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: SANDERSON, TX **COOP ID: 418022**

Climate Division: TX 5 **NWS Call Sign:** **Elevation: 2,855 Feet** **Lat: 30˚09N** **Lon: 102˚24W**

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	60.1	30.5	45.3	87	2000	20	51.3	1998	7	1930	23	38.6	1979	611	0	.0	.0	24.3	.7	18.5	.0
Feb	64.5	34.6	49.6	94+	1986	21	56.3	2000	4	1933	8	42.6	1978	436	3	.0	.2	24.8	.6	11.8	.0
Mar	72.3	42.4	57.4	96+	1988	25	61.9	1974	12	1932	13	52.5	1996	251	14	.0	1.0	30.1	.0	4.0	.0
Apr	79.8	50.6	65.2	101+	1996	26	72.4	1986	22	1973	9	58.7	1997	90	96	.1	5.1	29.8	.0	.3	.0
May	86.4	60.1	73.3	109	2000	25	79.3+	2000	37+	1970	3	65.8	1976	20	275	1.2	12.0	31.0	.0	.0	.0
Jun	90.5	66.8	78.7	110	1969	24	84.1	1998	40	1965	26	74.6	1979	0	409	2.9	18.6	30.0	.0	.0	.0
Jul	91.9	68.9	80.4	107	1934	4	85.7	1998	49+	1897	10	74.2	1976	0	477	1.9	22.1	31.0	.0	.0	.0
Aug	91.1	67.9	79.5	106+	1977	24	84.3	1977	54+	1962	26	73.8	1971	0	451	1.4	21.9	31.0	.0	.0	.0
Sep	86.1	61.9	74.0	106	1977	26	80.1	1977	40	1989	24	64.4	1974	17	288	.6	11.6	30.0	.0	.0	.0
Oct	77.5	50.9	64.2	102	1977	1	67.8	1998	21	1993	31	56.0	1976	100	74	@	2.5	30.7	.0	.4	.0
Nov	68.1	39.7	53.9	94	1996	21	60.7	1985	12	1976	29	46.6	1976	342	9	.0	.2	28.1	.1	6.0	.0
Dec	61.0	32.1	46.6	85+	1981	22	52.0	1984	3	1989	22	41.1	1983	573	0	.0	.0	25.9	.3	16.5	.0
Ann	77.4	50.5	64.0	110	Jun 1969	24	85.7	Jul 1998	3	Dec 1989	22	38.6	Jan 1979	2440	2096	8.1	95.2	346.7	1.7	57.5	.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	.39	.21	1.40	1903	15	1.74	1991	.00+	1999
Feb	.59	.36	1.00	1903	26	2.09	1992	.00+	1999
Mar	.40	.17	2.53	1997	10	3.00	1997	.00+	1996
Apr	.86	.79	2.67	1974	30	3.60	1981	.00+	1998
May	1.74	1.24	3.00	1992	24	5.34	1992	.00+	2000
Jun	2.09	1.75	5.35	1965	11	5.75	1999	.00	1990
Jul	1.52	.99	3.97	1999	11	7.33	1976	.00+	1983
Aug	1.87	1.36	3.60	1993	31	5.15	1980	.01	2000
Sep	2.41	2.07	5.03	1988	18	9.24	1978	.08	1998
Oct	1.75	.97	3.25	1984	11	6.18	1986	.00+	1991
Nov	.81	.44	5.10	1978	5	6.64	1978	.00+	1999
Dec	.51	.21	1.06	1986	22	2.37	1982	.00+	1995
Ann	14.94	14.20	5.35	Jun 1965	11	9.24	Sep 1978	.00+	May 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.6	1.1	.2	.1
Feb	3.2	1.6	.3	.0
Mar	1.9	.9	.2	@
Apr	2.4	1.5	.6	.2
May	4.9	3.0	1.3	.3
Jun	4.6	3.3	1.2	.7
Jul	3.4	2.4	1.0	.4
Aug	4.4	3.0	1.3	.4
Sep	4.7	3.7	1.7	.7
Oct	4.7	2.9	1.1	.5
Nov	2.7	1.7	.4	.1
Dec	2.2	1.2	.3	.1
Ann	41.7	26.3	9.6	3.5

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	.00	.00	.00	.04	.11	.21	.32	.47	.68	1.05	1.42
Feb	.00	.00	.07	.20	.32	.44	.58	.75	.99	1.35	1.74
Mar	.00	.00	.00	.00	.05	.14	.27	.44	.70	1.15	1.62
Apr	.00	.00	.09	.21	.35	.52	.74	1.03	1.44	2.15	2.87
May	.00	.20	.51	.79	1.08	1.38	1.74	2.16	2.75	3.70	4.61
Jun	.09	.26	.57	.88	1.21	1.58	2.02	2.56	3.32	4.57	5.79
Jul	.00	.04	.20	.40	.64	.94	1.32	1.81	2.52	3.75	5.00
Aug	.07	.15	.35	.59	.87	1.22	1.66	2.23	3.04	4.46	5.89
Sep	.09	.20	.46	.76	1.13	1.58	2.14	2.87	3.92	5.73	7.55
Oct	.00	.04	.23	.46	.75	1.09	1.53	2.09	2.91	4.32	5.75
Nov	.00	.00	.00	.14	.30	.49	.71	1.00	1.40	2.09	2.78
Dec	.00	.00	.00	.03	.14	.26	.42	.61	.89	1.38	1.85
Ann	8.62	9.74	11.23	12.40	13.46	14.50	15.59	16.82	18.35	20.60	22.59

\+ 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: 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	#	.0	0	0	#	1989	13	#	1989	0	0	0	0	0	.0	.0	.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	1	2000	7	#	2000	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.2	.0	#	0	3.0	1998	11	3.0	1998	1	1998	11	#	1998	.1	.1	.1	.0	.0	@	.0	.0	.0
Ann	.2	.0	N/A	N/A	3.0	Dec 1998	11	3.0	Dec 1998	1+	Nov 2000	7	#+	Nov 2000	.1	.1	.1	.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	4/15	4/09	4/05	4/02	3/30	3/27	3/24	3/20	3/14
32	4/10	4/03	3/30	3/26	3/22	3/18	3/14	3/09	3/03
28	4/02	3/25	3/19	3/14	3/09	3/04	2/27	2/21	2/13
24	3/26	3/14	3/06	2/27	2/20	2/13	2/06	1/29	1/17
20	3/03	2/18	2/09	1/31	1/23	1/15	1/05	12/23	0/00
16	2/11	1/29	1/18	1/08	12/27	12/06	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	10/13	10/19	10/24	10/28	10/31	11/04	11/08	11/12	11/18
32	10/24	10/30	11/03	11/07	11/10	11/14	11/17	11/22	11/28
28	11/02	11/08	11/12	11/16	11/19	11/23	11/26	12/01	12/07
24	11/11	11/19	11/25	11/29	12/04	12/09	12/13	12/19	12/27
20	11/26	12/05	12/12	12/17	12/23	12/28	1/04	1/15	0/00
16	12/07	12/19	12/29	1/08	1/21	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	237	229	224	219	214	210	205	200	192
32	258	250	243	238	233	228	222	216	207
28	285	274	267	261	255	249	242	235	225
24	330	315	304	295	286	278	268	258	243
20	>365	>365	>365	339	328	319	311	302	290
16	>365	>365	>365	>365	>365	>365	>365	334	315

***** 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)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	611	436	251	90	20	0	0	0	17	100	342	573	2440
60	458	307	134	32	5	0	0	0	4	36	216	419	1611
57	371	236	83	14	1	0	0	0	0	16	154	330	1205
55	315	194	57	8	0	0	0	0	0	8	119	274	975
50	191	111	17	0	0	0	0	0	0	1	53	150	523
32	5	1	0	0	0	0	0	0	0	0	0	0	6

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	417	493	786	996	1279	1399	1500	1473	1261	997	657	450	11708
55	14	42	130	314	566	709	787	760	571	292	86	11	4282
57	9	27	94	260	505	649	725	698	511	238	61	5	3782
60	3	14	52	188	415	559	632	605	424	165	33	1	3091
65	0	3	14	96	275	409	477	451	288	74	9	0	2096
70	0	0	1	37	160	265	327	303	173	24	1	0	1291

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	229	320	562	772	1048	1174	1263	1239	1034	761	439	251	229	549	1111	1883	2931	4105	5368	6607	7641	8402	8841	9092
45	125	203	414	624	893	1024	1108	1084	884	609	301	137	125	328	742	1366	2259	3283	4391	5475	6359	6968	7269	7406
50	52	110	279	478	738	874	953	929	734	458	185	63	52	162	441	919	1657	2531	3484	4413	5147	5605	5790	5853
55	13	48	159	339	583	724	798	774	585	311	96	22	13	61	220	559	1142	1866	2664	3438	4023	4334	4430	4452
60	0	13	72	210	428	574	643	619	438	185	35	0	0	13	85	295	723	1297	1940	2559	2997	3182	3217	3217
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	199	244	376	498	684	787	853	834	690	491	298	202	199	443	819	1317	2001	2788	3641	4475	5165	5656	5954	6156

(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