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: TOWN BLUFF DAM, TX **COOP ID: 419101**

Climate Division: TX 4 **NWS Call Sign:** **Elevation: 214 Feet** **Lat: 30˚48N** **Lon: 94˚11W**

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	59.2	38.3	48.8	82	1972	24	54.7	2000	11	1985	21	40.2	1978	514	3	.0	.0	23.8	.4	10.9	.0
Feb	63.9	41.3	52.6	89	1986	21	59.6	2000	16	1981	11	42.2	1978	355	8	.0	.0	24.2	.3	6.6	.0
Mar	70.7	48.7	59.7	90	1989	31	65.4	1974	21	1980	3	54.4	1996	193	28	.0	@	30.0	@	2.0	.0
Apr	76.9	54.9	65.9	93	1987	19	71.2	1981	29+	1987	4	61.5	1983	64	91	.0	.2	30.0	.0	.2	.0
May	83.6	63.3	73.5	99	1998	31	77.4+	1998	42	1992	8	69.6	1976	5	267	.0	3.4	31.0	.0	.0	.0
Jun	89.2	69.3	79.3	102	1998	15	84.3	1998	50	1988	5	76.7	1976	0	428	.2	15.6	30.0	.0	.0	.0
Jul	92.1	71.6	81.9	105	1980	18	86.1	1998	57	1990	15	79.7	1972	0	523	1.5	24.8	31.0	.0	.0	.0
Aug	92.3	71.0	81.7	106	1998	3	84.8	1999	54	1992	17	78.0	1992	0	515	.9	24.6	31.0	.0	.0	.0
Sep	87.6	66.8	77.2	109	2000	1	81.3	1980	45+	1993	29	73.5	1974	0	366	.4	13.9	30.0	.0	.0	.0
Oct	79.0	56.1	67.6	95	1982	5	70.9	1984	28+	1993	31	60.2	1976	49	128	.0	1.4	31.0	.0	.1	.0
Nov	68.8	47.7	58.3	87+	1988	5	64.4	1973	23+	1992	28	49.2	1976	238	35	.0	.0	29.1	.0	2.8	.0
Dec	61.6	40.3	51.0	84	1995	4	61.0	1984	6	1989	24	42.2	1989	446	10	.0	.0	26.5	.3	9.0	.0
Ann	77.1	55.8	66.5	109	Sep 2000	1	86.1	Jul 1998	6	Dec 1989	24	40.2	Jan 1978	1864	2402	3.0	83.9	347.6	1.0	31.6	.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: 1970-2001

(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	5.08	4.43	3.76	1994	28	11.70	1979	.62	1971
Feb	4.02	3.63	4.05	1984	12	9.77	1997	.61	1996
Mar	4.56	4.33	4.67	1990	29	9.10	1990	1.03	1996
Apr	4.41	4.04	5.67	1974	12	11.69	1991	.25	1978
May	5.61	5.68	3.97	1986	31	12.60	1975	.01	1998
Jun	5.74	4.54	5.30	1986	27	16.51	1989	.68	1980
Jul	3.46	3.42	4.06	1994	9	7.56	1994	.13	1986
Aug	3.42	2.79	3.50+	1987	10	8.55	1996	.10	1999
Sep	4.17	3.60	7.50	1996	27	10.75	1996	.43	1982
Oct	3.68	3.39	3.29	1994	17	11.25	1994	.40	1978
Nov	5.08	4.19	4.50	2001	27	11.61	2000	.57	1988
Dec	5.56	5.44	3.85	1992	15	14.12	1982	1.16	1980
Ann	54.79	52.63	7.50	Sep 1996	27	16.51	Jun 1989	.01	May 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.2	6.9	3.4	1.6
Feb	9.1	5.6	2.2	1.3
Mar	10.3	6.2	2.8	1.5
Apr	8.2	4.9	2.6	1.5
May	9.7	6.7	3.3	2.0
Jun	9.8	7.2	3.6	2.1
Jul	9.2	5.7	2.3	.7
Aug	8.6	5.5	2.3	.9
Sep	8.5	5.6	2.6	1.1
Oct	7.6	5.0	2.4	1.3
Nov	9.6	5.9	3.4	2.0
Dec	11.1	6.7	3.5	2.0
Ann	113.9	71.9	34.4	18.0

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	1.04	1.50	2.25	2.93	3.61	4.35	5.18	6.18	7.50	9.61	11.61
Feb	.76	1.12	1.71	2.25	2.80	3.40	4.08	4.90	5.98	7.73	9.39
Mar	1.56	1.99	2.62	3.16	3.67	4.19	4.76	5.43	6.29	7.61	8.83
Apr	.62	.99	1.62	2.23	2.88	3.58	4.39	5.39	6.74	8.93	11.05
May	.78	1.24	2.05	2.83	3.64	4.54	5.58	6.86	8.58	11.39	14.11
Jun	1.18	1.70	2.54	3.31	4.09	4.92	5.85	6.98	8.47	10.85	13.10
Jul	.61	.91	1.42	1.89	2.38	2.90	3.50	4.22	5.18	6.74	8.22
Aug	.36	.61	1.08	1.56	2.07	2.65	3.33	4.18	5.34	7.26	9.13
Sep	.73	1.09	1.70	2.27	2.85	3.49	4.21	5.08	6.25	8.14	9.94
Oct	.66	.98	1.52	2.02	2.54	3.09	3.72	4.49	5.51	7.15	8.71
Nov	1.02	1.48	2.23	2.91	3.60	4.34	5.18	6.18	7.51	9.65	11.67
Dec	1.71	2.24	3.02	3.70	4.35	5.03	5.78	6.66	7.79	9.56	11.20
Ann	40.06	42.95	46.62	49.40	51.86	54.23	56.68	59.37	62.63	67.35	71.41

\+ 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: 1970-2001
(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	#	1982	14	#	1982	#	1982	14	#	1982	.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	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	#	.0	#	0	#	1990	23	#	1990	#	1990	23	#	1990	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	#	.0	N/A	N/A	#+	Dec 1990	23	#+	Dec 1990	#+	Dec 1990	23	#+	Dec 1990	.0	.0	.0	.0	.0	.0	.0	.0	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	4/06	4/01	3/28	3/24	3/20	3/16	3/11	3/05
32	3/29	3/22	3/17	3/13	3/09	3/04	2/28	2/23	2/16
28	3/15	3/06	2/28	2/22	2/17	2/12	2/07	1/31	1/22
24	3/02	2/20	2/12	2/06	1/30	1/23	1/15	1/03	0/00
20	2/05	1/27	1/19	1/12	1/04	12/24	0/00	0/00	0/00
16	1/16	12/27	0/00	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	10/23	10/29	11/02	11/06	11/09	11/13	11/16	11/21	11/27
32	11/02	11/08	11/12	11/16	11/19	11/23	11/26	12/01	12/07
28	11/10	11/18	11/24	11/29	12/04	12/08	12/13	12/19	12/27
24	12/04	12/12	12/17	12/22	12/27	1/01	1/07	1/19	0/00
20	12/11	12/23	1/02	1/11	1/21	2/08	0/00	0/00	0/00
16	1/05	1/29	0/00	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	255	247	240	235	230	224	219	212	204
32	281	272	265	260	255	250	244	238	229
28	327	314	304	296	289	281	273	264	251
24	>365	>365	>365	337	325	317	310	302	293
20	>365	>365	>365	>365	>365	>365	>365	334	318
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	514	355	193	64	5	0	0	0	0	49	238	446	1864
60	374	232	96	17	0	0	0	0	0	14	141	308	1182
57	299	171	55	6	0	0	0	0	0	5	96	237	869
55	254	137	35	3	0	0	0	0	0	3	71	196	699
50	163	68	9	0	0	0	0	0	0	0	28	112	380
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	529	577	858	1017	1285	1418	1546	1538	1356	1102	787	588	12601
55	61	69	180	330	572	728	833	825	666	392	168	70	4894
57	43	48	138	273	510	668	771	763	606	333	133	49	4335
60	26	25	86	194	417	578	678	670	516	248	88	27	3553
65	3	8	28	91	267	428	523	515	366	128	35	10	2402
70	0	0	6	29	136	279	368	360	222	47	11	0	1458

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	304	384	619	785	1044	1184	1305	1295	1125	862	549	355	304	688	1307	2092	3136	4320	5625	6920	8045	8907	9456	9811
45	194	262	468	635	889	1034	1150	1140	975	707	408	234	194	456	924	1559	2448	3482	4632	5772	6747	7454	7862	8096
50	111	162	329	487	734	884	995	985	825	553	278	139	111	273	602	1089	1823	2707	3702	4687	5512	6065	6343	6482
55	55	86	200	343	579	734	840	830	675	404	174	76	55	141	341	684	1263	1997	2837	3667	4342	4746	4920	4996
60	24	42	101	211	424	584	685	675	525	265	93	34	24	66	167	378	802	1386	2071	2746	3271	3536	3629	3663
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	188	243	383	507	718	823	896	884	768	568	342	223	188	431	814	1321	2039	2862	3758	4642	5410	5978	6320	6543

(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