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: MONAHANS, TX **COOP ID: 415999**

Climate Division: TX 5 **NWS Call Sign:** **Elevation: 2,660 Feet** **Lat: 31˚35N** **Lon: 102˚53W**

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	60.1	26.5	43.3	87	1974	21	49.1	1999	-9	1962	11	36.2	1979	674	0	.0	.0	24.9	.8	22.6	.0
Feb	66.7	31.4	49.1	91+	1999	11	55.3	1999	-8	1985	2	43.4	1978	447	0	.0	.2	25.2	.5	14.2	@
Mar	75.5	38.8	57.2	100	1989	13	61.9	2000	12+	1989	5	52.3	1987	253	10	@	1.8	30.2	.0	5.5	.0
Apr	83.6	46.6	65.1	106	1996	28	70.1	1978	25+	1997	13	59.4	1997	83	87	.7	8.6	29.8	.0	.9	.0
May	91.5	56.9	74.2	114	2000	25	81.5	1996	35+	1970	3	70.9	1987	10	295	4.8	18.6	31.0	.0	.0	.0
Jun	97.6	65.4	81.5	118+	1994	29	87.9	1990	45+	1970	11	78.0	1979	0	496	11.3	26.3	30.0	.0	.0	.0
Jul	98.6	68.0	83.3	115	1998	13	88.0	2000	50+	1970	4	77.6	1976	0	567	14.2	29.0	31.0	.0	.0	.0
Aug	96.7	67.1	81.9	110+	1992	8	85.5	1977	50+	1970	29	77.8	1971	0	524	10.0	27.6	31.0	.0	.0	.0
Sep	90.0	60.1	75.1	108+	2000	6	81.3	1977	33+	1970	28	66.5	1974	13	314	3.3	19.5	30.0	.0	.0	.0
Oct	81.9	48.8	65.4	104	1977	1	70.4	1998	22	1993	31	56.8	1976	84	95	.4	7.2	30.7	.0	.8	.0
Nov	69.4	36.2	52.8	92+	1988	9	58.3	1981	10+	1976	29	43.8	1976	376	10	.0	.1	28.2	.1	8.8	.0
Dec	61.0	28.1	44.6	86	1995	14	49.0	1994	5+	1989	12	37.7	1983	634	0	.0	.0	25.7	.6	20.5	.0
Ann	81.1	47.8	64.5	118+	Jun 1994	29	88.0	Jul 2000	-9	Jan 1962	11	36.2	Jan 1979	2574	2398	44.7	138.9	347.7	2.0	73.3	@

+ 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	.51	.38	.77	1994	21	1.69	1992	.00+	1988
Feb	.57	.41	1.56	1965	17	1.83	1987	.00+	1999
Mar	.27	.10	1.10	1999	27	1.31	1999	.00+	1991
Apr	.55	.32	1.96	1969	12	3.27	1981	.00+	2000
May	1.80	1.20	2.80	1987	23	6.01	1992	.03+	1998
Jun	1.43	1.13	2.82	1978	3	4.37	1978	.00	1993
Jul	1.31	.58	3.50	1988	8	8.49	1991	.00	1971
Aug	1.65	1.51	2.49	1994	31	5.34	1996	.00	2000
Sep	2.55	1.67	4.40	1980	27	11.68	1980	.00	2000
Oct	1.39	.92	3.20	1983	8	5.12	1981	.00+	1996
Nov	.53	.50	1.35	1975	2	2.01	1984	.00+	1999
Dec	.67	.44	1.48	1986	21	3.55	1991	.00+	1996
Ann	13.23	11.55	4.40	Sep 1980	27	11.68	Sep 1980	.00+	Sep 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.0	1.4	.2	.0
Feb	2.8	1.7	.3	@
Mar	1.6	.6	.2	@
Apr	2.4	1.2	.3	.1
May	4.0	2.8	1.1	.5
Jun	4.1	2.4	1.0	.4
Jul	3.8	2.1	.7	.4
Aug	4.8	3.1	1.3	.3
Sep	5.4	3.4	1.9	.7
Oct	3.9	2.5	1.0	.4
Nov	1.9	1.2	.3	.1
Dec	2.7	1.6	.5	.1
Ann	40.4	24.0	8.8	3.0

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	.00	.00	.08	.16	.25	.35	.47	.63	.84	1.20	1.56
Feb	.00	.00	.08	.18	.28	.40	.54	.71	.95	1.35	1.74
Mar	.00	.00	.00	.03	.07	.13	.21	.31	.47	.75	1.03
Apr	.00	.00	.00	.08	.18	.31	.46	.67	.95	1.46	1.96
May	.09	.19	.40	.64	.92	1.25	1.65	2.17	2.90	4.15	5.40
Jun	.03	.12	.30	.50	.73	.99	1.32	1.73	2.31	3.30	4.29
Jul	.01	.05	.18	.34	.54	.79	1.11	1.54	2.16	3.25	4.36
Aug	.16	.35	.63	.87	1.11	1.38	1.68	2.04	2.53	3.31	4.05
Sep	.10	.31	.69	1.06	1.46	1.92	2.46	3.14	4.06	5.61	7.13
Oct	.00	.00	.12	.29	.51	.80	1.16	1.64	2.34	3.57	4.83
Nov	.00	.00	.00	.07	.18	.30	.45	.65	.93	1.40	1.87
Dec	.00	.00	.05	.15	.27	.41	.58	.81	1.14	1.70	2.26
Ann	6.66	7.77	9.28	10.48	11.59	12.70	13.87	15.21	16.88	19.38	21.61

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	.3	.0	#	0
Feb	.2	.0	#	0
Mar	.1	.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
Nov	.2	.0	#	0
Dec	.5	.0	#	0
Ann	1.3	.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	4.0	1974	23	4.0	1974	3	1972	30	#+	1991
Feb	3.0	1980	1	3.0	1980	3	1980	1	#+	1996
Mar	3.5	1989	4	3.5	1989	4	1989	4	#	1989
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	#	1980	29	#	1980	0	0	0	0	0
Nov	5.0	1976	13	5.0	1976	5	1976	14	#	1976
Dec	3.0	1974	26	3.0+	1992	3	1997	26	#	1997
Ann	5.0	Nov 1976	13	5.0	Nov 1976	5	Nov 1976	14	#+	Dec 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.2	.2	.1	.0	.0
Feb	.1	.1	@	.0	.0
Mar	@	@	@	.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
Dec	.2	.2	.1	.0	.0
Ann	.5	.5	.2	@	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	@	@	.0	.0
Feb	@	@	.0	.0
Mar	@	@	.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	.1	.1	.0
Dec	.1	.1	.0	.0
Ann	.2	.2	.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	4/23	4/19	4/16	4/13	4/11	4/08	4/06	4/03	3/29
32	4/17	4/11	4/08	4/04	4/01	3/29	3/26	3/22	3/17
28	4/04	3/29	3/24	3/20	3/16	3/13	3/09	3/04	2/25
24	3/20	3/13	3/07	3/03	2/26	2/22	2/17	2/12	2/04
20	3/17	3/07	2/27	2/21	2/15	2/09	2/03	1/26	1/16
16	2/25	2/14	2/06	1/31	1/24	1/17	1/10	12/31	12/13

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	10/12	10/18	10/22	10/25	10/28	11/01	11/04	11/08	11/14
32	10/22	10/27	10/31	11/03	11/07	11/10	11/13	11/17	11/23
28	10/30	11/05	11/10	11/14	11/17	11/21	11/25	11/29	12/06
24	11/07	11/13	11/17	11/21	11/25	11/28	12/02	12/06	12/12
20	11/13	11/22	11/28	12/04	12/09	12/14	12/20	12/27	1/07
16	11/26	12/06	12/13	12/19	12/25	1/01	1/08	1/18	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	216	211	207	203	200	197	193	189	183
32	241	233	228	223	219	214	210	204	197
28	274	264	257	251	245	239	233	226	216
24	299	289	282	276	270	265	259	252	242
20	343	326	315	306	297	289	280	270	256
16	>365	>365	>365	353	334	323	313	303	291

***** 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	674	447	253	83	10	0	0	0	13	84	376	634	2574
60	519	313	132	27	1	0	0	0	3	30	249	479	1753
57	429	237	79	11	0	0	0	0	0	13	185	389	1343
55	372	191	53	5	0	0	0	0	0	7	148	332	1108
50	235	100	13	0	0	0	0	0	0	1	76	200	625
32	8	0	0	0	0	0	0	0	0	0	0	2	10

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	358	477	781	994	1308	1486	1590	1547	1291	1034	624	392	11882
55	8	24	120	309	595	796	877	834	601	328	82	9	4583
57	3	14	85	255	533	736	815	772	541	272	59	4	4089
60	0	5	45	181	441	646	722	679	454	196	33	1	3403
65	0	0	10	87	295	496	567	524	314	95	10	0	2398
70	0	0	1	30	171	348	412	370	193	35	2	0	1562

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	200	325	561	769	1073	1263	1369	1328	1087	819	433	225	200	525	1086	1855	2928	4191	5560	6888	7975	8794	9227	9452
45	104	203	414	623	918	1113	1214	1173	937	665	295	120	104	307	721	1344	2262	3375	4589	5762	6699	7364	7659	7779
50	41	110	274	476	763	963	1059	1018	787	516	181	49	41	151	425	901	1664	2627	3686	4704	5491	6007	6188	6237
55	8	45	156	338	608	813	904	863	638	366	93	14	8	53	209	547	1155	1968	2872	3735	4373	4739	4832	4846
60	0	14	69	211	455	663	749	708	490	230	37	0	0	14	83	294	749	1412	2161	2869	3359	3589	3626	3626
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	196	269	400	495	671	791	864	846	695	525	315	207	196	465	865	1360	2031	2822	3686	4532	5227	5752	6067	6274

(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

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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