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: LULING, TX **COOP ID: 415429**

Climate Division: TX 7 **NWS Call Sign:** **Elevation: 400 Feet** **Lat: 29˚41N** **Lon: 97˚39W**

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	61.5	36.9	49.2	89	1975	27	55.9	1998	-3	1949	31	41.5	1979	499	3	.0	.0	24.9	.3	9.9	.0
Feb	66.0	40.7	53.4	99	1996	22	60.0	1999	4	1951	2	45.1	1978	335	8	.0	.3	24.8	.4	5.3	.0
Mar	73.6	48.3	61.0	100	1971	29	65.6	1974	18	1980	2	55.4	1996	157	31	@	.7	30.1	.0	1.9	.0
Apr	79.8	54.5	67.2	100	1939	2	71.4	1972	26	1971	7	62.0	1973	49	114	.0	2.1	30.0	.0	.2	.0
May	85.8	63.5	74.7	105	1967	11	81.2	1996	40	1903	1	69.1	1976	8	308	.2	8.0	31.0	.0	.0	.0
Jun	91.8	70.0	80.9	108	1934	17	86.5	1998	50	1919	3	77.6	1973	0	477	1.5	21.9	30.0	.0	.0	.0
Jul	95.8	71.8	83.8	110+	1954	27	87.9	1998	58	1967	16	79.9	1976	0	583	7.2	28.5	31.0	.0	.0	.0
Aug	96.5	70.8	83.7	109	1943	17	86.8	1988	56+	1992	29	79.7	1971	0	579	9.2	28.6	31.0	.0	.0	.0
Sep	91.3	65.9	78.6	110+	2000	6	82.6	1977	41	1981	19	71.9	1974	0	408	2.0	20.4	30.0	.0	.0	.0
Oct	82.9	56.4	69.7	99	1937	7	72.5	1979	26	1993	31	61.0	1976	28	172	.0	6.7	30.9	.0	.2	.0
Nov	71.7	46.6	59.2	92+	1989	9	64.6	1973	19	1911	30	51.7	1976	220	44	.0	.1	28.8	.0	2.7	.0
Dec	63.6	39.0	51.3	88	1955	26	59.5	1984	4+	1989	24	41.4	1989	436	10	.0	.0	26.7	.3	8.6	.0
Ann	80.0	55.4	67.7	110+	Sep 2000	6	87.9	Jul 1998	-3	Jan 1949	31	41.4	Dec 1989	1732	2737	20.1	117.3	349.2	1.0	28.8	.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: 1897-2001

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

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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	2.27	1.82	5.05	1965	22	9.70	1991	.03	1996
Feb	2.20	1.73	4.45	1907	24	8.07	1992	.00	1999
Mar	2.22	2.29	3.08	1911	19	5.55	1983	.21	1971
Apr	3.06	2.08	5.02	1938	25	11.89	1976	.08	1984
May	5.44	4.54	6.76	1972	12	16.75	1972	.08	1996
Jun	4.29	3.57	6.51	1961	17	13.16	1987	.28	1980
Jul	1.70	1.19	7.75	1936	1	5.81	1979	.00+	2000
Aug	2.32	1.47	5.27	1981	31	8.24	1996	.00	1985
Sep	3.70	3.42	8.08	1980	7	10.15	1980	.38	1993
Oct	4.36	3.33	10.53	1998	18	18.55	1998	.47	1999
Nov	3.00	2.84	3.87	1940	23	8.47	2000	.20	1999
Dec	2.30	1.61	4.19	1991	21	13.82	1991	.47	1980
Ann	36.86	35.96	10.53	Oct 1998	18	18.55	Oct 1998	.00+	Jul 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.2	4.6	1.2	.6
Feb	7.7	4.1	1.6	.4
Mar	8.2	4.0	1.4	.6
Apr	7.4	3.7	1.9	.8
May	8.6	5.9	3.4	1.8
Jun	7.4	5.0	2.9	1.4
Jul	4.7	3.1	1.2	.5
Aug	5.7	3.5	1.4	.7
Sep	8.2	4.9	2.2	1.1
Oct	7.3	4.5	2.4	1.4
Nov	8.0	4.7	1.9	1.0
Dec	8.7	4.4	1.4	.5
Ann	91.1	52.4	22.9	10.8

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	.15	.29	.57	.88	1.23	1.63	2.12	2.75	3.62	5.09	6.55
Feb	.08	.26	.58	.90	1.25	1.64	2.11	2.70	3.51	4.87	6.20
Mar	.48	.69	1.01	1.31	1.60	1.92	2.28	2.70	3.26	4.16	5.00
Apr	.21	.40	.78	1.20	1.67	2.22	2.88	3.71	4.87	6.84	8.79
May	.57	.98	1.73	2.48	3.30	4.22	5.29	6.64	8.47	11.50	14.47
Jun	.57	.92	1.53	2.13	2.76	3.45	4.25	5.24	6.57	8.75	10.86
Jul	.00	.09	.34	.59	.88	1.20	1.59	2.08	2.77	3.94	5.09
Aug	.03	.14	.39	.70	1.07	1.51	2.06	2.78	3.80	5.57	7.35
Sep	.44	.72	1.24	1.76	2.31	2.92	3.63	4.52	5.72	7.69	9.62
Oct	.26	.51	1.04	1.63	2.30	3.09	4.05	5.27	6.98	9.89	12.79
Nov	.42	.67	1.10	1.52	1.95	2.43	2.99	3.67	4.58	6.08	7.52
Dec	.22	.39	.70	1.02	1.37	1.76	2.22	2.80	3.59	4.91	6.20
Ann	21.00	23.81	27.55	30.49	33.15	35.79	38.55	41.67	45.52	51.23	56.29

\+ 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: 1897-2001
(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	.0	#	0
Feb	#	.0	#	0
Mar	.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
Dec	.0	.0	0	0
Ann	.5	.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	3.5	1985	12	10.0	1985	5	1985	13	1	1985
Feb	#	1996	5	#+	1996	#	1996	5	#	1996
Mar	.0	0	0	.0	0	#	2000	17	#	2000
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	#	1980	26	#+	1980	#	1976	28	#	1976
Dec	.5	1972	15	.5	1972	0	0	0	0	0
Ann	3.5	Jan 1985	12	10.0	Jan 1985	5	Jan 1985	13	1	Jan 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.2	.1	.1	.0	.0
Feb	.0	.0	.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	.0	.0	.0	.0	.0
Dec	.1	.0	.0	.0	.0
Ann	.3	.1	.1	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.1	.1	@	.0
Feb	.0	.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	.0
Dec	.0	.0	.0	.0
Ann	.1	.1	@	.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	4/16	4/08	4/02	3/28	3/24	3/19	3/14	3/09	3/01
32	3/30	3/22	3/16	3/11	3/07	3/02	2/25	2/19	2/11
28	3/13	3/03	2/23	2/17	2/11	2/05	1/30	1/22	1/10
24	2/28	2/16	2/08	1/31	1/23	1/15	1/06	12/23	0/00
20	2/12	2/02	1/25	1/18	1/10	12/31	0/00	0/00	0/00
16	1/16	1/08	12/31	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	10/20	10/27	11/01	11/05	11/09	11/13	11/17	11/22	11/28
32	10/30	11/06	11/12	11/16	11/20	11/24	11/29	12/04	12/11
28	11/15	11/22	11/27	12/01	12/05	12/09	12/14	12/19	12/28
24	11/26	12/05	12/12	12/19	12/25	12/31	1/09	1/24	0/00
20	12/13	12/25	1/03	1/12	1/21	2/04	0/00	0/00	0/00
16	12/26	1/04	1/14	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	258	248	241	235	229	224	218	211	201
32	290	279	271	264	258	252	245	237	226
28	>365	322	311	303	296	289	282	274	263
24	>365	>365	>365	348	334	325	316	307	295
20	>365	>365	>365	>365	>365	365	346	333	319
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	499	335	157	49	8	0	0	0	0	28	220	436	1732
60	360	214	68	11	1	0	0	0	0	6	128	299	1087
57	285	155	34	3	0	0	0	0	0	2	86	228	793
55	241	122	20	1	0	0	0	0	0	1	64	188	637
50	152	58	4	0	0	0	0	0	0	0	25	106	345
32	7	0	0	0	0	0	0	0	0	0	0	1	8

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	541	598	897	1055	1323	1467	1606	1602	1398	1167	814	598	13066
55	62	76	205	366	610	777	893	889	708	455	188	72	5301
57	44	53	157	308	548	717	831	827	648	394	151	51	4729
60	26	27	97	226	455	627	738	734	558	305	103	28	3924
65	3	8	31	114	308	477	583	579	408	172	44	10	2737
70	0	0	6	42	179	328	428	424	263	72	15	1	1758

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	338	421	672	835	1091	1241	1371	1370	1172	933	593	386	338	759	1431	2266	3357	4598	5969	7339	8511	9444	10037	10423
45	219	293	519	685	936	1091	1216	1215	1022	778	447	258	219	512	1031	1716	2652	3743	4959	6174	7196	7974	8421	8679
50	125	190	378	535	781	941	1061	1060	872	626	320	154	125	315	693	1228	2009	2950	4011	5071	5943	6569	6889	7043
55	63	106	245	392	626	791	906	905	722	476	205	83	63	169	414	806	1432	2223	3129	4034	4756	5232	5437	5520
60	26	49	140	255	471	641	751	750	572	329	118	40	26	75	215	470	941	1582	2333	3083	3655	3984	4102	4142
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	220	273	433	554	750	847	905	895	781	618	384	254	220	493	926	1480	2230	3077	3982	4877	5658	6276	6660	6914

(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