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: NEW BRAUNFELS, TX **COOP ID: 416276**

Climate Division: TX 7 **NWS Call Sign:** **Elevation: 710 Feet** **Lat: 29˚44N** **Lon: 98˚07W**

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	61.7	35.5	48.6	89+	1975	27	56.2	1999	2	1949	31	40.1	1979	517	4	.0	.0	25.1	.3	10.6	.0
Feb	66.6	38.9	52.8	98	1996	22	60.2	2000	8	1951	2	43.4	1978	353	10	.0	.2	24.6	.2	5.6	.0
Mar	74.1	46.3	60.2	100	1971	29	65.7	2000	17	1980	2	53.7	1996	184	35	@	.8	30.2	.0	2.1	.0
Apr	79.9	52.8	66.4	105	1951	19	71.3	1972	29+	1987	5	61.0	1973	64	105	@	2.2	30.0	.0	.2	.0
May	85.7	62.1	73.9	103	1967	9	79.8	1996	37	1996	1	68.1	1976	11	286	@	8.0	31.0	.0	.0	.0
Jun	91.2	68.3	79.8	110	1998	16	86.0	1998	46	1984	1	75.9	1973	0	443	1.1	20.6	30.0	.0	.0	.0
Jul	94.7	70.6	82.7	110	1951	19	86.9	1998	59	1905	11	78.2	1976	0	548	3.9	28.0	31.0	.0	.0	.0
Aug	95.3	69.9	82.6	110+	1952	23	85.7	1999	58+	1986	31	78.2	1973	0	545	3.5	28.6	31.0	.0	.0	.0
Sep	90.3	65.2	77.8	112	2000	5	82.0	1977	43+	1983	23	71.0	1974	1	383	1.0	19.5	30.0	.0	.0	.0
Oct	81.9	55.3	68.6	100	1938	2	71.6	1979	24	1993	31	60.3	1976	35	146	.0	4.6	30.9	.0	.1	.0
Nov	71.2	45.8	58.5	93	1947	4	64.3	1988	18	1911	30	51.9	1972	227	32	.0	.1	28.9	.0	2.3	.0
Dec	63.6	37.9	50.8	91	1955	25	58.0	1984	2	1989	23	41.5	1989	448	8	.0	.0	26.9	.3	7.7	.0
Ann	79.7	54.1	66.9	112	Sep 2000	5	86.9	Jul 1998	2+	Dec 1989	23	40.1	Jan 1979	1840	2545	9.5	112.6	349.6	.8	28.6	.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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1897-2001

(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	1.88	1.56	2.61	1919	21	6.40	1992	.02	1996
Feb	1.98	1.60	2.88	1912	23	6.17	1992	.00	1999
Mar	2.04	1.90	3.87	1911	18	5.24	1992	.11	1971
Apr	2.72	2.34	4.53	1926	21	9.08	1976	.08	1983
May	5.01	4.15	5.66	1972	12	14.56	1972	.30+	1996
Jun	4.81	3.71	6.25	1946	20	14.04	1981	.74	1990
Jul	1.99	1.30	5.45	1942	5	5.84	1990	.00+	2000
Aug	2.32	1.19	4.50	2001	29	10.49	1974	.00	2000
Sep	3.46	2.99	9.38	1921	9	9.11	1973	.00	1999
Oct	4.38	2.70	18.35	1998	18	26.75	1998	.30	1996
Nov	2.71	2.18	5.77	1974	24	8.81	1974	.17	1999
Dec	2.44	1.45	4.81	1991	21	17.51	1991	.00	1985
Ann	35.74	36.99	18.35	Oct 1998	18	26.75	Oct 1998	.00+	Aug 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.3	4.2	1.2	.3
Feb	6.6	4.2	1.3	.4
Mar	6.9	4.2	1.4	.5
Apr	6.7	3.9	1.8	.9
May	7.6	5.7	3.4	1.7
Jun	6.6	5.0	2.7	1.7
Jul	4.4	3.0	1.1	.6
Aug	4.8	3.5	1.5	.7
Sep	6.2	4.2	2.2	1.1
Oct	6.3	4.5	2.4	1.3
Nov	6.4	4.1	1.9	.6
Dec	7.6	4.1	1.3	.6
Ann	77.4	50.6	22.2	10.4

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	.12	.24	.48	.73	1.02	1.36	1.76	2.28	3.00	4.22	5.42
Feb	.10	.29	.59	.88	1.19	1.54	1.94	2.45	3.13	4.26	5.37
Mar	.41	.59	.89	1.17	1.44	1.74	2.08	2.48	3.01	3.87	4.68
Apr	.23	.41	.77	1.14	1.56	2.03	2.60	3.31	4.29	5.93	7.55
May	.59	.98	1.68	2.38	3.12	3.95	4.92	6.12	7.75	10.43	13.04
Jun	.75	1.16	1.86	2.52	3.21	3.96	4.82	5.88	7.29	9.57	11.77
Jul	.00	.00	.15	.52	.90	1.34	1.85	2.50	3.40	4.87	6.39
Aug	.06	.21	.51	.84	1.21	1.64	2.16	2.83	3.75	5.33	6.89
Sep	.31	.70	1.26	1.77	2.29	2.85	3.49	4.27	5.31	6.99	8.61
Oct	.23	.47	.98	1.57	2.25	3.05	4.02	5.28	7.05	10.08	13.11
Nov	.31	.52	.90	1.28	1.68	2.13	2.66	3.31	4.20	5.66	7.08
Dec	.03	.14	.41	.73	1.12	1.58	2.16	2.92	4.01	5.88	7.78
Ann	18.94	21.83	25.74	28.83	31.67	34.48	37.46	40.83	45.02	51.28	56.86

\+ 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: 1897-2001
(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	.1	.0	0	0	1.5	1973	11	1.5	1973	0	0	0	0	0	.1	.1	.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	.1	.0	N/A	N/A	1.5	Jan 1973	11	1.5	Jan 1973	0	0	0	0	0	.1	.1	.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	4/12	4/04	3/30	3/25	3/21	3/16	3/11	3/06	2/26
32	3/29	3/20	3/14	3/09	3/04	2/27	2/22	2/16	2/08
28	3/17	3/08	3/01	2/24	2/19	2/14	2/08	2/02	1/24
24	3/05	2/20	2/11	2/04	1/27	1/20	1/11	1/01	12/12
20	2/09	1/29	1/20	1/12	1/02	12/16	0/00	0/00	0/00
16	1/12	1/02	12/20	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	11/20	11/24	11/30
32	10/31	11/07	11/12	11/17	11/21	11/25	11/29	12/04	12/12
28	11/15	11/23	11/29	12/04	12/09	12/14	12/19	12/25	1/02
24	11/23	12/04	12/13	12/20	12/27	1/03	1/11	1/22	2/10
20	12/19	12/30	1/08	1/17	1/27	2/14	0/00	0/00	0/00
16	12/27	1/05	1/17	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	262	253	247	242	237	231	226	220	211
32	291	281	273	267	261	255	249	241	231
28	325	314	306	299	293	286	279	271	260
24	>365	>365	360	342	330	320	310	299	284
20	>365	>365	>365	>365	>365	>365	>365	347	331
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	517	353	184	64	11	0	0	0	1	35	227	448	1840
60	377	233	92	18	1	0	0	0	0	8	130	308	1167
57	301	175	53	7	0	0	0	0	0	3	86	235	860
55	255	141	34	3	0	0	0	0	0	1	62	193	689
50	163	73	9	0	0	0	0	0	0	0	23	108	376
32	9	0	0	0	0	0	0	0	0	0	0	1	10

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	524	582	874	1031	1298	1433	1571	1568	1373	1134	796	583	12767
55	58	79	195	344	585	743	858	855	683	422	168	63	5053
57	41	56	152	288	523	683	796	793	623	362	131	43	4491
60	24	31	98	209	432	593	703	700	533	274	85	23	3705
65	4	10	35	105	286	443	548	545	383	146	32	8	2545
70	0	0	9	39	162	296	393	390	243	56	9	0	1597

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	325	415	655	821	1083	1224	1357	1356	1171	921	588	380	325	740	1395	2216	3299	4523	5880	7236	8407	9328	9916	10296
45	207	287	505	671	928	1074	1202	1201	1021	766	443	253	207	494	999	1670	2598	3672	4874	6075	7096	7862	8305	8558
50	116	180	361	521	773	924	1047	1046	871	611	312	150	116	296	657	1178	1951	2875	3922	4968	5839	6450	6762	6912
55	54	97	234	378	618	774	892	891	721	460	198	75	54	151	385	763	1381	2155	3047	3938	4659	5119	5317	5392
60	23	48	131	242	463	624	737	736	571	318	110	32	23	71	202	444	907	1531	2268	3004	3575	3893	4003	4035
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	213	269	422	540	742	839	905	897	789	613	371	241	213	482	904	1444	2186	3025	3930	4827	5616	6229	6600	6841

(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

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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