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: CENTER, TX **COOP ID: 411578**

Climate Division: TX 4 **NWS Call Sign:** **Elevation: 325 Feet** **Lat: 31˚48N** **Lon: 94˚10W**

Temperature (˚F)

Month	Mean (1)			Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
	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	57.1	34.9	46.0	85+	1950	26	51.7	1999	5+	1982	12	35.9	1978	597	0	.0	.0	22.2	.8	15.0	.0
Feb	62.4	37.9	50.2	90	1986	21	56.9	1976	0	1951	2	39.4	1978	421	5	.0	@	23.3	.6	10.5	.0
Mar	69.8	44.7	57.3	94	1946	30	63.3	1974	15+	1980	4	51.7	1996	255	14	.0	.0	29.7	@	4.2	.0
Apr	76.4	51.5	64.0	94+	1987	21	69.0	1981	28+	1987	1	58.9	1997	96	65	.0	.4	29.9	.0	.7	.0
May	83.3	61.0	72.2	100+	1943	29	76.9	1996	40+	1996	1	67.7	1976	12	232	.0	4.3	31.0	.0	.0	.0
Jun	89.7	68.1	78.9	108	1943	13	83.7	1998	45	1984	1	76.0	1989	0	417	.2	17.6	30.0	.0	.0	.0
Jul	93.9	71.6	82.8	110	1954	26	87.9	1998	55+	1972	8	79.7	1972	0	550	3.5	26.7	31.0	.0	.0	.0
Aug	93.8	70.2	82.0	110	1951	18	85.7	2000	52+	1986	31	77.3	1992	0	526	3.6	25.6	31.0	.0	.0	.0
Sep	88.2	64.3	76.3	112	2000	2	81.9	1980	39	1967	29	70.8	1974	4	341	1.0	14.9	30.0	.0	.0	.0
Oct	78.8	52.6	65.7	100	1953	1	70.8	1971	26	1993	31	57.9	1976	74	97	.0	2.0	30.9	.0	.6	.0
Nov	67.8	43.5	55.7	91+	1944	11	62.5	1973	12+	1976	30	48.2	1976	299	18	.0	.0	28.2	.0	5.8	.0
Dec	59.8	36.7	48.3	84	1956	6	58.5	1984	2+	1989	24	39.5	1989	526	7	.0	.0	24.9	.5	13.7	.0
Ann	76.8	53.1	65.0	112	Sep 2000	2	87.9	Jul 1998	0	Feb 1951	2	35.9	Jan 1978	2284	2272	8.3	91.5	342.1	1.9	50.5	.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: 1922-2001

(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	5.04	4.69	4.04	1991	10	12.13	1999	.57	1986
Feb	4.13	3.05	3.43	1966	10	8.23	1991	.34	1996
Mar	4.21	4.12	6.00	1953	11	9.07	1997	.62	1986
Apr	4.41	3.42	7.40	1953	29	14.10	1991	.57	1987
May	5.04	4.99	5.84	1941	5	9.61	1990	.10	1998
Jun	4.81	4.17	4.54	1999	25	12.19	1989	1.05	1988
Jul	3.04	2.49	4.60	1968	23	9.12	1976	.42	2000
Aug	3.76	3.07	6.39	1997	9	15.10	1997	.05	1999
Sep	4.20	3.89	9.20	1978	15	16.64	1978	.66	1991
Oct	4.64	3.34	8.10	1994	17	14.14	1984	.81	2000
Nov	4.68	4.20	9.66	1940	23	12.47	2000	.46	1999
Dec	5.05	4.49	3.38	1992	15	10.05	1982	.87	1980
Ann	53.01	52.26	9.66	Nov 1940	23	16.64	Sep 1978	.05	Aug 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.8	7.2	3.2	1.5
Feb	8.4	6.3	2.9	1.3
Mar	9.7	6.3	3.1	1.3
Apr	7.7	5.2	2.5	1.3
May	9.6	6.7	3.4	1.7
Jun	8.8	6.2	2.9	1.6
Jul	8.2	5.3	2.2	.8
Aug	7.3	5.1	2.1	.9
Sep	7.7	5.5	2.4	1.0
Oct	7.2	5.0	2.8	1.6
Nov	8.5	6.4	3.0	1.7
Dec	10.2	6.9	3.3	1.8
Ann	104.1	72.1	33.8	16.5

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	.85	1.29	2.03	2.72	3.43	4.20	5.08	6.15	7.57	9.88	12.09
Feb	.78	1.15	1.75	2.31	2.88	3.50	4.20	5.04	6.16	7.96	9.67
Mar	1.42	1.82	2.40	2.89	3.37	3.86	4.39	5.01	5.81	7.05	8.19
Apr	.65	1.02	1.66	2.27	2.91	3.60	4.41	5.39	6.71	8.87	10.93
May	.81	1.24	1.97	2.67	3.38	4.16	5.06	6.15	7.61	9.98	12.24
Jun	1.00	1.44	2.14	2.79	3.43	4.13	4.91	5.85	7.09	9.08	10.96
Jul	.55	.82	1.27	1.68	2.10	2.56	3.08	3.71	4.55	5.89	7.18
Aug	.29	.54	1.03	1.55	2.13	2.79	3.57	4.57	5.95	8.26	10.55
Sep	.80	1.18	1.80	2.36	2.94	3.56	4.26	5.11	6.24	8.04	9.76
Oct	.70	1.09	1.76	2.41	3.07	3.80	4.64	5.67	7.05	9.30	11.45
Nov	1.31	1.75	2.42	3.01	3.58	4.18	4.85	5.63	6.64	8.24	9.73
Dec	1.55	2.03	2.75	3.36	3.96	4.58	5.26	6.05	7.09	8.69	10.18
Ann	36.46	39.63	43.70	46.81	49.58	52.26	55.05	58.13	61.88	67.34	72.08

\+ 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: 1922-2001
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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	1.2	.0	#	0
Feb	.1	.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	.2	.0	#	0
Dec	.1	.0	#	0
Ann	1.6	.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	1982	14	5.0	1973	4+	1982	14	#+	2000
Feb	1.0	1985	2	1.0	1985	1	1978	10	#+	1996
Mar	.8	1978	4	.8	1978	1	1978	4	#	1978
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	2.0	1980	27	2.0	1980	1	1976	28	#	1976
Dec	1.0	1983	17	1.0	1983	#	1998	23	#	1998
Ann	4.0	Jan 1982	14	5.0	Jan 1973	4+	Jan 1982	14	#+	Jan 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.6	.6	.2	.0	.0
Feb	.2	.1	.0	.0	.0
Mar	.1	.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	.1	.0	.0	.0
Dec	.2	.1	.0	.0	.0
Ann	1.2	.9	.2	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.8	.2	.0	.0
Feb	@	.0	.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	.1	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	.9	.2	.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	4/18	4/13	4/09	4/06	4/03	3/31	3/27	3/24	3/18
32	4/07	4/01	3/28	3/24	3/20	3/17	3/13	3/09	3/02
28	3/26	3/18	3/12	3/07	3/02	2/26	2/21	2/15	2/07
24	3/12	3/01	2/20	2/13	2/07	1/31	1/24	1/15	1/04
20	2/27	2/16	2/07	1/31	1/24	1/16	1/06	12/19	0/00
16	2/08	1/28	1/19	1/09	12/28	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	10/11	10/17	10/22	10/25	10/29	11/01	11/05	11/10	11/16
32	10/22	10/29	11/02	11/06	11/10	11/13	11/17	11/22	11/28
28	11/03	11/10	11/15	11/20	11/24	11/28	12/02	12/08	12/15
24	11/14	11/23	11/29	12/04	12/09	12/14	12/20	12/26	1/03
20	11/27	12/07	12/15	12/21	12/28	1/04	1/14	0/00	0/00
16	12/10	12/21	12/30	1/09	1/22	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	219	214	209	203	198	192	183
32	261	251	245	239	234	228	223	216	207
28	300	288	280	273	266	259	252	244	232
24	349	329	318	309	302	294	287	278	265
20	>365	>365	>365	>365	336	324	314	304	292
16	>365	>365	>365	>365	>365	>365	353	335	319

***** 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	597	421	255	96	12	0	0	0	4	74	299	526	2284
60	452	292	139	33	2	0	0	0	0	25	185	383	1511
57	371	223	88	14	0	0	0	0	0	10	132	305	1143
55	320	183	61	7	0	0	0	0	0	5	102	259	937
50	214	104	19	0	0	0	0	0	0	1	45	163	546
32	17	2	0	0	0	0	0	0	0	0	0	7	26

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	449	510	781	958	1243	1407	1573	1549	1327	1046	710	511	12064
55	40	47	129	275	530	717	860	836	637	338	121	49	4579
57	28	31	94	222	468	657	798	774	577	281	91	34	4055
60	17	16	53	151	377	567	705	681	487	202	55	19	3330
65	0	5	14	65	232	417	550	526	341	97	18	7	2272
70	0	0	1	18	114	268	395	372	209	34	4	0	1415

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	240	324	537	715	987	1160	1317	1290	1081	784	469	287	240	564	1101	1816	2803	3963	5280	6570	7651	8435	8904	9191
45	146	217	390	566	832	1010	1162	1135	931	629	330	176	146	363	753	1319	2151	3161	4323	5458	6389	7018	7348	7524
50	81	129	256	421	677	860	1007	980	781	479	216	100	81	210	466	887	1564	2424	3431	4411	5192	5671	5887	5987
55	42	69	154	282	522	710	852	825	631	334	125	52	42	111	265	547	1069	1779	2631	3456	4087	4421	4546	4598
60	16	31	73	163	370	560	697	670	482	209	62	29	16	47	120	283	653	1213	1910	2580	3062	3271	3333	3362
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	167	223	349	466	670	797	882	858	721	524	308	196	167	390	739	1205	1875	2672	3554	4412	5133	5657	5965	6161

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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