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: WINTERS 1 NNE, TX **COOP ID: 419847**

Climate Division: TX 2 **NWS Call Sign:** **Elevation: 1,862 Feet** **Lat: 31˚58N** **Lon: 99˚58W**

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	58.4	31.5	45.0	87	1969	9	51.2	1998	-5	1973	12	38.5	1978	621	0	.0	.0	23.2	1.1	18.1	@
Feb	63.6	35.8	49.7	95	1996	22	58.2	1976	6	1996	4	40.8	1978	432	3	.0	.1	23.5	.8	10.9	.0
Mar	72.4	43.3	57.9	95	1989	12	64.5	1974	8	1980	2	51.9	1987	243	22	.0	.5	29.9	@	4.5	.0
Apr	80.7	50.4	65.6	100	1972	14	70.9	1978	26+	1997	13	59.7	1997	79	95	@	4.2	30.0	.0	.7	.0
May	87.2	60.3	73.8	110	2000	24	82.0	2000	37	1979	12	69.8	1976	16	287	1.3	10.5	31.0	.0	.0	.0
Jun	92.3	67.4	79.9	109+	1994	28	84.3	1990	48	1970	2	76.8	1995	0	445	2.8	20.3	30.0	.0	.0	.0
Jul	95.6	70.5	83.1	109	1989	18	87.2	1978	59+	1971	31	77.6	1976	0	560	6.1	27.3	31.0	.0	.0	.0
Aug	94.7	69.6	82.2	107+	2000	25	86.1	1999	54	1989	9	75.1	1971	0	532	5.9	25.7	31.0	.0	.0	.0
Sep	88.5	63.3	75.9	109+	2000	6	82.8	1977	39	1989	24	68.0	1974	6	332	1.3	14.5	30.0	.0	.0	.0
Oct	79.9	53.8	66.9	103	1977	1	70.3	1979	28+	1997	27	59.2	1976	52	109	.1	3.2	30.8	.0	.3	.0
Nov	67.4	41.9	54.7	91	1980	8	59.4	1999	15	1979	30	47.5	1976	324	14	.0	.1	27.5	.1	5.7	.0
Dec	59.8	33.5	46.7	84	1995	13	50.5	1977	-5	1989	23	36.9	1983	570	0	.0	.0	25.2	.9	15.7	@
Ann	78.4	51.8	65.1	110	May 2000	24	87.2	Jul 1978	-5+	Dec 1989	23	36.9	Dec 1983	2343	2399	17.5	106.4	343.1	2.9	55.9	.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: 1968-2001

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

Issue Date: February 2004

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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	.88	.84	1.98	1999	29	2.97	1992	.00+	1988
Feb	1.25	.94	3.28	1992	24	6.54	1992	.00	1999
Mar	1.48	1.19	3.24	1979	19	5.59	1979	.00	1971
Apr	1.78	1.01	2.42	1970	30	4.84	1977	.03	1998
May	2.98	2.69	4.12	1994	10	10.13	1994	.35	1999
Jun	3.46	2.75	7.68	1982	19	14.56	1982	.05	1996
Jul	1.93	1.84	2.61	1979	19	5.83	1976	.00	1980
Aug	1.90	1.07	3.39	1978	3	7.44	1971	.00+	2000
Sep	3.75	2.85	4.45	1980	9	12.63	1991	.00	1979
Oct	2.94	1.96	4.61	1981	13	7.72	1981	.18	1988
Nov	1.23	1.42	2.43	1975	2	2.79	1986	.00+	1999
Dec	1.10	.59	2.02	1984	31	6.48	1991	.00+	1996
Ann	24.68	24.86	7.68	Jun 1982	19	14.56	Jun 1982	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	2.3	.5	.1
Feb	4.5	2.7	.7	.2
Mar	4.4	2.6	.9	.4
Apr	4.9	3.3	1.3	.5
May	6.7	4.7	2.2	.9
Jun	5.4	4.2	1.9	1.2
Jul	4.4	3.2	1.5	.5
Aug	4.6	3.2	1.2	.6
Sep	5.9	3.9	1.8	1.2
Oct	5.0	3.7	2.0	1.0
Nov	3.7	2.6	.8	.4
Dec	3.8	2.2	.7	.2
Ann	57.6	38.6	15.5	7.2

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	.10	.22	.37	.55	.77	1.06	1.47	2.17	2.88
Feb	.03	.10	.26	.44	.64	.87	1.15	1.52	2.03	2.90	3.76
Mar	.05	.17	.38	.59	.83	1.10	1.42	1.82	2.37	3.29	4.20
Apr	.15	.27	.50	.75	1.02	1.33	1.70	2.17	2.81	3.89	4.94
May	.61	.88	1.31	1.71	2.12	2.55	3.04	3.63	4.40	5.65	6.83
Jun	.27	.50	.95	1.43	1.96	2.57	3.30	4.21	5.48	7.61	9.71
Jul	.05	.19	.45	.72	1.03	1.39	1.81	2.35	3.10	4.36	5.62
Aug	.00	.05	.25	.50	.80	1.18	1.65	2.27	3.16	4.71	6.27
Sep	.07	.29	.75	1.27	1.87	2.58	3.44	4.54	6.10	8.75	11.40
Oct	.26	.46	.86	1.27	1.71	2.22	2.83	3.59	4.63	6.38	8.09
Nov	.00	.17	.41	.61	.81	1.02	1.26	1.54	1.93	2.55	3.14
Dec	.00	.01	.10	.23	.39	.61	.89	1.27	1.83	2.83	3.85
Ann	14.44	16.27	18.71	20.61	22.33	24.03	25.81	27.81	30.28	33.93	37.15

\+ 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: 1968-2001
(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	.7	.0	#	0
Feb	.2	.0	#	0
Mar	.1	.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	.3	.0	#	0
Dec	.1	.0	#	0
Ann	1.4	.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	7.5	1975	12	7.5	1975	8	1975	12	1	1975
Feb	3.0	1988	5	3.0+	1988	3	1985	1	#+	1988
Mar	3.0	1989	5	3.3	1989	3	1989	5	#+	1996
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	5.0	1976	13	5.0	1976	5	1976	14	1	1976
Dec	1.0	1997	26	1.0	1997	3	1986	11	#+	1998
Ann	7.5	Jan 1975	12	7.5	Jan 1975	8	Jan 1975	12	1+	Nov 1976

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.5	.2	@	@	.0
Feb	.2	.1	@	.0	.0
Mar	.1	@	@	.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	.1	.1	@	@	.0
Dec	.2	@	.0	.0	.0
Ann	1.1	.4	@	@	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.3	.1	.1	.0
Feb	.1	.0	.0	.0
Mar	@	@	.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	.2	.1	.1	.0
Dec	.0	.0	.0	.0
Ann	.6	.2	.2	.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	4/23	4/18	4/14	4/11	4/08	4/05	4/02	3/30	3/25
32	4/12	4/06	4/02	3/29	3/26	3/22	3/19	3/14	3/08
28	4/07	3/29	3/23	3/17	3/12	3/07	3/01	2/22	2/13
24	3/21	3/12	3/06	2/28	2/23	2/18	2/13	2/07	1/29
20	3/06	2/25	2/19	2/13	2/08	2/02	1/27	1/18	0/00
16	2/22	2/11	2/03	1/26	1/18	1/09	12/22	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	10/21	10/26	10/29	11/01	11/03	11/06	11/08	11/11	11/16
32	10/28	11/02	11/06	11/08	11/11	11/14	11/17	11/20	11/25
28	11/03	11/08	11/12	11/15	11/18	11/21	11/25	11/29	12/04
24	11/09	11/16	11/21	11/26	11/30	12/04	12/08	12/14	12/21
20	11/23	12/03	12/11	12/18	12/24	12/30	1/07	1/17	0/00
16	12/06	12/17	12/25	1/01	1/09	1/20	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	228	221	216	212	208	204	200	195	188
32	250	243	238	234	230	226	222	217	210
28	282	272	264	257	251	245	238	230	219
24	316	303	294	286	279	271	264	254	242
20	>365	>365	343	328	318	309	301	291	279
16	>365	>365	>365	>365	358	341	328	315	300

***** 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	621	432	243	79	16	0	0	0	6	52	324	570	2343
60	473	304	135	25	3	0	0	0	0	14	205	423	1582
57	386	234	87	11	0	0	0	0	0	5	147	338	1208
55	331	193	61	5	0	0	0	0	0	2	115	285	992
50	211	110	21	0	0	0	0	0	0	0	55	173	570
32	11	2	0	0	0	0	0	0	0	0	0	5	18

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	413	497	802	1007	1294	1435	1583	1555	1317	1080	680	458	12121
55	20	44	150	321	581	745	870	842	627	369	105	25	4699
57	13	29	114	267	519	685	808	780	567	310	77	16	4185
60	7	15	69	192	429	595	715	687	477	226	45	8	3465
65	0	3	22	95	287	445	560	532	332	109	14	0	2399
70	0	0	4	35	168	297	405	378	203	37	2	0	1529

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	209	309	545	761	1041	1196	1338	1313	1079	827	442	241	209	518	1063	1824	2865	4061	5399	6712	7791	8618	9060	9301
45	113	198	399	612	886	1046	1183	1158	929	673	309	137	113	311	710	1322	2208	3254	4437	5595	6524	7197	7506	7643
50	49	110	270	464	731	896	1028	1003	779	519	199	61	49	159	429	893	1624	2520	3548	4551	5330	5849	6048	6109
55	15	52	157	324	577	746	873	848	632	374	109	24	15	67	224	548	1125	1871	2744	3592	4224	4598	4707	4731
60	1	16	73	201	426	596	718	693	483	239	44	4	1	17	90	291	717	1313	2031	2724	3207	3446	3490	3494
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	168	224	363	496	685	801	881	866	718	537	284	183	168	392	755	1251	1936	2737	3618	4484	5202	5739	6023	6206

(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