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: QUANAH 5 SE, TX **COOP ID: 417336**

Climate Division: TX 2 **NWS Call Sign:** **Elevation: 1,495 Feet** **Lat: 34˚15N** **Lon: 99˚41W**

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	52.1	24.6	38.4	87	1997	4	45.2	1990	-9	1930	18	27.6	1979	826	0	.0	.0	18.1	3.3	25.8	.2
Feb	57.4	29.7	43.6	93	1917	24	51.3	1976	-8	1985	2	31.9	1978	601	0	.0	.1	19.6	2.1	17.4	.2
Mar	66.3	38.3	52.3	102+	1971	28	56.6	1972	1	1980	2	47.7	1998	397	1	@	.7	27.6	.3	7.6	.0
Apr	75.3	47.0	61.2	104	1959	26	66.6	1981	21	1936	2	55.4	1997	168	53	@	2.2	29.4	.0	1.5	.0
May	83.4	57.6	70.5	111+	2000	24	76.6	1996	30	1960	1	65.6	1976	33	204	.9	7.4	31.0	.0	.0	.0
Jun	91.7	66.9	79.3	119	1994	28	84.2	1980	42	1919	3	74.3	1983	1	430	3.1	18.1	30.0	.0	.0	.0
Jul	96.5	71.3	83.9	114+	1944	27	89.5	1980	50	1952	8	79.9	1975	0	587	9.4	27.3	31.0	.0	.0	.0
Aug	94.4	69.7	82.1	119	1936	12	86.8	2000	50	1917	29	77.4	1992	0	528	6.8	24.6	31.0	.0	.0	.0
Sep	86.4	61.5	74.0	110	1952	1	81.1	1998	29	1984	30	67.0	1974	15	283	2.1	13.1	30.0	.0	@	.0
Oct	76.8	48.8	62.8	107	2000	3	66.9	1998	16	1993	31	55.1	1976	122	52	.2	2.6	30.7	@	1.0	.0
Nov	63.5	36.6	50.1	95	1915	1	56.5	1999	5	1919	27	43.7	1972	451	2	.0	.0	25.2	.3	10.3	.0
Dec	54.5	27.1	40.8	89	1933	30	45.0	1984	-15	1989	23	27.8	1983	751	0	.0	.0	20.0	2.0	23.4	.2
Ann	74.9	48.3	61.6	119+	Jun 1994	28	89.5	Jul 1980	-15	Dec 1989	23	27.6	Jan 1979	3365	2140	22.5	96.1	323.6	8.0	87.0	.6

\+ 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: 1904-2001

(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	.96	.93	1.85	1990	19	2.89	1973	.00+	1986
Feb	1.17	.90	2.70	1911	18	4.71	1997	.00+	1991
Mar	1.65	1.42	3.76	2000	23	5.10	2000	.05	1971
Apr	2.08	1.73	6.60	1942	29	7.38	1997	.00	1996
May	3.86	3.48	5.59	1941	3	9.71	1987	.22	1984
Jun	3.73	3.17	5.21	1985	5	10.84	1995	.46	1998
Jul	2.42	1.54	5.40	1924	22	10.22	1975	.00	1980
Aug	2.57	2.32	8.03	1995	2	11.56	1995	.00	2000
Sep	3.43	2.64	6.20	1965	19	9.18	1973	.03	1979
Oct	2.37	1.62	6.28	1983	20	12.83	1983	.00	1992
Nov	1.40	1.13	2.61	1994	20	4.63	1992	.00+	1999
Dec	1.12	.79	4.00	1932	23	4.16	1991	.00	1996
Ann	26.76	25.68	8.03	Aug 1995	2	12.83	Oct 1983	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.8	1.9	.6	.3
Feb	4.8	2.9	.6	.2
Mar	4.8	3.0	1.0	.4
Apr	5.9	3.7	1.5	.6
May	7.8	5.4	2.8	1.3
Jun	7.2	5.3	2.3	1.3
Jul	5.4	2.9	1.4	.8
Aug	7.0	4.1	1.4	.6
Sep	6.9	4.4	2.3	1.1
Oct	5.5	3.6	1.6	.5
Nov	4.7	2.4	.9	.4
Dec	4.7	2.5	.8	.2
Ann	68.5	42.1	17.2	7.7

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	.11	.24	.41	.60	.84	1.16	1.61	2.39	3.17
Feb	.00	.04	.18	.35	.54	.77	1.05	1.41	1.92	2.80	3.69
Mar	.11	.22	.42	.65	.90	1.20	1.55	2.00	2.63	3.69	4.74
Apr	.05	.18	.45	.74	1.07	1.46	1.93	2.53	3.37	4.79	6.20
May	.64	.98	1.54	2.07	2.61	3.21	3.88	4.71	5.80	7.59	9.29
Jun	.77	1.11	1.66	2.16	2.66	3.20	3.81	4.54	5.51	7.05	8.51
Jul	.05	.20	.51	.85	1.24	1.69	2.24	2.94	3.92	5.59	7.25
Aug	.19	.47	.88	1.26	1.65	2.08	2.57	3.17	3.98	5.30	6.57
Sep	.17	.35	.74	1.20	1.73	2.35	3.12	4.12	5.53	7.94	10.35
Oct	.04	.18	.47	.79	1.17	1.62	2.16	2.87	3.86	5.55	7.24
Nov	.00	.13	.37	.59	.82	1.08	1.38	1.74	2.24	3.07	3.88
Dec	.01	.05	.16	.31	.48	.70	.97	1.33	1.85	2.77	3.69
Ann	16.38	18.27	20.76	22.69	24.43	26.14	27.93	29.93	32.38	36.00	39.18

\+ 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: 1904-2001
(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	2.0	.4	#	#
Feb	1.3	.0	#	#
Mar	.2	.0	#	0
Apr	.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
Nov	.6	.0	#	0
Dec	1.0	.0	#	#
Ann	5.1	.4	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	8.3	1983	2	8.3	1983	8	1983	2	1	1992
Feb	4.0	1978	9	7.4	1986	6	1985	2	2	1978
Mar	2.7	1989	21	2.7	1989	2	1989	21	#+	1996
Apr	1.0	1973	8	1.0	1973	1	1973	8	#+	1983
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	.2	1991	31	.2	1991	#	1991	31	#	1991
Nov	8.0	1980	17	8.3	1980	5	1980	17	#+	2000
Dec	6.0	1971	3	9.4	1987	5	1987	15	1	1987
Ann	8.3	Jan 1983	2	9.4	Dec 1987	8	Jan 1983	2	2	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.9	.7	.3	.1	.0
Feb	1.2	.9	.1	.0	.0
Mar	.1	.1	.0	.0	.0
Apr	@	@	.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
Nov	.3	.2	.1	@	.0
Dec	.8	.4	.1	@	.0
Ann	3.3	2.3	.6	.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	1.8	1.1	.4	.0
Feb	1.5	.5	.2	.0
Mar	.1	.0	.0	.0
Apr	@	.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	.1	@	.0
Dec	.9	.2	.1	.0
Ann	4.6	1.9	.7	.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	4/26	4/22	4/19	4/16	4/13	4/11	4/08	4/05	4/01
32	4/16	4/12	4/09	4/07	4/04	4/02	3/31	3/28	3/24
28	4/10	4/04	3/30	3/26	3/22	3/18	3/14	3/09	3/02
24	3/30	3/23	3/18	3/13	3/09	3/05	3/01	2/23	2/16
20	3/16	3/08	3/03	2/26	2/21	2/16	2/11	2/06	1/29
16	3/09	2/28	2/21	2/15	2/10	2/04	1/29	1/22	1/11

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	10/01	10/07	10/11	10/14	10/18	10/21	10/24	10/28	11/03
32	10/13	10/20	10/25	10/29	11/02	11/06	11/10	11/15	11/22
28	10/24	10/30	11/04	11/07	11/11	11/14	11/18	11/22	11/28
24	10/30	11/06	11/12	11/16	11/20	11/24	11/29	12/04	12/11
20	11/11	11/19	11/24	11/29	12/03	12/08	12/12	12/18	12/26
16	11/18	11/29	12/07	12/14	12/21	12/28	1/04	1/13	1/26

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	207	200	195	190	186	182	178	173	166
32	231	224	219	215	211	207	202	197	190
28	257	249	243	238	233	228	223	217	209
24	282	273	266	260	255	250	244	238	229
20	320	308	299	292	285	277	270	261	249
16	>365	354	335	323	312	302	292	280	265

***** 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	826	601	397	168	33	1	0	0	15	122	451	751	3365
60	672	472	254	84	8	0	0	0	3	46	314	597	2450
57	581	395	180	48	3	0	0	0	0	22	239	507	1975
55	522	346	138	31	1	0	0	0	0	12	196	450	1696
50	382	239	62	8	0	0	0	0	0	2	108	312	1113
32	53	27	0	0	0	0	0	0	0	0	2	29	111

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	250	350	628	874	1194	1419	1610	1551	1258	954	543	301	10932
55	6	25	53	215	482	729	897	838	568	252	47	9	4121
57	3	18	33	173	422	669	835	776	508	200	30	4	3671
60	1	10	14	118	334	579	742	683	421	132	14	1	3049
65	0	0	1	53	204	430	587	528	283	52	2	0	2140
70	0	0	0	17	104	289	432	375	168	14	0	0	1399

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	97	201	403	640	950	1180	1367	1312	1024	712	328	129	97	298	701	1341	2291	3471	4838	6150	7174	7886	8214	8343
45	44	119	275	496	795	1030	1212	1157	874	560	213	62	44	163	438	934	1729	2759	3971	5128	6002	6562	6775	6837
50	18	64	167	356	641	880	1057	1002	724	412	119	28	18	82	249	605	1246	2126	3183	4185	4909	5321	5440	5468
55	2	26	86	229	487	730	902	847	578	276	58	4	2	28	114	343	830	1560	2462	3309	3887	4163	4221	4225
60	0	6	41	127	337	580	747	692	437	161	20	0	0	6	47	174	511	1091	1838	2530	2967	3128	3148	3148
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	107	163	273	409	614	785	895	863	674	456	225	123	107	270	543	952	1566	2351	3246	4109	4783	5239	5464	5587

(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