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: PORCUPINE 11 N, SD **COOP ID: 396736**

Climate Division: SD 5 **NWS Call Sign:** **Elevation: 2,820 Feet** **Lat: 43˚24N** **Lon: 102˚23W**

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	33.0	6.9	20.0	69	1981	23	30.5	1990	-33+	1996	31	4.5	1979	1396	0	.0	.0	4.7	12.2	30.3	8.6
Feb	39.2	12.0	25.6	73	1988	27	37.9	1999	-44	1996	2	13.3	1978	1104	0	.0	.0	8.5	8.0	26.9	4.8
Mar	48.5	20.2	34.4	87	1997	21	42.4	1986	-32	1998	11	25.0	1996	949	0	.0	.0	16.4	3.9	26.0	1.3
Apr	59.4	30.0	44.7	95	1980	21	52.1	1981	0	1975	2	37.4	1983	610	0	.0	.3	23.2	.7	16.4	@
May	70.0	42.4	56.2	98	1969	27	63.3	1985	15	1990	1	50.5	1983	293	20	.0	1.2	29.8	.0	4.0	.0
Jun	80.3	51.9	66.1	109	1974	20	75.1	1988	29	1989	1	58.7	1998	91	124	1.0	6.4	29.8	.0	.2	.0
Jul	88.0	57.8	72.9	112	1980	29	78.7	1974	35	1997	4	64.4	1992	31	275	4.1	15.1	31.0	.0	.0	.0
Aug	87.6	55.2	71.4	114	1980	6	77.8	1983	33+	1993	31	65.7	1992	26	225	3.0	15.3	31.0	.0	.0	.0
Sep	78.0	43.2	60.6	106	1971	2	66.2	1978	12	1972	26	53.8	1993	185	53	.7	6.3	29.4	.0	4.0	.0
Oct	64.4	30.1	47.3	97	1975	6	50.7	1974	-11	1991	30	43.6	1993	550	0	.0	.4	26.9	.4	16.0	.1
Nov	45.6	17.7	31.7	84+	1999	9	42.3	1999	-22	1976	28	16.2	1985	1000	0	.0	.0	12.9	5.6	26.6	1.7
Dec	36.2	8.7	22.5	70	1998	2	32.0	1999	-45+	1990	22	2.5	1983	1320	0	.0	.0	6.4	10.1	30.4	6.5
Ann	60.9	31.3	46.1	114	Aug 1980	6	78.7	Jul 1974	-45+	Dec 1990	22	2.5	Dec 1983	7555	697	8.8	45.0	250.0	40.9	180.8	23.0

\+ 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: 1963-2001

(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	.40	.26	.86	1971	30	1.60	1996	.00+	1987
Feb	.47	.37	.86	2000	26	1.60	1987	.00	1977
Mar	1.00	.87	1.46	2000	8	3.63	1977	.10	1978
Apr	1.90	1.99	2.11	2000	19	5.09	2000	.02	1998
May	2.81	2.57	3.20	1965	14	5.54	1982	.41	1974
Jun	2.95	2.74	2.97	1964	18	7.42	1991	.22	1978
Jul	2.66	2.56	2.95	1976	21	4.92+	1982	.66	1971
Aug	1.57	1.18	1.84	1993	16	4.66	1993	.38	1973
Sep	1.35	.92	1.50+	1993	19	3.87	1986	.01	1991
Oct	1.43	1.11	2.20	1998	5	4.91	1998	.17	1988
Nov	.60	.48	.88	1983	8	1.84	1985	.00	1997
Dec	.38	.37	.80	1967	17	1.34	1996	.00+	1998
Ann	17.52	17.77	3.20	May 1965	14	7.42	Jun 1991	.00+	Dec 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.3	1.2	.2	.0
Feb	3.8	1.6	.1	.0
Mar	5.2	2.8	.5	.1
Apr	7.3	4.5	1.3	.3
May	9.1	6.2	1.7	.5
Jun	8.6	6.6	1.8	.6
Jul	7.2	4.9	1.7	.6
Aug	5.5	3.6	.9	.4
Sep	5.0	3.2	1.0	.2
Oct	5.3	3.5	1.0	.3
Nov	4.1	2.0	.2	.0
Dec	3.5	1.5	@	.0
Ann	67.9	41.6	10.4	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	.00	.02	.07	.13	.19	.27	.36	.48	.65	.94	1.22
Feb	.01	.04	.10	.17	.24	.33	.43	.57	.75	1.07	1.38
Mar	.12	.20	.34	.48	.62	.79	.98	1.22	1.55	2.09	2.61
Apr	.18	.32	.58	.84	1.13	1.46	1.84	2.32	2.98	4.08	5.16
May	.78	1.05	1.45	1.80	2.15	2.51	2.91	3.39	4.00	4.97	5.87
Jun	.67	.95	1.38	1.77	2.15	2.57	3.03	3.58	4.31	5.46	6.55
Jul	.72	.98	1.36	1.70	2.02	2.37	2.75	3.20	3.79	4.71	5.58
Aug	.30	.44	.67	.88	1.10	1.33	1.60	1.92	2.34	3.02	3.67
Sep	.06	.13	.28	.46	.66	.91	1.22	1.62	2.19	3.17	4.15
Oct	.18	.29	.49	.69	.90	1.14	1.41	1.75	2.20	2.96	3.68
Nov	.03	.09	.18	.27	.37	.47	.59	.74	.95	1.28	1.61
Dec	.00	.00	.08	.16	.23	.30	.38	.48	.62	.82	1.03
Ann	10.60	11.86	13.51	14.80	15.96	17.11	18.30	19.64	21.29	23.72	25.86

+ 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: 1963-2001
(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	3.6	3.4	3	2
Feb	5.2	4.0	2	1
Mar	4.1	3.9	1	1
Apr	2.9	1.3	#	#
May	.1	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	1.6	.0	#	0
Nov	5.9	5.0	2	1
Dec	4.8	4.4	2	1
Ann	28.2	22.0	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	8.0	1971	30	10.5	1971	13	1984	1	7	1993
Feb	6.0	1992	18	19.0	1987	14	1993	28	9	1993
Mar	12.0	1977	29	15.0	1987	25	1977	30	4	1993
Apr	11.0	1995	12	11.0+	1995	18	1995	12	2	1997
May	3.0	1983	12	3.0	1983	1	1979	9	#	1979
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	#	1985	29	#	1985	0	0	0	0	0
Oct	10.0	1991	29	11.5	1971	11	1991	31	1+	1997
Nov	8.0	1993	13	24.0	1985	17	1985	30	7	1985
Dec	8.0	1975	31	12.0	1983	18	1985	18	15	1985
Ann	12.0	Mar 1977	29	24.0	Nov 1985	25	Mar 1977	30	15	Dec 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.7	1.7	.5	.1	.0
Feb	2.8	2.2	.9	.1	.0
Mar	2.5	2.1	.6	.2	.1
Apr	1.3	1.1	.5	.3	@
May	@	@	@	.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	.6	.6	.2	.1	@
Nov	2.5	2.2	1.1	.3	.0
Dec	3.0	2.3	.6	.2	.0
Ann	15.4	12.2	4.4	1.3	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	16.7	11.0	6.5	1.1
Feb	10.2	7.1	4.4	.9
Mar	6.7	3.3	1.5	.6
Apr	1.2	.5	.1	.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	.8	.4	.4	.1
Nov	7.8	5.8	3.4	.8
Dec	13.9	10.4	5.8	2.6
Ann	57.3	38.5	22.1	6.1

+ 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	6/29	6/20	6/13	6/08	6/03	5/29	5/23	5/17	5/08
32	6/05	5/29	5/25	5/21	5/17	5/13	5/09	5/05	4/28
28	5/20	5/15	5/11	5/08	5/05	5/02	4/29	4/25	4/20
24	5/13	5/07	5/03	4/30	4/27	4/23	4/20	4/16	4/10
20	5/05	4/28	4/24	4/20	4/16	4/13	4/09	4/04	3/29
16	4/25	4/19	4/15	4/11	4/08	4/04	3/31	3/27	3/21

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	8/24	8/30	9/03	9/07	9/11	9/14	9/18	9/23	9/29
32	9/08	9/12	9/14	9/17	9/19	9/21	9/23	9/26	9/30
28	9/15	9/19	9/23	9/26	9/28	10/01	10/04	10/07	10/12
24	9/17	9/23	9/27	9/30	10/04	10/07	10/11	10/15	10/21
20	9/26	10/02	10/07	10/11	10/15	10/19	10/23	10/28	11/03
16	10/07	10/14	10/18	10/22	10/26	10/30	11/03	11/08	11/15

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	134	122	113	106	99	92	85	76	64
32	147	139	134	129	124	119	115	109	101
28	170	161	155	150	145	141	135	129	121
24	188	178	171	165	160	154	148	141	132
20	210	200	193	187	181	175	169	162	152
16	231	221	213	207	201	195	189	181	171

***** 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	1396	1104	949	610	293	91	31	26	185	550	1000	1320	7555
60	1241	964	794	465	176	36	11	6	96	396	850	1165	6200
57	1148	880	701	382	121	18	4	2	57	306	760	1072	5451
55	1086	830	639	329	91	11	1	1	38	249	705	1010	4990
50	935	699	490	212	38	1	0	0	10	128	566	861	3940
32	446	297	94	10	0	0	0	0	0	3	179	382	1411

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	73	117	168	391	750	1023	1267	1222	858	475	170	85	6599
55	0	6	0	19	128	344	555	510	206	9	6	0	1783
57	0	0	0	12	96	291	496	449	165	4	0	0	1513
60	0	0	0	5	58	219	410	360	114	1	0	0	1167
65	0	0	0	0	20	124	275	225	53	0	0	0	697
70	0	0	0	0	4	58	168	120	19	0	0	0	369

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	4	24	91	240	533	816	1045	1015	655	300	63	10	4	28	119	359	892	1708	2753	3768	4423	4723	4786	4796
45	0	3	41	146	387	667	890	860	511	183	28	0	0	3	44	190	577	1244	2134	2994	3505	3688	3716	3716
50	0	0	13	76	255	517	735	706	374	95	6	0	0	0	13	89	344	861	1596	2302	2676	2771	2777	2777
55	0	0	3	36	145	368	581	552	254	45	0	0	0	0	3	39	184	552	1133	1685	1939	1984	1984	1984
60	0	0	0	13	72	238	428	399	151	10	0	0	0	0	0	13	85	323	751	1150	1301	1311	1311	1311
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	12	37	97	194	345	511	662	637	439	251	71	21	12	49	146	340	685	1196	1858	2495	2934	3185	3256	3277

(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