

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 Madeline.

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	Per cent of possible.
Eureka.....	87	83	85	..	..
Fresno.....	82	49	68	234	76
Independence.....	45	26	36	256	83
Los Angeles.....	50	42	46	259	82
Mount Tamalpais.....	63	63	66	195	64
Red Bluff.....	83	56	70	156	52
Sacramento.....	90	69	80	191	63
San Diego.....	62	58	60	236	74
San Francisco.....	82	64	73	224	73
San Jose.....	..	60	..	224	73
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.
Eureka.....	5,536	7.4	43	sw.	15	se.
Fresno.....	3,413	4.6	23	nw.	25	nw.
Independence.....	3,999	5.4	24	nw.	1	nw.
Los Angeles.....	4,503	6.1	28	nw.	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.....	4,331	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	3.53	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.....	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	.086	.088	.120	.126	.077	.143	.119	.209	.381	.209	.091	.095	4.144
	{ Wind movement.....	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
Dodgoland*2....	{ Evaporation.....	†	†	†	†	†	4.07	†	0.48	0.36	0.10	0.16	0.47	0.26	0.15	0.11	0.48	0.17	0.13	0.72	1.04	0.42	0.36	0.40	0.66	0.27	0.66	0.47	0.39	0.49	0.36	0.49	1.357
	{ Wind movement.....	58	53	31	32	39	31	20	16	14	41	78	89	32	22	52	104	125	51	100	157	120	49	71	92	29	36	35	14	34	18	24	1,658
Oakdale (near)*3	{ Evaporation.....	†	1.41	.069	.029	.058	.054	.034	.088	.034	.062	.058	.051	.041	.031	.038	.056	.084	.035	.033	.000	.078	.097	.023	.031	.046	.055	.052	.067	.048	1.00	.038	1,622
	{ Wind movement.....	83	83	61	52	83	50	62	39	33	114	80	62	99	107	108	105	101	96	115	169	212	69	90	78	65	125	66	54	56	50	75	2,639
Tahoe**4.....	{ Evaporation.....	.020	.099	.045	.060	.075	.075	.080	.060	.030	.015	.035	.045	.095	.095	.075	.040	.015	†	.030	†	.055	.085	.095	.075	.110	.075	.050	.033	.035	.045	.045	2.093
	{ Wind movement.....	81	65	84	119	13	86	76	117	51	54	125	7	123	52	44	67	56	46	135	81	52	52	72	112	51	42	61	4	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; float in Lake Tahoe.

Climatological Data for January, 1919.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Snowfall), Number of days (Clear, Partly cloudy, Cloudy), Prevailing direction of wind, and Observers. The table lists data for 100 different stations across California, including locations like Alturas, Antioch, Atascadero, Azusa, Bakersfield, Barstow, Berkeley, Belteravia, Blue Canon, Blythe, Bonita, Branscomb, Calexico, Camptonville, Chico, Claremont, Cloverdale, Colfax, Corona, Crescent City, Davis, Downsville, Durham, El Cajon, Elsinore, Escondido, Eureka, Folsom, Fontana, Fort Bidwell, Fresno, Grass Valley, Greenland Ranch, Hanford, Healdsburg, Hollister, Independence, Indio, Inskip, Kennett, King City, La Porte, Lemon Cove, Lick Observatory, Lindsay, Lone Pine, Los Angeles, McCloud, Madeline, Marysville, Mecca, Merced, Mount Tamalpais, Mount Wilson, Napa, Needles, Nevada City, Newman, Oakland, Orland, Oroville, Pasadena, Paso Robles, Petaluma, Placerville, Point Reyes, Pomona, Porterville, Portola, Red Bluff, Redding, Redlands, Riverside, Rocklin, Rohnerville, Sacramento, St. Helena, Salinas, San Bernardino, San Diego, San Francisco, San Jacinto, San Jose, San Luis Obispo, Santa Ana, Santa Barbara, Santa Cruz, Santa Rosa, Sisson, Spreckels, Squirrel Inn, Stockton, Summit, Ukiah, Visalia, Watsonville, Weaverville, Willows, Yosemite, and Yreka.



Daily Temperature for January, 1919.

Table with columns for Stations, 1-31, and Mean. Rows list various California cities like Bakersfield, Calexico, Chico, Escondido, Eureka, Fresno, Independence, Los Angeles, Merced, Mount Tamalpais, Oakland, Orland, Oroville, Paso Robles, Point Reyes, Pomona, Porterville, Red Bluff, Redlands, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, San Luis Obispo, Santa Barbara, Santa Rosa, and Stockton.

SUPPLEMENTAL PRECIPITATION TABLE.

Table with columns for Stations, Watersheds, and Precip. inches. Rows list various locations and watersheds such as Abbots, Aguanga, Angiola, Antelope Valley, Arrowhead Springs, Auburn, Avalon, Bagdad, Barrett Dam, Beaumont, Beaumont (near), Bellota, Big Bar, Big Sur, Bishop, Bishop Creek, Cahulla, Calaveras R. S., Campbell, Campo, Canon Dam, Cascada, Cedarville, Centerville, Chester, China Flat, Chula Vista, Churn Creek, Clovis, Coalinga, Colgate, Colusa, Covelo, Crockett, Cucamonga, Deer Creek, Del Monte, Denair, De Sable, Dinuba, Dobbins (near), Dodgeland, Dudley, Dudleys, East Park, Edison, Electra, Emigrant Gap, Fairmont, Firebaugh, Fordyce Dam, Fort Bragg, Fort Ross, Fresno, Georgetown, Glennville, Goffs, Gold Run, Happy Camp, Hayfork, Head Dam, Helen Mine, Hetch Hetchy, Huntville (near), Huntington Lake, Idria, Indio, Jolon, Julian, Kennedy Mine, Kenfield, Kernville, Knights Landing, La Jolla, Lake Eleanor, Lake Spaulding, Las Plumas, Lathrop, Le Grand, Livermore, Llano, Lompoc, Lordsburg, Los Alamitos, Los Gatos, Lytle Creek, Maricopa, Mariposa, Melones, Merced Falls, Mesa Grande, Middlewater, Mill Creek-1, Mill Creek-2, Milo, Milton (near), Mokelumne Hill, Monroeville, Montague, Montgomery Creek, Nellie, Nicolaus, Niles, North Bloomfield, North Fork, North Lakeport, Oakdale (near), Ocean Grove, Ojai Valley, Orleans, Ozena, Parkfield, Pattiway, Peachland, Piedra, Point Loma, Priest Valley, Quincy, Reedley, Represa, Rio Vista, Rosamond, Ruth, San Miguel Island, San Pedro, Santa Ana River, Santa Clara, Santa Maria, Santa Monica, Seven Oaks, Shively, Sierra Madre, Sierraville, Sonora, Springfield (near), Standish, Stanwood, Stevenson Creek, Storey, Tahoe, Tamaraek, Tejon Rancho, Three Rivers, Truckee, Tustin (near), Twin Lakes, Twin Valley, Upper Mattole, Visalia, Walnut Creek, Warner Springs, Wasco, Wasioja, West Branch, West Point, Wrights, Yorba Linda.

**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
1900.....	60	78	67	54	87	68	72	96	106
1901.....	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	30	22	35

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.	.....	0	0
Ruth.....	2,925	2	.....	0	0
Weaverville.....	2,162	0	.....	0	0
<b>Mountain Lakes.</b>					
<i>Modoc County.</i>					
Alturas.....	4,400	3	-11	1	T.
Cedarville.....	4,675	2	-13	0	2
Fort Bidwell.....	4,375	5	.....	2	T.
<i>Lassen County.</i>					
Eagle Lake.....	5,000	8	-45	1	0
Madeline.....	5,270	7	-15	5	T.
<i>Nevada County.</i>					
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
<i>Placer County.</i>					
Gold Run.....	3,222	T.	-23	0	0
Tahoe.....	6,230	23	.....	12	23
<i>Inyo County.</i>					
Bishop.....	4,450	.....	.....	.....	.....
Bishop Creek.....	8,390	1	-51	3	1
Lone Pine.....	3,728	0	.....	0	0
Wells Meadow.....	5,280	.....	.....	.....	.....
<b>Sacramento Watershed.</b>					
<i>Siskiyou County.</i>					
McCloud.....	3,270	10	-52	3	0
Sisson.....	3,555	24	-13	7	0
<i>Plumas County.</i>					
Bucks.....	5,515	23	-102	24	39
Canon Dam.....	4,570	17	.....	10	19
Chester.....	4,550	22	-52	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
<i>Butte County.</i>					
De Saba.....	2,500	0	-18	0	0
Inskip.....	4,975	27	-51	13	20
West Branch.....	3,216	0	-46	0	0
<i>Yuba County.</i>					
Camptonville.....	3,500	T.	-32	0	0
<i>Sierra County.</i>					
Downieville.....	3,150	4	-31	0	0
Sierraville.....	5,000	4	-46	0	0
<i>Nevada County.</i>					
Deer Creek.....	3,700	5	-49	0	0
Fordyce Dam.....	6,500	39	-59	24	44
Lake Spaulding.....	4,600	23	-30	6	11
<i>Placer County.</i>					
Blue Canon.....	4,695	21	-33	4	8
Emigrant Gap.....	5,230	25	-29	3	T.
Summit.....	7,017	48	-31	10	42
<b>San Joaquin Watershed.</b>					
<i>Alpine County.</i>					
Tamarack.....	8,000	28	.....	22	35
Twin Lakes.....	7,970	.....	.....	.....	.....
<i>Tuolumne County.</i>					
Hetch Hetchy.....	3,665	4	.....	0	1
Lake Eleanor.....	4,700	8	-43	T.	1
<i>Kern County.</i>					
Glennville.....	3,300	0	-4	0	0
<i>Mariposa County.</i>					
Yosemite.....	3,945	4	-35	T.	T.
<i>Fresno County.</i>					
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
<i>Tulare County.</i>					
Hot Springs.....	3,300	0	-2	0	0
Springville.....	4,000	0	-15	0	0
<b>Mountains of Southern California.</b>					
<i>Cuyamaca.....</i>					
Julian.....	4,677	3	-5	0	0
Mount Wilson.....	4,222	0	.....	0	0
Nellie.....	5,704	7	.....	T.	5
Seven Oaks.....	5,350	T.	.....	0	0
Squirrel Inn.....	5,000	T.	-14	0	0
.....	5,280	2	-7	0	2