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: AMISTAD DAM, TX **COOP ID: 410225**

Climate Division: TX 6 **NWS Call Sign:** **Elevation: 1,157 Feet** **Lat: 29˚28N** **Lon: 101˚02W**

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	61.8	38.7	50.3	88	1971	31	56.4	1998	14	1977	10	42.1	1979	467	8	.0	.0	26.7	.2	6.6	.0
Feb	67.0	43.1	55.1	98	1996	23	62.2	1999	17	1985	2	47.6	1978	299	21	.0	.3	26.0	.1	3.6	.0
Mar	75.4	50.5	63.0	100	1971	29	68.9	2000	24	1980	2	57.7	1987	119	57	@	1.9	30.7	.0	.6	.0
Apr	82.8	58.0	70.4	105	1996	26	75.4	1986	34	1987	3	64.2	1997	21	183	.4	7.4	30.0	.0	.0	.0
May	89.0	65.8	77.4	109	2000	25	83.2	1998	42	1970	2	71.6	1976	4	389	2.0	16.0	31.0	.0	.0	.0
Jun	94.0	71.3	82.7	113	1994	26	88.1	1998	55	1967	3	77.8	1979	0	530	5.3	24.4	30.0	.0	.0	.0
Jul	96.6	73.3	85.0	114+	1995	30	90.8	1998	61	1968	6	77.4	1976	0	619	10.6	28.0	31.0	.0	.0	.0
Aug	96.6	72.8	84.7	110	1994	21	88.4	1995	62	1965	22	76.9	1971	0	611	10.5	27.9	31.0	.0	.0	.0
Sep	91.0	68.2	79.6	110	2000	6	84.6	1977	47+	1995	24	72.4	1974	0	438	2.2	21.0	30.0	.0	.0	.0
Oct	81.5	58.6	70.1	102	1979	4	73.0	1992	30	1993	31	62.0	1976	26	182	.1	5.3	30.9	.0	@	.0
Nov	70.5	48.4	59.5	95	1988	5	64.2	1985	24+	1974	30	52.7	1976	201	34	.0	.2	29.2	.0	.8	.0
Dec	62.4	40.4	51.4	90	1987	12	57.4	1984	9	1989	23	44.1	1989	426	5	.0	@	27.9	.2	4.9	.0
Ann	80.7	57.4	69.1	114+	Jul 1995	30	90.8	Jul 1998	9	Dec 1989	23	42.1	Jan 1979	1563	3077	31.1	132.4	354.4	.5	16.5	.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: 1964-2001

(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	.57	.46	1.04	1994	22	2.26	1992	.00+	1996
Feb	.83	.53	1.53	1987	5	2.79	1992	.00+	1976
Mar	1.02	.94	2.40	1977	27	3.25	1997	.00	1971
Apr	1.30	.77	3.18	1968	19	5.65	1981	.01	1998
May	2.22	2.10	2.49	1991	13	5.30	1990	.09	1999
Jun	2.42	2.04	3.45	1981	16	5.61	1987	.05+	1996
Jul	1.97	1.03	4.33	1988	21	14.55	1976	.00	1974
Aug	2.19	1.12	7.10	1998	24	11.14	1972	.00	1985
Sep	2.85	2.15	5.65	1964	24	8.93	1991	.05	1981
Oct	1.81	1.24	4.28	1983	20	6.43	1983	.00	1979
Nov	1.06	.90	2.00	1978	5	3.04	1978	.00+	1981
Dec	.75	.40	2.16	1994	28	3.00	1984	.00+	1985
Ann	18.99	17.91	7.10	Aug 1998	24	14.55	Jul 1976	.00+	Jan 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.0	1.3	.4	@
Feb	4.7	1.7	.6	.1
Mar	5.0	2.0	.5	.2
Apr	5.3	2.5	.6	.4
May	7.1	3.6	1.5	.7
Jun	5.8	3.3	1.6	.9
Jul	4.4	2.6	1.3	.5
Aug	4.4	2.7	1.1	.5
Sep	5.9	3.7	1.4	.9
Oct	5.9	3.3	1.0	.4
Nov	5.4	2.3	.7	.2
Dec	6.0	1.7	.3	.1
Ann	65.9	30.7	11.0	4.9

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	.02	.08	.16	.25	.36	.50	.68	.94	1.39	1.84
Feb	.00	.04	.16	.28	.42	.58	.77	1.01	1.35	1.93	2.50
Mar	.01	.04	.13	.26	.41	.61	.86	1.19	1.68	2.53	3.41
Apr	.04	.10	.23	.39	.59	.83	1.14	1.54	2.12	3.13	4.15
May	.25	.42	.73	1.04	1.37	1.74	2.18	2.71	3.44	4.65	5.82
Jun	.06	.15	.38	.68	1.04	1.50	2.08	2.85	3.96	5.93	7.93
Jul	.00	.04	.16	.36	.64	1.02	1.52	2.21	3.26	5.16	7.15
Aug	.00	.04	.17	.39	.70	1.12	1.67	2.45	3.63	5.76	8.00
Sep	.19	.36	.72	1.10	1.54	2.05	2.67	3.45	4.54	6.39	8.23
Oct	.02	.10	.29	.53	.81	1.16	1.59	2.16	2.97	4.38	5.80
Nov	.00	.05	.20	.36	.54	.74	.98	1.29	1.73	2.46	3.19
Dec	.00	.01	.08	.17	.28	.43	.62	.87	1.25	1.90	2.57
Ann	11.31	12.70	14.52	15.94	17.23	18.49	19.82	21.31	23.14	25.84	28.22

\+ 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: 1964-2001
(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	.2	.0	#	0	3.0	1986	8	3.0	1986	3	1986	8	#	1986	.1	.1	.1	.0	.0	@	@	.0	.0
Feb	.0	.0	0	0	.0	0	0	.0	0	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	.2	.0	N/A	N/A	3.0	Jan 1986	8	3.0	Jan 1986	3	Jan 1986	8	#	Jan 1986	.1	.1	.1	.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	3/30	3/22	3/16	3/11	3/06	3/02	2/25	2/19	2/11
32	3/12	3/01	2/22	2/16	2/10	2/04	1/28	1/21	1/08
28	2/25	2/16	2/09	2/02	1/27	1/21	1/12	12/28	0/00
24	2/11	2/01	1/24	1/17	1/10	1/01	12/17	0/00	0/00
20	1/21	1/11	1/01	0/00	0/00	0/00	0/00	0/00	0/00
16	12/26	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	11/05	11/11	11/15	11/18	11/22	11/25	11/29	12/03	12/09
32	11/14	11/22	11/27	12/02	12/06	12/10	12/15	12/21	12/30
28	12/04	12/13	12/19	12/25	12/31	1/06	1/13	1/27	0/00
24	12/14	12/23	12/31	1/07	1/14	1/24	0/00	0/00	0/00
20	12/30	1/10	1/22	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	290	280	272	266	260	254	247	240	230
32	>365	324	312	304	297	290	283	274	263
28	>365	>365	>365	360	339	327	317	306	293
24	>365	>365	>365	>365	>365	355	342	331	319
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	467	299	119	21	4	0	0	0	0	26	201	426	1563
60	327	193	48	3	0	0	0	0	0	5	107	286	969
57	253	143	24	0	0	0	0	0	0	2	67	213	702
55	209	114	14	0	0	0	0	0	0	0	46	171	554
50	122	55	3	0	0	0	0	0	0	0	14	88	282
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	564	645	960	1152	1408	1520	1642	1634	1428	1180	823	602	13558
55	61	115	261	462	695	830	929	921	738	467	178	60	5717
57	42	88	210	402	633	770	867	859	678	406	139	39	5133
60	23	55	141	315	540	680	774	766	588	317	89	20	4308
65	8	21	57	183	389	530	619	611	438	182	34	5	3077
70	0	7	14	86	250	381	464	456	292	81	8	0	2039

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	353	462	733	920	1174	1294	1406	1398	1204	951	605	390	353	815	1548	2468	3642	4936	6342	7740	8944	9895	10500	10890
45	228	329	580	770	1019	1144	1251	1243	1054	796	460	255	228	557	1137	1907	2926	4070	5321	6564	7618	8414	8874	9129
50	122	210	433	620	864	994	1096	1088	904	642	320	138	122	332	765	1385	2249	3243	4339	5427	6331	6973	7293	7431
55	49	115	290	472	709	844	941	933	754	489	198	64	49	164	454	926	1635	2479	3420	4353	5107	5596	5794	5858
60	12	54	167	331	554	694	786	778	604	343	102	17	12	66	233	564	1118	1812	2598	3376	3980	4323	4425	4442
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	221	283	462	604	787	866	929	923	808	626	371	235	221	504	966	1570	2357	3223	4152	5075	5883	6509	6880	7115

(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