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: BARDWELL DAM, TX **COOP ID: 410518**

Climate Division: TX 3 **NWS Call Sign:** **Elevation: 461 Feet** **Lat: 32˚16N** **Lon: 96˚38W**

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	56.2	31.1	43.7	81+	1971	31	50.7	1999	2	1982	11	34.3	1978	662	1	.0	.0	20.6	1.4	16.9	.0
Feb	61.6	36.2	48.9	95	1996	22	56.4	2000	8+	1985	3	37.4	1978	460	9	.0	.1	22.0	1.1	9.1	.0
Mar	68.8	44.3	56.6	93	1967	29	61.1	1974	15+	1989	6	52.1	1975	272	10	.0	.1	29.5	.1	2.8	.0
Apr	76.1	52.4	64.3	93	1996	19	69.0	1981	25	1989	11	60.7	1973	90	68	.0	.4	29.9	.0	.3	.0
May	83.4	61.6	72.5	100+	1998	31	79.0	1996	43+	1994	1	68.6	1976	14	246	.1	4.0	31.0	.0	.0	.0
Jun	90.8	68.9	79.9	108	1980	27	85.4	1998	49	1989	16	74.4	1989	0	445	.9	18.1	30.0	.0	.0	.0
Jul	95.6	72.1	83.9	108	1998	16	90.6	1998	57	1989	21	78.3	1989	0	585	5.5	27.5	31.0	.0	.0	.0
Aug	95.8	71.1	83.5	108+	1998	4	88.8	1999	53+	1992	28	77.1	1992	0	573	6.4	27.1	31.0	.0	.0	.0
Sep	89.5	64.6	77.1	110	2000	5	81.9	1980	37	1989	25	69.8	1974	4	366	1.1	16.5	30.0	.0	.0	.0
Oct	80.1	53.4	66.8	99	1989	3	70.0	1971	26	1993	31	60.2	1976	59	112	.0	3.0	30.9	.0	.2	.0
Nov	67.4	42.7	55.1	89+	1980	4	61.1	1999	20+	1976	29	48.7	1972	314	15	.0	.0	27.7	.0	3.9	.0
Dec	58.9	34.1	46.5	82+	1999	4	53.6	1984	-7	1989	23	35.2	1989	575	2	.0	.0	23.3	.9	12.5	.1
Ann	77.0	52.7	64.9	110	Sep 2000	5	90.6	Jul 1998	-7	Dec 1989	23	34.3	Jan 1978	2450	2432	14.0	96.8	336.9	3.5	45.7	.1

\+ 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: 1965-2001

(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	2.53	2.39	4.51	1990	19	8.53	1990	.06	1976
Feb	2.70	2.75	2.53	2001	28	6.58	1997	.20	1972
Mar	3.01	2.97	2.77	1995	13	8.06	1990	.56	1972
Apr	3.07	2.70	3.72	1973	24	9.23	1973	.06	1983
May	4.88	4.69	4.00	1979	30	11.74	1979	.29	1998
Jun	3.67	2.74	4.90	1981	16	13.71	1981	.05	1978
Jul	2.16	2.00	3.63	1971	27	6.26	1971	.00	1993
Aug	2.09	1.91	3.10	1998	14	5.56	1974	.00	1984
Sep	3.09	2.88	4.80	1976	2	10.44	1976	.03	1997
Oct	4.02	2.56	8.20	1974	31	12.57	1993	.24	1995
Nov	3.36	3.01	5.27	1998	13	9.83	2000	.33	1999
Dec	3.03	2.30	6.40	2001	16	9.03	1991	.15	1981
Ann	37.61	39.88	8.20	Oct 1974	31	13.71	Jun 1981	.00+	Jul 1993

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.8	4.7	1.5	.5
Feb	7.1	4.3	1.8	1.0
Mar	8.2	4.8	2.2	.8
Apr	7.4	4.6	2.1	1.0
May	9.2	6.1	3.2	1.7
Jun	7.3	5.2	2.4	1.2
Jul	5.1	3.3	1.5	.9
Aug	5.3	3.7	1.4	.4
Sep	6.2	4.2	2.0	1.0
Oct	7.1	4.3	2.2	1.1
Nov	7.9	4.8	2.5	.9
Dec	7.3	4.3	1.9	.8
Ann	85.9	54.3	24.7	11.3

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	.19	.36	.68	1.03	1.42	1.87	2.40	3.08	4.01	5.59	7.15
Feb	.40	.62	1.01	1.39	1.78	2.20	2.70	3.30	4.11	5.44	6.71
Mar	.73	1.01	1.45	1.84	2.22	2.63	3.09	3.64	4.35	5.49	6.55
Apr	.42	.67	1.11	1.54	1.99	2.48	3.05	3.75	4.69	6.23	7.72
May	.65	1.05	1.74	2.42	3.14	3.92	4.84	5.96	7.48	9.96	12.36
Jun	.40	.67	1.18	1.69	2.24	2.86	3.58	4.48	5.71	7.74	9.72
Jul	.14	.35	.69	1.01	1.34	1.71	2.14	2.66	3.37	4.53	5.66
Aug	.03	.13	.37	.65	.99	1.38	1.88	2.52	3.42	4.99	6.56
Sep	.32	.55	.97	1.40	1.87	2.39	3.01	3.78	4.82	6.56	8.26
Oct	.26	.50	1.00	1.54	2.16	2.88	3.75	4.86	6.42	9.05	11.66
Nov	.50	.78	1.27	1.73	2.22	2.75	3.36	4.10	5.11	6.74	8.31
Dec	.37	.60	1.03	1.45	1.90	2.40	2.98	3.70	4.68	6.29	7.85
Ann	24.45	26.91	30.10	32.57	34.77	36.92	39.16	41.66	44.71	49.17	53.07

\+ 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: 1965-2001
(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	.2	.0	#	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	.2	.0	0	0
Dec	.4	.0	#	0
Ann	.9	.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	1.3	1973	11	1.3	1973	1	1973	11	#	1973
Feb	1.0	1975	23	1.0	1975	0	0	0	0	0
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	2.5	1976	13	2.5	1976	0	0	0	0	0
Dec	4.0	2000	26	4.0	2000	#	2000	25	#	2000
Ann	4.0	Dec 2000	26	4.0	Dec 2000	1	Jan 1973	11	#+	Dec 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	.4	.0	.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	.1	.0	.0	.0
Dec	.1	.1	.1	.0	.0
Ann	-9.9	-9.9	-9.9	-9.9	-9.9

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	@	.0	.0	.0
Feb	.0	.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	.0
Dec	.0	.0	.0	.0
Ann	@	.0	.0	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	4/12	4/07	4/03	3/30	3/27	3/23	3/20	3/16	3/10
32	4/04	3/27	3/21	3/17	3/12	3/08	3/03	2/25	2/18
28	3/21	3/12	3/06	3/01	2/24	2/19	2/14	2/08	1/30
24	3/08	2/27	2/21	2/15	2/10	2/05	1/31	1/24	1/16
20	2/25	2/17	2/10	2/05	1/30	1/24	1/15	0/00	0/00
16	2/19	2/09	1/31	1/23	1/15	1/04	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	10/24	10/30	11/03	11/07	11/10	11/14	11/18	11/22	11/28
32	10/30	11/06	11/11	11/15	11/19	11/23	11/27	12/02	12/09
28	11/07	11/14	11/20	11/24	11/28	12/02	12/07	12/12	12/19
24	11/17	11/24	11/30	12/04	12/08	12/13	12/17	12/22	12/30
20	12/06	12/15	12/21	12/27	1/02	1/08	1/18	0/00	0/00
16	12/17	12/28	1/06	1/14	1/23	2/05	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	252	244	238	233	228	223	218	212	204
32	283	272	264	257	251	245	238	230	220
28	312	300	291	284	276	269	262	253	240
24	336	322	313	306	299	293	286	277	266
20	>365	>365	>365	>365	351	331	319	308	294
16	>365	>365	>365	>365	>365	>365	352	336	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)

Base — Heating Degree Days (1)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	662	460	272	90	14	0	0	0	4	59	314	575	2450
60	516	334	150	29	2	0	0	0	0	17	196	432	1676
57	430	267	96	11	0	0	0	0	0	6	140	349	1299
55	376	227	68	5	0	0	0	0	0	3	109	299	1087
50	255	144	23	0	0	0	0	0	0	0	51	192	665
32	23	8	0	0	0	0	0	0	0	0	0	11	42

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	384	481	760	968	1256	1435	1608	1596	1352	1076	691	461	12068
55	24	56	115	283	543	745	895	883	662	366	110	36	4718
57	17	40	81	229	481	685	833	821	602	307	81	24	4201
60	10	23	42	157	389	595	740	728	512	225	47	14	3482
65	1	9	10	68	246	445	585	573	366	112	15	2	2432
70	0	0	0	20	130	299	430	419	233	41	2	0	1574

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	196	306	529	730	1009	1195	1362	1350	1107	824	461	251	196	502	1031	1761	2770	3965	5327	6677	7784	8608	9069	9320
45	109	198	386	581	854	1045	1207	1195	957	669	328	147	109	307	693	1274	2128	3173	4380	5575	6532	7201	7529	7676
50	50	117	258	435	699	895	1052	1040	807	517	214	74	50	167	425	860	1559	2454	3506	4546	5353	5870	6084	6158
55	19	54	146	293	544	745	897	885	657	373	124	31	19	73	219	512	1056	1801	2698	3583	4240	4613	4737	4768
60	1	21	68	171	392	595	742	730	509	237	61	10	1	22	90	261	653	1248	1990	2720	3229	3466	3527	3537
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	140	201	323	461	684	822	908	893	736	532	285	165	140	341	664	1125	1809	2631	3539	4432	5168	5700	5985	6150

(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