

# Climatology of the United States

## No. 20

### 1971-2000

**Station: ANTIOCH PUMP PLANT #3, CA**

**COOP ID: 040232**

**Climate Division: CA 5**

**NWS Call Sign:**

**Elevation: 60 Feet**

**Lat: 37° 59N**

**Lon: 121° 45W**

### 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	53.5	37.8	45.7	72	1976	31	51.4	1995	20	1962	24	39.1	1972	600	0	.0	.0	22.7	.0	6.7	.0
Feb	59.9	41.3	50.6	76+	1985	28	54.7	1991	25	1989	6	47.2	1971	404	0	.0	.0	26.9	.1	1.8	.0
Mar	64.6	44.3	54.5	88	1988	27	58.2	1993	27	1966	4	50.3	1985	332	4	.0	.0	30.8	.0	.5	.0
Apr	71.1	47.2	59.2	94+	1981	30	64.2	1987	28	1961	19	51.8	1975	206	30	.0	.2	30.0	.0	.1	.0
May	78.5	51.9	65.2	103	1984	29	71.9	1997	35+	1975	5	59.1	1998	99	106	.2	4.0	31.0	.0	.0	.0
Jun	85.6	56.5	71.1	117	1961	17	77.5	1981	35+	1982	4	65.6	1982	18	200	1.9	9.8	30.0	.0	.0	.0
Jul	90.7	58.1	74.4	110+	1972	15	79.8	1988	41	1961	5	70.4	1975	4	296	3.2	18.6	31.0	.0	.0	.0
Aug	89.8	57.6	73.7	109	1998	5	77.5	1992	43	1958	6	69.9	1980	1	270	3.0	15.9	31.0	.0	.0	.0
Sep	85.9	56.0	71.0	109	1955	4	75.6	1984	41	1980	14	67.1	1986	10	190	1.1	9.7	30.0	.0	.0	.0
Oct	77.5	51.1	64.3	102	1964	5	69.2	1991	28	1971	30	58.6	1971	99	77	.1	2.3	31.0	.0	.1	.0
Nov	63.9	43.6	53.8	85	1967	2	59.8	1995	24	1958	17	48.3	1982	344	6	.0	.0	29.4	.0	1.2	.0
Dec	54.3	37.1	45.7	75	1977	1	51.9	1995	18+	1972	12	40.3	1972	597	0	.0	.0	24.2	.0	7.0	.0
Ann	72.9	48.5	60.8	117	Jun 1961	17	79.8	Jul 1988	18+	Dec 1972	12	39.1	Jan 1972	2714	1179	9.5	60.5	348.0	.1	17.4	.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: 1955-2001

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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	2.72	1.81	2.80	1982	5	6.97	1993	.13	1984	10.6	5.9	1.6	.4	.17	.33	.66	1.03	1.45	1.94	2.53	3.29	4.35	6.16	7.95	
Feb	2.51	2.29	2.33	1998	3	9.03	1998	.06	1995	9.1	5.6	1.7	.3	.17	.33	.65	.99	1.38	1.82	2.36	3.05	4.00	5.61	7.20	
Mar	2.16	1.91	1.17	1983	13	6.26	1983	.06	1972	9.4	6.0	1.1	.2	.21	.36	.65	.95	1.28	1.65	2.09	2.64	3.39	4.64	5.87	
Apr	.73	.51	1.47	1958	3	3.31	1983	.00	1997	4.2	2.2	.2	@	.04	.11	.22	.33	.44	.57	.71	.90	1.15	1.56	1.96	
May	.47	.22	1.10	1996	16	2.09	1998	.00+	1999	2.4	1.3	.2	.1	.00	.00	.00	.00	.06	.17	.33	.54	.84	1.37	1.90	
Jun	.09	.00	.78	1964	9	.64	1995	.00+	1999	.7	.2	@	.0	.00	.00	.00	.00	.00	.00	.04	.10	.18	.29	.40	
Jul	.03	.00	.40	1980	2	.46	1980	.00+	2000	.3	.1	.0	.0	**	**	**	**	**	**	**	**	**	**	**	
Aug	.03	.00	.45	1968	22	.74	1976	.00+	2000	.5	.2	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.18	
Sep	.24	.03	1.25	1959	19	1.84	1989	.00+	1997	1.3	.7	.1	.0	.00	.00	.00	.00	.00	.02	.08	.19	.39	.77	1.18	
Oct	.76	.47	3.03	1962	13	4.17	1972	.00+	1995	2.8	1.8	.4	.1	.00	.01	.08	.17	.29	.44	.63	.89	1.27	1.94	2.62	
Nov	1.70	1.32	2.34	1996	17	4.56	1972	.00+	1995	6.7	4.0	.9	.4	.00	.06	.27	.51	.79	1.13	1.54	2.06	2.81	4.09	5.38	
Dec	1.89	1.54	2.18	1995	12	5.05	1995	.00	1989	8.0	4.8	1.2	.1	.13	.32	.62	.90	1.19	1.51	1.88	2.33	2.94	3.93	4.90	
Ann	13.33	12.18	3.03	Oct 1962	13	9.03	Feb 1998	.00+	Aug 2000	56.0	32.8	7.4	1.6	6.06	7.24	8.87	10.19	11.42	12.66	13.99	15.50	17.41	20.30	22.90	

+ 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: 1955-2001

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

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Climate Division: CA 5

NWS Call Sign:

Elevation: 60 Feet

Lat: 37° 59N

Lon: 121° 45W

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	#	1990	14	#	1990	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	#	1972	13	#	1972	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	#	.0	N/A	N/A	#+	Feb 1990	14	#+	Feb 1990	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>	5/02	4/16	4/04	3/25	3/15	3/06	2/24	2/12	1/26
<b>32</b>	3/13	3/01	2/20	2/13	2/06	1/30	1/22	1/12	12/29
<b>28</b>	2/09	1/30	1/23	1/17	1/10	1/04	12/27	12/15	0/00
<b>24</b>	12/28	12/21	12/12	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>	10/30	11/07	11/12	11/17	11/22	11/26	12/01	12/07	12/14
<b>32</b>	11/09	11/17	11/22	11/27	12/01	12/05	12/10	12/16	12/25
<b>28</b>	11/23	12/05	12/13	12/20	12/27	1/04	1/14	1/31	0/00
<b>24</b>	12/16	12/23	1/01	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>	310	290	275	262	251	239	226	211	191
<b>32</b>	356	330	316	306	296	287	277	266	250
<b>28</b>	>365	>365	>365	>365	351	337	324	312	296
<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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**Elevation: 60 Feet**

**Lat: 37°59N**

**Lon: 121°45W**

### 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	600	404	332	206	99	18	4	1	10	99	344	597	2714
60	445	265	195	110	39	3	0	0	1	37	214	443	1752
57	359	187	129	66	19	0	0	0	0	17	150	354	1281
55	303	140	94	44	11	0	0	0	0	9	113	297	1011
50	179	54	29	12	2	0	0	0	0	1	47	169	493
32	4	0	0	0	0	0	0	0	0	0	0	1	5

### Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	427	520	695	814	1029	1172	1315	1292	1170	1001	652	427	10514
55	13	16	76	168	328	482	602	579	480	297	75	9	3125
57	8	8	49	131	273	422	540	517	420	243	51	5	2667
60	0	1	22	84	200	335	447	424	330	170	26	0	2039
65	0	0	4	30	106	200	296	270	190	77	6	0	1179
70	0	0	0	8	41	97	160	133	81	24	0	0	544

### 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	198	322	463	592	798	941	1076	1055	938	760	422	204	198	520	983	1575	2373	3314	4390	5445	6383	7143	7565	7769
45	86	186	308	442	643	791	921	900	788	605	276	87	86	272	580	1022	1665	2456	3377	4277	5065	5670	5946	6033
50	27	74	164	294	488	641	766	745	638	452	145	18	27	101	265	559	1047	1688	2454	3199	3837	4289	4434	4452
55	1	15	62	163	335	491	611	590	488	301	55	0	1	16	78	241	576	1067	1678	2268	2756	3057	3112	3112
60	0	0	8	63	193	344	456	435	338	165	9	0	0	0	8	71	264	608	1064	1499	1837	2002	2011	2011
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	84	160	248	348	488	595	675	668	597	465	223	93	84	244	492	840	1328	1923	2598	3266	3863	4328	4551	4644

(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)