

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

CALIFORNIA SECTION.

EDWARD A. BEALS, District Forecaster.

VOL. XXIII. SAN FRANCISCO, MARCH, 1919. No. 3.

GENERAL SUMMARY.

The mean temperature for California during March was about 3° below the normal, and the average precipitation was but 73 per cent of the normal. Unusually cold weather prevailed until the 30th, when the temperature rose rapidly, particularly in the southern portion of the State, where maxima exceeding 90° occurred on the last two days of the month. While the average precipitation was below normal, showers were frequent, and snowfall was moderately heavy in the Sierra Nevada and in the mountains of southern California. Streams maintained high stages, but no wide-spread floods occurred. Sunshine was everywhere deficient. Killing frosts were infrequent. The wind movement was high. At Point Reyes velocities reached or exceeded 40 miles per hour on 16 days of the month, culminating with a maximum of 80 miles per hour from the northwest on the 6th.

The first decade of the month was cold and showery, with heavy precipitation in the mountains on the 2d and 3d. Extremely cold weather prevailed in the plateau region of northeastern California from the 7th to the 10th, when temperatures fell below zero. The second decade of the month was cold and wet, a well-defined storm giving general precipitation on the 13th and 14th. Severe local storms were experienced at many places on the 13th. At Stockton destructive lightning occurred, and many windows were blown in during a gale. At Otterbein, Los Angeles County, wind destroyed a small church building and unroofed several dwellings. The last decade was relatively dry, with rapidly rising temperature near the close of the month.

Aside from the fact that the season was backward, the weather during March was satisfactory from an agricultural standpoint. While precipitation was below normal, the rains were well distributed throughout the month. Winter growing grains made splendid progress. Damage from frost was inconsequential. The soil was in excellent condition. There was extensive planting of rice, cotton, sugar beets and truck crops. Pastures showed new growth, and grass was abundant on the ranges. Deficient sunshine delayed the blossoming of deciduous fruit trees, however, and blossoms sustained some damage from light hail which fell during local thunderstorms on the 13th. Citrus fruits and early vegetables were harvested in southern California. At the close of the month rain was urgently needed in the San Joaquin Valley and throughout the southern portion of the State. Otherwise the agricultural situation was generally satisfactory, and the outlook for the future was favorable. A. H. P.

PRESSURE.

The mean sea level pressure, determined from the records of twelve regular Weather Bureau stations, was 30.07 inches. The highest was 30.50 inches at Eureka on the 5th; the lowest was 29.39 inches at Red Bluff on the 13th; the range for the State was 1.11 inches.

TEMPERATURE.

The monthly mean temperature for the State, as shown by the records of 99 stations, was 49.0°, which is 2.8° below the normal.

The highest monthly mean was 63.5°, at Indio; and the lowest was 27.8°, at Summit.

The highest temperature, 94°, occurred at Indio on the 31st; and the lowest, -13°, occurred at Madeline on the 10th.

The range for the State was 107°.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 242 stations, was 3.47 inches; or 1.27 inches below the normal.

The greatest monthly amount was 12.24 inches, at Crescent City. The least monthly amount was 0.01, at Bagdad and Greenland Ranch.

The greatest amount in 24 hours was 4.00 inches at La Porte on the 14th.

RELATIVE HUMIDITY, SUNSHINE AND CLOUDINESS.

Stations.	Relative humidity. (Per cent.)			Sunshine. Actual No. of hours Percent of possible.
	5 a. m.	5 p. m.	Mean.	
Eureka.....	91	88	87	161
Fresno.....	87	51	69	221
Independence.....	58	32	45	233
Los Angeles.....	75	62	68	263
Mount Tamalpais.....	83	80	81	207
Red Bluff.....	88	67	75	210
Sacramento.....	87	61	74	208
San Diego.....	81	68	74	229
San Francisco.....	81	67	74	214
San Jose.....	65	65	65	47
San Luis Obispo.....	80	64	72	196
				53

WIND MOVEMENT.—(Miles.)

Stations.	Total mov. for month	Ave. hr. velocity.	Maximum velocity.	Direction.	Date.	Prev. dir.
Eureka.....	5,689	7.6	37	n.	19	se.
Fresno.....	5,071	6.8	30	nw.	5	nw.
Independence.....	5,696	7.7	34	se.	13	nw.
Los Angeles.....	5,116	6.9	26	nw.	5	ne.
Mount Tamalpais.....	13,522	18.2	62	nw.	15	nw.
Point Reyes.....	15,998	21.5	80	nw.	6	nw.
Red Bluff.....	4,911	6.6	32	se.	12	s.
Sacramento.....	6,301	8.5	42	se.	13	se.
San Diego.....	4,829	6.5	39	s.	13	nw.
San Francisco.....	5,694	7.7	37	sw.	13	w.
San Jose.....	4,801	6.4	34	s.	12	nw.
San Luis Obispo.....	3,360	4.5	22	nw.	8	nw.

COMPARATIVE DATA FOR MARCH.

Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.	Year.	Mean temp.	Ave. precip.
1897.....	48.0	3.98	1903.....	50.9	5.80	1909.....	48.5	8.56	1915.....	53.1	2.38
1898.....	48.8	0.66	1904.....	51.1	8.52	1910.....	54.7	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	2.08	1919.....	49.0	3.47
1902.....	49.7	3.39	1908.....	51.8	1.49	1914.....	55.0	1.16	.....	.....	.....

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, 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.....	126	120	163	148	126	160	191	158	166	220	219	183	156	127	142	155	181	152	134	107	116	156	150	162	156	161	145	193	165	174	109	4.781
	Wind movement.....	79	111	125	92	70	165	102	89	94	95	88	111	223	196	109	81	79	129	120	94	104	98	90	85	84	98	73	117	134	113	64	3.307
Dodgeland**2 ..	Evaporation.....	013	043	.007	077	.062	.107	.048	.101	.064	.163	.099	.049	.150	.142	.083	.057	.118	.108	.115	.190	.148	.125	.115	.099	.160	.099	.041	.038	.141	.131	.133	2.926
Oakdale (near)**3 ..	Evaporation.....	33	143	86	23	38	41	88	50	50	60	31	57	129	121	25	81	35	53	73	97	55	42	23	43	.31	35	50	12	31	60	55	1.757
Tahoe**4 ..	Evaporation.....	086	127	.007	.141	.137	.182	.080	.130	.137	.210	.201	.133	.040	.099	.040	.117	.142	.193	.109	.144	.199	.008	.137	.091	.074	.069	.051	.099	.090	.150	.126	3.359
	Wind movement.....	36	122	126	109	49	145	183	145	113	183	110	57	274	325	188	75	43	61	109	124	119	111	80	59	74	62	74	41	53	103	101	3.528

* 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, 1919.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.				Precipitation, in inches.				Number of days.			Prevailing direction of wind.	Observers .				
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (unmelted).	Precipitation over one inch or more.	Clear.	Partly cloudy.	Cloudy.		
Alturas.....	Modoc.....	4,400	15	36.0	-3.0	67	31	-3	47	49	1.03	-0.43	0.47	10.5	8	10	16	5	w.	Prof. C. B. Towle.
Antioch.....	Contra Costa.....	46	40	46.2	-1.4	77	31	35	12	31	0.99	-1.31	0.45	0	4	9	22	0	e.	C. G. McDaniel.
Atascadero.....	San Luis Obispo.....	837	3	46.2	.....	74	31	23	10	44	2.97	.....	1.91	0	7	13	10	8	sw.	Colony Holding Corp.
Azusa.....	Los Angeles.....	30	17	54.9	-1.4	80	17	38	14	38	3.37	-0.91	1.01	0	9	15	3	13	ne.	C. C. Hillis.
Bakersfield.....	Kern.....	404	30	48.2	-8.5	78	30	34	18	30	0.42	-0.57	0.26	0	5	17	2	12	n.	Santa Fe Co.
Barstow.....	San Bernardino.....	2,105	16	49.7	-8.1	80	30	25	12	35	1.68	+1.12	0.69	0	4	23	1	7	w.	E. L. White.
Berkeley.....	Alameda.....	317	32	51.4	-0.4	68	31	38	18	26	2.70	-2.20	1.06	0	11	12	7	12	w.	State University.
Betteravia.....	Santa Barbara.....	155	6	52.8	.....	74	28	30	+10	36	1.62	0.76	0	8	15	3	13	.....	Union Sugar Co.	
Blue Canon.....	Placer.....	4,695	20	38.5	-1.3	55	31	28	71	20	6.40	-4.92	2.40	46.0	9	12	3	16	sw.	Southern Pacific Co.
Blythe.....	Riverside.....	268	10	59.8	.....	92	31	32	44	46	0.53	.....	0.33	0	3	23	2	6	n.	C. L. Suits.
Bonita.....	San Diego.....	110	3	54.3	.....	77	17	30	10	45	1.52	.....	0.45	0	6	16	9	6	n.	R. M. Allen.
Branscomb.....	Mendocino.....	2,000	19	47.0	-1.6	78	26	26	13	40	6.96	-5.78	2.00	10.0	11	16	11	4	sw.	A. J. Hamm.
Brawley.....	Imperial.....	-105	9	59.8	.....	490	31	+37	8	46	0.23	.....	0.10	0	3	24	3	4	sw.	M. D. Witter.
Calexico.....	Imperial.....	0	14	60.4	-3.2	689	31	35	11	43	0.26	-0.01	0.17	0	2	19	10	2	nw.	H. M. Rouse.
Campptonville (near).....	Yuba.....	3,500	12	41.6	.....	70	31	28	14	34	7.37	.....	2.20	27.0	12	7	11	13	w.	Pacific Gas & Electric Co.
Chico.....	Butte.....	189	49	50.8	-4.8	78	20	29	+8	36	3.37	+0.17	1.38	0	7	15	9	7	se.	U. S. Bureau Plant Ind.
Claremont.....	Los Angeles.....	1,200	27	52.8	-1.1	78	11	34	2	38	2.81	-1.47	1.46	0	6	15	4	12	.....	Prof. F. P. Brackett.
Cloverdale.....	Sonoma.....	340	17	49.6	-2.9	75	31	30	11	33	5.03	-0.44	1.55	0	13	13	3	15	s.	John O. Ogle.
Colfax.....	Placer.....	2,421	48	46.4	-2.7	74	31	29	7	34	4.88	-2.75	1.74	5.0	9	14	6	11	n.	Southern Pacific Co.
Corona.....	Riverside.....	615	5	53.7	.....	83	31	32	15	40	1.82	.....	0.71	0	6	17	5	9	uw.	T. C. Sims.
Crescent City.....	Del Norte.....	125	5	47.8	-0.2	78	20	31	7	37	12.24	+0.93	2.16	0	17	5	16	sw.	Thos. E. Peacock.	
Davis.....	Yolo.....	51	47	50.9	-5.3	78	21	30	10	36	1.54	-1.03	0.95	0	5	21	6	4	sw.	Prof. S. H. Beckett.
Downieville.....	Sierra.....	3,150	8	43.9	.....	75	31	22	17	44	8.50	.....	2.22	22.0	14	13	9	9	s.	J. T. Mason.
Durham.....	Butte.....	160	24	51.6	-0.6	81	31	29	5	42	2.23	-1.34	0.44	0	9	18	3	10	s.	R. W. Durham.
El Cajon.....	San Diego.....	482	20	53.9	-2.5	80	17	29	11	50	2.27	-0.44	0.63	0	8	17	3	8	sw.	Eugene P. Kessler.
Elsinore.....	Riverside.....	1,300	3	52.6	.....	80	18	30	9	44	1.48	.....	0.87	0	6	15	3	13	uw.	W. L. Withite.
Escondido.....	San Diego.....	657	25	52.0	-2.9	78	17	30	+12	42	2.73	-0.29	0.80	0	8	18	2	11	w.	H. L. Harlow.
EUREKA.....	Humboldt.....	64	33	47.6	-0.4	68	29	34	9	22	6.25	-0.72	2.25	0	6	8	7	17	se.	U. S. Weather Bureau.
Folsom.....	Sacramento.....	252	46	52.8	-2.0	75	31	34	10	32	2.64	-1.17	0.97	0	7	16	11	4	e.	G. I. Marvin.
Fontana.....	San Bernardino.....	1,325	7	51.8	.....	83	31	32	15	41	2.41	.....	1.06	0	7	18	3	10	sw.	Fontana Land Co.
Fort Bidwell.....	Modoc.....	4,375	30	36.0	-3.4	63	29	8	19	34	1.24	-1.14	0.40	10.5	7	9	8	14	sw.	C. R. Deicias.
FRESNO.....	Fresno.....	293	32	52.7	-2.2	74	31	36	1	28	1.07	-0.69	0.53	0	7	12	10	9	nw.	U. S. Weather Bureau.
Grass Valley.....	Nevada.....	2,690	47	44.8	.....	66	31	23	9	29	5.73	-2.31	1.71	10.0	11	9	7	15	sw.	Mrs. L. M. Wentworth.
Greenland Ranch.....	Inyo.....	-178	8	58.2	.....	90	29	30	+11	45	0.01	.....	0.01	0	11	19	0	12	.....	O. A. Denton.
Hanford.....	Kings.....	249	19	49.8	-4.5	80	31	28	+10	36	1.01	-0.94	0.41	0	4	18	0	13	se.	Santa Fe Co.
Healdsburg.....	Sonoma.....	110	26	51.0	-1.1	76	20	30	11	40	3.90	-2.97	1.38	0	9	11	8	12	w.	Dr. F. J. Kinley.
Hollister.....	San Benito.....	284	45	56.6	-3.9	73	31	30	10	36	1.83	-0.58	0.79	0	10	15	4	12	sw.	Gruingers' Union.
INDEPENDENCE.....	Inyo.....	3,957	23	45.3	-4.3	73	31	28	8	37	0.66	+0.16	0.49	0	3	15	11	5	nw.	U. S. Weather Bureau.
Indio.....	Riverside.....	-20	41	53.5	-1.8	94	31	34	+5	43	0.27	-0.04	0.18	0	2	21	4	6	sw.	Pacific Gas & Electric Co.
Inskip.....	Butte.....	4,975	12	37.4	.....	62	31	22	+7	24	10.08	.....	2.83	46.0	13	9	4	18	sw.	A. J. Reef.
King City.....	Shasta.....	730	7	51.0	.....	85	31	30	9	38	7.62	.....	3.97	3.0	8	12	11	5	sw.	Southern Pacific Co.
La Porte.....	Monterey.....	333	32	57.5	+4.4	81	18	32	22	47	1.45	-0.65	0.63	0	4	20	5	6	s.	C. W. Hendel.
Lemon Cove.....	Plumas.....	5,000	25	28.6	-6.6	58	28	8	9	35	12.12	-1.06	4.00	39.0	12	11	10	10	n.	T. E. Bence.
Lick Observatory.....	Tulare.....	600	24	51.2	-5.0	74	30	34	16	29	2.26	-1.15	0.69	0	10	17	5	9	nw.	The Director.
Lindsay.....	Santa Clara.....	4,209	30	38.8	-2.2	57	25	26	14	44	4.80	-0.87	1.30	18.5	14	10	7	14	n.	Basil Prior.
Lone Pine.....	Imyo.....	384	5	51.8	.....	78	29	31	8	36	2.11	.....	0.80	0	9	13	11	7	nw.	G. F. Marsh.
LOS ANGELES.....	Los Angeles.....	3,728	14	49.8	+0.4	73	+30	25	+1	36	0.90	-0.21	0.55	0	3	26	4	1	ne.	U. S. Weather Bureau.
McCloud.....	Siskiyou.....	293	42	55.6	-1.3	78	17	40	15	45	2.18	-0.82	1.11	0	7	16	5	10	s.	McCloud River Lbr. Co.
Madeleine.....	Lassen.....	3,270	9	38.3	.....	66	25	15	10	42	5.36	.....	2.25	25.0	8	14	4	13	nw.	J. H. Williams.
Marysville.....	Yuba.....	67	45	51.5	-5.9	70	31	31	10	30	1.23	.....	0.26	13.0	7	13	6	12	s.	Southern Pacific Co.
Mecca.....	Riverside.....	-185	13	60.0	-2.6	93	31	31	11	48	0.25	-0.10	0.15	0	2	16	10	5	se.	E. A. Palmer.
Merced.....	Marin.....	173	45	50.0	-5.0	73	+29	31	8	32	1.59	-0.18	0.51	0	6	10	12	9	nw.	Santa Fe Co.
MOUNT TAMALPAIS.....	Marin.....	2,375	20	42.9	-4.2	60	31	31	14	48	3.64	-1.53	0.92	1.1	15	12	7	12	nw.	U. S. Weather Bureau.
Mount Wilson.....	Los Angeles.....	5,704	2	41.0	.....	64	+17	21	15	28	3.96	.....	1.29	29.0	8	17	5	9	s.	Wendell P. Hoge.
Napa.....	El Dorado.....	20	42	41.1	-10.5	55	31	28	10	18	2.98	-0.72	1.70	0	10	18	5	8	sw.	State Hospital
Needles.....	San Bernardino.....	477	27	60.1	-3.7	91	31	34	11	45	0.65	+0.24	0.16	0	6	18	0	13	sw.	Santa Fe Co.
Nevada City.....	Nevada.....	2,850	27	41.3	-3.5	71	31	17	7	44	5.97	-2.53	2.01	11.0	13	12	10	9	sw.	R. H. Preston.
Newman.....	Stanislaus.....	91	33	49.4	-6.3	74	30	27	8	37	1.71	-0.41	0.50	0	7	12	5	14	nw.	E. S. Wangenheim.
Oakland.....	Alameda.....	36	43	50.0	-3.0	61	31	33	14	23	2.89	-1.21	1.03	0	11	12	5	14	nw.	Chabot Observatory.
Oroville (near).....	Glen.....	254	37	50.3	-5.4	77	31	32	+10	31	1.80	-0.87	1.58	0	8	15	8	8	s.	U. S. Rec. Service.
Pasadena.....	Butte.....	250	35	52.4	-1.9	78	24	29	7	37	1.21	-1.91	0.80	0	9	7	11	13	se.	Thomas Cole.
Paso Robles.....	Los Angeles.....	1,085	29	51.3	-3.1	80	31	30	15	41	2.91	-0.77	1.28	0	9	15	6	10	sw.	R. P. Hamlin.
Petaluma.....	San Luis Obispo.....	800	32	49.6	-2.0	73	31	28	+10	41	2.26	-0.97	0.81	0	7	14	6	11	s.	E. J. Nye.
Placerville.....	Sonoma.....	9	5	46.8	.....	69	31	26	10	40	2.13	-0.96	0.79	0	12	18	7	6	w.	John Landis.
POINT REYES.....	El Dorado.....	1,925	30	43.7	-3.7	72														

Daily Precipitation for March, 1919.

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.

Precipitation measured in the morning; amount then recorded is for the preceding 24 hours. * Precipitation included in the next following measurement. † Separate dates of fall not recorded. T., trace, or less than 0.01 inch.

CLIMATOLOGICAL DATA: CALIFORNIA SECTION.

MARCH, 1919.

Daily Temperature for March, 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.....	45	50	49	50	50	56	51	47	51	48	60	75	69	55	48	46	51	51	49	52	52	45	65	50	56	55	57	59	78	75	54.9	
	40	40	41	41	36	35	37	34	36	34	37	45	45	43	41	40	38	41	40	46	41	35	55	43	41	45	46	52	45	51	45	41.6
Calexico.....	75	80	73	73	76	72	67	65	68	78	69	71	86	71	86	71	..	62	..	75	77	82	83	82	85	87	89	75.7
Chico.....	41	40	58	43	37	39	55	39	41	42	35	40	57	58	46	40	40	39	43	56	54	42	46	43	45	44	46	53	53	51	54	45.0
Escondido.....	51	52	60	60	58	64	55	60	60	64	61	57	58	54	56	55	63	62	66	78	66	59	67	73	68	68	58	60	72	62	62.2	
Independence.....	39	37	41	36	32	35	39	29	36	29	31	39	35	40	41	38	35	47	39	42	39	38	42	40	44	48	49	46	50	52	39.3	
Los Angeles.....	64	63	59	68	64	71	62	71	66	72	75	69	57	52	60	69	78	69	55	55	56	60	62	65	65	66	65	69	71	64.4		
Merced.....	38	35	46	32	32	35	39	33	31	37	33	30	39	31	30	33	36	37	44	42	38	42	40	44	49	50	48	49	51	51	45	39.7
Mount Tamalpais.....	52	51	49	53	53	49	49	49	49	50	51	54	50	52	50	56	59	52	57	56	53	52	52	59	59	68	58	55	53	54	53.4	
Oakland.....	37	35	34	37	35	35	34	34	34	33	35	32	31	34	33	35	38	34	33	40	40	41	44	42	43	48	49	52	52	47	42.7	
Orland.....	62	60	69	67	70	68	69	70	69	72	67	56	51	60	63	78	69	57	61	61	63	59	64	62	65	66	70	64	60	64.0		
Pasro Robles.....	47	45	46	43	46	50	51	49	43	44	50	45	45	42	40	46	50	49	47	45	44	44	47	51	51	50	52	52	53	48	47.3	
Point Reyes.....	59	56	58	61	60	54	57	61	60	63	63	59	55	54	56	61	61	59	64	64	62	65	62	58	64	62	63	64	62	61	61.4	
Red Bluff.....	50	61	58	58	62	56	58	58	60	60	52	57	48	55	57	58	60	64	62	71	67	68	72	65	63	67	69	77	61.4			
Redlands.....	35	40	34	37	39	37	33	33	33	32	34	32	34	31	37	34	38	39	36	40	43	38	42	45	46	48	47	41	44	46	39.2	
San Bernardino.....	52	57	62	59	63	53	58	58	68	60	74	58	52	55	56	60	65	63	67	73	76	77	67	60	72	70	71	73	63.4			
San Francisco.....	65	60	64	70	68	69	73	68	72	75	72	55	42	62	66	79	71	58	51	59	63	65	63	67	61	64	65	71	77	65.6		
San Jose.....	41	40	42	31	31	34	36	31	29	27	29	28	38	38	29	33	34	37	47	39	33	37	33	35	48	45	41	46	49	47	40	37.5
San Luis Obispo.....	59	59	62	60	58	59	59	60	61	65	66	67	51	44	54	54	65	57	53	63	69	77	71	72	73	75	75	76	66	66	62.6	
Santa Barbara.....	42	42	45	38	36	38	41	33	38	34	36	47	40	43	41	38	42	43	47	40	39	36	40	39	46	45	50	50	50	41.4		
Santa Rosa.....	50	57	59	57	61	53	59	59	61	60	53	54	44	53	51	57	60	61	72	68	69	74	66	68	58	59	70	66	69	80	60.9	
Stockton.....	40	45	39	37	40	41	36	37	38	33	36	35	30	40	39	44	40	45	40	52	43	43	46	51	51	49	49	53	49	45	42.8	
	37	38	44	35	35	39	41	36	34	35	35	40	36	34	36	39	43	48	41	35	35	42	47	47	49	46	49	45	40	40.4		
	53	55	56	59	60	57	57	56	59	61	54	59	50	53	56	59	62	58	62	58	62	58	59	55	56	57	57	59	51	59.1		
	40	44	37	39	42	41	39	37	38	34	40	39	39	40	39	41	41	47	41	47	44	46	47	44	46	46	49	50	50	43.0		
	66	62	62	69	68	73	74	65	74	77	72	52	45	62	69	71	75	75	61	65	66	65	69	64	63	67	66	66	66	66	66	66
	37	40	45	39	33	37	40	32	33	47	32	30	36	39	32	36	37	39	49	42	34	36	39	48	50	50	49	47	47	40.3		
	63	62	58	61	61	64	64	71	62	69	63	59	57	58	60	69	60	58	55	56	61	62	62	63	64	63	63	62	62	61.9		
	49	47	49	43	45	46	51	46	48	47	44	47	48	41	46	46	49	48	45	42	45	44	48	48	49	47	44	48	48	48.1		
	59	56	57	60	60	55	61	55	62	64	59	55	57	58	62	64	59	62	62	58	56	59	62	59	59	57	56	56	54	54		
	45	45	45	45	45	46	46	45	45	44	44	44	42	40	45	48	43	46	43	46	44	46	46	46	46	46	46	46	46	46	46.3	
	60	59	57	63	59	60	58	63	67	65	61	51	54	56	61	62	69	51	65	65	66	65	64	67	64	65	67	61	60.5			
	37	46	40	35	44	39	38	33	32	34	35	39	41	36	35	42	45	44	47	43	46	42	48	49	48	51	49	47	41	41.6		
	65	53	57	63	65	63	65	63	65	67	66	57	52	51	57	64	72	61	52	56	57	65	59	64	60	67	78	61.2				
	46	42	40	43	46	45	41	41	42	40	35	43	40	37	39	33	42	43	42	43	45	41	43	48	47	45	46	45	45	43.1		
	58	55	63	66	70	70	68	70	66	70	70	60	57	51	63	63	70	61	58	60	68	62	58	63	58	64	70	74	63.3			
	48	41	46	48	45	46	45	38	44	37	40	41	46	43	39	40	42	49	40	41	40	48	42	45	46	46	46	44	40	40.0		
	53	58	53	53	63	58	60	59	66	66	64	55	55	58	54	59	63	60	66	62	55	54	55	60	61	61	65	71	60.2			
	37	35	32	29	39	34	27	29	29	34	32	32	33	30	33	30	31	30	32	31	33	39	40	37	39	44	45	50	48	48	38.0	
	57	58	58	62	60	58	57	60	63	58	64	54	53	57	60	66	60	65	63	57	63	59	60	56	58	63	69	73	60.8			
	39	43	40	40	43	43	38	38	37	34	38	45	40	39	45	38	46	44	46	43	41	42	44	45	45	46	46	46	46	39.0		

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.....	3.06	Dobbins (near).....	Sacramento.....	5.55	Livermore.....	Coast.....	2.33	Reedley.....	San Joaquin.....	2.50			
Aguanga.....	do.....	2.48	Dodgeland.....	do.....	1.69	Llano.....	do.....	1.05	Represa.....	Sacramento.....	2.87			
Angiola.....	San Joaquin.....	1.93	Dudley.....	San Joaquin.....	1.33	Lompoc.....	do.....	2.18	Rio Vista.....	do.....	1.35			
Antelope Valley.....	do.....	2.49	Dudleys.....	do.....	4.57	Lordsburg.....	do.....		Rosanond.....	Desert.....				
Arrowhead Springs.....	Coast.....	4.31	East Park.....	Sacramento.....	1.35	Los Alamos.....	do.....	1.65	Ruth.....	Coast.....	5.34			
Auburn.....	Sacramento.....	4.60	Edison.....	San Joaquin.....	2.18	Los Gatos.....	do.....	4.42	San Miguel Island.....	Ocean.....	0.85			
Avalon.....	Ocean.....	0.01	Electra.....	do.....	4.74	Lytle Creek.....	do.....	4.40	San Pedro.....					

SNOWFALL IN THE MOUNTAINS.

Because of frequent storms during February, the amount of snow on the ground in the mountains of California on March 1st was greater than that on a similar date in either of the two preceding years, and it was slightly above the normal for that date. The greatest amount on the ground at any of the stations from which reports were received was 144 inches, at Tamarack, Alpine County, altitude 8,000 feet.

During March, moderately heavy snow fell throughout the Sierra Nevada Mountains. Most of it fell during the middle decade. At Fordyce Dam, Nevada County, altitude 6,500 feet, a total of 36 inches fell within 48 hours on March 13-14. At the close of the month all streams were high, and the snow was melting rapidly, while the amount on the ground was about normal for that date, and it was greater than the amount on the ground on a similar date of the preceding year.

Abundant snowfall also occurred in the mountains of southern California, and most of it came during the second and third weeks of the month. At Squirrel Inn, in the San Bernardino Mountains, 24 inches fell on March 13-14. At Nellie, in the mountains of San Diego County, more than 13 inches fell within 24 hours, on the 13-14. Much of the snow melted in the warm spell which followed, and at the close of the month only the higher portions of the mountains were still covered.

In the Coast Ranges the snowfall was light, and little or no snow remained at the close of the month. The mountains in the San Francisco Bay region were covered with snow on the morning of the 14th, but it disappeared a few hours after sunrise.

If normal weather prevails during the spring months, there will be an ample amount of water available for irrigation and hydroelectric power during the coming summer. Below the 5,000-foot level in the Sierra Nevada Mountains the snow was soft and melting at the close of March. Above that level, however, it was hard and well packed, and ranged in depth from 20 to 100 inches. The greatest amount on the ground at any station from which reports were received was 109 inches, at Summit, Placer County, altitude 7,017 feet. Under normal conditions little new snow is added in the mountains of California after April 1. The season just closed has been similar to that of the preceding winter, with deficient snowfall during the first half, and abundant snowfall during the latter half. 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	130	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.....	45	80	67	26	81	53	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	153	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

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	T.		0	0
Trinity County.					
Hayfork	2,300	T.		0	0
Ruth	2,925	13		3	0
Weaverville.....	2,162	0		0	0
Mountain Lakes.					
Modoc County.					
Alturas	4,400	10	+ 5	6	0
Cederville	4,675	8	- 6	1	0
Fort Bidwell	4,375	10		0	0
Lassen County.					
Eagle Lake	5,000	24	+ 9	23	7
Madeleine	5,270	13	+ 3	16	T.
Nevada County.					
Grass Valley	2,690				
Nevada City	2,850	11	+ 2	T.	0
North Bloomfield	3,214	0	- 16	0	0
Truckee	5,817				
Placer County.					
Gold Run	3,222				
Tahoe	6,230	34		78	49
Inyo County.					
Bishop	4,450				
Bishop Creek	8,390	42	+ 15	33	22
Lone Pine	5,728	0		0	0
Wells Meadow	5,280				
Sacramento Watershed.					
Siskiyou County.					
McCloud	3,270	25	+ 9	19	0
Sisson	3,555	38	+ 16	24	0
Plumas County.					
Bucks	5,515	28	- 41	114	83
Canon Dam	4,570	25		60	30
Chester	4,550	28	+ 2	50	33
Clover Valley	5,700	15	+ 1	34	11
Le Porte	5,000	39	- 22	82	42
Portola	4,882	21		15	0
Quincy	3,400	19	- 1	5	0
Butte County.					
De Sabla	2,500	21	+ 8	6	0
Inskip	4,975	46	- 2	93	59
West Branch	3,216	22	+ 4	18	0
Yuba County.					
Camptonville	3,500	27	+ 12	18	0
Sierra County.					
Downieville	3,150	22	+ 13	3	0
Sierraville	5,000	16	+ 2	10	10
Nevada County.					
Deer Creek	3,700	39	+ 7	42	1
Fordyce Dam	6,500	79	- 7	135	103
Lake Spaulding	4,600	58	- 9	110	38
Placer County.					
Blue Canon	4,695	46	- 9	69	22
Emigrant Gap	5,230	67	+ 13	100	34
Summit	7,017	36	- 11	147	109
San Joaquin Watershed.					
Alpine County.					
Tamarack	8,000	59	- 37	140	102
Twin Lakes	7,970				
Tuolumne County.					
Hetch Hetchy	3,665	26	+ 16		
Lake Eleanor	4,700	55		40	T.
Kern County.					
Glenville	3,300	15	+ 11	4	0
Mariiposa County.					
Yosemite	3,945	23	+ 3	18	T.
Fresno County.					
Camp Seven	6,980	54		63	48
Cascada	4,900	23		15	0
Hume	5,300				
Huntington Lake	6,950	62		86	53
Stevenson Creek	4,250	29			
Tulare County.					
Hot Springs	3,300	0		0	0
Springville	4,000	28	+ 14	12	0
Mountains of Southern California.					
Cuyamaca	4,677	14	+ 4	12	0
Julian	4,222	20		10	0
Mount Wilson	5,704	29		19	T.
Nellie	5,250	24		10	T.
Seven Oaks	5,000				
Squirrel Inn	5,280	33	+ 22	22	4