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: FORESTBURG 3 NE, SD **COOP ID: 393029**

Climate Division: SD 7 **NWS Call Sign:** **Elevation: 1,230 Feet** **Lat: 44˚03N** **Lon: 98˚04W**

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	26.4	4.3	15.4	66	1908	24	26.9	1990	-45	1912	12	1.1	1978	1539	0	.0	.0	1.0	19.4	30.9	12.0
Feb	33.7	11.4	22.6	73	2000	21	34.1	1998	-46	1899	9	8.6	1979	1188	0	.0	.0	3.6	13.0	27.3	6.6
Mar	45.4	22.9	34.2	93	1943	30	42.1	2000	-23	1897	14	26.7	1996	957	0	.0	.0	10.9	5.2	25.0	1.6
Apr	61.1	34.8	48.0	99	1980	21	55.5	1981	0	1924	1	42.0	1995	514	3	.0	.3	24.1	.4	12.5	.0
May	72.6	46.7	59.7	110	1934	30	66.9	1977	16	1967	3	55.6	1997	203	37	.0	.3	30.7	.0	1.6	.0
Jun	82.0	56.3	69.2	112	1988	24	77.0	1988	27	1946	2	64.0	1985	43	167	.5	4.6	30.0	.0	.0	.0
Jul	87.6	61.3	74.5	114+	1936	22	79.1	1975	37+	1917	3	66.1	1992	12	305	1.6	11.1	31.0	.0	.0	.0
Aug	86.1	59.3	72.7	116	1934	4	79.7	1983	33+	1923	22	66.9	1992	20	258	1.1	9.4	31.0	.0	.0	.0
Sep	77.1	48.9	63.0	109	1931	10	69.4	1998	16+	1926	25	57.2	1984	136	76	.4	3.8	29.8	.0	1.4	.0
Oct	63.1	36.7	49.9	100	1910	11	55.3	1973	-13	1925	28	45.5	1987	470	1	.0	.2	26.6	.2	10.3	.0
Nov	43.1	22.4	32.8	83	1999	8	42.5	1999	-22+	1959	14	20.8	1985	969	0	.0	.0	8.9	6.5	25.8	1.2
Dec	30.4	9.5	20.0	73	1939	6	29.4	1979	-39	1917	29	2.1	1983	1398	0	.0	.0	1.7	16.9	30.9	8.0
Ann	59.1	34.5	46.8	116	Aug 1934	4	79.7	Aug 1983	-46	Feb 1899	9	1.1	Jan 1978	7449	847	3.6	29.7	229.3	61.6	165.7	29.4

\+ 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: 1896-2001

(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	.46	.41	2.00	1910	12	1.38	1975	.00	1990
Feb	.58	.51	1.36	1977	23	1.55	1971	.02+	1986
Mar	1.60	1.16	2.70	1987	17	5.68	1987	.14	1997
Apr	2.65	2.51	2.83	1942	30	6.56	1986	.73	1987
May	3.38	2.75	5.62	1914	24	9.56	1972	.55	1980
Jun	3.29	2.97	3.90	1905	24	7.32	1984	.20	1988
Jul	2.80	2.30	3.78	1957	4	6.81	1993	.44	1975
Aug	2.12	1.97	3.55	1930	18	4.08	1992	.61+	1983
Sep	1.94	1.56	4.12	1929	25	5.41	1973	.18	1974
Oct	1.74	1.40	2.57	1946	5	7.77	1998	.12	1988
Nov	1.19	1.05	2.16	2000	1	3.97	2000	.04	1976
Dec	.43	.42	1.83	1931	30	.99	1973	.00	1991
Ann	22.18	22.65	5.62	May 1914	24	9.56	May 1972	.00+	Dec 1991

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.2	1.7	.1	.0
Feb	4.4	1.8	.2	.1
Mar	6.6	3.9	.9	.3
Apr	8.7	6.0	1.8	.4
May	9.4	6.2	2.2	.9
Jun	9.4	6.3	2.2	.6
Jul	8.3	5.7	1.9	.6
Aug	7.3	4.4	1.3	.5
Sep	6.8	4.4	1.2	.3
Oct	6.1	3.4	1.1	.4
Nov	5.3	2.9	.5	.2
Dec	4.3	1.6	.1	.0
Ann	80.8	48.3	13.5	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	.02	.05	.12	.18	.26	.34	.44	.57	.74	1.03	1.31
Feb	.05	.08	.16	.24	.33	.43	.55	.70	.92	1.27	1.63
Mar	.17	.29	.51	.74	.97	1.24	1.56	1.95	2.48	3.36	4.22
Apr	.72	.97	1.35	1.68	2.01	2.36	2.74	3.19	3.78	4.70	5.56
May	.72	1.03	1.53	1.98	2.43	2.91	3.45	4.10	4.96	6.33	7.62
Jun	.90	1.21	1.69	2.10	2.51	2.93	3.41	3.97	4.69	5.84	6.90
Jul	.84	1.10	1.50	1.85	2.18	2.53	2.91	3.36	3.94	4.86	5.70
Aug	.71	.92	1.21	1.46	1.70	1.95	2.22	2.53	2.94	3.56	4.14
Sep	.27	.43	.71	.98	1.26	1.57	1.93	2.37	2.97	3.94	4.87
Oct	.14	.26	.49	.73	1.00	1.30	1.66	2.12	2.75	3.81	4.85
Nov	.08	.16	.31	.47	.65	.87	1.12	1.45	1.90	2.67	3.42
Dec	.02	.06	.13	.19	.26	.33	.42	.53	.68	.92	1.16
Ann	14.32	15.78	17.69	19.16	20.48	21.77	23.11	24.60	26.43	29.10	31.44

\+ 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: 1896-2001
(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	5.3	4.1	5	4	7.5	1994	27	16.5	1975	32	1988	26	26	1988	3.5	2.0	.7	.2	.0	19.4	15.1	10.3	3.0
Feb	5.1	4.0	5	3	11.0	1971	19	14.1	1971	26	1997	4	17	1997	3.2	2.0	.6	.2	@	15.2	10.8	6.8	3.0
Mar	7.8	5.1	2	1	13.0	1998	31	26.5	1975	18	1977	4	5	1985	3.0	2.2	.8	.4	.1	8.1	5.2	3.3	1.4
Apr	3.0	.5	#	#	9.0	1986	14	20.0	1995	13	1995	11	2	1995	1.1	.8	.4	.2	.0	1.0	.7	.6	.2
May	#	.0	0	0	#	1989	5	#+	1989	0	0	0	0	0	.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	0	.2	1985	28	.2	1985	0	0	0	0	0	@	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.2	.0	#	0	7.0	1980	27	10.0	1976	6	1995	23	1	1995	.5	.3	.2	@	.0	.5	@	.0	.0
Nov	5.8	4.0	1	#	11.5	1998	10	24.0	1985	15	1985	30	6	1985	3.1	2.1	.7	.2	.1	5.7	2.6	1.5	.3
Dec	4.9	4.4	3	2	8.0	1987	27	14.5	1985	24	1987	31	17	1985	3.8	2.2	.5	.1	.0	16.7	8.0	4.9	2.8
Ann	33.1	22.1	N/A	N/A	13.0	Mar 1998	31	26.5	Mar 1975	32	Jan 1988	26	26	Jan 1988	18.2	11.6	3.9	1.3	.2	66.6	42.4	27.4	10.7

+ 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	5/27	5/23	5/19	5/17	5/14	5/11	5/08	5/05	5/01
32	5/18	5/13	5/09	5/06	5/03	4/30	4/27	4/24	4/18
28	5/07	5/02	4/29	4/27	4/24	4/22	4/19	4/16	4/12
24	4/30	4/25	4/21	4/18	4/15	4/12	4/09	4/05	3/31
20	4/14	4/10	4/07	4/04	4/02	3/30	3/27	3/24	3/20
16	4/09	4/05	4/01	3/30	3/27	3/24	3/21	3/18	3/13

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	9/09	9/13	9/15	9/17	9/19	9/21	9/23	9/26	9/29
32	9/16	9/20	9/23	9/25	9/28	9/30	10/02	10/05	10/09
28	9/21	9/26	9/30	10/03	10/05	10/08	10/11	10/14	10/19
24	9/27	10/03	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	10/30	11/03	11/08
16	10/16	10/22	10/26	10/30	11/02	11/05	11/09	11/13	11/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	146	140	135	131	128	124	120	115	109
32	166	159	155	151	147	143	139	134	128
28	182	176	171	167	163	160	156	151	145
24	206	198	192	186	181	176	171	165	157
20	225	218	213	209	205	201	197	192	185
16	242	234	229	224	219	215	210	204	196

***** 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	1539	1188	957	514	203	43	12	20	136	470	969	1398	7449
60	1384	1048	802	374	107	12	1	4	62	321	819	1243	6177
57	1291	966	709	297	66	4	0	1	34	239	729	1150	5486
55	1229	915	647	250	46	2	0	0	21	191	671	1088	5060
50	1076	785	501	151	14	0	0	0	4	95	532	937	4095
32	569	371	111	5	0	0	0	0	0	1	153	446	1656

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	53	107	177	483	857	1114	1315	1261	930	556	174	72	7099
55	0	7	0	39	190	425	602	548	261	32	2	0	2106
57	0	2	0	26	148	368	540	487	214	18	0	0	1803
60	0	0	0	13	96	286	448	397	153	7	0	0	1400
65	0	0	0	3	37	167	305	258	76	1	0	0	847
70	0	0	0	0	10	82	180	145	30	0	0	0	447

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	7	65	267	605	871	1068	1012	692	332	48	2	0	7	72	339	944	1815	2883	3895	4587	4919	4967	4969
45	0	1	26	162	454	721	913	857	543	210	18	0	0	1	27	189	643	1364	2277	3134	3677	3887	3905	3905
50	0	0	8	89	311	572	758	702	399	116	6	0	0	0	8	97	408	980	1738	2440	2839	2955	2961	2961
55	0	0	0	48	189	423	603	547	270	50	1	0	0	0	0	48	237	660	1263	1810	2080	2130	2131	2131
60	0	0	0	17	92	281	449	397	161	17	0	0	0	0	0	17	109	390	839	1236	1397	1414	1414	1414
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	12	56	188	379	564	704	666	440	220	39	2	0	12	68	256	635	1199	1903	2569	3009	3229	3268	3270

(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