

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

CALIFORNIA SECTION.

EDWARD A. BEALS, METEOROLOGIST.

Vol. XXIV. SAN FRANCISCO, DECEMBER, 1920. No. 12

GENERAL SUMMARY.

December was somewhat colder than normal in California. Markedly deficient sunshine throughout northern California and cold nights in the southern portion of the State kept the mean temperature relatively low. Extremely cold weather prevailed in the Sierra Nevada Mountains and in the north-eastern plateau region where temperatures below zero were commonplace.

Precipitation was irregularly distributed. It was an abnormally wet month in northern California, while in southern California little or no rain fell. Abundant snow fell in the Sierra Nevada Mountains, while in the elevated portions of the south the snowfall was light, and little unmelted snow remained on the ground at the close of the month. Precipitation occurred somewhere in the State on every day of the month. Rainfall was particularly heavy in northern California between the 7th and 11th, and again between the 18th and 24th. At Wright's, Santa Cruz County, 6.07 inches of rain fell in 24 hours on the 9th-10th. Scattered light hail fell at many stations, but no damage resulted from that cause. While storms were of frequent occurrence, none was of destructive violence. Rivers in northern California rose rapidly following the advent of the rains, and a few of the smaller streams reached high stages, but no extensive damage from floods resulted. As far as human comfort was concerned, it was a gloomy and unpleasant month.

Agriculturally, the generous rains in northern California were beneficial, while deficient precipitation in the south was harmful. Farm work was generally backward, due in the north to the fact that excessive rainfall saturated the soil so that it could not be worked to advantage, while in the south lack of moisture caused it to become too hard for plowing. Growth was slow in consequence of insufficient sunshine in the north, and the prevalence of cold, frosty nights in the south. While frosts were of frequent occurrence in the agricultural regions, few were sufficiently severe to cause extensive damage. Maturing oranges and lemons escaped damage from frost, and all citrus fruits made good progress. The copious rains in the north were of especial benefit to unirrigated deciduous fruit trees which previously were in a weakened condition because of protracted drought. Unfortunately the rice harvest was not completed before the heavy rains began, and a large amount of unharvested rice remained in the fields at the close of the month. Except in southern counties, green feed was abundant, and grazing stock maintained excellent condition.

A. H. P.

PRESSURE.

The mean sea-level pressure, determined from the records of 12 regular Weather Bureau stations, was 30.09 inches. The highest was 30.48 inches at Independence on the 15th; the lowest was 29.49 inches at Point Reyes on the 19th; the range for the State was 0.99 inch.

TEMPERATURE.

The monthly mean temperature for the State, as shown by the records of 98 stations, was 45.7°, which is 1.0° below the normal.

The highest monthly mean was 55.8° at Los Angeles; and the lowest was 21.6°, at Medeline.

The highest temperature, 82°, occurred at El Cajon on the 14th; and the lowest, -11°, occurred at Madeline on the 12th.

The range for the State was 93°.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 249 stations, was 5.73 inches, or 1.70 inches above the normal.

The greatest monthly amount was 23.47 inches, at Wright's. No rain fell at 5 stations.

The greatest amount in 24 hours was 6.07 inches at Wright's on the 9th-10th.

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.....	88	85	86	56	19
Fresno.....	89	69	79	144	43
Independence.....	65	40	52	223	75
Los Angeles.....	68	62	65	212	69
Mount Tamalpais.....	86	.....	.....	176	60
Red Bluff.....	88	74	81	143	46
Sacramento.....	94	85	90	117	40
San Diego.....	74	74	74	223	72
San Francisco.....	50	70	75	163	55
San Jose.....	75	75	75	139	47
San Luis Obispo.....	79	65	72	188	62

WIND MOVEMENT.—(Miles.)

Stations.	Total mov. for month.	Ave. hr. velocity.	Maximum velocity.	Direction.		Date.	Prev. dir.
				Direction.	Date.		
Eureka.....	5,304	7.1	40	nw.	11	se.	
Fresno.....	4,123	5.5	31	nw.	19	nw.	
Independence.....	3,852	5.2	30	se.	11	nw.	
Los Angeles.....	4,341	5.8	30	nw.	20	ne.	
Mount Tamalpais.....	16,249	21.8	70	sw.	11	nw.	
Point Reyes.....	17,152	23.1	80	s.	19	nw.	
Red Bluff.....	4,488	6.0	35	se.	11	nw.	
Sacramento.....	5,238	7.4	36	se.	9	se.	
San Diego.....	3,976	5.3	33	w.	19	nw.	
San Francisco.....	6,264	8.4	34	sw.	1	se.	
San Jose.....	4,852	6.5	34	e.	9	se.	
San Luis Obispo.....	2,915	3.9	23	nw.	19	n.	

COMPARATIVE DATA FOR DECEMBER.

Year	Mean temp.	Ave. precip.	Year	Mean precip.	Ave. temp.	Year	Mean temp.	Ave. precip.	Year	Mean temp.	Ave. precip.
1897.....	44.4	1.75	1903.....	48.0	1.44	1909.....	43.3	6.92	1915.....	45.7	5.56
1898.....	44.4	1.20	1904.....	47.2	3.04	1910.....	47.8	1.87	1916.....	41.8	5.81
1899.....	45.8	3.03	1905.....	45.3	1.55	1911.....	43.3	2.05	1917.....	49.8	1.43
1900.....	47.3	1.68	1906.....	47.3	8.42	1912.....	44.7	1.58	1918.....	43.8	2.10
1901.....	47.4	1.45	1907.....	48.3	5.41	1913.....	44.8	7.04	1919.....	46.1	3.87
1902.....	46.6	2.96	1908.....	43.2	2.33	1914.....	41.8	5.00	1920.....	45.7	5.73

Daily evaporation (inches) and wind movement (miles) for December.

Stations.	Data.	Day of Month.																																	
		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	Total		
Chula Vista*.....	Evaporation.....	.093	.049	.107	.129	.119	.121	.050	.072	.081	.087	.131	.093	.109	.109	.341	.081	.080	.105	.175	.153	.087	.057	.061	.057	.085	.071	.079	.068	.067	.047	.087	3.051		
Dodgeland*.....	Wind movement.....	.74	.99	.79	.71	.80	.84	.78	.65	.60	.72	.151	.66	.68	.52	.134	.61	.50	.75	.255	.148	.82	.102	.66	.88	.19	.51	.57	.63	.69	.67	.69	2.585		
Oakdale (near)*.....	Evaporation.....	.024	.009	.066	.014	.077	.049	.000	.092	.038	.061	.130	.061	.028	.026	.071	.026	.040	.014	.000	.000	.004	.051	.004	.040	.017	.010	.011	.004	.046	.004	.010	1.018		
Tahoe**.....	Evaporation.....	.010	.051	.025	.087	.073	.082	.131	.084	.039	.043	.053	.001	.037	.025	.045	.000	.015	.141	.056	.000	.002	.000	.000	.026	.012	.029	.009	.046	.000	1.127				
	Wind movement.....	.50	.135	.70	.105	.135	.115	.245	.180	.150	.200	.180	.120	.100	.50	.60	.50	.50	.75	.325	.100	.105	.70	.240	.80	.90	.60	.60	.135	.155	3.705				
	Wind movement.....	.42	.27	.39	*	.198	.64	.49	.14	.83	*	*	*	*	.172	.132	.25	.129	.79	.76	.86	*	*	*	*	.484	.73	.81	.33	.111	.104	.111	.137	.72	2,421

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

CLIMATOLOGICAL DATA: CALIFORNIA SECTION.

DECEMBER, 1920.

Stations.		Counties.		Elevation, feet.				Length of record, years.				Temperature, in degrees Fahr.				Precipitation, in inches.				Number of days.				Observers.
				Mean.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (un-melted).	Precipitation of one inch or more.	Partly cloudy.	Cloudy.	Prevailing direction of wind.							
Antioch		Contra Costa		46	41	46.6	-1.7	60	+1	33	+1.31	.58	0	11	2	6	23	e.	C. G. McDaniel.					
Atascadero		San Luis Obispo		837	4	43.1	-	60	-2	20	-2.44	.62	0	13	14	3	14	n.w.	Colony Holding Corp.					
Bakersfield		Kern		404	31	49.0	+1.5	70	-17	28	+38	.76	+.07	.29	0	6	1	15	w.	Santa Fe Co.				
Barstow		San Bernardino		2,105	17	43.4	-3.4	68	-1	20	+6	.39	-42	.18	0	1	26	1	w.	E. L. White.				
Berkeley		Alameda		317	33	49.1	-0.6	61	+26	37	-12	21	6.97	-2.54	.80	0	16	12	11	w.	State University.			
Blue Canon		Placer		4,695	21	37.7	-2.5	64	+17	11	-13	34	16.59	+7.53	2.41	0	17	13	2	16	Southern Pacific Co.			
Blythe		Riverside		268	11	50.6	-	78	-19	27	+12	46	0	-37	0	0	0	13	18	0	s.w.	Palo Verde Water Co.		
Bonita		San Diego		110	4	52.6	-	80	-15	32	-6	42	.49	-23	0	5	11	13	7	w.	R. M. Allen.			
Branscomb		Mendocino		2,000	20	42.4	-2.1	65	-27	27	+5	27	+23.02	+10.04	4.40	T	20	8	4	19	n.	A. J. Haun.		
Brawley		Imperial		-105	10	50.8	-	75	-1	28	-14	48	T	-	0	0	0	0	0	0	m.d.	H. M. Rouse.		
Calexico		Imperial		0	15	52.8	+0.3	78	-2	29	-14	44	0	-37	0	0	0	18	8	5	w.	U. S. Bureau Plant Ind.		
Chico		Butte		189	50	45.7	-1.8	61	-2	30	+5	25	7.67	+3.49	1.93	0	0	15	10	10	11	s.w.	Western Salt Works.	
Chula Vista		San Diego		9	2	52.0	-	78	-15	38	+12	29	.41	-22	0	0	0	18	8	5	w.	Prof. F. P. Brackett.		
Claremont		Los Angeles		1,200	21	49.7	-2.7	76	-29	29	+21	42	1.26	-62	.81	0	6	21	3	7	s.	John O. Ogle.		
Cloverdale		Sonoma		340	18	46.9	-1.1	62	+14	31	-15	27	11.30	+5.79	1.61	0	18	12	0	19	u.	Southern Pacific Co.		
Colfax		Placer		2,421	49	42.6	-4.0	60	-29	29	-12	26	10.62	+2.59	1.58	1.0	12	10	6	15	s.w.	E. A. Houchins.		
Colusa		Colusa		60	17	46.8	+0.6	61	-26	31	-20	25	6.48	+2.20	1.51	0	16	15	1	15	uv.	Edwin T. Brink.		
Crescent City		Riverside		615	6	53.0	-	80	-1	30	-21	35	.67	-42	0	5	16	6	9	e.	Thos. E. Peacock.			
Davis		Del Norte		125	6	46.4	-0.8	67	-6	33	-24	30	21.20	-9.50	2.40	0	19	0	4	27	n.	Prof. S. H. Beckett.		
Dodgeland		Yolo		51	48	45.6	-3.2	59	-2	31	+13	24	4.39	+1.16	1.00	0	14	14	5	12	s.	Dodge Land Co.		
Durham		Butte		125	2	48.8	-	61	-3	29	-21	26	6.30	-	1.85	0	15	8	6	17	s.	R. W. Durham.		
El Cajon		San Diego		160	25	-	-	51	-2	27	-1	21	2.61	-44	.70	17.5	9	2	8	21	sw.	Eugene P. Kessler.		
Elsinore		Riverside		482	21	52.4	-1.7	82	-14	28	-14	54	.69	-59	.39	0	5	25	4	2	sw.	W. L. Wilhite.		
Escondido		San Diego		1,300	4	51.0	-	78	-1	26	-21	40	.42	-30	0	3	12	11	8	n.e.	H. L. Harlow.			
EUREKA		Humboldt		64	34	48.4	+0.4	67	-15	35	-5	27	10.89	+3.64	1.71	0	23	2	6	23	se.	U. S. Weather Bureau.		
Folsom		Sacramento		252	47	48.6	+1.6	65	-26	32	+14	21	6.67	+2.47	.85	0	14	11	0	20	s.w.	Mrs. G. I. Marvin.		
Fontana		San Bernardino		1,325	8	49.4	-	73	-28	29	-21	33	1.60	-	.75	0	6	24	3	4	sw.	Fontana Land Co.		
Fort Bidwell		Modoc		4,375	31	20.6	-2.2	51	+27	29	-21	31	2.61	-44	.70	17.5	9	2	8	21	sw.	C. R. Declois.		
FRESNO		Fresno		293	33	47.5	+0.7	64	-17	32	-5	27	1.07	-46	.24	0	13	12	6	13	uv.	U. S. Weather Bureau.		
Grass Valley		Nevada		2,690	48	41.7	-	58	+14	26	-5	26	14.41	+6.20	2.31	2.0	16	12	2	17	se.	Mrs. L. M. Wentworth.		
Greenland Ranch		Inyo		-178	9	46.4	-	71	-2	28	-19	35	0	-	0	0	0	28	0	3	.....	O. A. Denton.	
Hanford		Kings		249	20	39.6	-5.0	62	-9	27	-14	24	.85	-09	.20	0	11	8	5	26	.....	Santa Fe Co.	
Healdsburg		Sonoma		110	27	47.8	+0.8	67	-27	31	-14	29	12.37	+5.34	2.12	0	14	4	14	13	s.	Dr. F. J. Kinley.		
Hollister		San Benito		284	46	47.6	-2.5	61	-6	28	-6	28	6.33	+9.93	.52	0	15	12	4	15	uv.	Grangers' Union.		
INDEPENDENCE		Inyo		3,957	24	40.2	-1.4	69	-27	21	-13	38	.32	-46	.22	0	4	15	11	5	n.w.	U. S. Weather Bureau.		
Indio		Riverside		20	45	51.1	-5.5	75	-11	30	-16	41	0	-42	0	0	0	13	15	3	se.	U. S. Bureau Plant Ind.		
Inskip		Butte		4,975	13	34.6	-	56	-27	21	-12	24	21.06	-	4.14	88.0	14	5	8	18	sw.	Pacific Gas & Electric Co.		
Kennett		Shasta		730	4	43.2	-	66	-27	29	-11	28	17.04	-	2.35	20.0	4	4	4	23	sw.	Manomoth Copper Mine.		
La Porte		Plumas		5,000	26	28.7	-6.5	65	+16	10	-12	19	14.41	+3.48	2.42	66.1	16	9	7	15	uv.	Wm. Schuld.		
Lemon Cove		Tulare		600	25	47.0	-0.7	64	-1	29	-4	34	2.46	+82	.73	0	11	10	8	13	uv.	T. E. Bence.		
Lick Observatory		Santa Clara		4,209	31	39.8	-2.1	61	-27	24	+12	22	8.33	+2.02	1.87	T	15	9	9	13	.....	Lick Observatory.	
Lindsay		Tulare		384	6	46.6	-	66	-11	26	-13	37	1.49	-	.46	0	12	6	6	19	.....	Basil Prior.	
Lone Pine		Inyo		3,728	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G. F. Marsh.			
LOS ANGELES		Los Angeles		293	43	55.8	-0.7	75	-14	41	-21	25	1.01	-1.89	.59	0	5	15	7	9	ne.	U. S. Weather Bureau.		
McCloud		Siskiyou		3,270	10	35.2	-	54	-2	28	-10	34	3.86	-	47.5	13	5	4	22	s.	McCloud River Lbr. Co.			
Marysville		Yuba		67	49	46.2	-3.7	57	-12	31	-20	24	6.04	+2.47	1.00	0	13	11	4	16	s.	Southern Pacific Co.		
Mecca		Riverside		-185	14	51.2	-1.5	74	-3	28	-17	41	1.03	+63	1.03	0	1	17	9	5	se.	Cooperative Date Garden.		
Merced		Merced		173	46	46.3	-2.0	62	-1	28	-21	29	2.62	+1.03	.51	0	14	8	10	13	uv.	Santa Fe Co.		
MOUNT TAMALPAIS		Marin		2,375	21	43.0	-4.6	56	-28	32	-9	17	6.88	+2.98	1.12	0	21	7	7	17	w.	U. S. Weather Bureau.		
Mount Wilson		Los Angeles		5,704	3	43.1	-	69	-28	22	-20	26	1.78	-	1.10	3.00	6	14	9	8	s.w.	Solar Observatory.		
Napa		Napa		20	43	48.9	+1.2	64	+30	32	-12	29	6.19	+2.00	.94	0	15	10	11	10	sw.	State Hospital.		
Needles		San Bernardino		477	28	48.0	-4.8	70	-2	28	-14	36	T	-44	T	-	0	13	18	0	.....	Santa Fe Co.	
Newman		Nevada		2,850	28	41.6	-0.8	64	+27	22	-5	33	13.34	+3.36	2.11	3.25	16	8	10	13	w.	B. H. Preston.		
Stanislaus		Stanislaus		91	31	44.5	-3.4	64	+1	24	-6	35	2.25	+3.2	.59	0	10	17	6	16	s.w.	E. S. Wangenheim.		
Oakdale (near)		Stanislaus		215	2	43.8	-0.5	63	-2	27	-19	25	3.46	+1.25	.57	0	14	10	7	14	s.	S. San Joaquin Irr. Dist.		
Oakland		Alameda		322	44	48.4	-0.8	57	-27	38	-12	12	7.40	+3.54	1.16	0	17	9	11	uv.	Chabot Observatory.			
Ojai		Ventura		900	14	50.2	-1.7	76	-14	25	-13	45	1.00	-2.42	.75	0	23	5	3	sw.	W. H. Duncan.			
Orland		Glen		254	35	45.0	-2.9	60	-26	31	-20	24	4.48	+1.46	1.49	0	14	10	9	12	ue.	U. S. Rec. Service.		
Oroville (near)		Butte		250	45	45.4	-2.4	64	-1	30	-14	27	9.39	+4.63	2.16	0	14	10	8	13	ue.	N. R. Heberle.		
Pasadena		Los Angeles		805	30	51.2	-2.8	73	-14	30	-21	37	1.45	-1.18	.93	0	6	17	6	8	sw.	Morris S. Jones.		
Paso Robles—1		San Luis Obispo		800	33	46.4	+1.0	66	-28	32	-30	24	5.97	+1.48	1.48	0	18	11	10	10	uv.	Mrs. A. Z. Campbell.		
Petaluma		Sonoma		9	6	50.1	-	62	-30	36	-16	23	8.03	-3.10	1.39	0	16	11	7	13	s.	Iohn Landis.		
POINT REYES		El Dorado		1,925	31	43.9	+1.5	66	-1	25	-5	28	9.85	+2.63	0.8	0.5	17	7	0	24	sw.	O. E. Bailey.		
Pomona		Los Angeles		857	6	47.9	-1.1	74	-14	27	-16	44	1.44	-	.78	0	6	8	18	5	w.	U. S. Weather Bureau.		
Porterville																								

Daily Precipitation for December, 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 included in the next following measurement. † Separate dates of fall not recorded. T. trace, or less than 0.01 inch.

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

Daily Temperature for December, 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.....	68	63	64	53	51	69	65	63	66	62	59	60	58	57	68	65	70	63	58	54	57	58	60	61	54	56	61	66	49	64	53	60.5		
	Minimum.....	43	43	35	35	29	31	46	35	34	42	37	35	28	29	32	45	41	35	43	39	30	45	45	45	44	34	33	33	33	43	43	37.6	
Calexico.....	74	78	73	74	69	70	75	71	70	71	64	67	71	70	69	73	73	74	64	66	66	65	68	68	73	70	74	74	70.1					
	Minimum.....	42	34	41	33	38	35	30	36	34	35	35	39	33	29	34	35	40	36	34	49	35	30	32	35	36	36	39	34	34	35	35.6		
Chico.....	56	61	56	57	55	51	51	53	50	52	57	51	49	57	53	55	55	51	51	52	42	47	47	56	54	58	57	52	50	48	55	52.9		
	Minimum.....	49	42	33	38	30	35	40	43	45	45	43	30	32	35	30	35	36	48	48	30	33	37	43	45	35	34	35	37	43	38.5			
Escondido.....	73	58	72	67	70	73	57	61	65	64	60	62	70	79	77	75	70	67	54	55	60	61	65	59	63	69	71	73	68	60	64	65.9		
	Minimum.....	45	34	36	34	33	34	36	39	39	41	41	36	35	37	42	38	35	39	35	31	34	36	39	41	44	39	37	41	37	38.5			
Eureka.....	54	53	56	50	51	54	50	52	54	52	50	50	56	67	63	60	56	50	50	52	44	55	52	52	55	56	61	59	41	37	50.1			
	Minimum.....	46	43	41	38	35	42	41	49	43	46	39	36	40	49	50	52	45	39	36	42	49	48	46	42	43	49	47	52	42	37	50.1		
Fresno.....	62	58	58	54	52	62	52	54	58	60	53	52	58	55	57	58	64	55	54	51	48	48	54	55	48	54	60	61	50	50	52	54.9		
	Minimum.....	46	44	36	38	34	35	41	39	36	45	42	36	34	33	35	43	47	44	45	38	34	43	46	44	38	40	38	44	39	45	40.1		
Independence.....	63	53	51	55	56	50	53	51	52	53	54	48	49	55	47	44	51	46	47	43	51	50	48	48	45	65	69	58	60	57	64	52.9		
	Minimum.....	35	35	29	24	28	23	28	25	25	29	33	21	24	26	25	24	23	24	31	27	24	26	30	29	27	34	32	30	28	26	27.4		
Los Angeles.....	69	61	69	65	65	70	56	61	64	63	57	64	67	75	73	65	62	58	66	59	62	55	62	67	70	65	68	61	63	61	61	61		
	Minimum.....	52	52	49	48	45	47	44	46	48	50	47	42	51	54	49	47	47	46	41	44	40	46	47	47	50	50	46	46	47	46.7			
Merced.....	62	57	58	54	52	61	46	52	57	60	51	53	51	51	51	54	51	47	48	52	55	51	52	57	58	51	49	54	53	57	57.7			
	Minimum.....	37	44	34	45	30	32	38	37	35	38	49	41	31	31	34	39	41	47	46	35	28	42	45	50	38	37	34	35	40	45	47.7		
Mount Tamalpais.....	49	44	49	42	46	45	45	45	47	45	46	45	46	45	46	51	51	45	47	47	43	40	51	49	44	54	56	55	52	48	47.7			
Oakland.....	42	39	40	36	36	38	35	38	32	42	35	34	38	38	39	43	41	41	36	35	34	34	38	38	37	41	46	42	43	38	37.8			
	Minimum.....	56	55	54	50	51	54	52	52	51	54	52	50	54	51	52	54	54	54	50	46	44	40	54	51	50	57	54	57	56	52.3			
Orland.....	51	47	43	45	40	42	44	40	43	47	45	38	39	44	44	47	45	40	47	50	49	46	42	40	42	48	45	44	46	45	44.5			
	Minimum.....	56	57	54	54	54	50	58	48	53	56	49	56	50	52	50	53	51	52	44	48	45	45	44	48	50	54	55	55	50	55			
Oroville.....	64	56	60	57	55	56	53	50	52	50	53	58	51	52	57	53	55	56	52	50	51	43	49	51	57	53	57	59	53	53	52	57.7		
	Minimum.....	46	41	33	34	31	34	35	41	43	44	47	34	31	30	32	33	34	35	46	33	34	36	35	42	38	34	35	38	39	41			
Paso Robles.....	58	59	61	58	55	63	56	58	55	60	59	56	54	56	52	54	55	54	55	54	50	60	55	55	55	55	55	55	62	66	60	59	56	57.6
	Minimum.....	45	44	33	35	27	27	38	33	33	40	38	35	29	29	32	33	35	40	40	40	31	30	30	40	36	34	35	35	36	34	35.3		
Point Reyes.....	56	54	56	51	55	50	50	51	52	57	52	51	55	60	59	54	54	54	50	48	48	52	49	57	54	52	54	52	54	51.1				
	Minimum.....	51	48	49	46	42	47	44	47	45	50	43	43	45	45	45	51	49	49	42	43	43	42	44	49	45	44	48	50	49	47.6			
Pomona.....	72	58	67	66	64	67	52	58	63	58	54	60	65	74	68	71	66	63	54	56	58	57	62	54	61	65	69	73	67	59	65	62.7		
	Minimum.....	35	39	33	30	28	27	29	29	32	32	38	42	35	27	30	36	38	32	30	40	31	29	30	32	34	32	33	31	31	33	31.1		
Porterville.....	68	65	60	59	59	54	56	66	59	62	55	55	53	53	58	50	57	57	62	57	51	51	50	58	57	56	54	50	40	59	51.3			
	Minimum.....	38	36	35	35	35	31	37	40	34	35	36	29	30	39	31	41	37	37	37	30	42	44	43	45	42	39	34	34	34	35	36.8		
Red Bluff.....	53	57	52	54	51	43	49	52	48	51	54	54	47	60	54	52	49	49	38	51	35	46	40	52	53	63	55	51	49	55	51.1			
	Minimum.....	49	41	36	38	36	34	37	43	44	44	39	39	32	33	39	34	40	40	45	37	32	32	33	37	37	36	39	41	45	42	38	35.5	
Redlands.....	79	55	67	68	65	67	51	56	61	55	52	60	67	71	66	70	65	61	53	54	56	57	62	55	67	68	72	68	66	70	62.8			
	Minimum.....	40	38	34	34	32	30	31	31	32	38	38	32	30	35	34	38	37	34	40	32	30	31	34	35	41	37	38	39	37	36	35.4		
Sacramento.....	58	57	54	53	49	45	49	41	51	47	53	53	50	53	51	47	50	52	51	52	51	43	45	48	44	45	41	49	44	48	50	49.3		
	Minimum.....	49	44	36	41	37	38	40	41	39	43	41	36	35	39	38	42	37	47	40	34	35	40	43	44	38	37	37	41	37	40.1			
San Bernardino.....	74	57	71	68	65	71	52	59	69	61	55	60	69	74	70	73	69	63	56	57	60	60	66	58	66	71	73	77	72	65	66	65.6		
	Minimum.....	39	39	34	31	29	25	34	30	34	31	40	41	43	28	29	33	37	35	32	39	40	33	39	35	37	34	37	34	37	34	37.4		
San Diego.....	65	61	63	64	64	67	59	56	60	63	62	62	64	67	72	69	65	63	57	56	60	60	69	63	66	71	61	58	56	62.6				
	Minimum.....	52	53	46	46	42	46	47	46	47	44	46	42	47	49	51	54	48	47	44	45	40	43	45	47	41	46	45	46	47.0				
San Francisco.....	57	60	58	57	53	55	56	55	56	54	53	58	54	54	55	54	54	57	58	56	56	46	49	51	57	53	54	60	51	60	55.6			
	Minimum.....	52	50	47	46	44	44	48	44	48	47	48	43	47	46	47	48	49	47	48	49	51	47	53	54	57	53	54	54	50	45	46.6		
San Jose.....	60	59	63	55	57	65	55	57	56	61	55	54	57	60	57	52	53	60	57	55	54	54	55	54	57	54	56	53	57	52.7				
	Minimum.....	49	40	36	39	34	38	45	39	39	44	33	32	34	34	32	33	34	41	47	50	46	36	34	45	43	36	35	36	37	38.9			
San Luis Obispo.....	62	62	67	61	62	63	57	55	57	61	58	58	63	64	70	62	66	55	57	58	63	61	55	59	62	72	70	67	66	63	61.8			
	Minimum.....	47	45	42	40	39	31	40	39	36	46	45	41	40	43	39	45	50	50	41	33	41	46	44	49	41	40	39	47	43	42.5			
Santa Barbara.....	70	69	69	71	68	69	60	55	53	55	56	57	60	67	72	65	60	62	65	60	62	68	72	60	58	65	64.8							
	Minimum.....	40	45	39	38	37	34	45	42	40	49	44	36	34	38	44	48																	

SUPPLEMENTAL PRECIPITATION TABLE

Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.	Stations.	Watersheds.	Precip., inches.
Abbotts.....	Coast.....	2.69	Dobbins (near).....	Sacramento.....	11.50	Lathrop.....	San Joaquin.....	2.76	Repsa.....	Sacramento.....	7.31
Aguanga.....	do.....	.37	Downieville.....	do.....	16.77	La Verne.....	Coast.....	Rio Vista.....	do.....	do.....	4.82
Angiola.....	San Joaquin.....	.92	Dudley.....	San Joaquin.....	.57	Le Grand.....	San Joaquin.....	3.02	Ruth.....	Coast.....	17.00
Antelope Valley.....	do.....	.53	Dudleys.....	do.....	7.48	Livermore.....	Coast.....	3.81	St. John.....	Sacramento.....	6.27
Arrowhead Springs.....	Coast.....	3.32	East Park.....	Sacramento.....	6.02	Llano.....	do.....	.40	San Miguel Island.....	Ocean.....	.73
Auberry.....	San Joaquin.....	3.53	Edison.....	San Joaquin.....	1.81	Lompoc.....	do.....	1.44	San Pedro.....	Coast.....	1.01
Auburn.....	Sacramento.....	11.58	Electra.....	do.....	6.92	Los Alamos.....	do.....	1.29	Santa Ana River.....	do.....	1.88
Avalon.....	Ocean.....	1.05	Emigrant Gap.....	Sacramento.....	8.77	Los Gatos.....	do.....	6.39	Santa Clara.....	do.....	3.80
Azusa*.....	Coast.....		Fairmont.....	Coast.....	.52	Lytle Creek.....	Mountain Lakes.....	3.32	Santa Maria.....	do.....	1.24
Bagdad.....	Desert.....	0	Firebaugh.....	San Joaquin.....	1.05	Madelaine.....	San Joaquin.....	.17	Santa Monica.....	do.....	1.23
Barrett Dam.....	Coast.....	1.25	Fordyce Dam.....	Sacramento.....	11.06	Maricopa.....	do.....	6.16	Seven Oaks.....	do.....	1.45
Beaumont.....	do.....	1.51	Fort Bragg.....	Coast.....	12.23	Markleeville.....	Carson.....	2.34	Shield's Ranch.....	Walker.....	.72
Beaumont (near).....	do.....	1.57	Fort Ross.....	do.....	14.98	Melones.....	San Joaquin.....	5.47	Shively.....	Coast.....	19.80
Bellota.....	San Joaquin.....	4.75	Friant.....	San Joaquin.....	2.29	Merced Falls.....	do.....	4.12	Sierraville.....	Mountain Lakes.....	2.98
Benson's Ferry.....	Sacramento.....	3.95	Georgetown.....	Sacramento.....	14.21	Mess Granda.....	San Joaquin.....	2.30	Springville (near).....	San Joaquin.....	7.48
Betteravia.....	Coast.....	1.54	Glacier Point.....	San Joaquin.....	4.77	Middlewater.....	San Joaquin.....	10.24	Standish.....	do.....	6.12
Big Bar.....	Sacramento.....	11.10	Glenville.....	do.....	4.08	Mill Creek-1.....	do.....	1.79	Tanwood.....	Coast.....	1.47
Big Sur.....	Coast.....	10.05	Goffs.....	do.....	.25	Mill Creek-2.....	Coast.....	5.16	Sterling*.....	Desert.....	
Bishop Creek.....	Owens.....	1.00	Gray Mountain.....	Klamath.....	13.98	Milo.....	San Joaquin.....	5.85	Storey.....	San Joaquin.....	1.45
Calaveras R. S.....	San Joaquin.....	9.00	Happy Camp.....	Coast.....	11.33	Milton (near).....	do.....	6.42	Tamarack.....	Sacramento.....	11.43
Campbell.....	Coast.....	4.15	Hayfork.....	Sacramento.....	13.89	Mokelumne Hill.....	do.....	3.20	Tejon Rancho.....	San Joaquin.....	2.85
Campo.....	do.....	.79	Head Dam.....	do.....	21.96	Monroeville.....	Sacramento.....	6.65	Three Rivers.....	do.....	3.62
Camptonville.....	San Joaquin.....	17.15	Helen Mine.....	Coast.....	5.42	Montague.....	Klamath.....	2.62	Towle.....	Sacramento.....	
Canon Dam.....	Sacramento.....	8.24	Hetch Hetchy.....	San Joaquin.....	19.15	Nellie.....	Coast.....	3.20	Trona.....	Desert.....	.50
Cascade.....	San Joaquin.....	3.75	Hullville (near).....	Coast.....	4.82	Nicolaus.....	Sacramento.....	4.97	Truckee.....	Mountain Lakes.....	
Cederville.....	Mountain Lakes.....	1.99	Huntington Lake.....	San Joaquin.....	1.69	North Bloomfield.....	do.....	13.29	Turlock.....	San Joaquin.....	3.53
Centererville Pwr. H.....	Sacramento.....	12.59	Idria.....	do.....	1.87	North Fork.....	San Joaquin.....	6.07	Tustin (near).....	Coast.....	.87
Chester.....	do.....	8.69	Jenny Lind.....	do.....	1.98	Oak Grove.....	Coast.....	15.33	Twin Lakes.....	Mountain Lakes.....	11.27
China Flat.....	Coast.....	19.25	Jolon.....	Coast.....	1.60	Orleans.....	Klamath.....	1.00	Twin Valley.....	Sacramento.....	14.17
Churn Creek.....	Sacramento.....	9.06	Julian.....	do.....	6.87	Ozena.....	Coast.....	2.86	Upper Mattole.....	Coast.....	22.06
Clovis.....	San Joaquin.....	2.02	Kennedy Mine.....	San Joaquin.....	11.37	Parkfield.....	do.....	2.18	Vacaville.....	Sacramento.....	6.79
Coalinga.....	do.....	.66	Kentfield.....	Coast.....	1.90	Paso Robles-2.....	do.....	1.14	Walnut Creek.....	Coast.....	6.57
Colgate.....	Sacramento.....	11.05	Kernville.....	San Joaquin.....	1.03	Pattiyav.....	San Joaquin.....	12.84	Warner Springs.....	do.....	.59
Crockett.....	Coast.....	5.74	King City*.....	Coast.....	4.57	Peachland.....	Coast.....	2.20	Wasco.....	San Joaquin.....	.14
Cuyamaca.....	do.....	3.10	Knights Landing.....	Sacramento.....	7.48	Piedra.....	San Joaquin.....	5.30	Wastaja.....	Coast.....	
Deer Creek.....	Sacramento.....	17.59	La Jolla Ind. Res.....	Coast.....	7.35	Point Loma.....	Coast.....	2.98	West Branch.....	Sacramento.....	18.87
Del Monte.....	Coast.....	3.54	Lake Eleanor.....	Sacramento.....	9.46	Priest Valley.....	do.....	9.45	West Point.....	San Joaquin.....	9.21
Denair.....	San Joaquin.....	3.29	Lakeport.....	do.....	14.07	Quincy.....	Sacramento.....	1.78	Wrights.....	Coast.....	23.47
De Sabla.....	Sacramento.....	17.29	Lake Spaulding.....	do.....	13.25	Reedley.....	San Joaquin.....		Yorba Linda.....	do.....	1.08
Denuba.....	San Joaquin.....	1.60	Las Plumas.....	do.....							

Data obtained from 3-inch rain gage.

SNOWFALL IN THE MOUNTAINS.

Light snow fell in the Sierra Nevada Mountains during September and October, 1920, and moderately heavy snow fell during November. At the close of November there was about 22 inches of snow on the ground at the 8,000-foot level, and deeper snow at greater altitudes.

During December heavy snow fell throughout the Sierra Nevada. About 100 inches of snow fell at the 7,000-foot level, and larger amounts fell at greater heights. Most of the precipitation in the higher mountains came in the form of snow. The month was cold, and temperatures below zero were common. As a result, there was little run-off from melting snow in the Sierras. At the close of the month the snow was well packed, and there was more snow on the ground than on any similar date since 1916. The greatest snowfall reported for the month was 125 inches at Tamarack, Alpine County, altitude 8,000 feet. The greatest amount of unmelted snow on the ground at the close of the month was 96 inches at Twin Lakes, Alpine County, altitude 7,970 feet.

The higher levels of the Coast Range of mountains were snow-covered on several occasions during December, and moderately heavy snow fell throughout the northern portion. Most of it melted before the close of the month.

Little snow fell in the mountains of southern California, and only scattered patches of snow covered the highest peaks at the close of the month. Precipitation was markedly deficient throughout the southern portion of the State, and the accumulated seasonal amount was less than half of the normal on January 1st, 1921.

A. H. P.

COMPARATIVE SNOWFALL DATA FOR DECEMBER.

(Amount on the Ground.)

	FORDYCE DAM.			SUMMIT.			TAMARACK.		
	1st.	15th.	End of mo.	1st.	15th.	End of mo.	1st.	15th.	End of mo.
1906.	2	60	60	5	70	46	55	101	125
1907.	0	30	72	0	42	87	0	39	74
1908.	11	27	21	24	32	21	29	43	32
1909.	2	25	43	2	24	45	26	52	65
1910.	5	2	0	7	4	4	8	21	24
1911.	4	1	44	1	2	56	3	5	45
1912.	6	22	30	T.	14	19	3	29	42
1913.	35	35	60	31	24	80	35	41	110
1914.	8	40	31	12	46	26	10	31	27
1915.	9	55	45	6	67	40	3	67	48
1916.	15	42	74	14	16	77	7	32	86
1917.	4	0	0	6	0	0	16	8	8
1918.	17	23	23	20	17	16	17	27	32
1919.	18	50	35	34	52	37	35	48	29
1920.	15	55	55	18	66	67	29	83	85

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	9	.....	0	0
Trinity County. Hayfork.....	2,300	25	.....	0	0
Ruth.....	2,925	.....	.....	.....	0
Weaverville.....	2,162	11	.....	T.	0
Mountain Lakes.					
Inyo County. Bishop Creek.....	8,390	21	- 7	0	0
Independence.....	3,907	0	.....	0	0
Lassen County. Madeline.....	5,270	32	+21	8	8
Standish.....	4,000	7	.....	0	0
Madera County. Alturas.....	4,400	.....	.....	.....	1
Cedarville.....	4,675	16	+ 5	3	0
Fort Bidwell.....	4,375	18	.....	1	0
Nevada County. Grass Valley.....	2,690	2	.....	0	0
Nevada City.....	2,850	4	+ 1	0	0
North Bloomfield.....	3,214	8	+ 1	0	0
Placer County. Tahoe.....	6,230	59	+36	28	27
Mono County. Shields Ranch.....	3,500	7	.....	3	0
Sacramento Watershed.					
Butte County. De Sabla.....	2,500	8	- 2	0	0
Inskip.....	4,975	88	+47	30	48
West Branch.....	3,216	16	- 5	2	0
Nevada County. Deer Creek.....	3,700	29	+ 6	12	7
Fordyce Dam.....	6,500	93	+40	55	54
Lake Spaulding.....	4,600	91	+37	40	30
Placer County. Blue Canon.....	4,695	68	+39	34	20
Emigrant Gap.....	5,230	80	+41	35	21
Summit.....	7,017	110	+38	66	67
Plumas County. Canon Dam.....	4,570	47	.....	22	25
Chester.....	4,550	75	+4	22	26
La Porte.....	5,000	66	+29	36	35
Portola.....	4,882	33	.....	8	5
Quincy.....	3,400	25	+16	3	T.
Sierra County. Downieville.....	3,150	14	- 3	0	0
Sierraville.....	5,000	17	- 1	10	5
Siskiyou County. McCloud.....	3,270	48	+19	14	20
Sisson.....	3,555	45	+21	10	2
Yuba County. Camptownville.....	3,500	20	+ 7	0	0
San Joaquin Watershed.					
Alpine County. Markleeville.....	5,525	19	.....	7	T.
Tamarack.....	8,000	125	+30	83	85
Twin Lakes.....	7,970	116	.....	60	96
Calaveras County. Calaveras Ranger Station.....	3,400	.....	.....	.....	.....
Fresno County. Camp Seven.....	6,980	35	.....	20	24
Cascada.....	4,900	22	.....	0	0
Hume.....	5,300	56	.....	19	28
Huntington Lake.....	6,950	56	.....	.....	.....
Kern County. Glenville.....	3,300	T.	- 7	0	0
Mariiposa County. Dudley's.....	3,000	7	.....	0	0
Glacier Point.....	7,000	47	.....	21	20
Yosemite.....	3,945	19	+ 2	7	9
Tulare County. Hot Springs.....	3,800	0	- 2	0	0
Springville.....	4,000	11	- 1	0	0
Tuolumne County. Hetch Hetchy.....	3,665	37	+30	0	1
Lake Eleanor.....	4,700	38	+14	13	T.
Mountains of Southern California.					
Cuyamaca.....	4,677	0	- 2	0	0
Julian.....	4,222	1	.....	0	T.
Mount Wilson.....	5,704	3	.....	0	0
Nellie.....	5,350	1	.....	0	0
Seven Oaks.....	5,000	6	- 6	0	0
Squirrel Inn.....	5,280	5	- 6	0	0