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: BROOKINGS 2 NE, SD **COOP ID: 391076**

Climate Division: SD 7 **NWS Call Sign:** **Elevation: 1,640 Feet** **Lat: 44˚19N** **Lon: 96˚46W**

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	21.5	.3	10.9	65	1981	25	24.7	1990	-41	1912	12	-1.6	1979	1677	0	.0	.0	.4	24.0	31.0	15.2
Feb	28.0	7.8	17.9	69+	2000	23	31.6	1987	-41	1899	9	2.7	1979	1320	0	.0	.0	1.5	17.1	28.0	9.9
Mar	39.7	20.5	30.1	85	1943	30	38.3	2000	-23+	1948	11	20.6	1975	1082	0	.0	.0	6.1	9.8	27.2	2.9
Apr	55.5	32.8	44.2	93+	1980	22	51.2	1977	-2	1975	3	37.5	1995	627	1	.0	.1	19.5	1.3	16.6	@
May	68.9	44.4	56.7	106	1934	30	65.9	1977	7	1914	11	51.0	1997	289	31	.0	.2	29.4	.0	3.4	.0
Jun	78.0	54.2	66.1	105	1933	26	73.2	1988	28	1915	9	61.6	1993	70	103	.1	1.6	30.0	.0	.0	.0
Jul	82.7	58.6	70.7	109	1940	24	75.1	1983	37+	1971	30	62.0	1992	28	203	@	4.7	31.0	.0	.0	.0
Aug	80.6	56.6	68.6	106	1937	15	76.2	1983	28	1893	28	62.9	1992	48	159	.1	2.9	31.0	.0	.0	.0
Sep	71.8	46.3	59.1	102	1931	10	64.6	1978	12	1899	29	52.9	1993	206	26	@	1.1	29.3	.0	2.8	.0
Oct	58.9	33.6	46.3	93	1910	11	52.0	1973	-9	1925	29	41.8	1976	581	0	.0	@	23.7	.3	14.7	.0
Nov	39.6	20.3	30.0	77	1999	9	39.7	1999	-22	1977	26	20.2	1985	1051	0	.0	.0	6.8	10.1	27.4	1.5
Dec	26.1	6.5	16.3	68	1939	6	25.4	1979	-36	1917	29	-.5	1983	1511	0	.0	.0	.9	21.5	30.9	10.5
Ann	54.3	31.8	43.1	109	Jul 1940	24	76.2	Aug 1983	-41+	Jan 1912	12	-1.6	Jan 1979	8490	523	.2	10.6	209.6	84.1	182.0	40.0

\+ 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: 1893-2001

(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	.34	.31	1.20	1897	3	1.18	1979	.00+	1991
Feb	.40	.35	1.00	1905	26	1.22	1981	.03	1983
Mar	1.29	1.08	1.32	1900	30	3.45	1983	.17	1991
Apr	2.03	1.81	2.45	2001	23	5.36	1986	.26	1996
May	2.95	2.61	4.24	1912	3	9.27	1972	.43	1976
Jun	4.23	2.95	5.54	1980	25	10.21	1994	.82	1985
Jul	3.11	2.71	2.86	1956	31	6.85	1995	.77	1975
Aug	2.94	2.99	2.96	1985	12	5.03	1977	1.52	1989
Sep	2.48	2.36	4.11	1986	17	7.67	1986	.09	1974
Oct	1.78	1.33	2.20	1984	19	6.43	1984	.03	1988
Nov	1.00	.77	1.87	1975	21	4.46	1983	.01	1984
Dec	.26	.20	.97	1960	5	.73+	1984	.00+	1986
Ann	22.81	22.57	5.54	Jun 1980	25	10.21	Jun 1994	.00+	Jan 1991

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	.9	.1	.0
Feb	4.2	1.4	.1	.0
Mar	6.3	3.3	.9	@
Apr	9.1	5.4	1.1	.2
May	10.1	6.2	2.0	.6
Jun	10.7	6.6	2.7	1.2
Jul	9.8	5.8	2.1	.8
Aug	8.7	5.0	1.9	.7
Sep	7.9	4.7	1.8	.5
Oct	6.0	3.4	1.1	.4
Nov	5.1	2.5	.5	.2
Dec	3.9	.9	@	.0
Ann	86.1	46.1	14.3	4.6

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	.05	.11	.17	.24	.33	.43	.58	.81	1.05
Feb	.05	.08	.14	.19	.25	.32	.39	.48	.61	.81	1.01
Mar	.20	.31	.50	.67	.86	1.06	1.29	1.58	1.96	2.57	3.17
Apr	.44	.63	.93	1.20	1.47	1.76	2.08	2.47	2.98	3.79	4.56
May	.52	.78	1.21	1.61	2.03	2.47	2.98	3.60	4.43	5.76	7.03
Jun	.99	1.38	2.00	2.55	3.10	3.69	4.34	5.12	6.15	7.77	9.30
Jul	.89	1.19	1.63	2.02	2.40	2.79	3.23	3.74	4.41	5.45	6.42
Aug	1.34	1.60	1.96	2.25	2.52	2.79	3.09	3.42	3.84	4.48	5.05
Sep	.37	.58	.94	1.28	1.64	2.03	2.48	3.03	3.77	4.97	6.12
Oct	.12	.24	.46	.71	.98	1.30	1.68	2.16	2.83	3.97	5.09
Nov	.04	.09	.19	.32	.48	.66	.89	1.20	1.63	2.37	3.12
Dec	.00	.03	.08	.12	.17	.21	.26	.32	.40	.53	.65
Ann	14.78	16.28	18.23	19.73	21.08	22.40	23.77	25.29	27.16	29.89	32.28

\+ 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: 1893-2001
(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	5.2	5.0	5	4	8.0	1975	8	21.0	1979	20	1988	1	20	1988	4.1	2.1	.6	.2	.0	18.0	11.4	8.6	3.3
Feb	4.4	4.0	5	5	8.0	1997	4	9.9	1997	22	1979	28	19	1979	3.4	2.0	.3	.1	.0	14.1	9.4	6.9	1.5
Mar	5.2	4.6	3	1	12.0	1977	4	17.0	1984	25	1985	7	16	1979	3.5	2.2	.6	.3	@	7.3	4.0	2.2	1.0
Apr	2.6	1.0	#	#	7.0	1994	29	11.0+	1995	16	1975	1	3	1984	1.2	1.0	.4	.1	.0	1.6	.9	.3	.1
May	#	.0	#	0	#	1989	6	#+	1989	#+	1994	1	#+	1994	.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	1.0	1984	25	1.0	1984	#	1984	25	#	1984	.1	@	.0	.0	.0	.0	.0	.0	.0
Oct	.9	.0	#	0	5.0	1999	2	6.0	1995	4+	1999	2	#+	1999	.4	.3	.1	@	.0	.5	.1	.0	.0
Nov	5.8	3.0	1	1	10.0	1975	21	18.0	1983	13	1993	26	4	1985	2.8	2.0	.8	.3	@	6.1	3.2	1.5	.6
Dec	4.0	3.0	3	3	6.0	1973	25	15.0	1973	20	1987	31	15	1985	3.4	1.7	.4	.1	.0	12.6	7.2	3.1	.5
Ann	28.1	20.6	N/A	N/A	12.0	Mar 1977	4	21.0	Jan 1979	25	Mar 1985	7	20	Jan 1988	18.9	11.3	3.2	1.1	@	60.2	36.2	22.6	7.0

+ 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	6/05	6/01	5/28	5/26	5/23	5/20	5/17	5/14	5/10
32	5/25	5/21	5/17	5/14	5/12	5/09	5/06	5/03	4/28
28	5/14	5/09	5/05	5/03	4/30	4/27	4/24	4/21	4/16
24	5/07	5/01	4/26	4/22	4/19	4/15	4/12	4/07	4/01
20	4/17	4/13	4/10	4/07	4/05	4/02	3/31	3/28	3/23
16	4/12	4/07	4/04	4/01	3/30	3/27	3/24	3/21	3/16

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	9/04	9/08	9/10	9/12	9/14	9/16	9/18	9/21	9/24
32	9/11	9/14	9/17	9/19	9/21	9/23	9/25	9/27	9/30
28	9/16	9/21	9/25	9/28	10/01	10/04	10/07	10/10	10/15
24	9/26	10/01	10/05	10/08	10/11	10/14	10/17	10/21	10/26
20	10/06	10/12	10/15	10/19	10/22	10/25	10/28	11/01	11/06
16	10/18	10/23	10/27	10/31	11/03	11/06	11/09	11/13	11/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	131	125	121	117	113	110	106	102	96
32	151	144	139	135	131	127	123	118	111
28	174	167	162	157	153	149	144	139	132
24	194	187	182	178	174	170	166	161	154
20	218	212	207	203	199	196	192	187	181
16	240	233	227	222	218	213	208	203	195

***** 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	1677	1320	1082	627	289	70	28	48	206	581	1051	1511	8490
60	1522	1180	927	483	180	22	7	13	104	427	901	1356	7122
57	1429	1096	834	401	128	9	0	4	60	338	811	1263	6373
55	1367	1040	772	349	100	4	0	2	39	282	751	1201	5907
50	1212	909	625	233	46	0	0	0	9	162	607	1046	4849
32	690	466	191	18	0	0	0	0	0	5	190	530	2090

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	35	71	132	382	765	1023	1198	1134	811	447	129	42	6169
55	0	0	0	23	152	337	485	423	160	11	0	0	1591
57	0	0	0	15	119	282	423	364	121	5	0	0	1329
60	0	0	0	7	77	205	337	280	74	1	0	0	981
65	0	0	0	1	31	103	203	159	26	0	0	0	523
70	0	0	0	0	9	37	106	75	6	0	0	0	233

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	0	1	35	181	509	773	945	877	556	230	32	1	0	1	36	217	726	1499	2444	3321	3877	4107	4139	4140
45	0	0	10	100	364	623	790	722	409	133	11	0	0	0	10	110	474	1097	1887	2609	3018	3151	3162	3162
50	0	0	1	53	235	474	635	567	282	69	1	0	0	0	1	54	289	763	1398	1965	2247	2316	2317	2317
55	0	0	0	23	136	334	481	412	172	25	0	0	0	0	0	23	159	493	974	1386	1558	1583	1583	1583
60	0	0	0	6	69	202	327	266	92	8	0	0	0	0	0	6	75	277	604	870	962	970	970	970
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	28	126	311	487	618	564	352	163	28	0	0	2	30	156	467	954	1572	2136	2488	2651	2679	2679

(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