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: INTERIOR 3 NE, SD **COOP ID: 394184**

Climate Division: SD 5 **NWS Call Sign:** **Elevation: 2,440 Feet** **Lat: 43˚45N** **Lon: 101˚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	35.6	12.7	24.2	69+	1998	2	35.7	1990	-28	1963	19	7.5	1979	1266	0	.0	.0	5.8	11.5	28.6	7.1
Feb	41.8	17.6	29.7	75	1962	10	40.9	1999	-31	1996	2	16.2	1989	988	0	.0	.0	10.0	7.9	24.8	3.6
Mar	51.2	25.9	38.6	85	1978	31	46.7	1986	-23	1960	4	29.6	1996	820	0	.0	.0	17.4	3.7	23.0	.9
Apr	62.9	36.2	49.6	94+	1989	21	56.9	1981	3	1975	2	42.4	1995	467	4	.0	.4	25.2	.5	11.1	.0
May	73.2	47.3	60.3	102	1969	27	66.5	1985	20	1967	1	54.9	1995	190	43	.0	1.6	30.3	.0	1.0	.0
Jun	83.5	56.1	69.8	109	1988	24	78.6	1988	32	1998	3	63.2	1998	39	183	1.2	7.8	30.0	.0	@	.0
Jul	91.0	61.8	76.4	111	1973	6	82.2	1974	42	1971	30	68.1	1992	9	363	5.5	17.5	31.0	.0	.0	.0
Aug	90.8	60.4	75.6	110+	1988	15	81.8	1983	35	1978	20	69.9	1992	10	338	3.9	18.6	31.0	.0	.0	.0
Sep	81.0	50.0	65.5	106	2001	4	72.9	1998	25+	1972	26	60.3	1986	106	120	1.2	7.4	29.8	.0	.9	.0
Oct	66.9	37.8	52.4	97	1963	4	57.5	1997	2+	1991	31	47.6	1976	394	1	.0	.6	27.8	.3	7.5	.0
Nov	47.6	25.1	36.4	84	1999	7	47.5	1999	-21	1959	14	20.8	1985	860	0	.0	.0	13.7	4.4	22.9	.9
Dec	38.5	15.8	27.2	72	1957	9	37.0	1997	-31+	1989	22	7.0	1983	1174	0	.0	.0	6.5	9.0	28.3	4.8
Ann	63.7	37.2	50.5	111	Jul 1973	6	82.2	Jul 1974	-31+	Feb 1996	2	7.0	Dec 1983	6323	1052	11.8	53.9	258.5	37.3	148.1	17.3

\+ 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

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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	.39	.31	.80	1971	31	1.30	1971	.00	1974
Feb	.50	.35	1.10	1987	27	2.77	1987	.01	1981
Mar	1.11	.87	2.07	2000	8	3.11	1998	.00	1976
Apr	2.09	1.88	3.07	2000	19	4.64	2000	.12	1998
May	3.19	2.85	2.75	1996	27	7.28	1982	.42	1985
Jun	2.94	2.83	2.96	1994	8	7.75	1991	.71	1989
Jul	2.36	2.04	2.44	1999	17	5.48	1997	.30	1988
Aug	1.78	1.58	1.78	1979	8	3.40	1999	.16	1973
Sep	1.24	.81	3.31	1955	20	4.08	1989	.03	1979
Oct	1.47	1.09	2.27	1982	9	4.80	1998	.04	1984
Nov	.65	.47	1.19	1977	8	1.98	2000	.05	1987
Dec	.32	.28	.57	1965	11	1.13	1996	.00+	1986
Ann	18.04	16.54	3.31	Sep 1955	20	7.75	Jun 1991	.00+	Dec 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	1.3	@	.0
Feb	3.8	1.6	.2	@
Mar	5.8	2.8	.5	.1
Apr	8.8	4.7	1.4	.2
May	9.9	5.7	2.2	.8
Jun	10.0	6.2	1.6	.7
Jul	8.8	5.0	1.7	.4
Aug	6.5	3.7	1.2	.3
Sep	5.8	2.6	.8	.2
Oct	6.1	3.1	.8	.3
Nov	4.7	2.0	.3	@
Dec	4.0	1.3	.0	.0
Ann	78.5	40.0	10.7	3.0

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	.01	.04	.09	.15	.21	.28	.37	.48	.63	.89	1.14
Feb	.02	.04	.09	.15	.23	.32	.44	.59	.81	1.20	1.59
Mar	.03	.10	.25	.41	.59	.79	1.04	1.36	1.80	2.54	3.28
Apr	.37	.55	.86	1.14	1.44	1.75	2.11	2.55	3.13	4.07	4.96
May	.70	1.00	1.46	1.89	2.31	2.76	3.27	3.87	4.67	5.94	7.14
Jun	.66	.93	1.36	1.75	2.14	2.55	3.02	3.57	4.30	5.46	6.55
Jul	.65	.87	1.21	1.51	1.80	2.11	2.44	2.84	3.36	4.18	4.94
Aug	.52	.69	.94	1.16	1.38	1.60	1.85	2.14	2.52	3.12	3.67
Sep	.05	.12	.26	.42	.61	.83	1.12	1.48	2.00	2.89	3.78
Oct	.12	.21	.41	.61	.83	1.09	1.40	1.79	2.32	3.22	4.11
Nov	.07	.12	.21	.30	.39	.50	.63	.79	1.01	1.37	1.72
Dec	.00	.00	.08	.14	.19	.25	.32	.40	.51	.69	.86
Ann	10.74	12.05	13.79	15.15	16.38	17.59	18.85	20.27	22.02	24.60	26.88

\+ 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

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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	3.4	2.6	1	1	7.0	1976	1	12.2	1971	8	1975	7	5	1976	3.2	1.3	.4	.1	.0	11.4	4.2	1.1	.0
Feb	5.3	4.0	1	1	9.0	1987	27	27.0	1987	20	1987	28	5	1993	2.8	1.6	.4	.1	.0	6.7	3.4	2.1	.1
Mar	3.6	2.0	1	#	12.0	1999	5	14.7	1999	12	1999	5	2+	1999	2.2	1.7	.5	.3	@	3.1	1.6	.8	.1
Apr	3.1	.0	#	0	16.0	1995	11	29.0	1995	6	1993	19	1	1997	1.1	.9	.3	.2	@	.7	.2	.1	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.5	1998	3	.5	1998	#	1998	20	#	1998	@	.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	#	1983	20	#	1983	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.6	.0	#	0	3.5	1973	11	5.5	1997	3	1997	24	#+	1997	.4	.3	.1	.0	.0	.2	@	.0	.0
Nov	3.6	2.5	1	#	4.8	1985	30	18.6	1985	10	1985	30	5	1985	2.2	1.4	.4	.0	.0	3.5	1.0	.2	.0
Dec	4.0	3.3	1	#	4.0	1980	1	13.7	1996	10	1996	30	5	1996	3.2	1.5	.2	.0	.0	7.5	3.6	1.8	.3
Ann	23.6	14.4	N/A	N/A	16.0	Apr 1995	11	29.0	Apr 1995	20	Feb 1987	28	5+	Dec 1996	15.1	8.7	2.3	.7	@	33.1	14.0	6.1	.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	5/28	5/23	5/19	5/16	5/14	5/11	5/08	5/05	4/30
32	5/17	5/12	5/09	5/06	5/03	5/01	4/28	4/24	4/20
28	5/06	5/01	4/27	4/24	4/22	4/19	4/16	4/12	4/07
24	4/22	4/18	4/15	4/12	4/09	4/07	4/04	4/01	3/27
20	4/17	4/11	4/07	4/04	4/01	3/29	3/26	3/22	3/17
16	4/07	4/02	3/29	3/25	3/22	3/19	3/15	3/11	3/05

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	9/13	9/17	9/20	9/23	9/26	9/29	10/02	10/07
32	9/17	9/22	9/26	9/29	10/02	10/05	10/08	10/11	10/16
28	9/24	9/29	10/04	10/07	10/10	10/14	10/17	10/21	10/27
24	10/07	10/12	10/16	10/19	10/22	10/24	10/27	10/31	11/05
20	10/15	10/21	10/26	10/30	11/02	11/06	11/10	11/14	11/20
16	10/26	11/01	11/05	11/09	11/13	11/16	11/20	11/24	12/01

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	139	135	131	128	124	119	113
32	169	163	158	154	151	147	143	139	133
28	192	185	180	175	171	167	163	157	150
24	215	208	203	199	195	191	186	181	174
20	236	229	223	219	215	210	206	200	193
16	260	252	245	240	235	230	225	219	210

***** 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	1266	988	820	467	190	39	9	10	106	394	860	1174	6323
60	1112	856	665	329	98	11	0	2	46	247	716	1020	5102
57	1022	777	575	255	59	4	0	0	24	171	631	934	4452
55	968	725	518	210	40	1	0	0	14	127	575	877	4055
50	822	598	377	119	11	0	0	0	3	53	442	732	3157
32	375	243	63	2	0	0	0	0	0	0	121	309	1113

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	132	179	266	529	876	1134	1377	1351	1004	631	251	157	7887
55	12	17	8	47	202	445	664	638	328	45	15	13	2434
57	4	13	3	32	160	388	602	576	278	27	11	7	2101
60	1	8	0	16	105	305	509	485	210	10	6	1	1656
65	0	0	0	4	43	183	363	338	120	1	0	0	1052
70	0	0	0	0	12	94	229	207	59	0	0	0	601

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	18	44	130	313	625	900	1138	1116	770	409	92	26	18	62	192	505	1130	2030	3168	4284	5054	5463	5555	5581
45	2	16	64	198	474	750	983	961	624	280	44	6	2	18	82	280	754	1504	2487	3448	4072	4352	4396	4402
50	0	2	27	113	333	600	828	806	480	168	17	1	0	2	29	142	475	1075	1903	2709	3189	3357	3374	3375
55	0	0	6	58	209	451	673	651	345	88	2	0	0	0	6	64	273	724	1397	2048	2393	2481	2483	2483
60	0	0	0	26	114	308	518	498	229	34	0	0	0	0	0	26	140	448	966	1464	1693	1727	1727	1727
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	17	47	105	216	387	575	727	713	488	276	71	22	17	64	169	385	772	1347	2074	2787	3275	3551	3622	3644

(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

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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