

Climatography of the United States

No. 20

1971-2000

Station: BONESTEEL, SD

COOP ID: 390778

Climate Division: SD 9

NWS Call Sign:

Elevation: 1,985 Feet Lat: 43°05N Lon: 98°57W

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	29.1	7.4	18.3	72	1981	24	31.1	1990	-32	1966	29	2.7	1978	1449	0	.0	.0	3.0	15.9	30.5	9.5
Feb	35.0	13.2	24.1	76	2000	22	34.5	1999	-29	1994	10	7.3	1979	1144	0	.0	.0	6.2	11.4	26.2	5.0
Mar	45.4	22.5	34.0	87	1978	30	41.0	2000	-23	1960	4	25.9	1996	962	0	.0	.0	13.8	4.8	24.7	1.1
Apr	57.1	33.6	45.4	95	1980	21	53.1	1981	2	1975	3	39.1	1983	591	0	.0	.1	22.5	.7	12.3	.0
May	68.9	45.9	57.4	102	1967	25	62.8	1987	18	1967	3	52.1	1995	257	21	.0	.6	30.3	.0	1.5	.0
Jun	78.7	55.8	67.3	105	1961	30	74.9	1988	35+	1969	14	62.0	1982	64	130	.3	4.5	30.0	.0	.0	.0
Jul	84.8	62.0	73.4	109	1966	10	77.9	1980	40	1971	30	64.3	1992	15	276	1.5	12.1	31.0	.0	.0	.0
Aug	83.5	59.5	71.5	105+	1988	16	80.8	1983	33	1964	31	65.1	1992	37	238	1.3	10.5	31.0	.0	.0	.0
Sep	74.7	48.8	61.8	103+	1979	9	69.8	1998	19	1965	24	56.0	1993	165	67	.2	4.5	29.6	.0	.9	.0
Oct	61.7	36.5	49.1	95	1963	5	52.9	1973	10+	1997	27	43.7	1976	494	0	.0	.4	26.4	.3	9.0	.0
Nov	43.1	22.9	33.0	83	1965	2	45.0	1999	-22	1959	14	19.4	1985	959	0	.0	.0	11.2	6.2	24.9	1.0
Dec	32.2	12.0	22.1	73	1998	3	30.5	1979	-28	1989	23	2.9	1983	1331	0	.0	.0	3.9	13.7	30.1	6.0
Ann	57.9	35.0	46.5	109	Jul 1966	10	80.8	Aug 1983	-32	Jan 1966	29	2.7	Jan 1978	7468	732	3.3	32.7	238.9	53.0	160.1	22.6

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1956-2001

(3) Derived from 1971-2000 serially complete daily data

008-A

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: BONESTEEL, SD

COOP ID: 390778

Climate Division: SD 9

NWS Call Sign:

Elevation: 1,985 Feet Lat: 43°05N

Lon: 98°57W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.33	.24	1.10	2001	30	1.23	1979	.00	1989	3.0	1.3	@	.0	.02	.05	.10	.15	.20	.25	.32	.40	.52	.71	.89
Feb	.62	.42	1.15	1971	19	2.50	1987	.00+	1986	3.5	2.2	.4	.1	.00	.00	.06	.16	.27	.40	.56	.76	1.05	1.52	2.00
Mar	1.82	1.22	1.85	1977	10	8.10	1987	.05	1994	5.3	3.9	1.1	.5	.12	.23	.45	.70	.98	1.30	1.70	2.20	2.90	4.08	5.25
Apr	2.97	2.72	2.60	2001	12	6.80	1984	.83	1989	7.2	6.0	2.4	.7	.86	1.14	1.57	1.94	2.29	2.67	3.08	3.56	4.19	5.18	6.09
May	4.41	3.73	3.92	1963	27	9.13	1996	.37	1994	8.5	7.4	3.4	1.3	1.03	1.44	2.08	2.66	3.24	3.84	4.53	5.34	6.41	8.11	9.71
Jun	3.73	3.60	3.70	1974	9	8.88	1983	.59	1982	7.2	6.2	3.0	1.2	.96	1.31	1.85	2.33	2.80	3.30	3.85	4.51	5.37	6.72	7.98
Jul	3.55	3.28	5.00	1989	15	7.10	1993	.90	1991	7.1	6.4	2.5	1.1	1.03	1.37	1.87	2.31	2.74	3.19	3.68	4.26	5.02	6.20	7.30
Aug	2.89	2.97	4.06	1971	30	5.15	1985	.30	1999	5.2	4.2	2.1	1.0	.65	.92	1.34	1.72	2.10	2.51	2.97	3.51	4.23	5.37	6.44
Sep	2.96	2.48	3.40	1987	16	9.10	1986	.13	1990	4.6	4.1	2.1	1.1	.23	.43	.81	1.22	1.68	2.19	2.81	3.60	4.68	6.50	8.29
Oct	1.91	1.65	2.30	1980	16	6.05	1982	.00	1999	3.9	3.2	1.4	.6	.14	.34	.64	.92	1.21	1.53	1.90	2.35	2.96	3.95	4.90
Nov	.98	.88	2.30	1982	11	2.70	1982	.00	1980	3.8	2.7	.6	.2	.04	.12	.26	.40	.56	.73	.94	1.20	1.56	2.15	2.74
Dec	.43	.25	1.90	1981	1	2.47	1981	.00+	1986	3.2	1.7	.1	@	.00	.02	.08	.15	.22	.30	.40	.53	.70	1.00	1.29
Ann	26.60	27.21	5.00	Jul 1989	15	9.13	May 1996	.00+	Oct 1999	62.5	49.3	19.1	7.8	17.07	18.84	21.14	22.92	24.52	26.08	27.70	29.51	31.72	34.97	37.81

+ 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: 1956-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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151 Patton Avenue
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Station: BONESTEEL, SD

COOP ID: 390778

Climate Division: SD 9

NWS Call Sign:

Elevation: 1,985 Feet

Lat: 43°05N

Lon: 98°57W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	4	2	12.0	1988	19	15.0	1979	27	1988	26	17	1988	2.3	2.0	.7	.3	.1	13.9	8.1	5.6	2.5
Feb	6.0	5.0	4	2	10.0	1971	19	23.0	1978	34	1978	22	24	1978	2.2	2.2	.9	.2	.1	12.4	9.3	6.3	3.1
Mar	7.6	7.0	2	1	10.0	1986	13	24.0	1987	22	1978	6	7	1978	2.5	2.5	1.2	.4	@	8.6	5.0	3.2	.8
Apr	5.4	1.0	#	#	14.0	1988	26	34.0	1995	18+	1995	12	3	1995	1.1	1.1	.7	.4	.2	2.2	1.3	.9	.4
May	#	.0	#	0	#	1989	6	#+	1989	1	1989	22	#	1989	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1989	26	#	1989	.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	.1	.0	#	0	2.0	1985	28	3.0	1985	2	1985	28	#+	1985	.1	.1	.0	.0	.0	.1	.0	.0	.0
Oct	1.6	.0	#	0	9.0	1995	24	12.0	1995	10	1995	24	1	1995	.5	.4	.2	.1	.0	.7	.3	.1	@
Nov	7.5	5.0	2	#	14.0	1979	21	30.0	1983	22	1979	30	10	1985	2.5	2.4	1.0	.6	.1	6.8	4.7	3.5	2.1
Dec	6.1	4.0	3	2	10.0	1981	1	21.0	1981	22	1985	4	12	1985	2.4	2.1	.8	.3	.1	12.7	7.7	3.8	1.6
Ann	39.5	27.0	N/A	N/A	14.0+	Apr 1988	26	34.0	Apr 1995	34	Feb 1978	22	24	Feb 1978	13.6	12.8	5.5	2.3	.6	57.4	36.4	23.4	10.5

+ 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

Complete documentation available from:

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NWS Call Sign:

Elevation: 1,985 Feet

Lat: 43°05N

Lon: 98°57W

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	5/27	5/21	5/18	5/15	5/12	5/09	5/06	5/02	4/27
32	5/17	5/12	5/09	5/06	5/04	5/01	4/28	4/25	4/21
28	5/07	5/02	4/29	4/26	4/23	4/20	4/17	4/14	4/09
24	4/26	4/21	4/17	4/14	4/11	4/08	4/04	4/01	3/26
20	4/18	4/13	4/09	4/06	4/03	3/31	3/28	3/25	3/20
16	4/12	4/05	4/01	3/28	3/24	3/20	3/17	3/12	3/06
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	9/11	9/15	9/18	9/20	9/22	9/24	9/26	9/29	10/03
32	9/17	9/22	9/26	9/30	10/03	10/06	10/09	10/13	10/19
28	9/26	10/02	10/06	10/09	10/12	10/15	10/19	10/23	10/28
24	10/06	10/11	10/15	10/18	10/21	10/24	10/27	10/31	11/05
20	10/14	10/20	10/25	10/28	11/01	11/04	11/08	11/13	11/19
16	10/23	10/29	11/03	11/07	11/10	11/14	11/18	11/22	11/29
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	150	144	140	136	133	129	126	121	115
32	176	167	161	156	151	147	141	135	127
28	193	186	180	176	172	167	163	158	150
24	214	207	202	197	193	188	184	178	171
20	237	228	221	216	211	206	200	194	185
16	258	249	242	236	230	225	219	212	202

* 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

Complete documentation available from:

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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	1449	1144	962	591	257	64	15	37	165	494	959	1331	7468
60	1294	1004	807	446	146	20	1	12	83	343	809	1176	6141
57	1202	929	714	362	95	8	0	5	48	258	719	1083	5423
55	1141	877	653	309	68	4	0	2	32	208	662	1021	4977
50	995	746	505	194	25	0	0	0	9	105	523	877	3979
32	509	350	109	7	0	0	0	0	0	2	148	399	1524

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	83	130	170	406	787	1057	1284	1224	892	532	178	90	6833
55	2	13	1	19	142	371	571	514	234	25	3	0	1895
57	1	9	0	11	107	315	509	454	191	13	0	0	1610
60	0	0	0	5	65	237	417	369	135	5	0	0	1233
65	0	0	0	0	21	130	276	238	67	0	0	0	732
70	0	0	0	0	4	57	158	138	27	0	0	0	384

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	4	23	87	266	585	858	1075	1024	700	345	65	7	4	27	114	380	965	1823	2898	3922	4622	4967	5032	5039
45	0	4	41	160	433	708	920	869	553	225	28	1	0	4	45	205	638	1346	2266	3135	3688	3913	3941	3942
50	0	0	14	92	296	559	765	714	411	124	9	0	0	0	14	106	402	961	1726	2440	2851	2975	2984	2984
55	0	0	2	45	174	411	610	559	282	57	1	0	0	0	2	47	221	632	1242	1801	2083	2140	2141	2141
60	0	0	0	17	87	270	456	404	173	21	0	0	0	0	0	17	104	374	830	1234	1407	1428	1428	1428
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	5	25	73	178	358	550	708	666	443	229	55	10	5	30	103	281	639	1189	1897	2563	3006	3235	3290	3300

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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