0	+1.2	69	13	29	1	35	4.18	-7.50	1.50	0	6	19	3	ne.
Davis.....	Yolo.....	51	48	47.0	-0.6	71	16	27	14	38	0.37	-3.76	0.26	0	2	16	9	n.
Dodgeland.....	Butte.....	125	2	48.0	.....	74	14	27	10	43	0.09	.....	0.08	0	2	25	3	sw.
Durham.....	Butte.....	160	25	49.1	+3.8	78	14	29	9	45	0.55	-5.62	0.35	0	2	20	9	2.
El Cajon.....	San Diego.....	482	21	54.0	+0.7	90	17	26	10	50	0.70	-1.73	0.30	0	3	20	9	2.
Elsinore.....	Riverside.....	1,300	4	53.6	.....	88	18	30	10	49	0.67	0.55	0	2	8	15	se.	
Escondido.....	San Diego.....	742	26	54.3	+4.8	89	17	32	12	35	0.87	-3.23	0.30	0	5	10	6	15.
EUREKA.....	Humboldt.....	64	34	47.9	+1.0	66	13	32	7	30	1.37	-5.76	0.91	0	7	13	1	se.
Folsom.....	Sacramento.....	252	47	50.6	+3.5	71	18	30	9	32	0.91	-4.51	0.40	0	3	17	0	14.
Fontana.....	San Bernardino.....	1,325	8	52.8	.....	84	17	32	16	42	0.85	0.44	0	5	18	5	sw.	
Fort Bidwell.....	Modoc.....	4,375	31	35.4	+5.6	75	30	5	10	57	0.45	-3.61	0.18	0	3	17	5	9.
FRESNO.....	Fresno.....	293	33	48.2	+2.8	72	17	26	11	31	0.69	-0.91	0.69	0	1	15	4	12.
Grass Valley.....	Nevada.....	2,690	48	49.4	.....	78	17	29	6	34	1.64	-9.78	0.93	0	4	23	1	sw.
Greenland Ranch.....	Inyo.....	-178	9	51.2	.....	70	14	32	12	35	0.60	0.60	0	1	17	0	14.	
Hanford.....	Kings.....	249	20	46.0	-0.4	70	17	21	10	38	0.76	-1.25	0.68	0	3	13	0	18.
Healdsburg.....	Sonoma.....	110	27	48.9	+2.9	80	15	25	8	46.	0.78	-9.27	0.35	0	3	14	3	4.
Hollister.....	San Benito.....	284	46	48.0	-0.8	77	17	23	9	40	0.11	-2.60	0.05	0	3	21	5	nw.
INDEPENDENCE.....	Inyo.....	8,987	24	44.7	+4.2	71	16	24	9	31	0.00	-0.91	0.00	0	0	12	15	se.
Indio.....	Riverside.....	-20	24	56.8	+3.9	84	29	33	10	41	0.95	-1.19	0.95	0	2	10	15	6.
Inskip.....	Butte.....	4,975	18	44.2	.....	69	18	22	16	17	1.05	0.67	3.8	2	18	10	3.	
Kennett.....	Shasta.....	730	8	51.6	.....	83	18	27	5	48	0.45	0.26	0	2	23	4	sw.	
La Porte.....	Plumas.....	5,000	26	35.7	+2.2	62	18	5	6	30	1.60	-16.20	1.08	2.5	3	23	5	3.
Lemon Cove.....	Tulare.....	600	25	46.9	-1.5	71	18	25	10	37	0.87	-2.26	0.58	0	3	16	6	9.
Lick Observatory.....	Santa Clara.....	4,209	31	46.6	+6.7	70	19	26	16	38	0.63	-4.93	0.49	0	3	20	6	5.
Lindsay.....	Tulare.....	384	6	46.8	.....	74	18	21	11	44	1.14	1.14	0	0	1	13	8	10.
Lone Pine.....	Inyo.....	3,728	15	44.5	+4.8	67	31	24	7	36	0.00	-0.95	0.00	0	0	29	2	s.
LOS ANGELES.....	Los Angeles.....	293	43	56.6	+2.3	89	17	41	10	39	0.50	-2.34	0.27	0	0	12	9	10.
McCloud.....	Siskiyou.....	3,270	10	40.0	.....	71	19	13	9	46	0.30	0.18	0	1	2	23	0	s.
Marysville.....	Yuba.....	67	49	46.8	-1.6	66	26	28	10	36	0.60	-3.59	0.43	0	4	19	2	10.
Mecca.....	Riverside.....	-185	14	55.2	+3.1	81	26	34	10	37	1.00	-0.03	0.78	0	4	12	5	se.
Merced.....	Merced.....	173	45	45.0	-2.0	70	17	20	11	41	0.42	-1.80	0.27	0	2	20	0	11.
MOUNT TAMILPAIS.....	Marin.....	2,375	21	48.5	+2.6	71	18	29	1	23	0.38	-5.57	0.22	0	4	16	8	se.
Mount Wilson.....	Los Angeles.....	5,704	3	45.8	.....	75	17	20	8	23	0.84	0.36	0	4	14	5	12.	
Napa.....	San Bernardino.....	20	43	47.8	+0.9	76	16	25	1	42	0.39	-4.75	0.27	0	2	23	3	5.
Needles.....	San Bernardino.....	477	28	50.7	-2.1	70	17	30	14	34	1.41	+0.96	1.10	0	4	11	4	w.
Nevada City.....	Nevada.....	2,850	28	44.6	+3.1	83	17	18	11	55	1.31	-10.00	0.69	0.5	1	19	11	1.
Newman.....	Stanislaus.....	91	31	45.4	-2.3	71	16	18	10	41	0.21	-1.89	0.21	0	1	17	5	n.
Oakdale (near).....	Stanislaus.....	215	2	46.8	.....	70	18	24	8	33	0.43	-2.66	0.27	0	3	17	7	s.
Oakland.....	Alameda.....	322	44	50.2	+2.6	70	17	36	14	22	1.04	-4.01	0.74	0	3	16	7	sw.
Ojai.....	Ventura.....	900	14	52.7	+1.1	91	17	26	10	53	0.60	-7.79	0.50	0	3	22	4	5.
Orland.....	Glenn.....	254	38	49.5	+1.9	75	14	30	8	39	0.14	-3.77	0.12	0	3	16	3	12.
Oroville (near).....	Butte.....	250	36	49.2	+2.4	73	14	31	10	41	0.60	-5.62	0.30	0	3	17	1	nw.
Pasadena.....	Los Angeles.....	868	30	52.6	-0.1	86	17	29	10	42	0.51	-3.62	0.32	0	4	18	8	sw.
Paso Robles—1.....	San Luis Obispo.....	800	33	48.0	+2.6	75	17	22	18	42	0.80	-2.68	0.48	0	4	13	7	11.
Petaluma.....	Sonoma.....	9	6	47.4	.....	77	16	24	19	44	0.24	-4.99	0.19	0	3	19	7	5.
Placerville.....	El Dorado.....	1,925	31	46.8	+5.2	80	18	20	8	49	1.25	-6.98	0.75	0	3	33	4	8.
POINT REYES.....	Marin.....	490	28	51.3	+1.8	78	18	37	2	25	0.19	-4.83	0.11	0	3	14	9	8.
Pomona.....	Los Angeles.....	857	6	50.8	.....	85	17	25	15	49	0.68	0.45	0	0	3	12	18	1.
Porterville.....	Tulare.....	464	31	49.9	+1.9	86	20	26	16	45	1.44	-0.41	1.37	0	2	20	0	16.
Portola.....	Plumas.....	4,832	5	37.9	.....	68	30	-3	7	56	0.42	0.30	4.0	3	21	0	10	sw.
RED BLUFF.....	Tehama.....	307	48	50.4	+5.0	78	18	30	2	41	0.56	-3.38	0.32	0	5	19	5	7.
Redding.....	Shasta.....	552	46	52.9	+7.7	87	2	30	1	50	0.59	-7.66	0.26	0	4	21	3	7.
Riverside.....	San Bernardino.....	1,352	27	52.7	+1.7	86	17	27	9	41	0.68	-2.15	0.43	0	3	12	6	13.
Rocklin.....	Placer.....	851	38	53.8	+2.7	89	17	27	10	49	0.75	-1.26	0.58	0	3	11	17	3.
Rohnerville.....	Placer.....	249	49	46.7	.....	66	16	27	9	34	0.63	-4.53	0.33	0	2	16	3	12.
Humboldt.....	75	17	47.1	.....	62	13	27	7										

**Daily Precipitation for January, 1920.**

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		
Antioch .....	San Joaquin..																																	10
Atascadero .....	Coast.....																																	0.25
Bakersfield .....	San Joaquin..																																	0.54
Barstow .....	Desert.....																																	0.51
Berkeley .....	Coast.....																																	0.16
Blue Canon .....	Sacramento ..																																	0.83
Blythe .....	Colorado .....																																	1.99
Bonita .....	Coast.....																																	0.23
Branscomb .....	do.....																																	0.59
Brawley .....	Imperial Valley																																	0.31
Calexico .....	do.....																																	0.90
Chico .....	Sacramento ..																																	0.88
Chula Vista .....	Coast.....																																	0.47
Claremont .....	do.....																																	0.53
Cloverdale .....	do.....																																	0.72
Colfax .....	Sacramento ..																																	0.23
Colusa .....	do.....																																	0.87
Corona .....	Coast.....																																	0.53
Crescent City .....	do.....																																	0.72
Davis .....	Sacramento ..																																	0.48
Dodgeland .....	do.....																																	0.37
Durham .....	do.....																																	0.09
EJ Cajon .....	Coast.....																																	0.55
Elsinore .....	do.....																																	0.67
Escondido .....	do.....																																	0.63
EUREKA ***	do.....																																	1.87
Folsom .....	Sacramento ..																																	0.91
Fontana .....	Coast.....																																	0.85
Fort Bidwell .....	Mountain Lakes																																	0.45
FRESNO***	San Joaquin..																																	0.69
Grass Valley .....	do.....																																	1.64
Greenland Ranch .....	Desert.....																																	0.60
Hanford .....	San Joaquin..																																	0.01
Healdsburg .....	Coast.....																																	0.78
Hollister .....	do.....																																	0.11
INDEPENDENCE***	Owens .....																																	0.00
Indio .....	Coachella Val.																																	0.95
Inskip .....	Sacramento ..																																	1.03
Kennett .....	do.....																																	0.45
La Porte .....	do.....																																	1.60
Lemon Cove .....	San Joaquin..																																	0.87
Lick Observatory .....	Coast.....																																	0.63
Lindsay .....	do.....																																	1.14
Lone Pine .....	Owens .....																																	0.00
LOS ANGELES***	Coast.....																																	0.00
McCloud .....	Sacramento ..																																	0.50
Marysville .....	do.....																																	0.60
Merced .....	Coachella Val.																																	1.00
MT. TAMALPAIS***	San Joaquin..																																	0.42
Mount Wilson .....	do.....																																	0.38
Napa .....	do.....																																	0.39
Needles .....	Colorado .....																																	1.41
Nevada City .....	Sacramento ..																																	1.31
Neyman .....	San Joaquin..																																	0.21
Oakdale (near) .....	do.....																																	0.43
Oakland .....	Coast.....																																	1.04
Ojai .....	do.....																																	0.60
Orland .....	Sacramento ..																																	0.14
Oroville (near) .....	do.....																																	0.60
Pasadena .....	Coast.....																																	0.51
Paso Robles—I .....	do.....																																	0.24
Petaluma .....	Sacramento ..																																	1.25
Placerville .....	do.....																																	0.19
POINT REYES**	Coast.....																																	0.68
Pomona .....	do.....																																	1.44
Porterville .....	San Joaquin..																																	0.42
Portola .....	Sacramento ..																																	0.02
RED BLUFF***	do.....																																	0.56
Redding .....	do.....																																	0.59
Redlands .....	Coast.....																																	0.68
Riverside .....	Sacramento ..																																	0.63
Rocklin .....	do.....																																	1.89
Rohnerville .....	do.....				</																													

Except as otherwise indicated observations are generally made late in the afternoon, near sunset, and precipitation recorded is for the 24 hours ending at the time of observation. \* Regular Weather Bureau station; precipitation is for the 24-hour period, midnight to midnight.

## Daily Temperature for January, 1920.

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.....	43	53	52	63	56	49	53	51	59	62	68	65	67	72	68	72	68	62	73	62	63	60	53	62	65	63	66	50	48	53	60.0	
	34	35	34	34	34	29	27	24	25	25	27	28	28	32	31	32	33	39	45	36	46	49	42	39	41	47	41	39	46	45	35.3	
Calexico.....	66	67	62	64	68	63	53	56	52	61	63	65	61	70	81	71	71	78	74	72	74	76	78	80	81	79	81	76	75	69.2		
Chico.....	42	43	47	50	41	43	34	36	38	33	41	36	40	37	36	40	41	48	44	41	46	44	46	47	43	46	43	47	41.9			
Escondido.....	40	44	46	51	50	38	32	36	36	41	40	36	32	34	35	44	44	50	50	50	49	51	42	40	43	40	41	39	45	41.6		
Eureka.....	49	50	56	48	49	49	50	54	54	54	58	54	58	55	52	54	59	52	50	51	54	53	62	56	61	57	58	56	54.8			
Fresno.....	44	39	38	44	42	39	32	33	35	37	37	39	36	40	41	45	41	36	42	44	46	49	49	45	45	47	47	44	41.5			
Independe...co	37	38	35	41	41	30	29	30	30	26	38	34	36	38	38	42	41	40	43	34	49	48	46	42	49	47	42	45	45	38.9		
Independence.....	46	50	57	54	53	36	37	48	52	54	61	60	62	68	71	67	67	60	62	55	54	60	61	63	63	61	59	59	56.9			
Los Angeles.....	63	74	65	65	61	59	58	60	61	64	61	65	63	65	89	82	72	58	58	55	63	70	79	68	63	68	65	62	57	65.2		
Merced.....	47	55	55	53	50	45	42	42	41	41	49	45	43	44	45	43	50	57	54	53	51	50	49	54	45	43	46	40	48.0			
Mount Tamalpais.....	41	39	38	34	33	31	22	23	25	22	20	20	25	25	29	29	31	31	34	34	39	47	39	39	45	44	39	42	45	46	33.4	
Oakland.....	41	52	59	50	51	56	54	54	51	54	60	55	52	54	55	65	70	69	62	56	54	53	60	62	52	56	54	58	56.0			
Orland.....	37	37	48	44	43	39	47	42	38	44	42	35	36	43	43	54	52	48	46	48	49	45	43	48	48	49	46	44	45.5			
Oroville.....	34	32	30	34	34	35	40	38	39	37	47	32	42	50	35	35	38	35	34	36	36	38	41	40	45	42	42	41	38	38.2		
Paso Robles.....	55	34	34	32	44	33	41	36	45	31	53	40	36	33	39	38	40	39	40	41	45	42	41	44	43	44	44	44	39.6			
Point Reyes.....	29	33	39	40	35	29	22	23	22	25	29	29	28	28	31	36	34	38	44	41	49	43	37	37	39	38	39	37	41	34.5		
Pomona.....	48	55	54	50	54	58	56	56	65	67	69	59	74	75	63	74	68	67	61	50	52	62	60	61	65	60	60	60	60.8			
Porterville.....	35	37	39	41	41	36	41	36	45	31	53	40	36	33	39	38	40	39	40	41	45	42	41	43	42	41	41	42	35.7			
Red Bluff.....	38	42	32	30	33	26	27	28	27	26	33	29	29	29	32	33	34	36	34	36	34	37	37	35	33	34	32	34	32	32.3		
Redlands.....	30	30	35	34	39	34	42	39	35	43	39	31	46	44	38	42	40	40	37	33	34	38	45	46	42	41	41	39	32.2			
Sacramento.....	34	43	51	56	54	54	54	56	57	52	54	60	58	59	62	64	57	61	66	66	72	65	56	51	57	61	56	54	56.2			
San Bernardino.....	56	56	64	65	56	54	52	52	52	58	56	63	63	61	65	65	73	75	68	69	61	57	56	57	56	56	56	56	56.1			
San Diego.....	37	38	45	48	47	35	40	35	42	29	22	25	29	28	29	28	31	36	34	38	44	41	49	43	43	41	41	41	39.2			
San Francisco.....	49	63	65	52	56	55	56	68	66	69	72	74	76	73	75	71	78	73	55	51	50	53	62	68	67	63	68	61.7				
San Jose.....	39	43	46	46	44	48	45	40	42	47	44	41	38	44	42	42	42	52	47	43	46	48	47	46	49	49	49	48	47.5			
San Luis Obispo.....	42	38	39	33	40	32	35	33	37	27	23	32	32	35	37	35	38	34	36	36	37	40	40	39	40	40	40	37.6				
Santa Barbara.....	62	64	72	62	60	55	57	58	62	70	67	63	74	74	74	74	74	78	75	61	61	60	60	63	63	62	62	62	65.2			
Santa Rosa.....	45	40	46	48	43	41	34	33	33	31	36	38	38	36	44	42	52	47	47	48	48	45	44	43	43	43	43	43.7				
Stockton.....	36	36	33	32	32	32	32	32	32	25	26	28	28	28	29	29	32	34	33	32	36	47	34	35	35	39	37	34	41	33.4		
	42	41	52	68	54	56	58	56	51	54	55	57	63	65	66	62	59	59	59	57	55	51	56	55	57	57	57	57	57.1			
	38	39	34	34	44	33	36	30	26	28	29	32	30	30	32	34	36	35	37	35	37	45	46	38	38	43	42	48	41	44	36.9	

## SUPPLEMENTAL PRECIPITATION TABLE.

Stations.	Watersheds.	Precip. inches	Stations.	Watersheds.	Precip. inches	Stations.	Watersheds.	Precip. inches	Stations.	Watersheds.	Precip. inches	Stations.	Watersheds.	Precip. inches
Abbotts.....	Coast.....	0.31	Dobbins (near).....	Sacramento.....	1.42	Lathrop.....	San Joaquin.....	0.32	Repsa.....	Coast.....	0.99	Rio Vista.....	Coast.....	0.99
Agnanga.....	do.....	0.57	Downieville.....	do.....	1.94	La Verne.....	Coast.....	0.09	Rio Vista.....	Coast.....	0.18	Coast.....	Coast.....	0.35
Angiola.....	San Joaquin.....	0.95	Dudley.....	San Joaquin.....	1.05	Le Grand.....	San Joaquin.....	0.99	Ruth.....	Coast.....	0.26	Coast.....	Coast.....	0.10
Antelope Valley.....	do.....	1.18	Dudleys.....	do.....	2.30	Livermore.....	Coast.....	0.22	St. John.....	Coast.....	0.26	Sacramento.....	Ocean.....	0.80
Arrowhead Springs.....	Coast.....	0.08	East Park.....	Sacramento.....	0.14	Liano.....	do.....	1.20	San Miguel Island.....	Ocean.....	0.80	Coast.....	Coast.....	0.10
Auberry.....	San Joaquin.....	0.82	Edison.....	San Joaquin.....	0.94	Lompoc.....	do.....	0.07	San Pedro.....	Coast.....	0.71	Coast.....	Coast.....	0.10
Auburn.....	Sacramento.....	1.50	Electra.....	do.....	0.43	Los Alamos.....	do.....	0.39	Santa Ana River.....	do.....	0.71	Coast.....	Coast.....	0.19
Avalon.....	Ocean.....	0.32	Emigrant Gap.....	Sacramento.....	3.30	Los Gatos.....	do.....	0.55	Santa Clara.....	do.....	0.19	Coast.....	Coast.....	0.24
Azusa*.....	Coast.....	0.66	Fairmont.....	Coast.....	0.82	Lytle Creek.....	do.....	2.08	Santa Maria.....	do.....	0.24	Coast.....	Coast.....	0.24
Bagdad.....	Desert.....	0.00	Firebaugh.....	San Joaquin.....	0.18	Madeline.....	Mountain Lakes.....	0.36	Santa Monica.....	do.....	0.60	Coast.....	Coast.....	0.60
Barrett Dam.....	Coast.....	0.00	Fordyce Dam.....	Sacramento.....	1.48	Maricopa.....	San Joaquin.....	0.18	Seven Oaks.....	do.....	0.87	Coast.....	Coast.....	0.87
Beaumont.....	do.....	1.08	Fort Bragg.....	Coast.....	0.45	Mariposa.....	do.....	2.22	Sheld's Ranch.....	Coast.....	T.	Coast.....	Coast.....	0.35
Beaumont (near).....	do.....	0.95	Fort Ross.....	do.....	0.53	Markleeville.....	do.....	0.19	Shively.....	Coast.....	1.83	Coast.....	Coast.....	0.62
Bellota.....	San Joaquin.....	0.44	Friant.....	San Joaquin.....	0.70	Melones.....	San Joaquin.....	0.99	Sierraville.....	Mountain Lakes.....	0.62	Coast.....	Coast.....	0.62
Benson's Ferry.....	Sacramento.....	0.40	Georgetown.....	Sacramento.....	2.20	Merced Falls.....	do.....	0.76	Sierraville.....	Mountain Lakes.....	0.62	Coast.....	Coast.....	1.33
Betteravia.....	Coast.....	0.18	Glacier Point.....	San Joaquin.....	0.90	Mesa Grande.....	Coast.....	1.41	Santa Joaquin.....	do.....	1.50	Coast.....	Coast.....	1.21
Big Bar.....	Sacramento.....	0.99	Glenville.....	do.....	2.20	Middlewater.....	San Joaquin.....	0.36	Springville (near).....	do.....	2.22	Coast.....	Coast.....	0.22
Bishop Creek.....	Owens.....	0.10	Goffs.....	do.....	0.90	Mill Creek-1.....	do.....	1.55	Stanish.....	Coast.....	1.74	Coast.....	Coast.....	1.16
Calaveras R. S. ....	San Joaquin.....	1.95	Happy Camp.....	Klamath.....	1.64	Milo.....	San Joaquin.....	1.55	Storey.....	Coast.....	0.95	Coast.....	Coast.....	2.00
Campbell.....	Coast.....	0.14	Hayfork.....	Coast.....	0.44	Milton (near).....	do.....	0.43	Tamarack.....	Sacramento.....	0.87	Coast.....	Coast.....	0.87
Campo.....	do.....	1.90	Head Dam.....	Sacramento.....	1.65	Mokelumne Hill.....	do.....	0.47	Tejon Rancho.....	Coast.....	1.21	Coast.....	Coast.....	1.21
Campiont.....	San Joaquin.....	1.80	Helen Mine.....	Coast.....	0.75	Mourneville.....	Sacramento.....	0.30	Three Rivers.....	do.....	2.56	Coast.....	Coast.....	2.56
Canon Dam.....	Sacramento.....	0.25	Hetch Hetchy.....	San Joaquin.....	1.65	Montague.....	do.....	0.39						

## SNOWFALL IN THE MOUNTAINS.

At the close of December, 1919, the higher portions of the Sierra Nevada Mountains were snow-covered, but there was little snow on the ground below the 5,000-foot level. Except on the higher peaks, there was no snow in the Coast Ranges or in the mountains of southern California.

Little snow fell anywhere in California during January. Practically no snow fell below the 5,000-foot level in the Sierras, while above that level the snowfall was less than 25 per cent of the normal. The greatest snowfall in the State was but 24 inches, at Tamarack, Alpine County, altitude 8,000 feet. The normal January snowfall at that place is 187 inches. At Summit, Placer County, altitude 7,017 feet, the total snowfall was but 20 inches, whereas the January normal is 79 inches. At every station in the Sierras from which reports were received, the snow on the ground at the close of January was less than that at the close of the preceding month, an extraordinary condition.

Snowfall was also markedly deficient in the Coast Ranges and in the elevated portions of southern California. The peaks were snow-covered on several occasions, but little unmelted snow was to be found at the close of January.

The marked deficiency in snowfall has become serious. There has been no appreciable run-off from melting snow during the winter, and most streams have maintained the lowest stages ever recorded during January, the month which usually marks the middle of the rainy season. Even if the normal precipitation is received during the remainder of the present rainy season there will be an inevitable shortage of water for irrigation and power purposes during the coming dry season. The past three years have brought deficient precipitation throughout the State. As a result, the reserve supply of water in storage reservoirs is largely depleted. Moreover, the ground water in most agricultural regions has receded to an abnormally low level. Measures favoring the utmost conservation of water are demanded by the present conditions.

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	182	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	30	22	35
1920.....	34	33	32	37	43	82	28	28	20

T. means trace.

## Snowfall Data. [In inches.]

WATERSHED, COUNTY, STATION.	Elevation, feet.	Total snow-fall.	Compr'd with normal.	Am't on ground 15th.	Am't on ground end mo.
<b>Klamath Watershed.</b>					
<i>Siskiyou County.</i>					
Yreka .....	2,625	0		0	0
<i>Trinity County.</i>					
Hayfork .....	2,300	T.		T.	0
Ruth .....	2,925				
Weaverville .....	2,162	0		0	0
<b>Mountain Lakes.</b>					
<i>Inyo County.</i>					
Bishop Creek .....	8,390	T.	-52	0	0
Independence .....	3,907	0		0	0
Lone Pine .....	3,728	0		0	0
<i>Lassen County.</i>					
Madeline .....	5,270				
Standish .....	4,000	2		0	0
<i>Mendocino County.</i>					
Alturas .....	4,400				
Cedaryville .....	4,575	2	-13	0	0
Fort Bidwell .....	4,376	0		0	0
<i>Nevada County.</i>					
Grass Valley .....	2,690	0		0	0
Nevada City .....	2,850	T.	-9	0	0
North Bloomfield .....	3,214	0	-15	0	0
Truckee .....	5,817	T.		0	0
<i>Placer County.</i>					
Tahoe .....	6,230	8		30	28
<b>Sacramento Watershed.</b>					
<i>Butte County.</i>					
De Sabla .....	2,500	0	-18	0	0
Inskip .....	4,975	4	-74	12	T.
West Branch .....	3,216	2	-44	0	0
<i>Nevada County.</i>					
Deer Creek .....	3,700	2	-62	T.	T.
Fordyce Dam .....	6,500	11	-87	83	82
Lake Spaulding .....	4,600	7	-51	6	T.
<i>Placer County.</i>					
Blue Canon .....	4,695	4	-60	0	0
Emigrant Gap .....	5,230	8	-46	3	0
Summit .....	7,017	20	-59	43	32
<i>Plumas County.</i>					
Canon Dam .....	4,570	1		12	8
Chester .....	4,550	1	-73	12	6
La Porte .....	5,000	2	-61	15	3
Portola .....	4,832	4		1	0
Quincy .....	3,400	T.	-29	T.	T.
<i>Sierra County.</i>					
Downieville .....	3,150	T.	-35	0	0
Sierraville .....	5,000	4	-46	6	0
<i>Siskiyou County.</i>					
McCloud .....	3,270	T.	-62	T.	0
Sisson .....	3,555	1	-36	0	0
<i>Yuba County.</i>					
Camptonville .....	3,500	2	-30	0	0
<b>San Joaquin Watershed.</b>					
<i>Alpine County.</i>					
Markleeville .....	5,525	1		0	0
Tamarack .....	8,000	24	-163	28	20
Twin Lakes .....	7,970				
<i>Calaveras County.</i>					
Calaveras Ranger Station .....	3,400				
<i>Fresno County.</i>					
Camp Seven .....	6,980	4		16	16
Cascada .....	4,900	0		0	0
Hume .....	5,300				
Huntington Lake .....	6,950	8		16	9
Stevenson Creek .....	4,250	T.		0	0
<i>Kern County.</i>					
Glenville .....	3,300	0	-4	0	0
<i>Marietta County.</i>					
Glacier Point .....	3,945	9		22	20
Yosemite .....	3,945	1	-88	1	0
<i>Tulare County.</i>					
Hot Springs .....	3,300	0	-2	0	0
Springville .....	4,000	T.	-15	0	0
<i>Tuolumne County.</i>					
Hetch Hetchy .....	3,665	1	-10	0	0
Lake Eleanor .....	4,700	1	-50	T.	T.
<b>Mountains of Southern California.</b>					
Cuyamaca .....	4,677	2	-6	0	0
Julian .....	4,222	1		0	0
Mount Wilson .....	5,704	0		T.	0
Nellie .....	5,350	T.		0	0
Seven Oaks .....	5,000	3	-11	0	0
Squirrel Inn .....	5,280				