

Climatology of the United States

No. 20

1971-2000

Station: LIVERMORE, CA

COOP ID: 044997

Climate Division: CA 4

NWS Call Sign:

Elevation: 480 Feet Lat: 37° 42N

Lon: 121° 47W

Temperature (°F)

Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	56.9	37.4	47.2	75+	1976	30	52.0	1995	18	1961	5	42.9	1982	555	0	.0	.0	28.0	.0	8.9	.0
Feb	61.8	40.3	51.1	80	1977	17	54.6	1991	23+	1950	1	47.1	1989	391	0	.0	.0	27.4	.1	4.0	.0
Mar	65.3	42.3	53.8	88+	1988	26	57.7	1986	22	1971	2	49.2	1973	349	2	.0	.0	30.9	.0	1.3	.0
Apr	71.2	44.2	57.7	96	1981	29	62.4	1987	29+	1976	1	50.7	1975	238	18	.0	.4	30.0	.0	.4	.0
May	77.0	48.5	62.8	104	2001	31	68.6	1997	32+	1952	5	56.9	1977	130	60	.2	3.8	31.0	.0	.0	.0
Jun	84.0	52.5	68.3	113	1961	16	74.7	1981	30	1954	21	63.5	1982	34	131	2.2	9.1	30.0	.0	.0	.0
Jul	89.1	54.9	72.0	112+	1961	12	76.1	1988	36	1974	8	68.1	1987	6	222	3.9	15.3	31.0	.0	.0	.0
Aug	88.7	55.0	71.9	112	1946	2	76.0	1998	40+	1977	7	68.0	1976	4	216	3.5	14.9	31.0	.0	.0	.0
Sep	85.9	53.2	69.6	115	1950	3	73.8	1984	35	1950	30	63.8	1986	19	154	1.7	10.8	30.0	.0	.0	.0
Oct	77.9	48.4	63.2	106+	1980	4	67.7	1991	29+	1971	30	59.6	1971	111	53	.3	3.8	31.0	.0	.1	.0
Nov	64.8	41.5	53.2	90	1949	2	59.0	1995	23	1961	17	48.2	1994	358	2	.0	.0	29.9	.0	2.7	.0
Dec	57.0	36.9	47.0	79	1958	12	51.9	1995	18+	1990	22	41.9	1978	560	0	.0	.0	27.6	.0	8.8	.0
Ann	73.3	46.3	59.8	115	Sep 1950	3	76.1	Jul 1988	18+	Dec 1990	22	41.9	Dec 1978	2755	858	11.8	58.1	357.8	.1	26.2	.0

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1930-2001

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Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
		Means/Medians(1)		Extremes						Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution											
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	2.99	1.94	3.45	1952	12	6.64	1995	.30	1976	10.1	6.2	1.9	.7	.28	.49	.90	1.31	1.77	2.28	2.89	3.65	4.70	6.44	8.14	
Feb	2.77	2.71	2.93	1963	1	7.30	1998	.15	1997	9.2	6.2	2.1	.5	.28	.48	.86	1.25	1.67	2.14	2.69	3.38	4.32	5.89	7.42	
Mar	2.47	2.32	2.00	1937	21	6.66	1995	.06	1997	9.9	6.4	1.4	.3	.18	.34	.66	.99	1.37	1.81	2.33	3.00	3.92	5.47	7.00	
Apr	.96	.76	1.80	1958	3	3.51	1983	.15	1997	5.7	3.0	.3	@	.13	.21	.35	.48	.62	.77	.95	1.17	1.46	1.93	2.39	
May	.43	.18	.82	1990	28	2.00	1998	.00+	1992	3.1	1.3	.1	.0	.00	.00	.00	.03	.10	.19	.31	.49	.74	1.21	1.70	
Jun	.09	.04	.60	1995	16	.70	1995	.00+	1996	.9	.3	@	.0	.00	.00	.00	.00	.00	.02	.06	.11	.17	.27	.38	
Jul	.03	.00	.67	1980	2	.70	1980	.00+	2000	.2	.1	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.21	
Aug	.08	.00	.50	1983	19	.91	1976	.00+	1998	.5	.2	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.04	.25	.50	
Sep	.24	.04	1.53	1959	19	1.48	1982	.00+	1997	1.4	.6	.1	@	.00	.00	.00	.00	.00	.04	.11	.22	.40	.74	1.09	
Oct	.84	.58	2.17	1962	13	2.98	1972	.00+	1995	3.3	1.8	.6	.1	.00	.03	.12	.24	.37	.54	.74	1.01	1.39	2.05	2.71	
Nov	1.88	1.37	3.05	1950	19	5.44	1983	.01	1995	7.7	4.4	1.2	.2	.06	.14	.33	.57	.85	1.20	1.64	2.23	3.06	4.52	6.00	
Dec	2.04	1.96	3.26	1955	23	5.37	1995	.10	1989	8.4	4.9	1.3	.2	.25	.41	.70	.98	1.28	1.62	2.01	2.49	3.14	4.21	5.25	
Ann	14.82	13.37	3.45	Jan 1952	12	7.30	Feb 1998	.00+	Jul 2000	60.4	35.4	9.0	2.0	6.77	8.08	9.88	11.35	12.71	14.08	15.54	17.21	19.32	22.50	25.38	

+ Also occurred on an earlier date(s)

Denotes amounts of a trace

@ Denotes mean number of days greater than 0 but less than .05

** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1930-2001

(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Feb	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Mar	#	.0	0	0	#	1982	29	#+	1982	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	#	.0	#	0	#	1998	20	#+	1998	#	1998	20	#	1998	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	#	.0	N/A	N/A	#+	Dec 1998	20	#+	Dec 1998	#	Dec 1998	20	#	Dec 1998	.0	.0	.0	.0	.0	.0	.0	.0	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

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-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

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Freeze Data									
Spring Freeze Dates (Month/Day)									
Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	5/14	5/02	4/23	4/15	4/08	4/01	3/24	3/15	3/03
32	4/07	3/25	3/15	3/06	2/27	2/19	2/10	2/01	1/18
28	3/01	2/15	2/05	1/28	1/19	1/10	12/31	12/18	0/00
24	2/07	1/23	1/07	0/00	0/00	0/00	0/00	0/00	0/00
20	12/28	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Fall Freeze Dates (Month/Day)									
Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	10/23	10/30	11/04	11/08	11/12	11/15	11/19	11/24	12/01
32	10/26	11/05	11/12	11/18	11/24	11/30	12/06	12/13	12/23
28	11/22	12/02	12/08	12/14	12/20	12/26	1/03	1/14	0/00
24	12/18	1/06	1/31	0/00	0/00	0/00	0/00	0/00	0/00
20	12/31	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	264	247	236	226	217	207	197	186	170
32	323	302	289	278	268	258	247	234	217
28	>365	>365	>365	353	336	323	309	295	276
24	>365	>365	>365	>365	>365	>365	>365	>365	321
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

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Degree Days to Selected Base Temperatures (°F)

Base	Heating Degree Days (1)												
	Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
65	555	391	349	238	130	34	6	4	19	111	358	560	2755
60	400	253	208	130	55	7	0	0	2	39	221	405	1720
57	311	177	136	83	27	2	0	0	0	17	152	318	1223
55	253	131	99	56	16	0	0	0	0	8	113	262	938
50	131	49	30	16	3	0	0	0	0	1	44	142	416
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	468	533	676	771	953	1087	1240	1235	1126	965	634	464	10152
55	9	20	61	137	255	397	527	522	436	260	57	12	2693
57	4	10	37	103	204	339	465	460	376	207	36	7	2248
60	0	2	15	61	140	254	372	367	288	136	16	1	1652
65	0	0	2	18	60	131	222	216	154	53	2	0	858
70	0	0	0	4	17	50	99	89	61	12	0	0	332

Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	240	332	438	540	716	857	1002	996	898	729	406	235	240	572	1010	1550	2266	3123	4125	5121	6019	6748	7154	7389
45	110	193	284	390	561	707	847	841	748	574	260	110	110	303	587	977	1538	2245	3092	3933	4681	5255	5515	5625
50	35	82	147	247	406	557	692	686	598	419	131	35	35	117	264	511	917	1474	2166	2852	3450	3869	4000	4035
55	2	18	49	120	253	407	537	531	448	269	45	4	2	20	69	189	442	849	1386	1917	2365	2634	2679	2683
60	0	0	3	43	129	260	382	376	298	136	8	0	0	0	3	46	175	435	817	1193	1491	1627	1635	1635
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	126	183	252	333	435	522	616	611	556	451	234	127	126	309	561	894	1329	1851	2467	3078	3634	4085	4319	4446

(1) Derived from the 1971-2000 Monthly Normals

(2) Derived from 1971-2000 serially complete daily data

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Notes

- a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.
- b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.
- c. Only observed validated values were used to select the extreme daily values.
- d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.
- e. Degree Days were derived using the same techniques as the 1971-2000 normals.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html
- f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set.
Documentation of the serially complete data set is available from the link below:
- g. Snowfall and snow depth statistics were derived from the Snow Climatology.
Documentation for the Snow Climatology project is available from the link under references.

Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

- a. Temperature/ Precipitation Tables
 1. 1971-2000 Monthly Normals
 2. Cooperative Summary of the Day
 3. National Weather Service station records
 4. 1971-2000 serially complete daily data
- b. Degree Day Table
 1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
 2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data
- c. Snow Tables
 1. Snow Climatology
 2. Cooperative Summary of the Day
- d. Freeze Data Table
1971-2000 serially complete daily data

References

- U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html
Snow Climatology Project Description, www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,
www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf