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: CENTERVILLE 6 SE, SD **COOP ID: 391579**

Climate Division: SD 9 **NWS Call Sign:** **Elevation: 1,260 Feet** **Lat: 43˚03N** **Lon: 96˚54W**

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	25.5	5.3	15.4	70	1981	25	27.5	1992	-44	1912	12	1.2	1979	1537	0	.0	.0	1.1	19.7	31.0	12.2
Feb	32.2	12.0	22.1	72+	1982	23	33.8	1987	-35	1936	16	4.2	1979	1202	0	.0	.0	3.7	14.1	27.7	6.9
Mar	44.0	23.5	33.8	92	1943	30	41.1	2000	-21	1913	2	25.2	1975	969	0	.0	.0	10.8	6.4	25.3	1.6
Apr	59.0	35.3	47.2	97	1926	30	55.0	1977	1+	1975	3	41.3	1995	540	5	.0	.3	22.3	.6	12.9	.0
May	71.2	47.8	59.5	109	1934	30	67.3	1977	19+	1967	3	52.7	1997	225	55	.0	.8	30.3	.0	1.5	.0
Jun	80.8	58.0	69.4	108	1931	28	76.4	1988	33	1935	7	64.9	1982	33	164	.4	4.3	30.0	.0	.0	.0
Jul	85.0	62.3	73.7	113	1936	17	78.7	1974	38	1971	30	65.7	1992	16	285	.6	8.5	31.0	.0	.0	.0
Aug	83.0	60.0	71.5	111+	1936	24	78.7	1983	32	1986	28	65.2	1992	28	229	.3	6.1	31.0	.0	@	.0
Sep	75.2	49.3	62.3	106+	1971	3	68.6	1998	19	1984	26	55.4	1993	145	62	.1	2.5	29.6	.0	2.2	.0
Oct	62.5	36.9	49.7	95	1963	5	54.7	1975	-6	1925	29	44.4	1987	475	1	.0	.1	26.3	.2	12.0	.0
Nov	42.9	23.9	33.4	82	1999	9	44.1	1999	-20	1977	27	23.3	1985	948	0	.0	.0	9.6	6.7	25.7	1.3
Dec	29.2	10.7	20.0	67+	1998	2	27.9	1979	-39	1917	29	.9	1983	1397	0	.0	.0	1.8	17.4	30.8	7.7
Ann	57.5	35.4	46.5	113	Jul 1936	17	78.7+	Aug 1983	-44	Jan 1912	12	.9	Dec 1983	7515	801	1.4	22.6	227.5	65.1	169.1	29.7

\+ 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: 1897-2001

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

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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	.43	.35	1.20	1917	21	1.61	1975	.00+	1981
Feb	.52	.36	2.47	1954	20	1.83	1971	.00	1985
Mar	1.64	1.23	1.73	1979	22	4.19	1995	.00	1994
Apr	2.47	2.11	2.50	1944	23	6.43	1984	.41	1981
May	3.65	3.19	3.50	1944	20	9.34	1982	1.19	1989
Jun	3.95	3.54	4.21	1899	25	11.02	1983	1.31	1976
Jul	3.35	3.07	6.02	1900	14	10.61	1978	.31	1975
Aug	2.83	2.63	3.16	1906	2	6.70	1975	.58	1999
Sep	2.26	1.82	3.79	1909	12	5.36	1996	.25	1999
Oct	1.80	1.50	2.69	1968	16	4.99	1984	.21	1989
Nov	1.36	1.28	2.25	1998	10	3.88	1996	.03	1980
Dec	.55	.46	1.13	1953	3	1.85	1982	.04	1974
Ann	24.81	24.79	6.02	Jul 1900	14	11.02	Jun 1983	.00+	Mar 1994

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	1.3	.1	.0
Feb	3.8	1.4	.1	.1
Mar	6.9	3.9	.9	.3
Apr	9.2	5.2	1.6	.4
May	11.4	7.6	2.7	.7
Jun	9.9	6.8	2.6	1.0
Jul	8.8	5.4	2.2	1.1
Aug	8.7	5.4	1.9	.6
Sep	7.0	4.4	1.4	.6
Oct	6.3	3.7	1.1	.4
Nov	5.4	2.9	.9	.2
Dec	4.1	1.5	.2	.0
Ann	85.8	49.5	15.7	5.4

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	.05	.13	.19	.26	.34	.43	.53	.68	.92	1.14
Feb	.01	.04	.11	.18	.26	.36	.48	.63	.84	1.19	1.55
Mar	.16	.35	.62	.86	1.10	1.36	1.66	2.02	2.50	3.28	4.03
Apr	.51	.73	1.10	1.43	1.76	2.12	2.52	3.01	3.65	4.67	5.64
May	1.22	1.57	2.07	2.50	2.91	3.34	3.80	4.35	5.04	6.13	7.12
Jun	1.25	1.62	2.18	2.65	3.11	3.59	4.11	4.72	5.51	6.74	7.88
Jul	.65	.95	1.44	1.89	2.35	2.85	3.41	4.08	4.98	6.41	7.78
Aug	.67	.93	1.35	1.72	2.08	2.47	2.91	3.43	4.11	5.19	6.21
Sep	.42	.63	.96	1.26	1.58	1.91	2.29	2.75	3.36	4.35	5.28
Oct	.18	.31	.56	.81	1.08	1.39	1.75	2.20	2.81	3.83	4.83
Nov	.08	.16	.33	.52	.72	.97	1.26	1.64	2.17	3.07	3.97
Dec	.05	.09	.16	.24	.32	.42	.53	.67	.86	1.19	1.51
Ann	16.07	17.70	19.82	21.45	22.92	24.35	25.83	27.49	29.51	32.48	35.07

\+ 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: 1897-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	5.0	3.5	4	4	12.5	1988	20	18.8	1975	16	1979	31	8+	1997	3.7	1.9	.5	.1	@	19.1	12.2	6.2	1.3
Feb	3.5	2.5	4	1	14.0	1984	19	15.5	1984	20	1979	28	18	1979	2.7	1.7	.4	.1	.1	8.5	3.3	2.1	1.1
Mar	5.1	5.0	2	#	6.5	1974	20	13.5	1983	26	1979	5	15	1993	2.8	2.0	.9	.2	.0	5.2	2.4	1.4	.0
Apr	1.8	.8	#	0	7.0	1992	21	8.3	1992	7	1994	29	1	1994	1.2	.9	.2	.1	.0	.7	.2	@	.0
May	.0	.0	#	0	.0	0	0	.0	0	#	1994	2	#	1994	.0	.0	.0	.0	.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	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	#	.0	0	0	#	1984	25	#	1984	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.5	.0	#	0	4.0	1982	20	4.5	1980	3	1980	28	#+	1999	.3	.2	@	.0	.0	.1	.0	.0	.0
Nov	5.9	4.1	1	#	10.0	1979	22	19.5	1991	10+	2000	16	5	2000	2.7	1.9	.7	.3	.1	3.7	2.1	1.5	.1
Dec	6.2	6.3	2	1	10.0	1982	28	13.5	1985	11+	1996	31	6	1996	3.5	2.0	.6	.2	@	14.7	10.1	4.3	.5
Ann	28.0	22.2	N/A	N/A	14.0	Feb 1984	19	19.5	Nov 1991	26	Mar 1979	5	18	Feb 1979	16.9	10.6	3.3	1.0	.2	52.0	30.3	15.5	3.0

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

(1) Derived from Snow Climatology and 1971-2000 daily data

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

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	5/26	5/21	5/17	5/14	5/10	5/07	5/04	4/30	4/25
32	5/16	5/11	5/08	5/05	5/02	4/29	4/26	4/23	4/18
28	5/10	5/05	5/01	4/27	4/24	4/21	4/17	4/13	4/08
24	5/02	4/26	4/22	4/18	4/15	4/11	4/08	4/03	3/28
20	4/17	4/12	4/08	4/05	4/02	3/30	3/27	3/23	3/18
16	4/08	4/03	3/30	3/27	3/24	3/20	3/17	3/13	3/08

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	9/08	9/11	9/14	9/16	9/18	9/20	9/23	9/25	9/29
32	9/11	9/15	9/18	9/21	9/24	9/27	9/29	10/03	10/07
28	9/18	9/23	9/27	10/01	10/04	10/07	10/11	10/15	10/20
24	9/26	10/02	10/07	10/11	10/14	10/18	10/21	10/26	11/01
20	10/09	10/14	10/18	10/21	10/24	10/27	10/31	11/03	11/09
16	10/18	10/24	10/29	11/02	11/05	11/09	11/12	11/17	11/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	153	145	139	135	130	126	121	115	107
32	165	158	153	148	144	140	135	130	123
28	182	175	170	166	162	158	154	149	142
24	204	197	191	186	182	177	172	167	159
20	226	219	214	209	205	201	196	191	183
16	251	242	236	231	226	221	215	209	200

***** 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	1537	1202	969	540	225	33	16	28	145	475	948	1397	7515
60	1382	1062	814	401	133	7	4	8	66	326	798	1242	6243
57	1289	978	722	325	91	2	0	2	36	245	709	1149	5548
55	1227	927	661	277	68	1	0	0	22	197	653	1087	5120
50	1073	797	518	176	29	0	0	0	4	100	514	935	4146
32	564	379	132	9	0	0	0	0	0	2	145	443	1674

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	50	101	186	464	852	1121	1292	1225	906	550	186	69	7002
55	0	6	2	42	207	432	579	512	238	32	4	0	2054
57	0	0	0	30	168	374	517	452	192	19	0	0	1752
60	0	0	0	16	117	289	428	365	133	6	0	0	1354
65	0	0	0	5	55	164	285	229	62	1	0	0	801
70	0	0	0	0	20	75	167	126	21	0	0	0	409

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	9	67	259	602	873	1033	960	651	312	53	1	0	9	76	335	937	1810	2843	3803	4454	4766	4819	4820
45	0	1	34	163	452	723	878	805	504	193	21	0	0	1	35	198	650	1373	2251	3056	3560	3753	3774	3774
50	0	0	11	90	312	573	723	650	365	108	6	0	0	0	11	101	413	986	1709	2359	2724	2832	2838	2838
55	0	0	3	48	191	425	568	495	240	49	0	0	0	0	3	51	242	667	1235	1730	1970	2019	2019	2019
60	0	0	0	21	102	286	413	342	139	16	0	0	0	0	0	21	123	409	822	1164	1303	1319	1319	1319
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	13	57	178	371	561	680	630	417	219	41	1	0	13	70	248	619	1180	1860	2490	2907	3126	3167	3168

(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