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: MARFA # 2, TX **COOP ID: 415596**

Climate Division: TX 5 **NWS Call Sign:** **Elevation: 4,760 Feet** **Lat: 30˚18N** **Lon: 104˚01W**

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	59.1	23.9	41.5	81	1974	21	45.9	2000	-2	1972	5	36.5	1985	728	0	.0	.0	26.9	.5	25.3	@
Feb	63.8	26.6	45.2	86	1972	21	50.3	2000	0	1985	2	41.0	1984	555	0	.0	.0	26.8	.3	19.4	@
Mar	70.4	32.4	51.4	90+	1971	27	58.2	1974	6	1971	3	46.1	1987	421	1	.0	@	30.6	.0	12.2	.0
Apr	77.5	39.6	58.6	95+	1996	28	63.1	1989	17	1973	9	52.4	1983	215	21	.0	.9	29.8	.0	3.6	.0
May	85.0	49.6	67.3	102	1959	12	74.4	1996	27	1970	1	63.0	1976	63	136	.1	8.7	31.0	.0	@	.0
Jun	90.7	57.2	74.0	106+	1994	28	79.8	1980	39	1970	2	70.2	1979	3	272	2.4	19.1	30.0	.0	.0	.0
Jul	88.9	60.0	74.5	103	1989	2	78.9	1980	53+	1985	4	70.7	1975	0	293	.6	16.2	31.0	.0	.0	.0
Aug	87.3	58.8	73.1	104+	1980	3	76.7	1977	50+	1989	11	68.8	1971	3	253	.2	12.5	31.0	.0	.0	.0
Sep	83.0	53.2	68.1	100	1983	5	73.9	1977	36+	2001	26	63.5	1991	39	133	@	5.7	29.9	.0	.0	.0
Oct	76.7	43.0	59.9	95+	1979	8	63.0	1998	16	1993	30	54.2	1976	179	19	.0	.7	30.8	@	1.6	.0
Nov	66.9	31.7	49.3	86+	1973	13	54.2	1999	-1	1976	29	42.9	1976	472	0	.0	.0	28.5	.1	12.8	@
Dec	59.8	24.7	42.3	79+	1971	25	47.2	1984	2+	1989	23	38.0	1997	705	0	.0	.0	26.8	.4	24.1	.0
Ann	75.8	41.7	58.8	106+	Jun 1994	28	79.8	Jun 1980	-2	Jan 1972	5	36.5	Jan 1985	3383	1128	3.3	63.8	353.1	1.3	99.0	@

\+ 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: 1958-2001

(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	.41	.30	.62	1994	21	1.46	1992	.00+	1999
Feb	.47	.27	1.98	1997	20	2.08	1997	.00+	1999
Mar	.24	.14	.88	1981	11	1.44	1981	.00+	1982
Apr	.67	.46	1.61	1987	27	4.23	1987	.00+	1996
May	1.33	1.12	2.93	1984	16	4.69	1992	.00	1971
Jun	1.80	1.53	2.34	1975	24	5.41	1984	.07	1998
Jul	2.83	2.55	2.76	2001	31	7.01	1991	.47	1989
Aug	2.70	2.50	2.90	1996	6	5.61	1988	.27	1982
Sep	2.88	1.85	2.74	1978	26	8.81	1990	.41	2000
Oct	1.48	1.02	2.00	1990	2	5.48	1981	.00+	1991
Nov	.39	.32	1.25	1968	26	1.27	1974	.00+	1999
Dec	.59	.31	1.02	1986	22	3.02	1986	.00+	1985
Ann	15.79	15.59	2.93	May 1984	16	8.81	Sep 1990	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.0	1.4	.1	.0
Feb	2.7	1.0	.1	.1
Mar	1.7	.8	.1	.0
Apr	2.7	1.4	.4	.1
May	4.9	2.8	.7	.3
Jun	7.3	4.1	.8	.3
Jul	9.2	5.5	2.0	.8
Aug	9.1	5.4	1.8	.6
Sep	8.2	5.0	1.7	.9
Oct	5.4	2.9	1.0	.3
Nov	2.6	1.0	.2	.0
Dec	3.5	1.6	.3	@
Ann	60.3	32.9	9.2	3.4

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	.06	.12	.19	.28	.37	.50	.67	.97	1.26
Feb	.00	.00	.02	.08	.17	.27	.39	.56	.80	1.20	1.63
Mar	.00	.00	.01	.04	.09	.14	.21	.29	.42	.63	.86
Apr	.00	.00	.04	.15	.28	.42	.60	.83	1.15	1.68	2.24
May	.11	.25	.46	.66	.86	1.08	1.33	1.64	2.05	2.72	3.37
Jun	.20	.34	.59	.84	1.10	1.40	1.76	2.19	2.79	3.77	4.73
Jul	.56	.82	1.23	1.61	2.00	2.41	2.88	3.45	4.20	5.40	6.54
Aug	.63	.89	1.28	1.64	1.99	2.36	2.78	3.28	3.93	4.97	5.95
Sep	.30	.51	.90	1.30	1.74	2.22	2.80	3.51	4.49	6.11	7.69
Oct	.00	.05	.23	.44	.68	.97	1.33	1.79	2.44	3.57	4.70
Nov	.00	.00	.02	.07	.14	.22	.33	.46	.67	1.01	1.37
Dec	.00	.01	.06	.13	.22	.33	.48	.69	.98	1.51	2.05
Ann	9.13	10.32	11.89	13.12	14.24	15.34	16.50	17.81	19.41	21.80	23.90

+ 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: 1958-2001
(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	1.0	.2	#	0
Feb	.5	.0	#	0
Mar	#	.0	#	0
Apr	#	.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	.3	.0	#	0
Dec	.6	.0	#	0
Ann	2.4	.2	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	1983	1	4.3	1975	4	1985	13	1	1985
Feb	4.0	1979	5	5.0	1979	4	1973	8	#+	1987
Mar	#	1989	6	#+	1989	#	1984	5	#	1984
Apr	#	1982	22	#+	1982	1	1983	7	#	1983
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	28	#+	1980	0	0	0	0	0
Nov	3.9	1980	16	3.9	1980	3	1976	28	#+	1983
Dec	4.0	1974	25	4.5	1974	3	1987	14	#+	1989
Ann	4.0+	Jan 1983	1	5.0	Feb 1979	4+	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	.6	.3	.2	.0	.0
Feb	.3	.2	.1	.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	.2	.1	@	.0	.0
Dec	.3	.2	.1	.0	.0
Ann	1.4	.8	.4	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.3	.1	.0	.0
Feb	.1	.1	.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	.1	.1	.0	.0
Ann	.6	.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	5/06	5/01	4/28	4/25	4/23	4/20	4/17	4/14	4/09
32	4/30	4/23	4/19	4/15	4/11	4/07	4/03	3/30	3/23
28	4/22	4/15	4/10	4/06	4/02	3/28	3/24	3/19	3/12
24	4/06	3/29	3/24	3/19	3/15	3/10	3/06	2/28	2/21
20	3/31	3/22	3/15	3/09	3/03	2/26	2/20	2/13	2/03
16	3/12	3/02	2/23	2/17	2/12	2/06	1/31	1/24	1/15

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	10/03	10/08	10/12	10/15	10/18	10/21	10/24	10/28	11/02
32	10/14	10/20	10/23	10/27	10/30	11/02	11/05	11/09	11/14
28	10/20	10/27	11/01	11/05	11/08	11/12	11/16	11/21	11/28
24	10/28	11/04	11/08	11/12	11/15	11/19	11/22	11/27	12/03
20	11/09	11/16	11/21	11/25	11/28	12/02	12/06	12/11	12/17
16	11/15	11/24	12/01	12/06	12/11	12/17	12/22	12/30	1/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	198	191	186	182	178	174	170	165	158
32	225	216	211	206	201	197	192	186	178
28	251	240	233	226	220	214	208	200	189
24	276	265	257	251	245	239	232	225	214
20	309	295	286	277	269	261	253	243	229
16	339	322	313	306	299	293	287	279	269

***** 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	728	555	421	215	63	3	0	3	39	179	472	705	3383
60	573	415	274	111	20	0	0	0	8	77	330	550	2358
57	480	332	195	66	8	0	0	0	2	39	251	457	1830
55	418	279	150	43	4	0	0	0	0	23	204	396	1517
50	268	157	64	11	0	0	0	0	0	4	108	251	863
32	3	0	0	0	0	0	0	0	0	0	0	4	7

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	298	369	602	796	1096	1258	1316	1273	1083	864	518	322	9795
55	0	4	39	149	387	568	603	560	393	174	32	1	2910
57	0	1	23	112	329	508	541	498	336	128	19	0	2495
60	0	0	9	67	248	418	448	405	252	72	8	0	1927
65	0	0	1	21	136	272	293	253	133	19	0	0	1128
70	0	0	0	4	58	142	152	120	53	2	0	0	531

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	154	238	418	612	875	1053	1100	1049	887	662	333	174	154	392	810	1422	2297	3350	4450	5499	6386	7048	7381	7555
45	63	125	273	466	720	903	945	894	737	510	208	77	63	188	461	927	1647	2550	3495	4389	5126	5636	5844	5921
50	17	52	149	322	565	753	790	739	588	362	101	21	17	69	218	540	1105	1858	2648	3387	3975	4337	4438	4459
55	0	17	55	192	410	603	635	584	440	220	31	0	0	17	72	264	674	1277	1912	2496	2936	3156	3187	3187
60	0	0	11	86	259	453	480	429	294	98	3	0	0	0	11	97	356	809	1289	1718	2012	2110	2113	2113
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	181	235	345	441	567	664	722	691	572	443	276	187	181	416	761	1202	1769	2433	3155	3846	4418	4861	5137	5324

(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