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: BOQUILLAS RANGER STN, TX **COOP ID: 410950**

Climate Division: TX 5 **NWS Call Sign:** **Elevation: 1,880 Feet** **Lat: 29˚11N** **Lon: 102˚58W**

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	69.0	28.0	48.5	90+	1999	22	54.1	2000	13	1996	3	41.1	1979	512	0	.0	.1	28.4	.2	20.2	.0
Feb	75.1	33.2	54.2	99	1996	23	59.6	2000	13	1985	2	47.9	1978	308	4	.0	1.8	27.0	.2	9.5	.0
Mar	83.4	41.2	62.3	103+	1998	27	67.7	1974	19	1996	9	55.7	1987	137	54	.4	7.2	30.9	.0	3.0	.0
Apr	91.2	49.5	70.4	109	2000	20	76.4	1986	29+	1998	1	64.5	1987	31	192	3.8	14.8	30.0	.0	.2	.0
May	98.6	61.3	80.0	116	1989	25	86.4	1996	44+	1995	9	73.6	1976	3	467	11.4	23.0	31.0	.0	.0	.0
Jun	103.2	69.2	86.2	117+	1998	4	91.6	1998	55	1972	9	82.7	1979	0	636	17.8	27.3	30.0	.0	.0	.0
Jul	102.8	70.7	86.8	116+	1998	11	90.7	1980	59	1985	1	81.9	1976	0	675	18.0	26.3	31.0	.0	.0	.0
Aug	100.9	68.9	84.9	115+	1953	10	87.6	1993	60	1949	1	79.9	1971	0	618	16.5	24.2	31.0	.0	.0	.0
Sep	96.4	63.7	80.1	115	1952	1	85.0	1977	40+	1989	26	72.9	1974	0	452	9.4	21.9	30.0	.0	.0	.0
Oct	88.5	51.6	70.1	105+	2000	4	74.1	1998	24	1993	31	61.9	1976	27	184	1.9	12.6	30.9	.0	.2	.0
Nov	77.8	38.8	58.3	99	1952	1	63.3	1998	16	1992	28	49.8	1976	236	35	.0	2.1	29.2	.1	5.6	.0
Dec	69.1	30.3	49.7	90+	1984	21	56.2	1984	4+	1989	24	43.7	1989	475	1	.0	.1	28.8	.1	17.5	.0
Ann	88.0	50.5	69.3	117+	Jun 1998	4	91.6	Jun 1998	4+	Dec 1989	24	41.1	Jan 1979	1729	3318	79.2	161.4	358.2	.6	56.2	.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: 1910-2001

(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	.34	.17	1.02	1982	12	1.28	1983	.00+	2000
Feb	.40	.29	1.11	1970	22	1.90	1994	.00+	1999
Mar	.19	.10	.55	1999	28	.83	1994	.00+	2000
Apr	.45	.22	1.76	1990	23	2.52	1981	.00+	1998
May	1.35	1.12	1.83	1987	23	3.96	1992	.00	2000
Jun	1.34	1.28	2.69	1966	21	3.68	1982	.00+	1990
Jul	1.24	1.26	1.84	1990	25	3.53	1976	.11	1994
Aug	1.26	.89	2.06	1980	17	3.88	1975	.19	1985
Sep	1.18	.91	1.60	1974	16	4.78	1974	.00+	1998
Oct	1.22	.40	2.14	1983	20	5.60	1981	.00+	1999
Nov	.51	.39	1.10	1995	17	1.75	2000	.00+	1999
Dec	.40	.25	1.16	1991	20	2.72	1991	.00+	1998
Ann	9.88	9.91	2.69	Jun 1966	21	5.60	Oct 1981	.00+	May 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.6	1.0	.1	.1
Feb	2.3	1.1	.3	@
Mar	1.5	.6	@	.0
Apr	2.2	1.1	.2	.1
May	4.6	2.8	1.0	.3
Jun	5.2	2.9	1.0	.2
Jul	5.7	2.9	.8	.2
Aug	5.5	3.0	.6	.1
Sep	4.2	2.4	.7	.3
Oct	3.8	2.3	.8	.3
Nov	2.6	1.3	.3	.1
Dec	2.5	1.0	.2	@
Ann	42.7	22.4	6.0	1.7

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	.01	.05	.10	.17	.27	.39	.58	.90	1.23
Feb	.00	.00	.02	.07	.13	.21	.32	.46	.68	1.07	1.47
Mar	.00	.00	.00	.02	.07	.12	.17	.24	.34	.50	.66
Apr	.00	.00	.02	.07	.14	.23	.36	.52	.76	1.19	1.64
May	.06	.17	.37	.57	.78	1.02	1.31	1.66	2.15	2.96	3.75
Jun	.00	.00	.41	.65	.87	1.11	1.38	1.71	2.13	2.81	3.47
Jul	.12	.21	.38	.56	.75	.96	1.21	1.52	1.94	2.65	3.34
Aug	.17	.27	.45	.63	.81	1.02	1.25	1.54	1.93	2.58	3.19
Sep	.00	.03	.17	.33	.52	.75	1.04	1.42	1.95	2.88	3.81
Oct	.00	.00	.02	.12	.30	.55	.89	1.36	2.07	3.35	4.70
Nov	.00	.00	.04	.13	.23	.34	.47	.64	.88	1.26	1.66
Dec	.00	.00	.00	.02	.10	.20	.32	.48	.71	1.11	1.51
Ann	5.82	6.55	7.52	8.28	8.96	9.64	10.34	11.14	12.11	13.56	14.84

\+ 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: 1910-2001
(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	.0	.0	0	0	.5	1986	8	.5	1986	3	1985	13	3	1985	@	.0	.0	.0	.0	.0	.0	.0	.0
Feb	.1	.0	0	0	2.0	1973	8	2.0	1973	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	#	1995	5	#	1995	.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	#	1989	23	#+	1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.1	.0	N/A	N/A	2.0	Feb 1973	8	2.0	Feb 1973	3	Jan 1985	13	3	Jan 1985	@	@	.0	.0	.0	.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	4/14	4/08	4/05	4/01	3/29	3/26	3/23	3/19	3/14
32	4/01	3/26	3/21	3/18	3/14	3/10	3/06	3/02	2/24
28	3/21	3/12	3/06	3/01	2/23	2/18	2/13	2/06	1/29
24	3/16	3/03	2/22	2/14	2/06	1/30	1/22	1/13	12/31
20	2/24	2/11	2/02	1/25	1/17	1/09	12/30	12/14	0/00
16	1/28	1/18	1/10	1/02	12/23	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	10/22	10/28	11/01	11/05	11/08	11/11	11/15	11/19	11/24
32	10/27	11/02	11/06	11/10	11/13	11/17	11/21	11/25	12/01
28	11/11	11/16	11/20	11/23	11/26	11/29	12/02	12/05	12/10
24	11/14	11/21	11/27	12/01	12/06	12/10	12/15	12/20	12/28
20	11/28	12/06	12/12	12/17	12/22	12/27	1/02	1/12	0/00
16	12/10	12/20	12/28	1/05	1/17	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	246	238	232	227	223	218	213	207	199
32	267	259	253	248	244	239	234	228	220
28	305	294	287	281	275	268	262	255	244
24	348	330	318	309	300	291	282	271	256
20	>365	>365	>365	346	333	324	315	305	293
16	>365	>365	>365	>365	>365	>365	>365	351	328

***** 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	512	308	137	31	3	0	0	0	0	27	236	475	1729
60	364	186	58	7	0	0	0	0	0	6	137	325	1083
57	279	126	29	2	0	0	0	0	0	2	92	243	773
55	227	93	17	0	0	0	0	0	0	1	68	193	599
50	124	35	3	0	0	0	0	0	0	0	26	95	283
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	511	619	940	1150	1487	1626	1698	1641	1442	1180	789	549	13632
55	25	69	244	461	774	936	985	928	752	468	167	29	5838
57	15	45	194	402	712	876	923	866	692	407	131	17	5280
60	7	21	130	318	619	786	830	773	602	318	86	6	4496
65	0	4	54	192	467	636	675	618	452	184	35	1	3318
70	0	0	15	98	323	486	520	463	309	82	10	0	2306

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	288	431	702	900	1214	1368	1408	1369	1180	917	543	318	288	719	1421	2321	3535	4903	6311	7680	8860	9777	10320	10638
45	171	300	548	750	1059	1218	1253	1214	1030	762	396	193	171	471	1019	1769	2828	4046	5299	6513	7543	8305	8701	8894
50	78	177	401	602	904	1068	1098	1059	880	607	265	93	78	255	656	1258	2162	3230	4328	5387	6267	6874	7139	7232
55	25	86	263	456	749	918	943	904	730	457	155	33	25	111	374	830	1579	2497	3440	4344	5074	5531	5686	5719
60	0	32	145	319	596	768	788	749	580	316	71	3	0	32	177	496	1092	1860	2648	3397	3977	4293	4364	4367
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	279	336	478	558	747	849	891	874	745	578	387	282	279	615	1093	1651	2398	3247	4138	5012	5757	6335	6722	7004

(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