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

COOP ID: 390559

Lon: 103°51W

Station: BELLE FOURCHE, SD

Climate Division: SD 3

NWS Call Sign:

Temperature (°F) Degree Days (1) Mean (1) Mean Number of Days (3) **Extremes** Base Temp 65 Max Max Max Max Min Min Highest Lowest Daily Daily Highest Lowest Month(1) Month(1) Cooling >= >= >= <= <= <= Month Mean Year Day Year Year Day Year Heating Max Min Daily(2) Daily(2) Mean Mean 100 90 50 32 32 0 36.0 10.6 23.3 69 1992 31 33.8 1990 -35+ 1950 4 9.0 1979 1294 0 .0 .0 5.9 11.5 29.1 8.0 Jan 41.4 15.0 28.2 72 +1995 25 38.1 1999 -32 1989 3 14.9 1979 1031 0 .0 .0 9.2 7.5 26.2 4.7 Feb Mar 49.4 22.2 35.8 82+ 1978 30 44.1 1986 -30 1960 4 27.7 1998 905 0 .0 .0 16.1 3.9 26.3 1.5 32.3 1997 Apr 60.9 46.6 93 1980 21 53.5 1987 -1 1975 2 41.0 552 0 .0 .1 23.9 .6 15.3 (a) May 71.3 42.7 57.0 97+ 1980 22 62.6 1977 15 1954 3 50.2 1996 267 19 .0 .6 30.3 .0 2.9 .0 27 29 3 60.9 4.9 81.4 51.9 66.7 106 1970 76.6 1988 1951 1998 75 124 .3 30.0 .0 .0 0. Jun Jul 88.6 57.2 72.9 1981 7 76.2 1974 37 1950 13 64.9 1993 17 262 2.0 13.4 31.0 110 .0 .0 .0 1992 21 88.0 55.1 71.6 108 +1975 7 77.3 1983 36+ 1993 31 66.3 223 1.0 13.1 31.0 .0 .0 .0 Aug Sep 77.6 43.9 60.8 107 1978 6 68.2 1998 18 1995 22 55.4 1993 178 52 .4 4.2 29.4 .0 2.4 .0 4 52.3 30 45.6 1972 Oct 65.0 33.0 49.0 94 +1963 1973 -12 1991 496 0 .0 .2 27.1 .3 14.7 (a) 47.1 21.1 34.1 83 1999 7 43.8 1999 -26 1959 14 19.4 1985 928 0 .0 .0 12.4 26.3 1.2 Nov 5.1 Dec 38.2 12.4 25.3 74 1979 18 35.2 1999 -44 1989 22 5.4 1983 1231 0 .0 .0 6.2 9.2 29.6 5.8 Jul Aug Dec Dec 33.1 47.6 110 1981 7 77.3 1983 -44 1989 22 5.4 1983 6995 680 3.7 36.5 252.5 38.1 172.8 21.2 62.1 Ann

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Issue Date: February 2004 006-A

Elevation: 3,020 Feet Lat: 44°40N

⁺ Also occurred on an earlier date(s)

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

⁽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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COOP ID: 390559

Station: BELLE FOURCHE, SD

Climate Division: SD 3 NWS Call Sign: Elevation: 3,020 Feet Lat: 44°40N Lon: 103°51W

										Pı	recipi	tation	(incl	nes)												
	Ma	Precipitation Totals Means/										Numbo Pays (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												
		ans(1)				Extremes	S			D	aily Pre	cipitatio	n	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	.46	.35	.54	1996	3	1.39	1971	.07	1992	5.3	1.8	@	.0	.05	.09	.15	.22	.28	.36	.45	.56	.71	.96	1.20		
Feb	.54	.49	.72	1998	26	1.69	1987	.06	1985	4.9	1.9	.2	.0	.09	.14	.21	.29	.36	.45	.54	.66	.81	1.06	1.30		
Mar	1.06	.88	2.30	1993	21	2.99	1993	.00	2000	6.6	3.1	.5	.2	.10	.22	.40	.55	.71	.88	1.07	1.31	1.62	2.13	2.61		
Apr	1.97	1.91	1.93	1997	5	4.60	1997	.14	1981	9.0	4.8	1.2	.3	.37	.55	.83	1.10	1.37	1.66	1.99	2.39	2.92	3.78	4.59		
May	2.99	2.39	4.25	1982	20	10.70	1982	.70	1998	10.8	6.5	1.7	.5	.75	1.03	1.46	1.85	2.23	2.63	3.08	3.61	4.31	5.42	6.45		
Jun	3.10	2.39	3.41	1976	14	9.36	1976	.26	1983	10.4	6.4	1.8	.6	.55	.83	1.28	1.70	2.13	2.60	3.13	3.78	4.63	6.01	7.33		
Jul	2.05	1.80	2.30	2001	24	4.55	1993	.08	1988	8.9	5.1	1.3	.4	.33	.50	.80	1.08	1.37	1.69	2.05	2.50	3.09	4.06	4.98		
Aug	1.39	1.07	2.04	1953	3	4.52	1983	.22	1990	6.2	3.4	.8	.2	.26	.38	.58	.77	.97	1.17	1.41	1.69	2.07	2.68	3.26		
Sep	1.30	1.12	2.17	1981	6	4.79	1986	.10	1975	5.2	2.8	.8	.2	.14	.24	.42	.60	.79	1.01	1.26	1.58	2.02	2.74	3.44		
Oct	1.74	1.24	2.49	1996	26	6.06	1998	.05	1993	6.1	3.6	1.0	.4	.11	.22	.43	.67	.94	1.25	1.63	2.11	2.78	3.92	5.05		
Nov	.71	.79	1.06	1986	7	2.00	2000	.02	1979	5.6	2.2	.2	.1	.08	.13	.23	.33	.44	.56	.69	.87	1.10	1.49	1.87		
Dec	.62	.47	.80	1984	23	2.27	1996	.06	1994	6.1	2.2	.2	.0	.05	.09	.17	.26	.36	.46	.59	.76	.99	1.37	1.74		
Ann	17.93	17.89	4.25	May 1982	20	10.70	May 1982	.00	Mar 2000	85.1	43.8	9.7	2.9	11.21	12.44	14.06	15.31	16.43	17.54	18.69	19.97	21.54	23.86	25.89		

⁺ Also occurred on an earlier date(s)

Complete documentation available from:

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

[#] 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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COOP ID: 390559

Station: BELLE FOURCHE, SD

Climate Division: SD 3 NWS Call Sign: Elevation: 3,020 Feet Lat: 44°40N Lon: 103°51W

										Snov	w (incl	hes)														
						Sn	ow To	tals							Mean Number of Days (1)											
	Mean	s/Medi	ians (1))					Extre	mes (2)				ow Fa	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	7.3	5.0	2	1	9.0	1971	31	24.2	1971	13	1971	31	7	1996	3.8	2.4	.9	.3	.0	12.9	6.9	3.2	.1			
Feb	4.7	5.0	1	#	7.0	1979	22	15.0	1978	13	1971	8	7	1978	2.5	1.7	.6	.1	.0	6.3	4.1	2.4	.5			
Mar	8.5	5.8	2	#	14.0	1987	21	30.0	1977	23	1977	30	7	1987	2.7	2.1	.8	.6	.2	3.9	2.1	1.2	.5			
Apr	3.0	.0	1	0	19.0	1997	5	19.0	1997	28	1997	10	10	1997	1.2	1.0	.4	.3	.1	.6	.4	.2	.2			
May	.2	.0	#	0	3.5	1991	3	3.5	1991	1	1972	1	#+	1998	.1	.1	.1	.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	#	2000	27	#	2000	.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	1985	30	1.0	1985	#	1985	28	#	1985	.1	@	.0	.0	.0	.0	.0	.0	.0			
Oct	1.8	.0	#	0	8.0	1989	29	11.5	1971	4	1971	29	#+	1999	.6	.5	.3	.1	.0	.4	.2	.0	.0			
Nov	4.7	2.1	1	#	8.5	1993	26	15.8	1978	11	1978	12	4	1978	1.9	1.4	.6	.3	.0	3.7	1.7	.6	.2			
Dec	5.2	4.5	1	1	10.0	1983	4	12.0	1975	12	1983	5	11	1983	3.6	2.4	.6	.3	@	8.1	3.1	1.8	.0			
Ann	35.4	22.4	N/A	N/A	19.0	Apr 1997	5	30.0	Mar 1977	28	Apr 1997	10	11	Dec 1983	16.5	11.6	4.3	2.0	.3	35.9	18.5	9.4	1.5			

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

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

[@] 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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Lat: 44°40N

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Station: BELLE FOURCHE, SD

Climate Division: SD 3 NWS Call Sign:

Freeze Data Spring Freeze Dates (Month/Day) Probability of later date in spring (thru Jul 31) than indicated(*) Temp (F) .10 .20 .30 .40 .60 .70 .80 .90 36 6/03 5/29 5/25 5/22 5/19 5/16 5/13 5/09 5/04 32 5/23 5/18 5/15 5/13 5/10 5/07 5/05 5/02 4/27 28 5/12 5/07 5/03 4/30 4/27 4/24 4/21 4/17 4/12 5/04 4/22 4/05 24 4/29 4/25 4/20 4/17 4/14 4/10 20 4/23 4/18 4/15 4/12 4/09 4/07 4/04 3/31 3/27 4/11 4/05 4/02 16 4/16 4/08 3/30 3/27 3/23 3/18 Fall Freeze Dates (Month/Day) Probability of earlier date in fall (beginning Aug 1) than indicated(*) Temp (F) .20 .30 .40 .50 .70 .10 .60 .80 .90 9/09 36 9/03 9/07 9/12 9/14 9/16 9/18 9/21 9/25 32 9/12 9/16 9/19 9/21 9/23 9/25 9/28 9/30 10/04 10/15 28 9/17 9/21 9/25 9/28 10/01 10/03 10/06 10/10 24 9/28 10/03 10/07 10/11 10/14 10/17 10/21 10/25 10/31 20 10/06 10/11 10/15 10/19 10/22 10/25 10/28 11/01 11/06 10/23 10/27 10/30 11/03 16 10/17 11/06 11/09 11/13 11/19 Freeze Free Period **Probability of longer than indicated freeze free period (Days)** Temp (F) .10 .20 .30 .40 .50 .60 .70 .80 .90 136 129 125 121 117 113 109 36 105 98 32 154 147 143 139 135 132 128 123 117 28 177 170 164 156 152 147 142 135 160 24 198 191 186 181 177 173 168 163 156 172 20 217 209 204 199 195 190 185 180 229 16 237 224 219 214 210 205 199 191

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:

Elevation: 3,020 Feet

^{*} Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

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Station: BELLE FOURCHE, SD COOP ID: 390559

Climate Division: SD 3 NWS Call Sign: Elevation: 3,020 Feet Lat: 44°40N Lon: 103°51W

				Deg	ree Days t	o Selected	Base Tem	peratures	(°F)				
Base						Heatin	g Degree l	Days (1)					
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1294	1031	905	552	267	75	17	21	178	496	928	1231	6995
60	1139	896	750	407	152	26	3	4	90	343	778	1076	5664
57	1048	818	658	325	100	12	0	1	53	254	688	983	4940
55	988	765	597	274	72	6	0	1	34	200	636	923	4496
50	845	636	451	163	25	0	0	0	9	92	496	780	3497
32	384	268	84	4	0	0	0	0	0	1	137	327	1205

Base						Coolin	g Degree l	Days (1)					
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	114	161	202	442	776	1039	1269	1225	864	528	198	119	6937
55	5	15	1	21	134	355	556	512	208	14	8	2	1831
57	2	12	0	13	100	301	494	451	166	6	0	0	1545
60	0	5	0	5	60	225	404	361	113	2	0	0	1175
65	0	0	0	0	19	124	262	223	52	0	0	0	680
70	0	0	0	0	4	55	147	114	18	0	0	0	338

										Gro	wing 1	Degre	e Uni	ts (2)												
Base					Growin	g Degree	Units (M	Ionthly)					Growing Degree Units (Accumulated Monthly)													
	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec J													Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
40	19	30	80	246	531	799	1019	980	626	306	65	13	19	49	129	375	906	1705	2724	3704	4330	4636	4701	4714		
45	1	8	33	141	384	649	864	825	484	184	24	2	1	9	42	183	567	1216	2080	2905	3389	3573	3597	3599		
50	1	0	6	68	247	499	709	670	344	94	5	0	1	1	7	75	322	821	1530	2200	2544	2638	2643	2643		
55	0	0	0	23	136	352	554	515	215	35	0	0	0	0	0	23	159	511	1065	1580	1795	1830	1830	1830		
60	0	0	0	8	59	218	399	363	120	8	0	0	0	0	0	8	67	285	684	1047	1167	1175	1175	1175		
Base	Growing Degree Units for Corn (Monthly)													Gr	owing D	egree Un	its for C	orn (Acc	umulate	d Month	ly)					
50/86	6 20 40 89 192 343 503 645 621 417 245 68 20											20	60	149	341	684	1187	1832	2453	2870	3115	3183	3203			

(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

- c. Snow Tables
 - 1. Snow Climatology
 - 2. Cooperative Summary of the Day
- d. Freeze Data Table

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

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