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: DE SMET, SD **COOP ID: 392302**

Climate Division: SD 7 **NWS Call Sign:** **Elevation: 1,720 Feet** **Lat: 44˚23N** **Lon: 97˚33W**

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	22.0	2.1	12.1	65	1981	24	25.8	1990	-32+	1972	15	-2.7	1979	1642	0	.0	.0	.5	22.3	30.9	13.2
Feb	29.0	9.5	19.3	68	1958	23	30.6	1987	-36	1994	9	5.3	1979	1280	0	.0	.0	2.2	15.2	27.8	7.3
Mar	40.7	20.9	30.8	79	1967	30	39.8	2000	-21	1948	11	23.5	1984	1061	0	.0	.0	8.6	7.2	26.4	2.1
Apr	56.7	33.8	45.3	96+	1980	21	53.1	1987	-3	1975	3	38.4	1995	595	3	.0	.1	22.2	.7	13.3	@
May	69.3	45.6	57.5	97	1967	25	64.6	1977	19+	1967	3	50.7	1997	267	33	.0	.2	30.5	.0	1.2	.0
Jun	78.8	55.8	67.3	105+	1988	24	74.9	1988	33	1958	25	62.2	1985	61	130	.2	2.4	30.0	.0	.0	.0
Jul	83.7	60.5	72.1	108	1966	10	77.6	1974	34	1965	10	63.2	1992	24	244	.4	8.3	31.0	.0	.0	.0
Aug	81.6	58.3	70.0	106	1988	15	76.5	1983	38+	1964	13	64.9	1985	37	191	.2	5.5	31.0	.0	.0	.0
Sep	72.3	48.0	60.2	102	1976	6	66.8	1998	22	1974	30	52.8	1993	192	47	.1	1.9	29.6	.0	.8	.0
Oct	59.1	35.3	47.2	91+	1963	5	52.0	1973	8	1991	29	42.5	1976	553	0	.0	.0	25.4	.4	10.4	.0
Nov	38.9	20.4	29.7	78+	1999	8	41.6	1999	-17	1964	30	17.7	1985	1060	0	.0	.0	7.4	9.2	26.1	1.2
Dec	26.1	7.3	16.7	63	1998	1	26.2	1997	-30+	1989	21	-1.5	1983	1497	0	.0	.0	1.0	19.7	30.7	8.8
Ann	54.9	33.1	44.0	108	Jul 1966	10	77.6	Jul 1974	-36	Feb 1994	9	-2.7	Jan 1979	8269	648	.9	18.4	219.4	74.7	167.6	32.6

\+ 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/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	.62	.53	1.16	1976	1	2.22	1975	.00+	1991
Feb	.62	.51	2.31	1977	23	2.40	1977	.08	1982
Mar	1.53	1.40	1.60	1998	31	3.51+	1985	.05	1971
Apr	2.21	2.05	2.46	1986	14	7.63	1986	.25	1996
May	3.08	2.61	2.65	1965	21	6.54	1991	.10	1997
Jun	3.92	3.51	4.39	1984	19	11.92	1984	1.21	1973
Jul	3.55	2.99	3.72	1986	26	8.31	1987	.13	1975
Aug	2.76	2.61	4.06	1984	3	5.85	1984	.50	1976
Sep	2.36	2.34	3.50	1995	30	7.62	1985	.05	1974
Oct	1.68	1.20	3.05	1956	30	4.86	1984	.00	1993
Nov	1.06	.88	1.76	1971	16	4.16	2000	.05	1990
Dec	.45	.38	1.10	1949	11	1.42	1972	.00+	1999
Ann	23.84	23.45	4.39	Jun 1984	19	11.92	Jun 1984	.00+	Dec 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.6	2.3	.2	@
Feb	3.7	1.9	.1	@
Mar	5.7	3.6	1.0	.2
Apr	6.9	4.7	1.5	.4
May	8.4	5.9	2.2	.7
Jun	8.2	6.5	2.7	1.1
Jul	7.7	5.5	2.5	1.0
Aug	6.8	4.8	1.8	.8
Sep	5.7	3.8	1.4	.8
Oct	4.5	3.2	1.1	.5
Nov	4.8	2.9	.5	.2
Dec	3.3	1.5	.1	.0
Ann	69.3	46.6	15.1	5.7

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	.21	.32	.42	.53	.65	.79	.97	1.27	1.55
Feb	.14	.20	.29	.37	.45	.54	.63	.75	.91	1.15	1.38
Mar	.20	.32	.54	.75	.98	1.23	1.52	1.87	2.36	3.15	3.92
Apr	.38	.58	.90	1.20	1.51	1.84	2.23	2.69	3.31	4.31	5.26
May	.55	.82	1.27	1.69	2.12	2.58	3.11	3.75	4.60	5.98	7.29
Jun	1.01	1.38	1.95	2.45	2.95	3.47	4.05	4.74	5.63	7.05	8.37
Jul	.68	1.00	1.52	2.00	2.49	3.01	3.60	4.32	5.27	6.79	8.24
Aug	.87	1.13	1.52	1.85	2.17	2.50	2.87	3.30	3.85	4.71	5.50
Sep	.19	.35	.65	.98	1.34	1.75	2.25	2.87	3.73	5.17	6.60
Oct	.08	.23	.48	.73	.99	1.29	1.64	2.07	2.67	3.65	4.61
Nov	.04	.09	.20	.34	.50	.70	.94	1.26	1.72	2.51	3.31
Dec	.00	.00	.08	.16	.24	.33	.44	.57	.74	1.03	1.31
Ann	14.78	16.44	18.62	20.30	21.82	23.31	24.86	26.60	28.73	31.87	34.62

\+ 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	6.3	5.5	7	4
Feb	6.3	6.0	7	4
Mar	7.9	5.0	3	2
Apr	2.0	.5	#	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
Oct	1.3	.0	#	0
Nov	6.1	3.0	1	#
Dec	5.5	4.1	5	3
Ann	35.4	24.1	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	12.0	1975	8	23.0	1988	43	1988	24	26	1988
Feb	10.0	1977	23	18.5	1989	47	1988	15	40	1988
Mar	12.0	1985	2	30.0	1985	29	1985	5	10	1986
Apr	8.0	1994	28	11.0	1982	17	1975	2	3	1975
May	1.0	1979	9	1.0	1979	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	#	1984	25	#	1984	0	0	0	0	0
Oct	8.5	1999	1	8.5	1999	6	1999	1	1	1995
Nov	11.0	1998	9	21.5	2000	12	1983	29	7	1975
Dec	12.0	1987	27	18.5	1985	44	1985	4	33	1985
Ann	12.0+	Dec 1987	27	30.0	Mar 1985	47	Feb 1988	15	40	Feb 1988

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.7	.8	.2	.1
Feb	2.7	2.3	.8	.2	@
Mar	2.6	2.3	1.0	.4	.2
Apr	1.0	.8	.3	.2	.0
May	@	@	.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	.4	.4	.2	.1	.0
Nov	3.0	2.6	.9	.4	.1
Dec	2.8	2.2	.4	.2	@
Ann	15.5	13.3	4.4	1.7	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	20.3	15.9	11.6	4.1
Feb	16.1	12.3	7.4	.9
Mar	9.7	6.9	4.6	2.3
Apr	1.3	.8	.6	.3
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	.4	.2	.1	.0
Nov	6.0	4.3	3.2	.8
Dec	16.4	13.9	10.9	3.1
Ann	70.2	54.3	38.4	11.5

+ 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

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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	5/25	5/21	5/18	5/15	5/12	5/10	5/07	5/04	4/29
32	5/15	5/10	5/07	5/04	5/01	4/28	4/25	4/22	4/17
28	5/09	5/04	5/01	4/28	4/25	4/22	4/19	4/16	4/11
24	4/30	4/25	4/21	4/18	4/15	4/12	4/08	4/04	3/30
20	4/16	4/11	4/08	4/06	4/04	4/01	3/30	3/27	3/22
16	4/08	4/03	3/30	3/27	3/25	3/22	3/19	3/15	3/11

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	9/23	9/25	9/27	9/29	10/02	10/06
32	9/21	9/25	9/27	9/29	10/01	10/02	10/04	10/06	10/10
28	9/26	10/01	10/04	10/07	10/10	10/13	10/16	10/19	10/24
24	10/08	10/13	10/16	10/19	10/22	10/25	10/28	10/31	11/05
20	10/14	10/20	10/23	10/27	10/30	11/02	11/05	11/09	11/14
16	10/25	10/30	11/02	11/05	11/08	11/11	11/14	11/17	11/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	154	147	143	139	135	131	127	122	116
32	169	163	159	155	152	148	145	141	135
28	188	181	176	171	167	163	159	154	147
24	210	203	198	194	190	185	181	176	169
20	229	222	217	212	208	204	200	195	188
16	248	241	236	231	228	224	219	214	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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1642	1280	1061	595	267	61	24	37	192	553	1060	1497	8269
60	1487	1140	906	453	162	19	7	11	101	401	910	1342	6939
57	1394	1056	813	373	113	8	0	3	62	314	820	1249	6205
55	1332	1000	751	323	86	4	0	1	42	261	760	1187	5747
50	1177	869	602	213	37	0	0	0	12	146	616	1032	4704
32	664	429	175	15	0	0	0	0	0	4	197	531	2015

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	45	73	138	413	789	1059	1244	1176	845	474	127	57	6440
55	0	0	0	31	161	373	531	465	197	17	0	0	1775
57	0	0	0	21	126	317	469	405	157	9	0	0	1504
60	0	0	0	11	83	238	382	319	106	3	0	0	1142
65	0	0	0	3	33	130	244	191	47	0	0	0	648
70	0	0	0	0	10	57	138	97	16	0	0	0	318

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	6	47	240	583	846	1029	970	651	294	37	1	0	6	53	293	876	1722	2751	3721	4372	4666	4703	4704
45	0	1	17	143	432	696	874	815	502	178	14	0	0	1	18	161	593	1289	2163	2978	3480	3658	3672	3672
50	0	0	3	79	293	546	719	660	363	93	3	0	0	0	3	82	375	921	1640	2300	2663	2756	2759	2759
55	0	0	0	41	171	397	564	505	231	37	0	0	0	0	0	41	212	609	1173	1678	1909	1946	1946	1946
60	0	0	0	15	85	257	411	353	133	12	0	0	0	0	0	15	100	357	768	1121	1254	1266	1266	1266
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	6	39	158	358	545	681	639	401	185	26	0	0	6	45	203	561	1106	1787	2426	2827	3012	3038	3038

(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