

# Climatology of the United States

## No. 20

### 1971-2000

**Station: MODESTO CITY-COUNTY AP, CA**

**COOP ID: 045738**

**Climate Division: CA 5**

**NWS Call Sign: MOD**

**Elevation: 73 Feet**

**Lat: 37° 37N**

**Lon: 120° 57W**

### 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	54.3	40.1	47.2	75	1998	17	53.0	1995	18	1949	11	41.7	1972	551	0	.0	.0	23.9	.0	4.4	.0
Feb	62.2	43.6	52.9	80	1992	27	56.4	1992	24+	1989	6	48.8	1971	339	0	.0	.0	27.2	@	1.4	.0
Mar	67.5	46.2	56.9	89	1960	20	61.4	1978	27	1971	2	51.9	1973	267	16	.0	.0	30.9	.0	.2	.0
Apr	74.1	49.2	61.7	100	1981	30	66.7	1987	32	1936	1	55.5	1975	140	41	@	1.1	30.0	.0	.0	.0
May	81.5	53.8	67.7	105+	2001	31	73.4	1997	32	1959	5	61.4	1998	62	145	.3	6.4	31.0	.0	.0	.0
Jun	88.7	58.7	73.7	112	1961	15	79.5	1981	39	1950	7	69.6	1980	6	266	3.2	14.1	30.0	.0	.0	.0
Jul	93.6	61.7	77.7	111	1972	14	81.8	1988	46	1935	8	73.9	1987	0	393	6.2	22.8	31.0	.0	.0	.0
Aug	92.3	61.1	76.7	108	1998	4	80.6	1998	46	1957	30	72.0	1976	0	362	4.3	20.1	31.0	.0	.0	.0
Sep	87.9	58.2	73.1	106	1955	2	78.2	1984	40	1948	26	67.8	1986	7	248	1.8	12.9	30.0	.0	.0	.0
Oct	78.4	52.1	65.3	101	1991	10	70.4	1991	29	1935	31	61.1	1971	85	93	.1	3.0	31.0	.0	.0	.0
Nov	64.1	44.2	54.2	88	1997	2	61.3	1995	25	1961	17	48.8	2000	331	6	.0	.0	29.4	.0	.8	.0
Dec	54.3	38.9	46.6	75+	1995	5	52.0	1995	18	1932	13	42.0	1985	570	0	.0	.0	23.9	.0	6.5	.0
Ann	74.9	50.7	62.8	112	Jun 1961	15	81.8	Jul 1988	18+	Jan 1949	11	41.7	Jan 1972	2358	1570	15.9	80.4	349.3	@	13.3	.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: 1931-2001

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

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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	2.56	2.19	1.80	1935	15	7.27	1995	.12	1991	10.2	5.9	1.7	.4	.19	.35	.68	1.03	1.42	1.88	2.42	3.11	4.06	5.67	7.25	
Feb	2.38	2.08	1.91	1998	3	8.80	1998	.08	1997	9.2	5.6	1.7	.2	.21	.37	.68	1.02	1.38	1.79	2.28	2.90	3.75	5.18	6.58	
Mar	2.30	1.75	2.72	1978	4	6.49	1982	.00	1988	8.9	5.5	1.4	.2	.03	.14	.41	.71	1.08	1.52	2.06	2.76	3.77	5.50	7.23	
Apr	.91	.73	2.01	1958	2	2.86	1978	.07	1992	4.6	2.6	.4	@	.08	.14	.26	.39	.53	.69	.88	1.11	1.44	1.98	2.52	
May	.55	.10	1.67	1998	12	3.95	1998	.00+	1992	2.2	1.2	.4	.1	.00	.00	.00	.00	.03	.12	.27	.52	.92	1.69	2.53	
Jun	.13	.00	1.14	2000	8	1.14	2000	.00+	1999	.8	.3	@	@	.00	.00	.00	.00	.00	.00	.04	.12	.23	.42	.61	
Jul	.05	.00	.65	1974	9	.69	1974	.00+	2000	.3	.1	.1	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.26	
Aug	.06	.00	.59	1975	18	.72	1976	.00+	2000	.4	.2	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.16	.40	
Sep	.27	.01	1.86	1959	18	2.19	1983	.00+	1998	1.2	.7	.2	@	.00	.00	.00	.00	.00	.00	.03	.14	.37	.85	1.42	
Oct	.75	.72	1.75	1973	7	2.43	1973	.00+	1995	2.9	1.7	.5	.1	.00	.00	.06	.21	.36	.52	.72	.95	1.28	1.82	2.37	
Nov	1.48	.88	2.25	1970	28	4.64	1983	.01+	1995	6.5	3.7	1.0	.1	.03	.08	.21	.39	.61	.89	1.25	1.73	2.43	3.67	4.95	
Dec	1.68	1.49	1.81	1996	21	4.51	1996	.01	1989	7.5	4.1	1.1	.1	.10	.20	.41	.64	.90	1.20	1.57	2.03	2.69	3.81	4.91	
Ann	13.12	11.31	2.72	Mar 1978	4	8.80	Feb 1998	.00+	Aug 2000	54.7	31.6	8.5	1.2	5.74	6.91	8.56	9.89	11.14	12.41	13.76	15.32	17.28	20.26	22.95	

+ 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: 1931-2001

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

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

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Lon: 120° 57W

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	.1	.0	#	0	1.3	1976	5	1.3	1976	1	1976	5	#	1976	.0	.0	.0	.0	.0	.0	@	.0	.0
Mar	#	.0	0	0	#	1975	13	#	1975	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	.3	1972	6	.3	1972	#	1972	6	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.1	.0	N/A	N/A	1.3	Feb 1976	5	1.3	Feb 1976	1	Feb 1976	5	#	Feb 1976	.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>	4/05	3/24	3/16	3/08	3/02	2/23	2/15	2/07	1/26
<b>32</b>	3/03	2/21	2/13	2/07	2/01	1/25	1/19	1/11	12/29
<b>28</b>	2/02	1/23	1/15	1/08	1/01	12/21	0/00	0/00	0/00
<b>24</b>	1/01	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>	11/05	11/11	11/15	11/18	11/21	11/24	11/28	12/02	12/07
<b>32</b>	11/16	11/23	11/29	12/04	12/08	12/13	12/18	12/24	1/02
<b>28</b>	12/03	12/12	12/19	12/25	1/01	1/11	0/00	0/00	0/00
<b>24</b>	1/13	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>	309	293	282	273	264	255	245	234	219
<b>32</b>	>365	337	324	315	307	299	290	281	268
<b>28</b>	>365	>365	>365	>365	>365	>365	349	331	313
<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)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Below 65	551	339	267	140	62	6	0	0	7	85	331	570	2358
60	398	204	150	60	20	0	0	0	0	30	203	416	1481
57	312	133	98	29	8	0	0	0	0	13	140	329	1062
55	256	93	69	16	4	0	0	0	0	7	104	272	821
50	142	27	21	2	0	0	0	0	0	1	41	150	384
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Base	Cooling Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Above 32	472	585	771	891	1106	1250	1416	1385	1231	1031	665	453	11256
55	15	34	127	217	397	560	703	672	541	324	79	12	3681
57	9	17	94	169	339	500	641	610	481	269	54	7	3190
60	2	5	53	110	257	411	548	517	391	193	28	1	2516
65	0	0	16	41	145	266	393	362	248	93	6	0	1570
70	0	0	3	10	67	141	241	212	126	33	1	0	834

### 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	226	373	516	648	855	1009	1166	1140	997	787	423	210	226	599	1115	1763	2618	3627	4793	5933	6930	7717	8140	8350
45	107	230	361	498	700	859	1011	985	847	632	276	97	107	337	698	1196	1896	2755	3766	4751	5598	6230	6506	6603
50	37	107	212	350	545	709	856	830	697	477	146	27	37	144	356	706	1251	1960	2816	3646	4343	4820	4966	4993
55	2	31	94	205	390	559	701	675	547	323	55	1	2	33	127	332	722	1281	1982	2657	3204	3527	3582	3583
60	0	1	27	95	240	409	546	520	397	184	11	0	0	1	28	123	363	772	1318	1838	2235	2419	2430	2430
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	93	190	290	386	531	640	734	724	637	486	228	96	93	283	573	959	1490	2130	2864	3588	4225	4711	4939	5035

(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)