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: SAN MARCOS, TX **COOP ID: 417983**

Climate Division: TX 7 **NWS Call Sign:** **Elevation: 612 Feet** **Lat: 29˚52N** **Lon: 97˚55W**

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	61.1	38.6	49.9	89+	1972	24	56.5	1998	-2	1949	31	41.4	1979	482	5	.0	.0	24.9	.3	9.3	.0
Feb	65.8	42.0	53.9	99	1996	22	60.6	1999	5	1951	2	44.6	1978	322	12	.0	.3	24.6	.3	5.5	.0
Mar	73.4	49.7	61.6	100	1925	30	66.4	1972	17	1980	2	55.6	1996	149	43	.0	.5	30.2	.0	1.7	.0
Apr	79.6	56.8	68.2	102+	1939	2	73.4	1972	30+	1971	7	63.8	1997	37	133	.0	1.9	30.0	.0	.1	.0
May	85.7	65.5	75.6	106+	1927	29	81.1	1996	40	1908	1	70.2	1976	4	333	.1	8.4	31.0	.0	.0	.0
Jun	91.5	71.5	81.5	109	1998	15	86.4	1998	51+	1970	3	78.8	1976	0	495	.9	21.8	30.0	.0	.0	.0
Jul	95.1	73.7	84.4	110	1954	27	87.9	1998	56	1967	16	80.6	1976	0	601	4.3	28.5	31.0	.0	.0	.0
Aug	95.4	73.4	84.4	111	1917	23	87.6	1999	55	1949	23	80.7	1974	0	601	4.7	28.5	31.0	.0	.0	.0
Sep	90.7	68.6	79.7	111	2000	5	83.4	1977	42+	1983	22	73.6	1974	0	439	.9	20.1	30.0	.0	.0	.0
Oct	82.3	58.7	70.5	101+	1938	2	74.1	1979	27	1917	30	61.5	1976	22	193	.0	5.0	30.9	.0	.1	.0
Nov	71.3	48.5	59.9	98	1934	1	66.2	1973	17+	1976	29	52.3	1976	201	48	.0	.1	28.9	.0	2.4	.0
Dec	63.3	40.8	52.1	89+	1955	26	60.4	1984	4	1989	23	42.9	1983	412	10	.0	.0	26.9	.2	7.7	.0
Ann	79.6	57.3	68.5	111+	Sep 2000	5	87.9	Jul 1998	-2	Jan 1949	31	41.4	Jan 1979	1629	2913	10.9	115.1	349.4	.8	26.8	.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: 1896-2001

(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	2.05	1.61	2.76	1965	22	6.63	1991	.04	1996
Feb	2.21	2.04	4.92	1955	5	7.55	1992	.02	1999
Mar	2.09	2.09	4.00	1921	13	5.24	1983	.01	1972
Apr	2.85	2.47	6.60	1926	21	8.09	1976	.15	1983
May	5.31	4.65	7.37	1970	15	13.14	1975	.31	1998
Jun	4.84	3.53	13.98	1981	14	22.96	1981	.88	1998
Jul	2.12	.91	7.32	1902	29	9.06	1979	.00+	1994
Aug	2.65	1.57	4.41	1981	31	11.02	1996	.04+	1999
Sep	3.46	3.43	8.00	1921	9	8.73	1998	.26	1989
Oct	4.03	2.88	15.78	1998	17	25.31	1998	.10	1995
Nov	3.17	2.63	9.07	1985	24	13.00	1985	.10	1999
Dec	2.41	1.44	10.00	1913	4	15.75	1991	.20	1989
Ann	37.19	37.96	15.78	Oct 1998	17	25.31	Oct 1998	.00+	Jul 1994

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.8	4.4	1.4	.4
Feb	7.3	4.0	1.5	.6
Mar	7.4	4.5	1.3	.5
Apr	7.4	4.3	2.1	.9
May	9.1	6.3	3.3	1.8
Jun	7.7	5.7	3.1	1.4
Jul	5.0	3.1	1.2	.6
Aug	5.6	3.5	1.5	.8
Sep	8.0	4.9	1.8	.9
Oct	7.2	4.9	2.0	1.1
Nov	7.7	4.2	2.0	.8
Dec	8.3	4.0	1.3	.7
Ann	89.5	53.8	22.5	10.5

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	.18	.32	.59	.87	1.18	1.54	1.96	2.49	3.22	4.45	5.65
Feb	.16	.31	.59	.90	1.24	1.63	2.09	2.69	3.51	4.89	6.26
Mar	.24	.40	.69	.98	1.29	1.64	2.05	2.55	3.24	4.38	5.48
Apr	.31	.52	.91	1.31	1.74	2.22	2.78	3.48	4.43	6.01	7.56
May	.93	1.39	2.17	2.90	3.64	4.44	5.36	6.48	7.96	10.36	12.65
Jun	.78	1.19	1.90	2.56	3.25	4.00	4.86	5.90	7.30	9.57	11.75
Jul	.00	.00	.15	.39	.72	1.15	1.71	2.46	3.56	5.53	7.55
Aug	.06	.16	.40	.72	1.12	1.62	2.25	3.10	4.34	6.51	8.74
Sep	.57	.87	1.37	1.85	2.34	2.87	3.48	4.23	5.22	6.83	8.37
Oct	.16	.35	.80	1.32	1.94	2.68	3.61	4.81	6.53	9.50	12.48
Nov	.25	.46	.88	1.32	1.80	2.36	3.02	3.86	5.02	6.96	8.87
Dec	.14	.28	.57	.90	1.27	1.71	2.24	2.92	3.87	5.49	7.10
Ann	21.73	24.50	28.17	31.04	33.64	36.20	38.88	41.90	45.62	51.13	56.00

\+ 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: 1896-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	#	.0	#	0
Feb	.1	.0	#	0
Mar	.0	.0	0	0
Apr	.0	.0	0	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.0	.0	0	0
Nov	#	.0	0	0
Dec	#	.0	#	0
Ann	.1	.0	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	#	1994	31	#+	1994	#	1973	11	#	1973
Feb	1.5	1973	9	1.5+	1973	#	1989	4	#	1989
Mar	.0	0	0	.0	0	0	0	0	0	0
Apr	.0	0	0	.0	0	0	0	0	0	0
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	.0	0	0	.0	0	0	0	0	0	0
Nov	#	1980	26	#+	1980	0	0	0	0	0
Dec	#	1990	30	#+	1990	#	1990	30	#	1990
Ann	1.5	Feb 1973	9	1.5+	Feb 1973	#+	Dec 1990	30	#+	Dec 1990

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.0	.0	.0	.0	.0
Feb	.0	.0	.0	.0	.0
Mar	.0	.0	.0	.0	.0
Apr	.0	.0	.0	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.0	.0	.0	.0	.0
Dec	.0	.0	.0	.0	.0
Ann	.0	.0	.0	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.0	.0	.0	.0
Feb	.0	.0	.0	.0
Mar	.0	.0	.0	.0
Apr	.0	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.0	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	.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	4/10	4/02	3/27	3/23	3/18	3/14	3/09	3/03	2/23
32	3/29	3/20	3/12	3/06	2/28	2/23	2/16	2/09	1/30
28	3/07	2/26	2/20	2/15	2/10	2/05	1/31	1/24	1/14
24	2/28	2/16	2/08	1/31	1/24	1/16	1/07	12/24	0/00
20	2/11	1/31	1/22	1/13	1/02	0/00	0/00	0/00	0/00
16	1/16	1/06	12/25	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	10/27	11/02	11/06	11/09	11/13	11/16	11/19	11/24	11/29
32	11/05	11/12	11/16	11/20	11/24	11/28	12/02	12/06	12/13
28	11/16	11/24	11/29	12/04	12/09	12/13	12/18	12/24	1/03
24	11/29	12/08	12/14	12/20	12/26	1/01	1/09	1/23	0/00
20	12/15	12/28	1/07	1/17	1/30	0/00	0/00	0/00	0/00
16	12/25	1/05	1/19	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	266	257	250	244	239	233	228	221	211
32	306	293	284	275	268	260	252	243	230
28	346	327	317	309	301	294	287	278	266
24	>365	>365	>365	345	332	322	313	303	291
20	>365	>365	>365	>365	>365	>365	349	336	322
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	482	322	149	37	4	0	0	0	0	22	201	412	1629
60	344	207	66	7	0	0	0	0	0	5	112	276	1017
57	272	152	35	2	0	0	0	0	0	2	73	208	744
55	229	120	21	0	0	0	0	0	0	1	52	169	592
50	142	58	4	0	0	0	0	0	0	0	19	89	312
32	6	0	0	0	0	0	0	0	0	0	0	0	6

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	559	614	916	1086	1352	1485	1624	1624	1429	1194	837	621	13341
55	69	90	224	396	639	795	911	911	739	481	199	77	5531
57	50	65	176	337	577	735	849	849	679	420	160	54	4951
60	29	36	115	253	484	645	756	756	589	330	110	29	4132
65	5	12	43	133	333	495	601	601	439	193	48	10	2913
70	0	1	10	53	196	345	446	446	292	86	16	1	1892

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	332	420	667	837	1093	1240	1368	1368	1175	935	591	384	332	752	1419	2256	3349	4589	5957	7325	8500	9435	10026	10410
45	214	292	514	687	938	1090	1213	1213	1025	780	447	255	214	506	1020	1707	2645	3735	4948	6161	7186	7966	8413	8668
50	126	185	369	538	783	940	1058	1058	875	627	315	149	126	311	680	1218	2001	2941	3999	5057	5932	6559	6874	7023
55	58	100	238	390	628	790	903	903	725	474	203	76	58	158	396	786	1414	2204	3107	4010	4735	5209	5412	5488
60	23	47	129	255	473	640	748	748	575	327	109	32	23	70	199	454	927	1567	2315	3063	3638	3965	4074	4106
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	216	271	427	551	754	852	918	907	791	617	374	246	216	487	914	1465	2219	3071	3989	4896	5687	6304	6678	6924

(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/normals/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.
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