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: REDFIELD 5 SE, SD **COOP ID: 397052**

Climate Division: SD 7 **NWS Call Sign: 3DE** **Elevation: 1,275 Feet** **Lat: 44˚50N** **Lon: 98˚26W**

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	23.5	2.5	13.0	63	1981	24	27.2	1990	-38	1970	19	-.4	1978	1612	0	.0	.0	.5	22.7	31.0	15.0
Feb	31.2	11.3	21.3	72	1958	25	34.2	1987	-47	1994	9	5.0	1979	1225	0	.0	.0	2.5	15.9	27.7	9.0
Mar	42.9	22.7	32.8	83	1963	31	40.9	2000	-26	1960	4	23.7	1996	999	0	.0	.0	8.2	7.8	27.0	2.4
Apr	59.7	33.6	46.7	98	1980	22	53.2	1977	-8	1975	3	40.1	1995	551	2	.0	.2	21.6	.8	15.7	.1
May	72.2	44.9	58.6	102	1959	1	67.3	1977	15	1967	3	53.9	1996	238	39	.0	.5	30.4	.0	3.3	.0
Jun	81.0	54.7	67.9	110	1988	25	76.3	1988	29	1964	2	62.6	1982	59	144	.2	3.2	30.0	.0	.0	.0
Jul	87.2	59.9	73.6	113	1966	10	79.5	1974	36	1971	30	64.7	1992	17	282	1.5	9.7	31.0	.0	.0	.0
Aug	86.3	57.9	72.1	114	1965	13	78.7	1983	31	1950	20	65.8	1992	26	247	1.0	8.1	31.0	.0	.0	.0
Sep	76.1	46.5	61.3	106	1978	6	68.6	1978	16+	1974	30	55.7	1993	166	54	.2	2.6	29.5	.0	2.5	.0
Oct	62.0	34.6	48.3	97	1963	5	55.0	1973	7+	1991	31	42.8	1972	519	0	.0	.2	25.1	.2	14.8	.0
Nov	42.1	21.1	31.6	79	1999	9	41.1	1999	-22	1964	30	20.0	1985	1002	0	.0	.0	8.2	8.6	27.8	1.7
Dec	29.3	8.4	18.9	65	1998	2	29.7	1997	-36+	1990	31	1.5	1983	1430	0	.0	.0	1.2	19.1	31.0	10.0
Ann	57.8	33.2	45.5	114	Aug 1965	13	79.5	Jul 1974	-47	Feb 1994	9	-.4	Jan 1978	7844	768	2.9	24.5	219.2	75.1	180.8	38.2

\+ 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: 1949-2001

(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	.37	.27	.46	1992	8	1.11	1975	.00+	1978
Feb	.51	.40	1.75	1958	27	1.33	1977	.02	1985
Mar	1.19	.92	1.51	1977	12	5.30	1977	.08	1971
Apr	1.92	1.73	2.00	1970	12	6.25	1986	.09	1996
May	2.97	2.28	2.48	1972	29	10.24	1972	.53	1976
Jun	3.17	2.91	3.84	1992	17	7.28	1992	1.12+	1996
Jul	3.00	2.67	3.80	1994	7	9.20	1993	.00	1975
Aug	2.41	2.25	2.68	1966	20	4.71	1984	.06	1972
Sep	1.85	1.36	2.04	1989	21	4.86	1996	.00+	1998
Oct	1.64	1.17	2.28	1998	17	6.82	1998	.14	1978
Nov	.60	.57	1.06	1970	8	1.75	2000	.00+	1999
Dec	.33	.26	1.16	1951	7	1.04+	1996	.00+	1999
Ann	19.96	21.03	3.84	Jun 1992	17	10.24	May 1972	.00+	Dec 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.7	1.1	.0	.0
Feb	3.7	1.6	.2	.0
Mar	5.3	3.1	.7	.2
Apr	7.3	4.6	1.0	.3
May	10.0	6.3	2.1	.7
Jun	9.1	6.0	2.2	.7
Jul	8.0	5.3	1.7	.7
Aug	6.5	4.0	1.7	.7
Sep	5.5	3.3	1.2	.6
Oct	4.7	3.1	1.1	.4
Nov	4.3	1.8	.3	.0
Dec	3.0	1.1	.1	.0
Ann	71.1	41.3	12.3	4.3

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
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.00	.02	.07	.12	.19	.26	.34	.45	.60	.85	1.10
Feb	.06	.10	.17	.24	.32	.40	.50	.62	.78	1.05	1.31
Mar	.12	.20	.36	.53	.71	.91	1.15	1.45	1.86	2.55	3.21
Apr	.30	.47	.75	1.01	1.29	1.59	1.93	2.35	2.91	3.82	4.69
May	.57	.84	1.28	1.68	2.09	2.52	3.02	3.62	4.42	5.69	6.90
Jun	.94	1.24	1.69	2.08	2.46	2.86	3.29	3.81	4.47	5.50	6.47
Jul	.31	.67	1.17	1.60	2.04	2.51	3.05	3.70	4.56	5.95	7.27
Aug	.45	.67	1.02	1.35	1.68	2.04	2.44	2.93	3.59	4.64	5.64
Sep	.00	.00	.47	.79	1.11	1.45	1.85	2.34	2.97	4.03	5.05
Oct	.13	.24	.46	.69	.94	1.22	1.56	1.99	2.59	3.59	4.57
Nov	.00	.00	.10	.22	.33	.45	.59	.76	1.00	1.38	1.75
Dec	.00	.00	.04	.09	.15	.21	.30	.40	.55	.81	1.07
Ann	12.80	14.13	15.86	17.20	18.40	19.57	20.79	22.15	23.81	26.25	28.38

\+ 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: 1949-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Climate Division: SD 7 **NWS Call Sign: 3DE** **Elevation: 1,275 Feet** **Lat: 44°50N** **Lon: 98°26W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	4.6	2.9	5	4
Feb	5.8	6.0	5	3
Mar	6.7	5.8	3	2
Apr	2.3	.0	1	#
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	#	0
Oct	.5	.0	#	0
Nov	4.4	3.3	1	1
Dec	5.3	5.0	3	2
Ann	29.6	23.0	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	1982	23	15.0	1994	22	1994	31	16	1994
Feb	8.0	1977	24	12.5	1986	29	1994	15	21	1978
Mar	11.0	1985	4	30.0	1985	23	1985	4	11	1978
Apr	8.0	1990	29	12.0	1995	22	1975	5	12	1975
May	#	1989	6	#	1989	#	1989	5	#	1989
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	#	1995	22	#	1995	#	1995	22	#	1995
Oct	3.0	1976	19	6.5	1976	3	1976	19	#+	1999
Nov	8.0	1993	25	15.0	1993	16	1985	30	6	2000
Dec	14.0	1996	15	14.0	1996	18	1985	4	12	1985
Ann	14.0	Dec 1996	15	30.0	Mar 1985	29	Feb 1994	15	21	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.3	2.5	.5	.1	.0
Feb	2.7	2.3	.7	.2	.0
Mar	2.5	2.0	.7	.4	.1
Apr	.9	.8	.3	.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	.3	.2	@	.0	.0
Nov	2.0	1.8	.6	.2	.0
Dec	2.3	1.6	.6	.3	@
Ann	14.0	11.2	3.4	1.3	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	16.6	7.3	3.7	.0
Feb	11.5	4.4	1.7	.0
Mar	6.6	4.6	3.4	1.4
Apr	1.1	.4	.2	.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	.4	@	.0	.0
Nov	4.8	2.4	.6	.2
Dec	7.3	3.2	2.0	.0
Ann	48.3	22.3	11.6	1.6

+ 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	6/14	6/07	6/01	5/27	5/23	5/18	5/13	5/07	4/30
32	5/25	5/20	5/16	5/13	5/10	5/07	5/03	4/30	4/24
28	5/16	5/11	5/08	5/05	5/03	4/30	4/28	4/25	4/20
24	5/07	5/01	4/27	4/24	4/21	4/18	4/14	4/11	4/05
20	4/26	4/20	4/16	4/12	4/09	4/05	4/02	3/29	3/23
16	4/12	4/08	4/04	4/01	3/29	3/26	3/23	3/20	3/15

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	9/05	9/08	9/10	9/13	9/15	9/16	9/19	9/21	9/24
32	9/12	9/16	9/18	9/21	9/23	9/25	9/28	10/01	10/05
28	9/18	9/23	9/26	9/29	10/02	10/05	10/08	10/12	10/17
24	9/25	9/30	10/04	10/07	10/11	10/14	10/17	10/21	10/26
20	10/07	10/12	10/16	10/19	10/22	10/25	10/29	11/01	11/07
16	10/13	10/19	10/24	10/28	10/31	11/04	11/08	11/12	11/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	142	132	125	120	114	109	103	96	87
32	157	149	144	140	136	132	127	122	115
28	170	164	159	155	152	148	144	140	133
24	191	185	180	176	172	168	164	159	153
20	217	210	204	200	196	191	187	182	174
16	237	229	224	220	215	211	207	201	194

***** 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	1612	1225	999	551	238	59	17	26	166	519	1002	1430	7844
60	1457	1085	844	408	138	19	3	7	81	369	852	1275	6538
57	1364	1009	751	328	92	8	0	2	46	285	762	1182	5829
55	1302	957	691	279	67	4	0	1	30	235	703	1120	5389
50	1149	826	546	172	26	0	0	0	7	129	563	973	4391
32	636	416	150	6	0	0	0	0	0	3	168	485	1864

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	115	175	447	823	1075	1288	1244	878	508	155	78	6834
55	0	12	2	29	178	389	575	532	218	27	0	0	1962
57	0	8	1	19	140	333	513	471	175	15	0	0	1675
60	0	0	0	9	93	254	423	383	119	5	0	0	1286
65	0	0	0	2	39	144	282	247	54	0	0	0	768
70	0	0	0	0	12	67	165	140	18	0	0	0	402

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	3	39	214	549	815	1018	952	613	261	34	0	0	3	42	256	805	1620	2638	3590	4203	4464	4498	4498
45	0	0	11	127	404	665	863	797	468	153	11	0	0	0	11	138	542	1207	2070	2867	3335	3488	3499	3499
50	0	0	1	65	272	515	708	642	329	79	2	0	0	0	1	66	338	853	1561	2203	2532	2611	2613	2613
55	0	0	0	28	157	370	553	488	211	31	0	0	0	0	0	28	185	555	1108	1596	1807	1838	1838	1838
60	0	0	0	11	77	235	400	341	123	9	0	0	0	0	0	11	88	323	723	1064	1187	1196	1196	1196
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	6	36	154	343	521	665	617	399	192	34	0	0	6	42	196	539	1060	1725	2342	2741	2933	2967	2967

(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