

# Climatology of the United States

## No. 20 1971-2000

Station: OAKLAND MUSEUM, CA

COOP ID: 046336

Climate Division: CA 4

NWS Call Sign:

Elevation: 30 Feet

Lat: 37° 48N

Lon: 122° 16W

### 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	57.1	44.7	50.9	74	1984	28	54.9	1978	30	1975	30	47.3	1987	438	0	.0	.0	29.8	.0	.1	.0
Feb	61.2	47.6	54.4	81+	1986	26	58.1	1992	29	1976	5	50.2	1989	298	1	.0	.0	27.7	.0	.1	.0
Mar	63.2	49.0	56.1	84+	1978	17	59.9	1978	34	1976	3	52.3	1976	282	6	.0	.0	30.9	.0	.0	.0
Apr	66.4	50.6	58.5	97	1981	29	61.9	1992	37	1976	1	51.8	1975	202	8	.0	.1	29.9	.0	.0	.0
May	68.9	53.3	61.1	105	1976	12	65.6	1978	43	1975	5	58.1	1974	143	23	.1	.7	31.0	.0	.0	.0
Jun	71.6	55.7	63.7	107	1973	8	70.5	1981	48	1976	3	60.2	1975	89	49	.3	1.6	30.0	.0	.0	.0
Jul	72.7	57.0	64.9	103	1972	13	69.4	1992	51+	1975	1	61.6	1994	60	55	@	.7	31.0	.0	.0	.0
Aug	73.5	58.3	65.9	99	1983	6	69.8	1983	50	1977	17	62.1	1973	45	72	.0	.4	31.0	.0	.0	.0
Sep	74.6	58.2	66.4	109	1971	14	72.2	1984	48	1986	28	61.7	1986	69	110	.2	1.6	30.0	.0	.0	.0
Oct	72.1	55.2	63.7	103+	1980	2	68.8	1992	44+	1975	29	59.6	1988	89	47	.1	.8	31.0	.0	.0	.0
Nov	63.9	49.4	56.7	84	1997	2	61.5	1995	36	1975	29	52.0	1994	257	6	.0	.0	29.9	.0	.0	.0
Dec	57.6	44.8	51.2	75	1979	7	55.5	1995	26	1972	9	46.5	1972	428	0	.0	.0	29.5	.0	.4	.0
Ann	66.9	52.0	59.5	109	Sep 1971	14	72.2	Sep 1984	26	Dec 1972	9	46.5	Dec 1972	2400	377	.7	5.9	361.7	.0	.6	.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](http://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: 1970-2001

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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	4.85	4.23	4.74	1982	4	12.45	1998	.31	1976	10.5	7.9	3.2	1.4	.45	.79	1.44	2.12	2.85	3.69	4.68	5.92	7.62	10.46	13.24
Feb	4.27	3.84	3.05	2000	13	15.14	1998	.21	1995	10.1	7.2	3.1	1.2	.31	.58	1.13	1.71	2.37	3.12	4.03	5.18	6.78	9.48	12.15
Mar	3.56	2.81	2.87	1982	31	9.83	1983	.03	1988	10.5	6.8	2.8	.6	.27	.50	.96	1.45	1.99	2.62	3.37	4.33	5.65	7.87	10.07
Apr	1.38	1.00	2.07	1974	1	4.13	1982	.00	1977	5.9	3.1	.8	.2	.04	.13	.31	.51	.73	.98	1.29	1.68	2.22	3.14	4.04
May	.57	.12	1.73	1996	15	2.98	1998	.00+	1992	3.0	1.3	.3	.1	.00	.00	.00	.03	.10	.21	.36	.59	.95	1.62	2.35
Jun	.11	.02	.44	1988	6	.92	1995	.00+	1996	1.0	.4	.0	.0	.00	.00	.00	.00	.00	.02	.05	.11	.19	.34	.50
Jul	.07	.00	.95	1974	8	1.19	1974	.00+	2000	.3	.2	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.01	.16	.37
Aug	.10	.00	1.00	1997	19	1.25	1997	.00+	2000	.7	.2	.1	@	.00	.00	.00	.00	.00	.00	.00	.00	.06	.29	.53
Sep	.33	.07	.78	1989	16	1.54	1986	.00+	1995	1.8	.9	.2	.0	.00	.00	.00	.00	.04	.11	.21	.36	.58	.98	1.41
Oct	1.33	1.14	2.06	1992	29	4.25	1972	.00	1978	3.8	2.2	.9	.4	.02	.09	.24	.42	.63	.88	1.19	1.59	2.17	3.15	4.14
Nov	3.14	2.42	4.15	1994	5	9.67	1973	.07	1995	8.5	5.5	2.2	.7	.13	.29	.64	1.05	1.53	2.11	2.82	3.75	5.07	7.35	9.63
Dec	3.23	3.06	3.43	1979	24	8.90	1996	.00	1989	8.7	6.0	2.0	.8	.32	.70	1.23	1.70	2.18	2.70	3.28	3.99	4.93	6.45	7.90
Ann	22.94	21.02	4.74	Jan 1982	4	15.14	Feb 1998	.00+	Aug 2000	64.8	41.7	15.6	5.4	10.37	12.40	15.21	17.49	19.62	21.76	24.05	26.67	29.96	34.96	39.47

+ 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: 1970-2001

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

Complete documentation available from:  
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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	0	.0	0	0	.0	0	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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.0	.0	N/A	N/A	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0

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

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

-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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<b>Freeze Data</b>									
<b>Spring Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of later date in spring (thru Jul 31) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	2/21	2/07	1/28	1/18	1/06	12/16	0/00	0/00	0/00
<b>32</b>	1/17	12/30	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>28</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>24</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>20</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>16</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>Fall Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of earlier date in fall (beginning Aug 1) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	12/10	12/21	12/29	1/06	1/17	0/00	0/00	0/00	0/00
<b>32</b>	12/26	1/11	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>28</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>24</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>20</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>16</b>	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
<b>Freeze Free Period</b>									
<b>Temp (F)</b>	<b>Probability of longer than indicated freeze free period (Days)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	>365	>365	>365	>365	>365	>365	>365	334	308
<b>32</b>	>365	>365	>365	>365	>365	>365	>365	>365	>365
<b>28</b>	>365	>365	>365	>365	>365	>365	>365	>365	>365
<b>24</b>	>365	>365	>365	>365	>365	>365	>365	>365	>365
<b>20</b>	>365	>365	>365	>365	>365	>365	>365	>365	>365
<b>16</b>	>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	438	298	282	202	143	89	60	45	69	89	257	428	2400
60	287	171	152	90	54	23	9	6	20	22	135	281	1250
57	202	109	95	45	21	8	2	1	8	7	82	200	780
55	152	77	65	24	10	3	0	0	4	2	55	153	545
50	61	20	16	3	0	0	0	0	0	0	14	66	180
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	585	627	747	796	903	950	1018	1051	1032	981	739	595	10024
55	24	60	98	129	200	263	305	338	346	270	104	35	2172
57	12	36	67	90	149	208	245	276	290	213	71	20	1677
60	4	14	31	45	89	133	159	188	212	135	34	8	1052
65	0	1	6	8	23	49	55	72	110	47	6	0	377
70	0	0	0	0	3	9	8	14	41	8	0	0	83

### 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	349	429	513	571	663	719	775	808	800	740	514	360	349	778	1291	1862	2525	3244	4019	4827	5627	6367	6881	7241
45	200	284	358	421	508	569	620	653	650	585	364	210	200	484	842	1263	1771	2340	2960	3613	4263	4848	5212	5422
50	81	149	206	271	353	419	465	498	500	430	217	88	81	230	436	707	1060	1479	1944	2442	2942	3372	3589	3677
55	14	49	84	130	199	269	310	343	350	276	91	16	14	63	147	277	476	745	1055	1398	1748	2024	2115	2131
60	0	5	19	40	78	127	156	188	201	132	21	0	0	5	24	64	142	269	425	613	814	946	967	967
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	130	187	237	284	353	409	463	496	491	430	244	140	130	317	554	838	1191	1600	2063	2559	3050	3480	3724	3864

(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:

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## 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)