

## U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

## CALIFORNIA SECTION.

EDWARD A. BEALS, District Forecaster.

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SAN FRANCISCO, MARCH, 1920.

No. 3.

## GENERAL SUMMARY.

The feature of the weather of March was the abundant and well distributed precipitation. Based upon records from a large number of stations, the average precipitation for the State was 5.79 inches, or 22 per cent above the normal for March. Heavy snow fell in the elevated regions. It was the wettest March in nine years, and more rain fell than in any other month in more than a year. The marked deficiency during the early part of the present season was so great, however, that the generous precipitation of March did not bring the seasonal amount up to normal anywhere in the State. At the close of the month the seasonal precipitation was less than 50 per cent of the normal throughout the northern half of the State. It was a windy and stormy month. At Point Reyes the wind velocity exceeded 40 miles per hour on 20 days of the month, culminating with a maximum velocity of 90 miles per hour from the northwest on the 31st. Less than the usual amount of sunshine was received. Scattered light hail fell on several occasions, but did no damage. Frosts were of frequent occurrence in the agricultural portions of the State, and a severe freeze on the morning of the 26th did considerable damage to deciduous fruit in the Sacramento Valley. Streams maintained low stages throughout the month.

The timely rains were highly beneficial from an agricultural viewpoint. Orchards were revived, truck crops thrived, pastures and ranges improved, and grazing cattle found ample fresh feed. There was extensive planting of summer growing crops. Much land was also prepared for late planting. Deciduous fruit completed blossoming under generally favorable weather conditions. There was a good set of fruit, but frost and high winds reduced the size of the prospective crops somewhat. Citrus fruit thrived, the harvesting and shipping of lemons and Navel oranges continued, and the picking of Valencia oranges was begun. Citrus fruits were everywhere in excellent condition, and the trees bloomed heavily. Winter growing vegetables in the Imperial Valley were harvested in large quantities. The only unfavorable features of the weather were the cold nights and the desiccating northerly winds, which caused the soil to become crusted. At the close of the month the agricultural situation was generally satisfactory, with the exception of the prospect of a serious shortage of irrigation water in northern California during the coming summer.

A. H. P.

## PRESSURE.

The mean sea level pressure, determined from the records of twelve regular Weather Bureau stations, was 30.01 inches. The highest was 30.50 inches at Independence on the 12th; the lowest was 29.41 inches at Point Reyes on the 22d; the range for the State was 1.09 inches.

## TEMPERATURE.

The monthly mean temperature for the State, as shown by the records of 100 stations, was 49.3°, which is 2.5° below the normal.

The highest monthly mean was 61.5°, at Indio; and the lowest was 25.2°, at Summit. The highest temperature, 88°, occurred at Blythe on the 13th and 20th; and the lowest, -2° occurred at Portola on the 3d.

The range for the State was 90°.

## PRECIPITATION.

The average precipitation for the State, as shown by the records of 247 stations, was 5.79 inches, or 1.05 inches above the normal.

The greatest monthly amount was 15.94 inches, at Inskip. No rain fell at Brawley.

The greatest amount in 24 hours was 3.00 inches at Placerville on the 1st.

## RELATIVE HUMIDITY, SUNSHINE AND CLOUDINESS.

Stations.	Relative humidity. (Per cent.)			Sunshine.	
	5 a. m.	5 p. m.	Mean.		
Eureka.....	88	76	82	205	55
Fresno.....	86	52	69	279	75
Independence.....	59	24	42	298	80
Los Angeles.....	78	61	70	267	72
Mount Tamalpais.....	82	80	81	244	66
Red Bluff.....	85	51	68	190	52
Sacramento.....	87	59	73	252	68
San Diego.....	83	69	76	240	65
San Francisco.....	82	65	74	264	71
San Jose.....	63	.....	.....	245	66
San Luis Obispo.....	80	64	72	250	67

## WIND MOVEMENT.—(Miles.)

Stations.	Total movt. for month.	Ave. hr. velocity.	Maximum velocity.	Direction.	Date.	Prev. dir.
Eureka.....	6,154	8.3	36	n.	30	se.
Fresno.....	4,977	6.7	42	nw.	31	nw.
Independence.....	5,493	7.4	38	nw.	14	nw.
Los Angeles.....	5,282	7.1	35	nw.	14	ne.
Mount Tamalpais.....	14,612	19.6	88	nw.	13	nw.
Point Reyes.....	18,428	24.8	90	nw.	31	nw.
Red Bluff.....	4,608	6.2	36	nw.	30	se.
Sacramento.....	6,163	8.3	40	nw.	31	se.
San Diego.....	5,021	6.7	34	s.	22	w.
San Francisco.....	7,598	10.2	34	nw.	31	w.
San Jose.....	4,522	6.1	30	nw.	14	w.
San Luis Obispo.....	3,586	4.8	22	ne.	5	n.

## COMPARATIVE DATA FOR MARCH.

Year.	Mean temp.	Ave. precip.									
1897.....	48.0	3.98	1903.....	50.9	5.80	1909.....	48.5	3.56	1915.....	53.1	2.33
1898.....	48.8	0.66	1904.....	51.1	8.52	1910.....	64.7	2.43	1916.....	53.0	3.38
1899.....	51.2	6.10	1905.....	54.7	5.42	1911.....	52.7	6.02	1917.....	45.7	1.58
1900.....	55.7	2.38	1906.....	50.8	9.19	1912.....	48.6	5.17	1918.....	51.5	5.75
1901.....	53.0	1.01	1907.....	49.0	10.67	1913.....	49.6	2.06	1919.....	49.0	3.47
1902.....	49.7	3.39	1908.....	51.8	1.49	1914.....	55.0	1.16	1920.....	49.3	5.79

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 March, 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.....	.197	.197	.173	.151	.136	.119	.122	.128	.215	.154	.146	.182	.143	.187	.179	.225	.173	.177	.159	.160	.129	.061	.097	.200	.245	.113	.189	.169	.152	.174	.117	4.919
	Wind movement.....	.199	.161	.95	.88	.71	.78	.76	.88	.196	.119	.83	.70	.81	.101	.121	.193	.98	.83	.87	.105	.185	.190	.72	.138	.171	.219	.93	.85	.87	.99	.171	3.683
Dodgeland**2 ..	Evaporation.....	.009	.151	.061	.070	.121	.102	.130	.141	.214	.110	.090	.125	.085	.160	.065	.060	.090	.091	.089	.084	0	.080	.035	.095	.126	.092	.182	.124	.166	.250	3.138	
Oakdale (near)*3	Evaporation.....	.030	.100	.50	.39	.25	.45	.36	.50	.80	.90	.30	.40	.20	.55	.115	.110	.46	.30	.30	.40	.100	.150	.10	.20	.120	.59	.90	.30	.40	.40	.120	1.810
Tahoe**4 ..	Evaporation.....	.036	.049	.163	.072	.067	.108	.087	.102	.057	0	.065	.122	.056	.087	.084	.084	.182	.128	.155	.148	.162	.084	0	.038	.230	.003	.171	.166	.189	.202	.245	3.254
	Wind movement.....	.308	.76	.42	.47	.39	.46	.47	.60	.56	.39	.28	.91	.....	.170	.55	.30	.46	.43	.41	.34	.090	.....	.125	.34	.78	.92	.....	.040	.010	.150	3.030	

\* 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 March, 1920.

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 (unmeted).	Precipitation, 01 inch or more.	Partly cloudy.	Cloudy.			
Antioch	Contra Costa	46	41	50.2	-4.2	77	20	39	+ 8	36	2.16	-0.14	0.60	0	7	9	19	e.	C. G. McDaniel.	
Atascadero	San Luis Obispo	837	4	48.1	.....	73	+12	25	27	40	4.85	.....	1.37	0	10	14	6	11	nw.	Colony Holding Corp.
Bakersfield	Kern	404	31	53.4	-3.3	78	20	33	15	38	2.28	+1.29	0.60	0	9	11	8	12	se.	Santa Fe Co.
Barstow	San Bernardino	2,105	17	50.2	-7.6	80	+14	28	18	42	0.98	+0.42	0.35	0	5	25	2	2	w.	E. L. White.
Berkeley	Alameda	317	33	51.2	-0.6	69	12	37	26	27	3.89	-1.01	0.96	0	12	10	11	11	nw.	State University.
Blue Canon	Placer	4,695	21	37.2	-2.6	55	+ 9	15	4	30	10.46	-0.86	2.00	\$4.0	13	14	1	16	sw.	Southern Pacific Co.
Blythe	Riverside	268	11	60.8	.....	85	+13	35	26	45	10.10	.....	0.10	0	1	21	5	5	sv.	Palo Verde Water Co.
Bonita	San Diego	110	4	56.0	.....	83	12	36	18	40	3.05	.....	0.85	0	10	14	7	10	w.	R. M. Allen.
Branscomb	Imperial	2,000	20	40.8	-4.6	65	29	24	26	35	11.23	-1.51	2.45	5.5	14	13	8	10	n.	A. J. Haun.
Brawley	Calexico	-105	10	60.9	.....	87	21	37	20	49	0	.....	0	0	0	30	1	0	sv.	M. D. Witter.
Chico	Butte	189	50	50.8	-4.8	76	6	31	26	41	5.06	+1.86	1.46	0	9	12	9	10	n.	H. M. Rouse.
Chula Vista	San Diego	9	2	53.6	.....	74	12	38	17	29	2.67	.....	1.01	0	8	14	1	1	nw.	U. S. Bureau Plant E.
Claremont	Los Angeles	1,200	28	51.5	-2.4	80	13	29	27	45	7.61	+3.33	1.42	0	11	13	5	13	sw.	Western Salt W.
Cloverdale	Sonoma	340	18	50.8	-1.7	76	29	32	18	37	4.98	-4.51	1.22	0	10	14	1	11	n.	Prof. F. P. Packett.
Colfax	Placer	2,421	49	45.2	-3.9	70	+ 7	26	3	30	10.70	+3.10	1.98	20.0	11	14	7	10	nw.	John O. O' e.
Colusa	Colusa	60	17	51.8	-1.3	73	+ 6	30	26	35	1.98	-0.44	0.61	0	9	18	4	9	nw.	Southern Pacific Co.
Corona	Riverside	615	6	55.9	.....	82	+13	32	27	43	4.12	.....	1.36	0	10	16	5	10	w.	E. A. Houchins.
Crescent City	Del Norte	125	6	46.7	-0.9	65	18	30	+27	28	8.74	-2.57	2.00	T	15	7	8	16	n.	Edwin T. Brink.
Davis	Butte	51	48	50.8	-5.4	72	6	32	+ 3	35	3.47	+0.90	2.08	0	7	23	4	4	sw.	Thos. E. Peacock.
Dodgeland	Butte	125	2	55.1	.....	75	7	41	26	27	3.28	.....	0.80	0	8	16	1	14	sw.	Prof. S. H. Beckett.
Durham	Butte	160	25	50.8	-1.4	76	6	30	26	48	5.17	+1.60	1.32	0	9	14	7	10	s.	Dodge Land Co.
El Cajon	San Diego	482	21	54.4	-2.0	82	+12	32	18	44	4.90	+2.19	1.06	0	8	16	4	4	sw.	R. W. Durham.
Elsinore	Riverside	1,300	4	53.2	.....	82	14	26	16	38	4.63	.....	0.26	0	8	13	6	12	nw.	Eugene P. Kessler.
Escondido	San Diego	742	26	53.2	-1.7	82	12	32	27	42	4.93	+1.91	1.54	0	13	15	4	12	w.	W. L. Wilhite.
EUREKA	Humboldt	64	34	47.0	-1.0	66	19	33	26	23	5.79	+1.18	1.46	0	17	13	4	11	se.	H. L. Harlow.
Folsom	Sacramento	252	47	52.8	-2.0	76	31	34	26	36	6.50	+2.69	1.25	0	12	17	0	14	n.	U. S. Weather Bureau.
Fontana	San Bernardino	1,325	8	50.6	.....	79	13	30	27	39	6.37	.....	1.64	0	11	16	4	11	sw.	Mrs. G. I. Marvin.
Fort Bidwell	Modoc	4,375	31	38.4	-1.0	58	13	14	17	37	2.65	+0.27	0.52	17.5	8	7	15	9	n.	Fontana Land Co.
FRESNO	Fresno	293	33	52.7	-2.2	75	20	36	27	39	3.98	+2.22	1.46	0	8	17	8	6	nw.	C. R. Decius.
Grass Valley	Nevada	2,690	48	43.2	.....	64	6	20	27	38	11.29	+3.25	2.48	14.0	13	17	5	10	sw.	U. S. Weather Bureau.
Greenland Ranch	Yreka	-178	9	60.8	.....	82	20	41	24	37	0.30	.....	0.20	0	2	24	0	7	ne.	Mrs. L. M. Wentworth.
Harford	Kings	249	20	52.0	-2.3	76	7	34	+ 2	34	3.05	+1.10	1.42	0	9	9	0	22	ll.	O. A. Denton.
Healdsburg	Sonoma	110	27	50.8	-1.3	72	+12	30	26	38	3.08	-3.79	1.18	0	8	13	12	6	s.	Santa Fe Co.
Hollister	San Benito	284	46	50.2	-4.3	70	+ 6	33	+ 3	34	3.29	+0.91	0.69	0	11	13	7	11	w.	Dr. F. J. Kinley.
INDEPENDENCE	Inyo	3,957	24	46.8	-2.8	72	13	25	27	34	0.67	+0.17	0.33	0.2	5	17	10	4	nw.	Grangers' Union.
Indio	Riverside	-20	42	61.5	-3.8	87	20	38	18	41	0.37	+0.06	0.20	0	3	16	11	4	se.	U. S. Weather Bureau.
Inskip	Butte	4,975	13	36.3	.....	56	+ 5	15	26	32	15.94	.....	2.89	85.5	11	7	9	15	sw.	U. S. Bureau Plant Ind.
Kennett	Shasta	730	8	49.6	.....	78	6	27	25	41	7.23	.....	1.93	2.0	0	15	4	12	sw.	Pacific Gas & Electric Co.
La Porte	Plumas	5,000	26	28.8	-6.4	53	12	14	+14	36	8.41	-4.76	1.66	70.0	11	7	13	11	s.	Mammoth Copper Mine.
Lemon Cove	Tulare	600	25	53.0	-3.2	76	20	31	+ 3	31	5.71	+2.30	2.00	0	11	13	9	9	sw.	C. W. Hendel.
Lick Observatory	Santa Clara	4,209	31	38.2	-2.8	57	6	+24	15	17	8.41	+2.74	1.47	16.0	13	14	5	12	n.	T. E. Bence.
Linds	Tulare	384	6	51.6	.....	77	20	30	27	39	5.27	.....	1.35	0	11	12	10	9	nw.	Lick Observatory.
Lone Pine	Inyo	3,728	15	46.6	-2.8	67	25	27	+18	36	2.52	+1.41	1.35	0	3	24	5	2	s.	Basil Prior.
Los ANGELES	Los Angeles	293	43	56.8	-0.1	80	13	48	18	28	4.25	+1.25	1.40	0	10	15	8	8	ne.	G. F. Marsh.
McCloud	Siskiyou	3,270	10	37.7	.....	66	7	9	26	42	5.39	.....	1.70	6.5	0	11	4	16	s.	U. S. Weather Bureau.
Marysville	Yuba	67	49	51.2	-6.2	74	6	32	3	35	4.30	+1.49	1.12	0	9	14	8	9	s.	McCloud River Lbr. Co.
Meces	Riverside	-185	14	61.2	-1.4	85	30	37	4	40	0.12	-0.23	0.07	0	3	22	3	6	se.	Southern Pacific Co.
Merced	Merced	173	46	50.2	-4.8	73	7	33	+ 2	31	4.88	+3.11	1.07	0	11	16	12	3	nw.	Cooperative Date Garden.
MOUNT TAMALPAIS	Marin	2,375	21	43.4	-3.7	61	29	30	26	22	4.23	-0.94	0.99	0.1	13	14	4	9	nw.	Santa Fe Co.
Mount Wilson	Los Angeles	5,704	3	41.2	.....	66	13	18	27	39	10.12	.....	2.48	27.0	10	13	7	11	s.	U. S. Weather Bureau.
Napa	Napa	20	49	50.3	-2.3	72	11	28	1	36	3.58	-0.17	1.58	0	8	19	6	6	sw.	Solar Observatory.
Needles	San Bernardino	477	28	58.0	-5.8	80	20	38	+ 4	38	0.11	-0.30	0.04	0	2	18	4	9	s.	State Hospital.
Nevada City	Nevada	2,850	40	45.5	-4.3	69	6	16	3	44	11.85	+3.35	2.48	11.9	14	15	4	12	sw.	Santa Fe Co.
Nevinan	Stanislaus	91	31	50.0	-5.7	75	9	29	+16	39	2.15	+0.89	1.16	0	9	11	4	16	s.	B. H. Preston.
Oakdale (near)	Stanislaus	215	2	53.9	+2.1	77	31	33	+15	38	5.12	+2.31	1.17	0	10	20	3	8	n.	E. S. Wangenheim.
Oakdale (near)	Stanislaus	322	44	49.6	-3.4	64	14	22	+ 3	19	3.94	-0.16	1.00	0	11	15	1	16	s.	S. San Joaquin Irr. Dist.
Oakland	Alameda	900	14	52.0	-2.7	77	+ 6	30	18	41	6.97	+2.06	2.03	0	7	20	7	4	sw.	Chabot Observatory.
Ojai	Ventura	254	38	50.0	-5.7	75	6	30	26	37	2.55	-0.12	1.10	0	11	15	1	16	n.	W. H. Duncan.
Oroville (near)	Butte	250	36	50.8	-3.5	74	7	31	26	32	6.50	+2.47	1.55	0	12	14	1	16	sw.	N. R. Heberlie.
Pasadena	Los Angeles	868	30	53.2	-1.2	80	13	33	18	41	6.25	+2.57	1.45	0	9	17	5	9	sw.	Morris S. Jones.
Paso Robles	San Luis Obispo	800	33	49.4	-2.2	76	12	29	17	36	4.05	+0.82	1.40	0	11	14	7	10	w.	Mrs. A. Z. Campbell.
Petaluma	Sonoma	9	6	50.3	.....	71	12	28	+ 3	38	3.00	-0.09	0.51	0	11	18	11	2	w.	John Landis.
Placererville	El Dorado	1,925	31	46.3	-1.1	69	20	26	3	38	11.72	+3.86	3.00	4.0	12	9	7	15	sw.	O. E. Bailey.
PONT REYES	Marin	490	28	48.6	-1.8	64	12	37	26	38	1.27	-2.48	0.33	0	12	11	8	11	nw.	U. S. Weather Bureau.
Pomona	Los Angeles	857	6	52.4	.....	81	13	29	+ 6	27	4.61	.....	1.46	0	11	14	6	12	w.	J. E. Adamson.
Porterville	Tulare	464	31	52.0	-4.2	7														

**Daily Precipitation for March, 1920.**

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.

III Precipitation measured in the morning; amount then recorded is for the preceding 24 hours. \* Precipitation  
1. Fall at recorded. T trace or less than .01 in.

dates of fall not recorded. T., trace, or less than 0.01 inch.

## Daily Temperature for March, 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.....	75	61	61	62	66	72	73	72	61	53	65	71	71	59	59	56	61	62	71	78	60	60	59	64	63	58	59	64	70	72	67	64.0		
	Minimum.....	59	40	39	41	43	40	43	46	44	43	41	40	43	43	39	41	39	37	38	40	49	46	43	47	45	39	36	38	41	44	47	42.0	
Calexico.....	85	76	73	76	77	80	84	81	80	71	77	81	83	75	72	68	74	81	81	75	75	73	73	77	81	78	76	76	74	77	76	76.5		
Chico.....	50	56	48	40	43	43	45	47	48	51	41	43	44	52	50	41	50	49	40	45	55	46	44	44	45	46	45	41	38	39	45	52	45.5	
Escondido.....	45	41	32	34	32	39	39	37	39	47	32	38	38	47	36	33	41	36	38	35	41	46	44	44	40	40	46	31	36	35	42	40	40	39.1
Eureka.....	55	53	44	35	38	40	43	47	49	46	36	41	43	45	35	40	47	33	36	39	43	49	42	38	45	47	32	34	37	40	46	41.8		
Fresno.....	62	56	58	60	64	69	74	70	56	57	62	69	66	66	57	63	60	66	70	75	60	60	57	57	64	60	54	58	64	67	74	59	62.4	
Independence.....	63	54	57	63	64	65	64	62	59	69	68	72	54	50	56	58	62	67	54	50	50	59	59	46	58	60	61	65	66	59.7				
Los Angeles.....	67	63	66	68	77	75	67	59	57	64	64	80	82	66	62	56	69	70	74	61	57	56	62	57	55	59	65	66	72	62	65.0			
Merced.....	57	50	47	47	48	53	49	52	48	47	48	52	56	52	47	46	43	46	47	50	47	46	45	49	48	45	46	46	51	52	48.5			
Mount Tamalpais.....	47	33	33	35	36	45	44	39	36	35	43	39	36	41	34	37	38	40	45	41	42	45	38	40	35	37	42	45	48	43	38.9			
Oakland.....	50	51	55	56	58	61	54	53	63	54	58	64	62	61	50	51	53	56	58	61	54	51	55	59	61	58	54	55.6						
Orland.....	52	56	69	62	72	75	70	56	56	61	61	65	67	58	51	57	63	67	61	56	51	60	60	56	61	70	73	71	59	61.8				
Oroville.....	39	40	34	34	38	40	52	45	38	36	42	46	33	35	34	38	35	37	39	43	44	40	37	44	30	34	38	40	40	41	38.3			
Paso Robles.....	57	54	56	61	61	71	59	52	59	63	73	70	59	60	59	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	61.4			
Point Reyes.....	52	50	52	54	54	53	50	52	52	52	54	53	55	52	52	52	49	48	56	58	55	56	52	53	51	50	47	50	52	52	52.5			
Pomona.....	67	64	66	70	77	71	58	58	64	68	73	81	68	63	62	67	65	65	66	67	62	68	71	77	62	66	65	65	66	66.5				
Porterville.....	53	49	32	30	32	37	31	37	30	40	41	33	39	47	39	37	37	35	31	33	39	40	35	38	34	32	34	32	38	32	38.2			
Red Bluff.....	30	32	30	36	34	40	34	41	43	50	40	35	41	35	41	36	35	37	36	39	42	44	45	31	39	43	50	38	40	40.8				
Redlands.....	43	41	33	43	40	40	42	43	36	34	42	44	42	37	36	38	39	36	40	46	42	41	38	40	39	37	42	39	37	34.8				
Sacramento.....	50	53	58	61	64	70	67	66	53	60	64	65	64	56	53	55	52	52	52	56	57	57	56	56	56	56	56	56	56	56	56.5			
San Bernardino.....	68	64	69	72	79	75	67	65	59	63	70	81	84	68	66	55	60	72	79	60	60	66	68	64	63	63	63	63	63	63	67.6			
San Diego.....	68	60	62	63	71	64	63	61	61	60	62	77	72	62	61	60	68	64	63	65	59	60	66	65	65	65	65	65	65	65	64.2			
San Francisco.....	55	55	49	46	46	51	54	55	51	45	44	46	46	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45.6		
San Jose.....	47	41	44	45	46	47	47	49	47	44	49	50	45	45	44	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45.1			
San Luis Obispo.....	63	57	63	64	73	73	58	54	59	69	76	81	75	68	62	65	62	65	62	65	65	65	65	65	65	65	65	65	65	65	62.2			
Santa Barbara.....	60	65	65	68	73	72	65	58	58	66	65	76	62	65	65	65	57	62	64	67	60	66	66	66	66	66	66	66	66	66	65.0			
Santa Rosa.....	53	57	69	62	65	69	64	61	60	62	67	70	62	66	52	54	57	60	57	64	67	60	65	63	62	62	62	62	62	62	62.9			
Stockton.....	58	37	36	33	42	48	52	50	45	40	43	46	48	46	39	36	38	36	37	40	48	45	45	49	40	40	40	40	40	40	41.7			
	Maximum.....	52	56	58	63	65	67	60	55	57	57	64	67	62	55	54	55	57	62	66	60	60	63	64	63	62	63	62	63	62	62.0			

## SUPPLEMENTAL PRECIPITATION TABLE.

Stations.	Watersheds.	Precip. inches.	Stations.	Watersheds.	Precip. inches.	Stations.	Watersheds.	Precip. inches.	Stations.	Watersheds.	Precip. inches.
Abbotts.....	Coast.....	4.38	Dobbins (near).....	Sacramento.....	10.19	Lathrop.....	San Joaquin.....	3.08	Repsa.....	Sacramento.....	7.10
Aguanga.....	do.....	4.97	Downdeville.....	do.....	13.25	La Verne.....	Coast.....	do.....	Rio Vista.....	Coast.....	4.17
Angiola.....	San Joaquin.....	2.86	Dudley.....	San Joaquin.....	1.68	Le Grand.....	San Joaquin.....	4.17	Ruth.....	Coast.....	6.52
Antelope Valley.....	do.....	3.07	Dudleys.....	do.....	10.99	Livermore.....	Coast.....	3.52	St. John.....	Sacramento.....	3.78
Arrowhead Springs.....	Coast.....	7.98	East Park.....	Sacramento.....	2.31	Llano.....	do.....	0.98	San Miguel Island.....	Ocean.....	2.3
Autberry.....	San Joaquin.....	8.14	Edison.....	San Joaquin.....	3.45	Lompoc.....	do.....	3.76	San Pedro.....	Coast.....	2.32
Auburn.....	Sacramento.....	10.63	Electra.....	do.....	10.60	Maricopa.....	San Joaquin.....	1.74	Santa Ana River.....	do.....	10.05
Avalon.....	Ocean.....	3.61	Emigrant Gap.....	Sacramento.....	14.33	Mariopolis.....	do.....	7.38	Santa Clara.....	do.....	3.54
Azusa*.....	Coast.....	6.71	Fairmont.....	Coast.....	4.01	Madeline.....	Mountain Lakes.....	1.46	Santa Maria.....	do.....	4.02
Badgad.....	Desert.....	T.....	Firebaugh.....	San Joaquin.....	2.88	Maricopa.....	San Joaquin.....	1.74	Santa Monica.....	do.....	6.09
Barrett Dam.....	Coast.....	6.09	Fordyce Dam.....	Sacramento.....	12.22	Mariopolis.....	do.....	8.26	Seven Oaks.....	do.....	10.72
Beaumont.....	Coast.....	7.13	Fort Bragg.....	Coast.....	5.36	Mariposa.....	do.....	7.56	Sheld's Ranch.....	Walker.....	1.50
Beaumont (near).....	do.....	8.62	Fort Ross.....	do.....	4.05	Mariopolis.....	do.....	7.26	Shively.....	Coast.....	8.25
Bellota.....	San Joaquin.....	6.56	Friant.....	Coast.....	4.70	Mariopolis.....	do.....	7.14	Sierra....	Mountain Lakes.....	5.01
Benson's Ferry.....	Sacramento.....	3.39	Georgetown.....	Coast.....	11.98	Melones.....	San Joaquin.....	9.38	Sierra....	San Joaquin.....	8.95
Betteravia.....	Coast.....	4.16	Glacier Point.....	San Joaquin.....	5.70	Merced Falls.....	Coast.....	6.67	Standish.....	Mountain Lakes.....	12.88
Big Bar.....	Sacramento.....	3.86	Glenville.....	do.....	7.46	Mesa Grande.....	Coast.....	11.00	Standish.....	Mountain Lakes.....	1.64
Big Sur.....	Coast.....	9.71	Goffs.....	do.....	1.88	Middleway.....	San Joaquin.....	1.49	Stanwood.....	Coast.....	10.38
Bishop Creek.....	Coast.....	3.36	Graz Mountain.....	do.....	40.35	Mill Creek-1.....	Coast.....	12.43	Sterling*.....	Desert.....	0.08
Calaveras R. S. ....	San Joaquin.....	13.86	Happy Camp.....	Klamath.....	5.07	Mill Creek-2.....	Coast.....	8.87	Storey.....	San Joaquin.....	2.20
Campbell.....	Coast.....	4.25	Hayfork.....	Coast.....	3.29	Milo.....	San Joaquin.....	7.57	Tamarack.....	Sacramento.....	7.49
Campo.....	do.....	5.84	Head Dam.....	Sacramento.....	11.75	Nicolitus.....	do.....	6.91	Tejon Rancho.....	San Joaquin.....	3.13
Camptonville.....	San Joaquin.....	13.76	Helen Mine.....	Coast.....	9.66	Mouroueville.....	Sacramento.....	3.34	Three Rivers.....	Coast.....	7.68
Canon Danl.....	Sacramento.....	6.91	Hetch Hetchy.....	San Joaquin.....	8.86	Ometigue.....	Coast.....	4.89	Towle.....	Sacramento.....	5.88
Cascada.....	San Joaquin.....	9.14	Hillyville (near).....	Coast.....	6.26	Nellie.....	Coast.....	4.89	Upper Mattole.....	Coast.....	9.83
Cedarville.....	Mountain Lakes.....	2.31	Huntington Lake.....	San Joaquin.....	8.42	Nellie.....	Coast.....	14.72	Vacaville.....	Sacramento.....	4.64
Centerville Pwr. H. ....	Sacramento.....	8.63	Idria.....	do.....	3.25	Nicholas.....	Sacramento.....	4.19	Walnut Creek.....	Coast.....	4.12
Chester.....	do.....	4.79	Jenly Lind.....	Coast.....	7.00	North Bloomfield.....	do.....	11.01	Truckee.....	Mountain Lakes.....	3.60
China Flat.....	Coast.....	7.28	Jolon.....	Coast.....	2.35	North Fork.....	do.....	10.31	Turlock.....</td		

## SNOWFALL IN THE MOUNTAINS.

At the close of February there was no snow on the ground in the Coast Ranges or in the mountains of southern California. In the Sierra Nevada Mountains the amounts varied from 5 inches, at the 5,000-foot level, to 50 inches, at the 8,000-foot level. There was everywhere a deficiency of the densely packed snow usually to be found in large amounts at that time of the year, and which in past years has served as the principal source of the summer water supply.

Abundant snow fell during March in the elevated portions of the State. The Coast Ranges were snow-covered on several occasions, and in the mountains of southern California about 35 inches of snow fell at the 5,000-foot level. In the Sierra Nevada Mountains the snowfall varied from 10 inches, at the 2,000-foot level, to 130 inches, at the 8,000-foot level. Throughout the Sierras the snowfall was about 25 per cent above the normal for March. However, because of the markedly deficient snowfall during the early part of the present season, the danger of a water shortage next summer was not removed. The amount of snow on the ground at the close of March was everywhere less than normal in depth. Moreover, it was not well packed, and for this reason it was comparatively low in water content. Without causing an appreciable run-off, it showed a tendency to disappear rapidly under the desiccating, northerly winds, which were of frequent occurrence. Streams maintained low stages, and in some places the flow was not much above that usually to be found in midsummer. It now appears certain that there will be a marked shortage of water for hydroelectric power and irrigation purposes in central and northern California during the summer of 1920. Not only will the total run-off from the mountain watersheds be less than normal, but an early delivery into the streams is also to be expected on account of the light density and the lateness of the snowfall. The utmost conservation of water is recommended, particularly in the Sacramento Valley.

A. H. P.

## COMPARATIVE SNOWFALL DATA FOR MARCH.

(Amount on the Ground.)

	FORDYCE DAM.			SUMMIT.			TAMARACK.		
	1st.	15th.	End of mo.	1st.	15th.	End of mo.	1st.	15th.	End of mo.
1907.....	98	119	154	104	191	262	101	210	348
1908.....	105	87	75	116	120	60	131	126	84
1909.....	131	116	126	201	196	191	256	255	253
1910.....	72	58	71	65	88	68	101	82	90
1911.....	128	154	124	222	276	138	443	440	338
1912.....	46	80	67	26	81	63	44	79	62
1913.....	80	72	82	52	42	50	115	103	107
1914.....	130	113	108	178	140	124	271	255	258
1915.....	133	117	100	182	163	119	185	161	143
1916.....	165	148	133	151	139	120	192	179	160
1917.....	114	114	110	128	143	114	152	153	125
1918.....	127	106	82	102	114	78	116	120	100
1919.....	122	135	103	142	147	109	144	140	102
1920.....	54	58	67	53	65	76	60	56	87

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.				
<b>Klamath Watershed.</b>									
Siskiyou County. Yreka.....	2,625	2	.....	0	0				
Trinity County. Hayfork.....	2,300	2	.....	2	0				
Ruth.....	2,925	24	.....	8	0				
Weaverville.....	2,162	4	.....	4	0				
<b>Mountain Lakes.</b>									
Inyo County. Bishop Creek.....	8,890	45	+18	12	17				
Independence.....	8,907	0	.....	0	0				
Lone Pine.....	3,728	0	.....	0	0				
Lassen County. Madeline.....	5,270	.....	.....	0	0				
Standish.....	4,000	10	.....	0	0				
Modoc County. Alturas.....	4,400	.....	.....	0	0				
Cedarville.....	4,675	9	-5	0	0				
Fort Bidwell.....	4,375	18	.....	4	0				
Nevada County. Grass Valley.....	2,690	14	.....	0	0				
Nevada City.....	2,850	11	+2	0	0				
North Bloomfield.....	3,214	14	-2	1	0				
Truckee.....	5,817	.....	.....	.....	.....				
Placer County. Tahoe.....	6,230	55	.....	30	28				
<b>Sacramento Watershed.</b>									
Butte County. De Sabla.....	2,500	10	-3	3	0				
Inskip.....	4,975	86	+38	34	36				
West Branch.....	3,216	21	+3	4	0				
Nevada County. Deer Creek.....	3,700	56	+24	2	0				
Fordyce Dam.....	6,500	102	+16	58	67				
Lake Spaulding.....	4,600	82	+15	12	12				
Placer County. Blue Canon.....	4,695	84	+30	17	4				
Emigrant Gap.....	5,230	115	+61	5	18				
Summit.....	7,017	111	+64	65	76				
Plumas County. Canon Dam.....	4,570	48	.....	23	20				
Chester.....	4,550	52	+26	15	13				
La Porte.....	5,000	70	+9	18	25				
Portola.....	4,832	37	.....	13	0				
Quincy.....	3,400	26	+6	T.	T.				
Stereo County. Downieville.....	3,150	34	+25	T.	0				
Sierraville.....	5,000	32	+16	0	0				
Siskiyou County. McCloud.....	3,270	6	-10	4	0				
Sisson.....	3,555	18	-4	4	0				
Yuba County. Camptonville.....	3,500	40	+25	3	0				
<b>San Joaquin Watershed.</b>									
Alpine County. Markleeville.....	5,525	17	.....	0	0				
Tamarack.....	8,000	96	0	56	87				
Twin Lakes.....	7,970	130	.....	109	120				
Calaveras County. Calaveras Ranger Station.....	3,400	35	.....	0	0				
Fresno County. Camp Seven.....	6,980	80	.....	41	64				
Cascada.....	4,900	64	.....	1	0				
Hume.....	5,300	.....	.....	39	57				
Huntington Lake.....	6,950	101	.....	.....	.....				
Stevenson Creek.....	4,250	.....	.....	.....	.....				
Kern County. Glennville.....	3,300	4	0	0	0				
Mariposa County. Glacier Point.....	.....	57	.....	50	58				
Yosemite.....	3,945	40	+20	T.	T.				
Tulare County. Hot Springs.....	3,300	1	-3	0	0				
Springville.....	4,000	46	+32	T.	1				
Tuolumne County. Hetch Hetchy.....	3,665	52	+42	0	0				
Lake Eleanor.....	4,700	71	+35	0	4				
<b>Mountains of Southern California.</b>									
Cuyamaca.....	4,677	24	+14	0	0				
Julian.....	4,222	14	.....	0	0				
Mount Wilson.....	5,704	27	.....	0	6				
Nellie.....	5,350	22	.....	0	3				
Seven Oaks.....	5,000	35	+25	0	0				
Squirrel Inn.....	5,280	29	+18	0	3				