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: CHAPMAN RANCH, TX **COOP ID: 411651**

Climate Division: TX 7 **NWS Call Sign:** **Elevation: 25 Feet** **Lat: 27˚35N** **Lon: 97˚27W**

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	67.3	45.6	56.5	91	1971	30	63.6	1989	12	1962	12	49.5	1977	301	34	.0	.1	28.6	@	2.5	.0
Feb	70.5	49.3	59.9	94+	1986	19	67.1	2000	23+	1985	2	51.0	1978	180	36	.0	.1	27.0	.1	1.1	.0
Mar	76.5	56.1	66.3	102	1989	30	71.3	2000	25	1980	2	60.5	1996	64	103	.1	.7	30.9	.0	.5	.0
Apr	81.1	62.7	71.9	98	1984	26	75.9	1972	34	1987	3	67.8	1987	7	213	.0	1.1	30.0	.0	.0	.0
May	85.4	69.4	77.4	102	1984	3	80.9	2000	48+	1970	5	73.1	1976	0	384	.1	3.5	31.0	.0	.0	.0
Jun	89.9	73.3	81.6	99	1964	24	85.7	1998	59+	1970	3	79.2	1974	0	499	.1	17.5	30.0	.0	.0	.0
Jul	92.4	74.3	83.4	101+	2000	15	86.9	1998	64	1967	16	80.4	1976	0	569	@	27.0	31.0	.0	.0	.0
Aug	92.6	74.1	83.4	104+	1962	14	85.6	1998	54	2001	24	81.1	1976	0	569	.1	27.2	31.0	.0	.0	.0
Sep	89.8	71.2	80.5	109	2000	5	83.5	2000	51+	1975	26	77.2	1979	0	464	.2	17.8	30.0	.0	.0	.0
Oct	83.6	63.8	73.7	98	2001	10	75.9	1973	27	1993	31	66.5	1976	6	275	.0	2.9	31.0	.0	@	.0
Nov	75.4	55.1	65.3	96	1988	4	72.6	1973	27+	1993	28	56.2	1976	113	121	.0	.2	29.7	.0	.3	.0
Dec	69.0	47.5	58.3	92	1968	27	64.4	1984	12+	1989	23	47.5	1989	250	41	.0	.0	29.3	.1	1.7	.0
Ann	81.1	61.9	71.5	109	Sep 2000	5	86.9	Jul 1998	12+	Dec 1989	23	47.5	Dec 1989	921	3308	.6	98.1	359.5	.2	6.1	.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: 1959-2001

(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	1.58	1.41	2.40	1992	18	4.83	1992	.00+	1996
Feb	1.84	1.52	3.11	1990	21	5.04	1983	.00+	1989
Mar	1.59	1.43	3.80	1994	15	5.23	1994	.00+	1989
Apr	2.25	1.76	5.26	1976	29	8.31	1976	.00+	2000
May	3.43	2.81	9.60	1975	1	10.86	1975	.00	1998
Jun	3.41	3.04	3.55	1993	20	10.38	1973	.00+	1998
Jul	1.80	.99	3.80	1983	14	9.82	1983	.00+	2000
Aug	3.45	2.24	5.00	1999	22	13.72	1980	.00	1990
Sep	4.91	3.34	10.00	1967	20	14.38	1978	.44	2000
Oct	4.57	2.72	9.90	1973	12	22.51	1997	.00	1979
Nov	1.73	1.32	5.36	2001	16	5.00	2000	.11	1988
Dec	1.32	.81	3.96	1960	29	5.11	1991	.00+	1999
Ann	31.88	32.61	10.00	Sep 1967	20	22.51	Oct 1997	.00+	Jul 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.9	3.3	.9	.3
Feb	4.0	3.0	1.2	.6
Mar	3.5	2.5	1.0	.5
Apr	3.4	2.8	1.4	.7
May	4.5	3.6	2.2	1.3
Jun	5.1	4.2	2.3	1.2
Jul	3.0	2.4	1.2	.6
Aug	4.3	3.5	2.0	1.2
Sep	6.6	5.8	3.0	1.6
Oct	5.1	4.5	2.0	1.1
Nov	4.2	3.1	1.4	.4
Dec	3.6	2.6	.8	.3
Ann	52.2	41.3	19.4	9.8

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	.00	.15	.43	.68	.94	1.23	1.57	1.97	2.53	3.45	4.35
Feb	.00	.00	.36	.66	.98	1.34	1.77	2.30	3.01	4.22	5.40
Mar	.00	.00	.12	.34	.62	.95	1.37	1.92	2.70	4.04	5.41
Apr	.00	.00	.24	.56	.93	1.39	1.97	2.71	3.77	5.61	7.47
May	.12	.38	.87	1.36	1.91	2.53	3.27	4.20	5.49	7.64	9.76
Jun	.00	.34	.94	1.48	2.05	2.66	3.38	4.25	5.44	7.40	9.30
Jul	.00	.00	.00	.26	.60	1.00	1.51	2.17	3.12	4.77	6.41
Aug	.15	.43	.94	1.44	1.99	2.61	3.33	4.24	5.49	7.57	9.61
Sep	.46	.81	1.47	2.16	2.90	3.74	4.74	5.99	7.70	10.55	13.35
Oct	.13	.44	1.06	1.71	2.44	3.28	4.29	5.57	7.36	10.37	13.36
Nov	.25	.39	.64	.88	1.13	1.41	1.73	2.12	2.64	3.50	4.33
Dec	.00	.00	.13	.34	.58	.85	1.19	1.62	2.23	3.25	4.28
Ann	17.36	19.89	23.28	25.96	28.41	30.83	33.39	36.28	39.87	45.21	49.96

\+ 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: 1959-2001
(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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Feb	#	.0	0	0	#	1989	6	#	1989	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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	#	.0	N/A	N/A	#	Feb 1989	6	#	Feb 1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.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	3/22	3/12	3/05	2/26	2/21	2/15	2/09	2/02	1/23
32	3/15	3/01	2/19	2/10	2/02	1/24	1/15	1/04	12/18
28	2/21	2/08	1/30	1/21	1/12	1/01	12/13	0/00	0/00
24	1/13	1/02	12/22	0/00	0/00	0/00	0/00	0/00	0/00
20	12/30	12/14	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	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	11/10	11/18	11/24	11/29	12/03	12/08	12/13	12/18	12/26
32	11/23	12/02	12/09	12/14	12/20	12/25	12/31	1/07	1/18
28	12/04	12/18	12/29	1/08	1/18	2/01	0/00	0/00	0/00
24	12/20	12/30	1/10	0/00	0/00	0/00	0/00	0/00	0/00
20	12/24	1/08	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	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	320	308	299	292	285	278	270	262	250
32	>365	349	337	328	321	313	306	297	285
28	>365	>365	>365	>365	>365	353	339	328	315
24	>365	>365	>365	>365	>365	>365	>365	>365	>365
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
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	301	180	64	7	0	0	0	0	0	6	113	250	921
60	194	98	18	0	0	0	0	0	0	1	54	152	517
57	143	60	7	0	0	0	0	0	0	0	31	105	346
55	113	41	3	0	0	0	0	0	0	0	20	78	255
50	51	13	0	0	0	0	0	0	0	0	6	30	100
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	757	780	1062	1197	1407	1489	1592	1592	1454	1293	997	814	14434
55	157	177	352	507	694	799	879	879	764	580	328	178	6294
57	125	140	294	447	632	739	817	817	704	518	278	143	5654
60	82	94	212	357	539	649	724	724	614	425	211	97	4728
65	34	36	103	213	384	499	569	569	464	275	121	41	3308
70	13	11	34	97	235	349	414	414	314	143	56	15	2095

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	547	603	832	977	1173	1266	1361	1358	1233	1065	784	597	547	1150	1982	2959	4132	5398	6759	8117	9350	10415	11199	11796
45	398	467	678	827	1018	1116	1206	1203	1083	910	635	452	398	865	1543	2370	3388	4504	5710	6913	7996	8906	9541	9993
50	270	332	525	677	863	966	1051	1048	933	755	489	314	270	602	1127	1804	2667	3633	4684	5732	6665	7420	7909	8223
55	158	215	377	527	708	816	896	893	783	601	353	197	158	373	750	1277	1985	2801	3697	4590	5373	5974	6327	6524
60	82	118	242	380	553	666	741	738	633	447	226	110	82	200	442	822	1375	2041	2782	3520	4153	4600	4826	4936
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	324	374	544	676	848	903	954	948	869	746	511	366	324	698	1242	1918	2766	3669	4623	5571	6440	7186	7697	8063

(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