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: MARSHALL, TX **COOP ID: 415618**

Climate Division: TX 4 **NWS Call Sign:** **Elevation: 352 Feet** **Lat: 32˚32N** **Lon: 94˚21W**

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	54.2	33.4	43.8	87	1912	18	53.9	1990	-5	1930	18	34.0	1979	664	0	.0	.0	20.1	1.2	15.6	@
Feb	59.7	37.3	48.5	90	1986	21	55.3+	2000	4	1951	2	38.0	1978	467	5	.0	@	22.1	.7	9.8	.0
Mar	67.5	45.0	56.3	95+	1929	24	62.3	1974	12	1943	3	51.8	1980	282	11	.0	.0	29.3	.0	3.2	.0
Apr	74.8	51.6	63.2	97	1930	7	68.9	1981	26	1920	5	57.8	1983	110	56	.0	.2	29.9	.0	.4	.0
May	81.6	60.5	71.1	100+	1928	31	76.4	1996	38	1931	7	66.3	1976	20	207	.0	2.1	31.0	.0	.0	.0
Jun	88.5	67.8	78.2	106+	1937	27	83.6	1998	47	1933	20	75.0	1974	0	395	.1	13.8	30.0	.0	.0	.0
Jul	92.4	71.3	81.9	108+	1930	30	87.5	1998	52	1985	1	79.2	1972	0	523	1.5	24.0	31.0	.0	.0	.0
Aug	92.5	70.5	81.5	112	1909	18	86.0	2000	53	1967	13	77.4	1992	0	511	1.4	24.1	31.0	.0	.0	.0
Sep	86.3	64.4	75.4	108+	1951	1	81.0	1998	35	1985	27	68.8	1974	6	317	.5	11.5	30.0	.0	.0	.0
Oct	76.6	52.0	64.3	101	1953	1	68.2	1971	23	1910	29	56.1	1976	100	78	.0	1.0	30.9	.0	.4	.0
Nov	65.1	43.1	54.1	88+	1989	7	61.7	1989	14	1976	29	46.1	1976	341	14	.0	.0	27.5	@	4.6	.0
Dec	56.7	35.7	46.2	85	1920	31	54.0	1984	3	1989	23	36.5	1983	584	0	.0	.0	23.3	.6	12.2	.0
Ann	74.7	52.7	63.7	112	Aug 1909	18	87.5	Jul 1998	-5	Jan 1930	18	34.0	Jan 1979	2574	2117	3.5	76.7	336.1	2.5	46.2	@

\+ 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: 1908-2001

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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	4.38	4.42	4.49	1952	27	14.32	1979	.40	1986
Feb	4.07	3.62	2.60	1997	13	9.07	1997	.32	1999
Mar	4.33	4.04	8.58	1989	29	10.25	1989	.55	1986
Apr	4.35	3.26	5.53	1966	24	15.59	1991	.74	1987
May	5.07	4.86	5.10	1997	28	11.40	1989	.88	1996
Jun	5.23	4.96	6.84	1993	21	12.57	1989	.71	1988
Jul	3.02	3.03	4.12	1917	20	7.82	1979	.10	1993
Aug	2.68	2.37	5.25	1912	9	6.92	1996	.01	1985
Sep	3.89	3.09	5.58	1951	13	10.59	1973	1.01	2000
Oct	4.66	4.52	5.95	1957	15	12.04	1984	1.00	1977
Nov	4.59	4.37	6.30	1937	9	10.99	2000	.50	1999
Dec	4.95	4.46	6.95	1982	3	16.68	1982	.92+	1981
Ann	51.22	51.16	8.58	Mar 1989	29	16.68	Dec 1982	.01	Aug 1985

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.4	6.4	3.0	1.5
Feb	8.1	5.6	2.8	1.5
Mar	8.8	6.0	3.1	1.3
Apr	7.7	5.5	2.8	1.7
May	9.1	6.1	3.3	1.8
Jun	7.9	6.2	3.0	1.8
Jul	6.8	4.7	1.9	1.1
Aug	6.3	4.0	1.9	.9
Sep	6.8	4.9	2.6	1.3
Oct	7.5	5.3	2.8	1.8
Nov	8.5	6.2	3.1	1.7
Dec	9.4	6.1	3.2	1.7
Ann	96.3	67.0	33.5	18.1

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	.75	1.13	1.77	2.37	2.99	3.65	4.42	5.34	6.58	8.58	10.49
Feb	.82	1.19	1.78	2.33	2.88	3.47	4.14	4.95	6.01	7.72	9.34
Mar	1.24	1.66	2.28	2.82	3.34	3.89	4.49	5.21	6.14	7.59	8.94
Apr	.91	1.31	1.95	2.53	3.11	3.74	4.44	5.28	6.39	8.17	9.86
May	1.11	1.58	2.32	2.99	3.67	4.39	5.19	6.16	7.43	9.47	11.38
Jun	1.07	1.55	2.32	3.02	3.72	4.48	5.33	6.36	7.72	9.89	11.95
Jul	.58	.85	1.29	1.70	2.11	2.56	3.07	3.68	4.49	5.79	7.03
Aug	.20	.37	.72	1.09	1.50	1.97	2.54	3.26	4.25	5.92	7.58
Sep	.94	1.30	1.87	2.37	2.88	3.41	4.00	4.71	5.64	7.11	8.49
Oct	1.22	1.66	2.33	2.93	3.51	4.13	4.81	5.62	6.67	8.34	9.89
Nov	1.20	1.63	2.30	2.88	3.46	4.07	4.74	5.54	6.59	8.23	9.77
Dec	1.20	1.66	2.38	3.03	3.67	4.34	5.10	6.00	7.18	9.04	10.80
Ann	36.31	39.19	42.88	45.69	48.18	50.60	53.09	55.84	59.18	64.03	68.22

\+ 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: 1908-2001
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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	1.1	.0	#	0
Feb	.4	.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	1.5	.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	5.5	1977	31	5.9	1978	6	1977	31	#+	2000
Feb	2.6	1996	2	2.6	1996	2	1996	3	#	1996
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	.5	1976	13	.5	1976	1	1976	13	#	1976
Dec	.1	1996	17	.1	1996	0	0	0	0	0
Ann	5.5	Jan 1977	31	5.9	Jan 1978	6	Jan 1977	31	#+	Jan 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.5	.3	.1	.1	.0
Feb	.2	.1	.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	.0	.0	.0	.0
Dec	.1	.0	.0	.0	.0
Ann	.9	.4	.1	.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.2	.1	@	.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	.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	4/15	4/11	4/08	4/05	4/02	3/31	3/28	3/25	3/20
32	4/10	4/03	3/29	3/24	3/20	3/16	3/12	3/07	2/28
28	3/23	3/14	3/07	3/02	2/25	2/20	2/14	2/08	1/30
24	3/09	2/26	2/19	2/12	2/06	1/31	1/25	1/17	1/06
20	2/22	2/13	2/06	1/30	1/24	1/17	1/07	0/00	0/00
16	2/15	2/03	1/25	1/15	1/03	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	10/13	10/19	10/24	10/28	10/31	11/04	11/08	11/12	11/19
32	10/26	11/01	11/05	11/09	11/12	11/16	11/19	11/23	11/29
28	11/04	11/12	11/18	11/23	11/27	12/02	12/06	12/12	12/20
24	11/15	11/26	12/04	12/11	12/17	12/24	12/31	1/07	1/18
20	12/03	12/12	12/18	12/24	12/30	1/07	1/17	0/00	0/00
16	12/14	12/25	1/03	1/12	1/25	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	234	226	221	216	211	207	202	196	189
32	263	253	247	241	236	231	225	219	210
28	309	297	289	281	275	268	260	252	240
24	358	338	327	318	310	303	295	285	273
20	>365	>365	>365	>365	347	328	317	306	294
16	>365	>365	>365	>365	>365	>365	348	333	317

***** 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	664	467	282	110	20	0	0	0	6	100	341	584	2574
60	520	337	159	40	4	0	0	0	0	39	220	439	1758
57	437	266	104	17	1	0	0	0	0	19	161	354	1359
55	386	223	75	9	0	0	0	0	0	10	127	302	1132
50	272	137	26	1	0	0	0	0	0	2	62	191	691
32	35	6	0	0	0	0	0	0	0	0	0	9	50

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	400	467	752	936	1210	1385	1546	1534	1301	1001	663	448	11643
55	38	41	114	255	497	695	833	821	611	299	100	28	4332
57	28	28	81	203	436	635	771	759	551	245	73	18	3828
60	17	15	43	136	346	545	678	666	461	172	42	10	3131
65	0	5	11	56	207	395	523	511	317	78	14	0	2117
70	0	0	1	15	100	248	368	357	189	26	3	0	1307

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	210	304	517	704	973	1152	1302	1296	1066	772	446	253	210	514	1031	1735	2708	3860	5162	6458	7524	8296	8742	8995
45	121	199	378	554	818	1002	1147	1141	916	618	315	152	121	320	698	1252	2070	3072	4219	5360	6276	6894	7209	7361
50	63	116	249	410	663	852	992	986	766	467	202	81	63	179	428	838	1501	2353	3345	4331	5097	5564	5766	5847
55	30	60	142	271	508	702	837	831	616	322	114	41	30	90	232	503	1011	1713	2550	3381	3997	4319	4433	4474
60	11	21	70	158	356	552	682	676	468	196	54	14	11	32	102	260	616	1168	1850	2526	2994	3190	3244	3258
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	138	193	321	447	653	799	894	879	724	499	277	159	138	331	652	1099	1752	2551	3445	4324	5048	5547	5824	5983

(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