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: BORGER, TX **COOP ID: 410958**

Climate Division: TX 1 **NWS Call Sign:** **Elevation: 3,140 Feet** **Lat: 35˚39N** **Lon: 101˚27W**

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	49.4	23.4	36.4	80	1951	26	44.8	1986	-11	1959	4	25.3	1979	887	0	.0	.0	17.4	3.9	25.6	.3
Feb	55.4	27.5	41.5	89	1963	1	49.1	2000	-12	1951	1	29.5	1978	660	0	.0	.0	19.6	2.4	18.6	.4
Mar	63.8	34.1	49.0	95	1971	27	54.1	1986	1	1960	3	44.1	1998	496	0	.0	.2	27.3	.5	12.1	.0
Apr	72.4	42.7	57.6	99	1965	22	63.5	1981	16	1997	12	50.8+	1997	250	26	.0	.7	28.9	.0	3.1	.0
May	80.2	52.6	66.4	103+	2000	23	74.0	1996	29	1954	3	61.8	1995	81	123	.2	4.5	30.9	.0	.1	.0
Jun	88.8	61.7	75.3	108+	1998	27	81.7	1990	44	1979	10	70.2	1992	9	316	2.4	14.5	30.0	.0	.0	.0
Jul	92.6	66.4	79.5	107+	2001	23	85.7	1980	52	1990	13	75.8	1975	0	449	3.2	22.3	31.0	.0	.0	.0
Aug	90.6	65.0	77.8	106	1969	17	83.7	2000	50+	1961	23	73.7	1992	1	398	1.4	19.6	31.0	.0	.0	.0
Sep	84.0	57.5	70.8	105	1995	5	77.1	1998	29	1985	30	64.4	1974	29	202	.4	8.4	29.8	.0	.1	.0
Oct	74.3	46.1	60.2	99	2000	3	64.3	1979	13	1993	30	54.4	1976	174	26	.0	1.0	30.4	.0	1.7	.0
Nov	59.7	33.6	46.7	88	1980	8	53.9	1999	2	1976	28	38.4	1972	552	0	.0	.0	23.6	.6	12.9	.0
Dec	50.4	25.4	37.9	82+	1955	24	43.5	1980	-7+	1989	22	26.3	1983	840	0	.0	.0	17.6	2.8	24.3	.5
Ann	71.8	44.7	58.3	108+	Jun 1998	27	85.7	Jul 1980	-12	Feb 1951	1	25.3	Jan 1979	3979	1540	7.6	71.2	317.5	10.2	98.5	1.2

\+ 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

Issue Date: February 2004

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Climate Division: TX 1 **NWS Call Sign:** **Elevation: 3,140 Feet** **Lat: 35˚39N** **Lon: 101˚27W**

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	.65	.54	1.67	1999	29	2.34	1999	.00+	1996
Feb	.69	.61	1.60	1964	4	2.26	1983	.00+	2000
Mar	1.56	1.33	3.32	2000	23	6.80	2000	.00	1997
Apr	1.77	1.20	2.50	1997	25	8.05	1997	.00	1996
May	3.08	3.18	3.79	1959	4	6.38	1977	.35	1971
Jun	3.20	3.19	2.87	1993	19	7.03	1978	.10	1998
Jul	2.69	2.20	3.66	1982	30	7.41	1982	.18	1974
Aug	3.16	2.98	2.51	1991	13	6.21	1974	.70	2000
Sep	2.00	1.54	3.05	1978	20	4.79	1971	.09	2000
Oct	1.60	.91	2.87	1998	31	6.05	1998	.00+	1992
Nov	.88	.74	1.77	1986	4	2.44	1986	.00+	1999
Dec	.70	.50	1.96	1959	17	3.28	1991	.00	1976
Ann	21.98	22.01	3.79	May 1959	4	8.05	Apr 1997	.00+	Feb 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.7	1.7	.3	.1
Feb	4.1	1.9	.4	.1
Mar	5.4	3.0	.9	.3
Apr	5.7	3.3	1.1	.3
May	8.5	5.4	2.1	.8
Jun	7.5	5.0	2.4	.9
Jul	6.5	4.6	1.6	.7
Aug	8.2	5.3	2.2	.9
Sep	6.0	3.5	1.3	.4
Oct	4.5	3.0	1.0	.4
Nov	4.2	2.4	.5	.1
Dec	4.1	1.9	.5	.0
Ann	68.4	41.0	14.3	5.0

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	.04	.14	.24	.35	.48	.62	.81	1.06	1.49	1.91
Feb	.00	.00	.11	.22	.33	.47	.64	.85	1.14	1.63	2.12
Mar	.04	.14	.35	.57	.82	1.11	1.46	1.90	2.52	3.56	4.59
Apr	.04	.16	.39	.64	.92	1.25	1.65	2.15	2.86	4.07	5.26
May	.74	1.03	1.48	1.88	2.28	2.70	3.17	3.73	4.46	5.62	6.72
Jun	.32	.55	.99	1.44	1.92	2.46	3.10	3.90	4.99	6.81	8.58
Jul	.32	.53	.91	1.29	1.69	2.13	2.65	3.28	4.15	5.58	6.97
Aug	.95	1.25	1.70	2.09	2.46	2.85	3.28	3.79	4.44	5.47	6.42
Sep	.22	.37	.65	.93	1.23	1.56	1.96	2.45	3.11	4.22	5.29
Oct	.00	.07	.27	.51	.77	1.08	1.46	1.94	2.63	3.79	4.95
Nov	.00	.10	.27	.41	.55	.71	.89	1.10	1.39	1.87	2.33
Dec	.02	.06	.15	.24	.36	.49	.64	.85	1.13	1.61	2.09
Ann	15.70	16.91	18.47	19.65	20.70	21.71	22.76	23.91	25.31	27.35	29.10

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	5.5	6.1	1	#
Feb	5.5	2.5	1	#
Mar	3.4	1.9	#	#
Apr	.8	.0	#	0
May	.1	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.4	.0	#	0
Nov	2.8	.9	#	#
Dec	4.8	2.4	1	#
Ann	23.3	13.8	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	8.2	1988	6	15.8	1987	13	1987	18	3	1987
Feb	15.0	1971	21	21.4	1983	15	1986	9	5	1983
Mar	9.0	1987	23	15.6	1988	10	1994	9	1	1995
Apr	5.0	1988	1	6.8	1983	4	1973	8	#+	1997
May	2.7	1978	3	2.7	1978	#+	1982	19	#+	1982
Jun	.0	0	0	.0	0	#+	1984	10	#+	1984
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.3	1984	29	.3	1984	0	0	0	0	0
Oct	4.0	1991	31	4.4	1991	4	1991	31	#+	1997
Nov	7.5	1996	30	17.5	1972	8	1996	30	1	1992
Dec	11.0	2000	26	20.5	1987	17	1987	14	3+	2000
Ann	15.0	Feb 1971	21	21.4	Feb 1983	17	Dec 1987	14	5	Feb 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.2	1.9	.7	.3	.0
Feb	2.6	1.5	.5	.3	.1
Mar	1.6	.9	.4	.2	.0
Apr	.5	.2	.1	@	.0
May	@	@	.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
Oct	.3	.1	.1	.0	.0
Nov	1.5	.9	.4	.1	.0
Dec	3.0	1.3	.4	.3	@
Ann	12.7	6.8	2.6	1.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	4.1	2.3	1.0	.1
Feb	2.8	1.8	1.1	.3
Mar	.9	.6	.3	@
Apr	.2	.1	.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	.1	.1	.0	.0
Nov	1.2	.6	.2	.0
Dec	3.1	1.6	.8	.2
Ann	12.4	7.1	3.4	.6

+ 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	5/09	5/03	4/30	4/26	4/23	4/20	4/17	4/13	4/08
32	4/29	4/24	4/20	4/17	4/14	4/11	4/08	4/04	3/29
28	4/14	4/10	4/07	4/04	4/02	3/30	3/27	3/24	3/20
24	4/06	3/31	3/27	3/23	3/19	3/15	3/11	3/07	3/01
20	4/03	3/27	3/21	3/16	3/12	3/07	3/03	2/25	2/17
16	3/26	3/16	3/09	3/03	2/25	2/20	2/14	2/07	1/28

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	9/28	10/03	10/07	10/11	10/14	10/17	10/20	10/24	10/29
32	10/09	10/14	10/18	10/21	10/25	10/28	10/31	11/04	11/10
28	10/23	10/27	10/30	11/02	11/05	11/07	11/10	11/13	11/18
24	10/31	11/05	11/09	11/12	11/15	11/18	11/21	11/25	11/30
20	11/05	11/11	11/15	11/19	11/22	11/26	11/29	12/04	12/10
16	11/12	11/20	11/26	12/01	12/06	12/10	12/15	12/21	12/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	196	188	182	177	172	168	163	157	149
32	212	205	201	197	193	189	186	181	175
28	234	228	224	220	216	213	209	205	199
24	264	256	250	245	240	235	230	224	216
20	281	272	266	260	255	250	244	238	229
16	321	308	298	290	283	275	267	257	244

***** 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	887	660	496	250	81	9	0	1	29	174	552	840	3979
60	732	526	345	145	30	1	0	0	7	76	410	685	2957
57	641	448	261	96	14	0	0	0	2	41	330	593	2426
55	581	397	210	69	8	0	0	0	0	25	280	532	2102
50	437	280	107	24	1	0	0	0	0	6	175	388	1418
32	76	37	1	0	0	0	0	0	0	0	9	47	170

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	212	301	528	766	1065	1297	1472	1420	1164	875	447	229	9776
55	4	17	23	145	360	607	759	707	474	187	29	2	3314
57	2	12	13	112	304	547	697	645	415	141	18	1	2907
60	0	6	4	70	227	458	604	552	330	83	8	0	2342
65	0	0	0	26	123	316	449	398	202	26	0	0	1540
70	0	0	0	7	53	192	297	251	106	4	0	0	910

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	89	169	327	543	827	1063	1231	1179	932	642	257	100	89	258	585	1128	1955	3018	4249	5428	6360	7002	7259	7359
45	36	90	209	402	672	913	1076	1024	783	488	155	45	36	126	335	737	1409	2322	3398	4422	5205	5693	5848	5893
50	9	37	118	273	520	763	921	869	634	343	78	15	9	46	164	437	957	1720	2641	3510	4144	4487	4565	4580
55	0	11	52	161	367	613	766	714	488	212	34	0	0	11	63	224	591	1204	1970	2684	3172	3384	3418	3418
60	0	1	18	75	233	465	611	559	348	110	9	0	0	1	19	94	327	792	1403	1962	2310	2420	2429	2429
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	87	145	240	357	523	694	812	781	611	408	180	89	87	232	472	829	1352	2046	2858	3639	4250	4658	4838	4927

(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