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: BRIDGEWATER, SD **COOP ID: 391032**

Climate Division: SD 9 **NWS Call Sign:** **Elevation: 1,420 Feet** **Lat: 43˚33N** **Lon: 97˚30W**

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	24.8	3.2	14.0	61	1989	30	28.1	1990	-35	1970	19	-.2	1978	1581	0	.0	.0	1.0	20.1	31.0	11.1
Feb	31.8	10.3	21.1	74	1958	23	32.6	1987	-33	1988	11	7.1	1979	1231	0	.0	.0	3.6	13.3	27.4	6.3
Mar	43.5	21.2	32.4	85	1968	30	40.8	2000	-23+	1960	4	23.8	1975	1012	0	.0	.0	11.1	5.6	25.1	1.5
Apr	58.6	33.9	46.3	97	1980	21	54.0	1981	4	1982	6	39.7	1975	566	4	.0	.3	23.2	.5	11.4	.0
May	71.1	46.7	58.9	104	1967	25	65.7	1977	19	1967	4	52.3	1997	227	38	.0	.5	30.3	.0	1.0	.0
Jun	81.2	56.7	69.0	106+	1988	25	76.2	1988	33	1956	1	64.5	1982	40	158	.4	5.4	30.0	.0	.0	.0
Jul	86.1	61.4	73.8	106+	1967	22	78.3	1974	40	1971	30	64.8	1992	13	285	1.4	11.5	31.0	.0	.0	.0
Aug	83.5	58.9	71.2	105	1973	26	77.6	1983	34	1950	20	65.0	1992	26	219	.6	8.2	31.0	.0	.0	.0
Sep	74.7	48.7	61.7	103	1976	6	67.8	1978	22	1974	30	55.1	1993	156	58	.1	2.7	29.7	.0	1.0	.0
Oct	61.7	35.6	48.7	94	1953	2	53.0	1973	11	1991	30	44.0	1976	507	0	.0	.1	26.8	.2	9.3	.0
Nov	41.9	21.9	31.9	79	1999	9	43.2	1999	-21	1959	14	20.5	1985	992	0	.0	.0	9.5	6.8	24.9	.9
Dec	28.7	8.6	18.7	66+	1998	4	27.5	1979	-29	1989	22	.4	1983	1437	0	.0	.0	1.3	16.9	30.7	7.0
Ann	57.3	33.9	45.6	106+	Jun 1988	25	78.3	Jul 1974	-35	Jan 1970	19	-.2	Jan 1978	7788	762	2.5	28.7	228.5	63.4	161.8	26.8

\+ 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: 1948-2001

(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	.40	.24	1.07	1976	2	1.59	1979	.00+	1988
Feb	.47	.40	1.50+	1997	4	1.55	1997	.00+	1990
Mar	1.58	1.35	2.00	1970	3	3.80	1995	.00	1997
Apr	2.45	2.12	3.80	2001	23	7.06	1986	.36	1987
May	3.86	3.27	3.75	1972	1	9.09	1972	.83	1981
Jun	3.63	3.04	4.26	1948	17	8.45	1994	.57	1988
Jul	3.23	2.83	3.25	2001	24	9.55	1992	.40	1975
Aug	3.52	3.07	4.20	1981	25	7.33	1975	.83	1976
Sep	2.78	2.65	5.85	1999	4	7.00	1986	.37	1974
Oct	2.03	1.70	3.30	1998	5	7.60	1998	.00	1988
Nov	1.12	.99	2.17	1948	19	3.54	1971	.00+	1999
Dec	.43	.31	1.40	1953	3	1.75	1982	.00+	2000
Ann	25.50	25.98	5.85	Sep 1999	4	9.55	Jul 1992	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.0	1.6	.1	@
Feb	4.0	1.7	.2	.1
Mar	6.3	3.9	1.0	.3
Apr	8.2	5.9	1.7	.5
May	9.6	7.2	2.6	1.0
Jun	9.1	6.8	2.9	1.2
Jul	8.0	5.8	2.4	1.0
Aug	7.0	5.3	2.2	1.0
Sep	6.3	4.6	1.8	.8
Oct	5.5	3.6	1.5	.5
Nov	4.9	2.8	.8	.2
Dec	3.6	1.6	.1	.0
Ann	76.5	50.8	17.3	6.6

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	.01	.06	.12	.19	.27	.36	.49	.66	.97	1.27
Feb	.00	.00	.10	.18	.26	.35	.45	.59	.76	1.06	1.34
Mar	.14	.32	.58	.81	1.05	1.30	1.59	1.95	2.42	3.19	3.93
Apr	.52	.74	1.10	1.43	1.75	2.10	2.50	2.97	3.60	4.59	5.54
May	.90	1.26	1.82	2.33	2.83	3.36	3.96	4.67	5.61	7.09	8.49
Jun	.97	1.31	1.83	2.30	2.75	3.23	3.75	4.38	5.20	6.48	7.68
Jul	.84	1.14	1.61	2.02	2.43	2.86	3.33	3.90	4.64	5.80	6.89
Aug	1.04	1.37	1.88	2.31	2.73	3.17	3.65	4.22	4.96	6.11	7.18
Sep	.59	.84	1.25	1.62	1.99	2.39	2.84	3.37	4.08	5.22	6.29
Oct	.14	.35	.67	.97	1.28	1.62	2.02	2.50	3.16	4.23	5.26
Nov	.00	.05	.21	.37	.56	.78	1.04	1.37	1.83	2.62	3.40
Dec	.00	.00	.00	.09	.19	.29	.41	.55	.74	1.06	1.37
Ann	16.09	17.82	20.09	21.84	23.41	24.95	26.56	28.35	30.55	33.77	36.60

\+ 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: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

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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	5.6	2.5	#	#
Feb	6.3	4.2	1	0
Mar	4.4	3.3	1	0
Apr	1.6	.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	.2	.0	#	0
Nov	3.8	1.5	1	0
Dec	7.1	6.0	2	0
Ann	29.0	17.5	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	6.0	1973	21	19.7	1975	1	1990	24	1	1990
Feb	8.0	1972	9	17.0	1993	4	1971	4	4	1971
Mar	12.0	1998	31	17.0	1989	14	1972	3	14	1972
Apr	6.0	1992	22	9.0	1995	#	1992	13	#	1992
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	4.0	1995	24	4.0	1995	#	1997	25	#	1997
Nov	8.0	1975	20	12.0	1975	12	1975	20	12	1975
Dec	8.0	1996	15	16.3	1971	9	1971	30	7	1971
Ann	12.0	Mar 1998	31	19.7	Jan 1975	14	Mar 1972	3	14	Mar 1972

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.3	.7	.2	.0
Feb	2.6	1.8	.6	.2	.0
Mar	1.5	1.3	.8	.2	.1
Apr	.5	.5	.2	.1	.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	.1	.1	@	.0	.0
Nov	1.4	1.1	.6	.3	.0
Dec	2.5	1.8	.7	.2	.0
Ann	11.6	8.9	3.6	1.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
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	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	5/24	5/19	5/15	5/12	5/09	5/07	5/04	4/30	4/25
32	5/14	5/09	5/06	5/03	4/30	4/27	4/24	4/20	4/16
28	5/07	5/02	4/28	4/25	4/22	4/19	4/15	4/12	4/06
24	4/24	4/19	4/16	4/13	4/10	4/07	4/04	3/31	3/26
20	4/14	4/09	4/06	4/03	3/31	3/29	3/26	3/23	3/18
16	4/08	4/04	3/31	3/28	3/26	3/23	3/20	3/17	3/12

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	9/14	9/17	9/20	9/22	9/24	9/25	9/28	9/30	10/03
32	9/20	9/24	9/27	9/29	10/02	10/04	10/06	10/09	10/13
28	9/25	9/30	10/04	10/07	10/11	10/14	10/17	10/21	10/26
24	10/09	10/13	10/17	10/20	10/23	10/26	10/29	11/01	11/06
20	10/17	10/22	10/25	10/28	10/31	11/03	11/06	11/10	11/15
16	10/27	11/02	11/06	11/10	11/13	11/17	11/20	11/25	12/01

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	156	149	144	140	136	133	128	124	117
32	171	165	161	158	154	151	147	143	137
28	190	183	179	175	171	167	163	158	152
24	215	208	203	199	195	191	187	182	175
20	234	227	222	217	213	209	205	200	192
16	256	247	242	237	232	227	222	216	208

***** 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	1581	1231	1012	566	227	40	13	26	156	507	992	1437	7788
60	1426	1091	857	426	129	11	0	6	74	355	842	1282	6499
57	1333	1007	764	348	85	3	0	2	41	269	752	1189	5793
55	1271	951	703	299	62	1	0	1	25	218	695	1127	5353
50	1118	823	556	194	24	0	0	0	5	111	555	973	4359
32	609	393	146	12	0	0	0	0	0	2	167	472	1801

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	52	86	157	439	834	1108	1295	1216	891	518	164	58	6818
55	0	0	1	36	183	419	582	503	227	21	2	0	1974
57	0	0	0	25	144	361	520	442	182	10	0	0	1684
60	0	0	0	13	94	279	427	353	125	3	0	0	1294
65	0	0	0	4	38	158	285	219	58	0	0	0	762
70	0	0	0	0	11	73	163	115	20	0	0	0	382

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	10	67	273	626	898	1074	1006	687	339	55	1	0	10	77	350	976	1874	2948	3954	4641	4980	5035	5036
45	0	0	31	169	474	748	919	851	542	214	21	0	0	0	31	200	674	1422	2341	3192	3734	3948	3969	3969
50	0	0	8	93	331	599	764	696	399	117	8	0	0	0	8	101	432	1031	1795	2491	2890	3007	3015	3015
55	0	0	3	48	201	452	609	541	268	51	0	0	0	0	3	51	252	704	1313	1854	2122	2173	2173	2173
60	0	0	0	23	108	306	454	389	163	17	0	0	0	0	0	23	131	437	891	1280	1443	1460	1460	1460
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	12	56	185	381	584	712	663	435	220	39	0	0	12	68	253	634	1218	1930	2593	3028	3248	3287	3287

(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