U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: TRACY CARBONA, CA **COOP ID: 048999**

Climate Division: CA 5 **NWS Call Sign:** **Elevation: 140 Feet** **Lat: 37˚42N** **Lon: 121˚26W**

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	54.7	35.0	44.9	74	1976	31	49.9	1995	18	1961	2	39.4	1972	625	0	.0	.0	24.3	.0	8.5	.0
Feb	61.7	37.8	49.8	81	1977	19	54.2	1991	23	1989	6	45.6	1990	427	0	.0	.0	27.1	.0	2.5	.0
Mar	66.5	40.9	53.7	89	1988	26	58.6	1972	26	1976	1	49.7	1991	354	3	.0	.0	30.9	.0	.4	.0
Apr	73.3	43.8	58.6	94	1981	30	63.5	1987	31	1953	9	51.7	1975	214	21	.0	.6	30.0	.0	.1	.0
May	80.9	48.5	64.7	105	1984	29	70.9	1992	34	1952	4	57.9	1998	105	95	.3	5.6	31.0	.0	.0	.0
Jun	88.1	53.0	70.6	112	1961	16	77.4	1981	37	1997	29	65.3	1980	20	188	2.8	13.1	30.0	.0	.0	.0
Jul	93.1	54.9	74.0	111	1991	5	79.3	1996	38	1995	2	69.7	1987	2	281	5.4	22.0	31.0	.0	.0	.0
Aug	92.1	54.0	73.1	109	1971	11	77.5	1996	38	1990	25	69.1	1976	1	250	4.4	19.8	31.0	.0	.0	.0
Sep	87.8	52.1	70.0	108	1950	2	74.1	1984	38+	1988	26	65.2	1985	13	162	1.1	13.0	30.0	.0	.0	.0
Oct	78.9	47.4	63.2	99+	1991	1	68.1	1991	32+	1997	28	58.0	1984	113	54	.0	3.1	31.0	.0	.1	.0
Nov	65.1	39.8	52.5	85	1949	2	58.4	1995	24	1952	28	47.1	1994	378	2	.0	.0	29.4	.0	1.3	.0
Dec	55.4	34.1	44.8	73	1995	1	49.5	1996	17+	1998	24	39.9	1972	628	0	.0	.0	24.2	.0	9.9	.0
Ann	74.8	45.1	60.0	112	Jun 1961	16	79.3	Jul 1996	17+	Dec 1998	24	39.4	Jan 1972	2880	1056	14.0	77.2	349.9	.0	22.8	.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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1949-2001

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

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Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	1.97	1.51	2.23	1968	31	4.89	1983	.17	1976
Feb	1.92	1.53	1.80	1998	3	6.98	1998	.12	1995
Mar	1.71	1.64	1.67	1955	10	5.87	1983	.00+	1994
Apr	.70	.61	1.20	1958	3	2.43	1982	.05	1989
May	.59	.16	2.25	1990	28	2.96	1990	.00+	1992
Jun	.08	.00	.43	1964	9	.52	1988	.00+	1997
Jul	.04	.00	.29	1974	9	.48	1980	.00+	2000
Aug	.06	.00	2.49	1968	22	.89	1975	.00+	2000
Sep	.26	.01	1.90	1959	19	2.05	1982	.00+	1997
Oct	.65	.60	1.78	1976	2	2.54	2000	.00+	1995
Nov	1.19	.87	1.87	1970	29	3.84	1972	.00+	1995
Dec	1.41	1.32	1.44	2001	29	4.18	1992	.07	1999
Ann	10.58	9.10	2.49	Aug 1968	22	6.98	Feb 1998	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.6	5.5	1.0	.1
Feb	8.0	5.0	1.1	.1
Mar	7.6	5.0	.9	@
Apr	3.7	2.0	.3	@
May	2.0	1.3	.3	.1
Jun	.7	.4	.0	.0
Jul	.3	.1	.0	.0
Aug	.3	.2	.0	.0
Sep	1.0	.5	.2	.1
Oct	2.7	1.7	.4	@
Nov	5.1	3.1	.7	.1
Dec	7.1	3.8	.5	.1
Ann	47.1	28.6	5.4	.6

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.22	.37	.64	.91	1.21	1.54	1.92	2.40	3.06	4.14	5.19
Feb	.19	.33	.60	.86	1.15	1.48	1.86	2.34	3.00	4.09	5.15
Mar	.00	.18	.49	.76	1.04	1.35	1.70	2.13	2.71	3.67	4.60
Apr	.07	.12	.21	.31	.42	.54	.68	.86	1.10	1.51	1.91
May	.00	.00	.00	.00	.05	.18	.37	.64	1.04	1.76	2.51
Jun	.00	.00	.00	.00	.00	.00	.03	.08	.14	.26	.37
Jul	.00	.00	.00	.00	.00	.00	.00	.00	.00	.11	.26
Aug	**	**	**	**	**	**	**	**	**	**	**
Sep	.00	.00	.00	.00	.00	.00	.04	.16	.38	.84	1.35
Oct	.00	.00	.08	.22	.35	.49	.65	.84	1.10	1.50	1.92
Nov	.00	.07	.25	.43	.62	.85	1.12	1.46	1.94	2.74	3.53
Dec	.16	.27	.47	.67	.88	1.11	1.39	1.72	2.18	2.94	3.68
Ann	5.13	6.04	7.28	8.27	9.19	10.11	11.09	12.20	13.60	15.70	17.59

\+ 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: 1949-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	#	1976	5	#	1976	#	1976	5	#	1976	.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	N/A	N/A	#	Feb 1976	5	#	Feb 1976	#	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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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	4/27	4/16	4/07	3/31	3/24	3/18	3/10	3/02	2/18
32	3/19	3/09	3/01	2/22	2/16	2/09	2/03	1/26	1/15
28	2/08	1/31	1/24	1/19	1/14	1/09	1/03	12/26	12/13
24	1/11	1/01	12/20	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	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	11/01	11/06	11/09	11/13	11/16	11/18	11/22	11/25	11/30
32	11/03	11/13	11/20	11/26	12/01	12/07	12/13	12/20	12/29
28	11/28	12/05	12/11	12/15	12/20	12/25	12/30	1/05	1/17
24	12/18	12/30	1/12	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	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	271	259	250	243	236	229	221	212	200
32	324	309	299	292	284	277	270	261	249
28	>365	>365	359	346	338	330	323	315	304
24	>365	>365	>365	>365	>365	>365	>365	>365	>365
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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	625	427	354	214	105	20	2	1	13	113	378	628	2880
60	470	288	214	111	41	4	0	0	1	42	240	473	1884
57	381	209	144	66	20	1	0	0	0	19	170	381	1391
55	323	161	107	42	12	0	0	0	0	10	129	324	1108
50	191	68	37	11	2	0	0	0	0	1	54	189	553
32	3	0	0	0	0	0	0	0	0	0	0	2	5

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	401	497	672	797	1014	1157	1302	1272	1138	964	615	397	10226
55	8	14	66	149	312	467	589	559	448	261	54	6	2933
57	4	7	41	113	258	408	527	497	388	208	34	1	2486
60	0	1	18	68	187	321	434	404	299	138	15	0	1885
65	0	0	3	21	95	188	281	250	162	54	2	0	1056
70	0	0	0	4	35	88	145	115	62	13	0	0	462

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	186	322	463	584	794	949	1085	1052	936	748	408	184	186	508	971	1555	2349	3298	4383	5435	6371	7119	7527	7711
45	76	188	308	434	639	799	930	897	786	593	263	70	76	264	572	1006	1645	2444	3374	4271	5057	5650	5913	5983
50	20	75	163	286	484	649	775	742	636	438	132	15	20	95	258	544	1028	1677	2452	3194	3830	4268	4400	4415
55	1	18	59	155	331	499	620	587	486	285	45	0	1	19	78	233	564	1063	1683	2270	2756	3041	3086	3086
60	0	1	13	63	196	351	465	433	337	154	8	0	0	1	14	77	273	624	1089	1522	1859	2013	2021	2021
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	96	181	264	359	492	587	658	641	582	468	237	95	96	277	541	900	1392	1979	2637	3278	3860	4328	4565	4660

(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.
Compete 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