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: CLEVELAND, TX **COOP ID: 411810**

Climate Division: TX 8 **NWS Call Sign:** **Elevation: 196 Feet** **Lat: 30˚22N** **Lon: 95˚06W**

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	60.2	38.4	49.3	82+	1972	24	54.9	1972	11+	1982	12	40.8	1978	500	4	.0	.0	24.5	.5	10.3	.0
Feb	65.0	41.2	53.1	90	1986	21	59.6	1999	16+	1981	12	42.8	1978	343	10	.0	@	24.7	.3	6.2	.0
Mar	72.5	48.4	60.5	91	1989	31	66.2	1974	20+	1971	4	54.6	1996	175	34	.0	.1	30.1	.0	2.0	.0
Apr	78.3	54.8	66.6	98	1963	15	71.4	1981	29+	1987	1	62.3	1983	53	99	.0	.5	30.0	.0	.2	.0
May	84.8	63.2	74.0	98+	1998	31	78.7	1996	43+	1978	4	69.8	1976	5	283	.0	3.9	31.0	.0	.0	.0
Jun	90.4	69.4	79.9	101+	1998	22	84.4	1998	50	1970	3	76.9	1988	0	447	.1	16.2	30.0	.0	.0	.0
Jul	93.7	71.6	82.7	105+	2000	21	87.0	1998	55	1967	16	80.2	1989	0	547	1.7	25.3	31.0	.0	.0	.0
Aug	93.9	70.9	82.4	112	1962	9	85.3	1999	54+	1986	30	78.8	1992	0	539	1.7	25.1	31.0	.0	.0	.0
Sep	89.0	66.3	77.7	110	2000	5	81.7	1980	39+	1967	30	73.6	1974	0	380	.3	14.4	30.0	.0	.0	.0
Oct	80.1	56.1	68.1	98	1962	9	71.6	1984	28	1993	31	59.4	1976	47	143	.0	1.7	31.0	.0	.1	.0
Nov	69.3	47.1	58.2	87+	1992	1	65.1	1973	19	1976	30	50.4	1976	243	38	.0	.0	29.0	@	3.0	.0
Dec	62.1	39.9	51.0	84	1995	4	60.7	1984	5+	1989	24	42.0	1989	443	9	.0	.0	26.4	.3	8.9	.0
Ann	78.3	55.6	67.0	112	Aug 1962	9	87.0	Jul 1998	5+	Dec 1989	24	40.8	Jan 1978	1809	2533	3.8	87.2	348.7	1.1	30.7	.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: 1954-2001

(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	4.76	4.02	6.37	1979	19	12.12	1974	.51	1971
Feb	3.79	3.52	6.74	1986	4	9.27	1997	.55	1996
Mar	4.04	4.05	2.74	1989	27	7.44	1979	.53	1996
Apr	3.75	3.45	3.58	1979	19	10.67	1979	.29	1987
May	5.89	6.06	9.06	1989	19	18.35	1989	.02	1998
Jun	5.32	4.23	5.58	1989	27	14.18	1973	.37	1980
Jul	3.56	3.30	10.63	1954	30	8.94	1973	.05	1993
Aug	3.40	2.61	4.99	1983	19	8.62	1983	.10	1999
Sep	4.88	4.83	6.47	1996	27	10.34	1998	.78	1995
Oct	5.34	4.21	13.17	1994	17	25.12	1994	.12	1978
Nov	5.25	4.07	6.92	1998	13	12.69	2000	1.15	1988
Dec	4.85	4.66	5.91	1959	16	10.86	1997	1.45	1980
Ann	54.83	53.31	13.17	Oct 1994	17	25.12	Oct 1994	.02	May 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.0	6.9	2.8	1.4
Feb	8.7	5.5	2.4	1.3
Mar	9.6	5.8	2.6	1.3
Apr	7.3	4.7	2.6	1.3
May	9.1	5.9	3.3	2.1
Jun	9.1	6.8	3.0	1.7
Jul	8.7	5.7	2.3	.9
Aug	7.7	5.4	2.3	1.0
Sep	8.6	6.4	2.8	1.4
Oct	7.4	5.4	2.8	1.7
Nov	9.2	6.2	2.9	1.7
Dec	10.0	6.8	2.7	1.7
Ann	106.4	71.5	32.5	17.5

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	.88	1.31	2.01	2.65	3.31	4.02	4.83	5.81	7.10	9.19	11.17
Feb	.76	1.11	1.67	2.17	2.69	3.24	3.86	4.61	5.61	7.20	8.70
Mar	1.07	1.45	2.03	2.55	3.05	3.58	4.17	4.87	5.78	7.22	8.56
Apr	.68	1.01	1.56	2.07	2.59	3.16	3.80	4.57	5.60	7.26	8.84
May	.60	1.03	1.84	2.66	3.55	4.54	5.72	7.18	9.19	12.51	15.76
Jun	.62	1.04	1.78	2.53	3.32	4.20	5.22	6.50	8.23	11.08	13.85
Jul	.20	.40	.82	1.30	1.85	2.50	3.29	4.30	5.72	8.15	10.57
Aug	.49	.77	1.26	1.73	2.23	2.77	3.39	4.16	5.18	6.86	8.48
Sep	.96	1.40	2.12	2.78	3.45	4.16	4.97	5.95	7.24	9.31	11.28
Oct	.44	.80	1.51	2.25	3.06	3.99	5.10	6.49	8.42	11.65	14.82
Nov	1.19	1.68	2.45	3.14	3.83	4.56	5.39	6.37	7.66	9.72	11.66
Dec	1.63	2.09	2.76	3.33	3.88	4.44	5.06	5.78	6.70	8.14	9.46
Ann	34.03	37.85	42.85	46.73	50.22	53.65	57.22	61.22	66.12	73.34	79.67

\+ 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: 1954-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	.8	.0	#	0
Feb	.3	.0	#	0
Mar	.0	.0	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	.1	.0	#	0
Dec	#	.0	#	0
Ann	1.2	.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	8.0	1973	12	10.0	1973	4	1973	12	#+	1985
Feb	2.0	1988	6	2.8	1988	2	1980	2	#+	1988
Mar	.0	0	0	.0	0	0	0	0	0	0
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	1.0	1976	29	1.0	1976	1	1976	29	#	1976
Dec	#	1990	23	#	1990	#	1990	23	#	1990
Ann	8.0	Jan 1973	12	10.0	Jan 1973	4	Jan 1973	12	#+	Dec 1990

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.4	.3	.1	.1	.0
Feb	.4	.2	.0	.0	.0
Mar	.0	.0	.0	.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	.0	.0
Dec	.0	.0	.0	.0	.0
Ann	.9	.6	.1	.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.2	@	.0	.0
Feb	.1	.0	.0	.0
Mar	.0	.0	.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	@	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	.3	@	.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	4/09	4/02	3/28	3/23	3/19	3/14	3/10	3/04	2/25
32	3/29	3/20	3/15	3/10	3/05	2/28	2/23	2/17	2/09
28	3/19	3/07	2/27	2/20	2/13	2/06	1/29	1/19	12/31
24	2/25	2/14	2/06	1/30	1/23	1/15	1/06	12/19	0/00
20	2/05	1/25	1/15	1/04	12/18	0/00	0/00	0/00	0/00
16	1/18	1/07	12/23	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	10/27	11/02	11/06	11/09	11/12	11/15	11/19	11/23	11/29
32	10/31	11/07	11/12	11/17	11/21	11/25	11/30	12/05	12/12
28	11/18	11/25	12/01	12/05	12/10	12/14	12/19	12/25	1/06
24	12/04	12/13	12/20	12/27	1/02	1/08	1/17	2/01	0/00
20	12/14	12/26	1/05	1/16	0/00	0/00	0/00	0/00	0/00
16	12/31	1/12	1/28	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	265	256	249	243	238	233	227	220	211
32	291	281	273	267	260	254	248	240	230
28	>365	338	317	306	297	289	280	271	258
24	>365	>365	>365	361	340	328	318	307	294
20	>365	>365	>365	>365	>365	>365	>365	345	327
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)

Base — Heating Degree Days (1)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	500	343	175	53	5	0	0	0	0	47	243	443	1809
60	362	223	84	12	0	0	0	0	0	14	146	305	1146
57	289	165	47	4	0	0	0	0	0	6	101	234	846
55	246	132	30	1	0	0	0	0	0	3	75	192	679
50	157	66	7	0	0	0	0	0	0	0	31	109	370
32	9	0	0	0	0	0	0	0	0	0	0	1	10

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	544	591	881	1036	1301	1437	1570	1562	1370	1119	785	590	12786
55	68	79	198	347	588	747	857	849	680	409	170	69	5061
57	49	56	153	290	526	687	795	787	620	350	136	48	4497
60	29	30	98	208	433	597	702	694	530	265	91	26	3703
65	4	10	34	99	283	447	547	539	380	143	38	9	2533
70	0	0	8	31	152	297	392	384	236	57	13	0	1570

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	321	399	634	790	1047	1189	1316	1306	1125	872	552	365	321	720	1354	2144	3191	4380	5696	7002	8127	8999	9551	9916
45	211	277	484	640	892	1039	1161	1151	975	717	408	239	211	488	972	1612	2504	3543	4704	5855	6830	7547	7955	8194
50	122	174	340	490	737	889	1006	996	825	563	281	144	122	296	636	1126	1863	2752	3758	4754	5579	6142	6423	6567
55	65	92	215	346	582	739	851	841	675	412	179	78	65	157	372	718	1300	2039	2890	3731	4406	4818	4997	5075
60	29	46	118	218	427	589	696	686	525	274	93	38	29	75	193	411	838	1427	2123	2809	3334	3608	3701	3739
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	202	256	401	515	722	826	898	888	765	573	345	228	202	458	859	1374	2096	2922	3820	4708	5473	6046	6391	6619

(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