

# Climatography of the United States

No. 20

1971-2000

Station: BREIEN, ND

COOP ID: 321052

Climate Division: ND 8

NWS Call Sign:

Elevation: 1,720 Feet Lat: 46° 24N

Lon: 100° 56W

## 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	-1.6	11.0	57	1964	20	25.0	1987	-42+	1970	19	-3.6	1978	1678	0	.0	.0	.8	20.5	30.9	16.2
Feb	30.6	6.9	18.8	72	1992	29	31.0	1998	-48	1994	9	2.7	1979	1296	0	.0	.0	3.0	14.5	28.0	9.3
Mar	42.5	18.1	30.3	86	1967	29	39.6	1986	-28	1962	1	21.1	1996	1075	0	.0	.0	9.9	7.0	28.8	3.2
Apr	58.8	29.5	44.2	98	1980	20	52.7	1987	-11	1975	2	35.9	1975	627	0	.0	.3	22.8	.8	18.7	.2
May	71.2	41.8	56.5	99	1969	27	64.8	1977	12	1967	3	52.0	1983	284	20	.0	1.1	30.3	.0	4.9	.0
Jun	79.7	50.8	65.3	108	1988	27	77.4	1988	26+	1969	20	60.2	1993	100	106	.3	4.0	30.0	.0	.3	.0
Jul	86.0	55.4	70.7	110	1960	20	77.2	1989	33+	1972	4	63.0	1992	39	216	1.6	10.6	31.0	.0	.0	.0
Aug	85.7	53.5	69.6	106+	1973	27	75.4	1983	31+	1988	29	62.9	1977	49	192	1.2	10.6	31.0	.0	@	.0
Sep	74.7	42.2	58.5	106	1959	8	64.2	1978	11	1974	30	53.8	1993	230	33	.3	3.0	29.6	.0	4.2	.0
Oct	60.7	30.1	45.4	97	1963	4	49.1	1997	-7	1991	30	38.9	1976	608	0	.0	.1	25.6	.5	17.9	.1
Nov	40.2	16.3	28.3	83	1999	7	37.9	1999	-30+	1985	29	15.1	1985	1102	0	.0	.0	7.4	8.7	28.5	3.0
Dec	28.0	3.6	15.8	65+	1998	1	28.0	1997	-49	1983	23	-3.6	1983	1525	0	.0	.0	1.5	18.1	30.9	11.7
Ann	56.8	28.9	42.9	110	Jul 1960	20	77.4	Jun 1988	-49	Dec 1983	23	-3.6+	Dec 1983	8613	567	3.4	29.7	222.9	70.1	193.1	43.7

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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

009-A

# 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: BREIEN, ND**

**COOP ID: 321052**

**Climate Division: ND 8**

**NWS Call Sign:**

**Elevation: 1,720 Feet Lat: 46°24N**

**Lon: 100°56W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.35	.39	.80	1996	17	1.05	1996	.00	1974	4.5	1.1	.1	.0	.02	.05	.10	.15	.20	.27	.34	.43	.56	.77	.97
Feb	.38	.28	.74	2000	25	1.37	1994	.00	1973	3.9	1.4	.1	.0	.01	.04	.09	.15	.21	.28	.36	.46	.60	.84	1.08
Mar	.66	.48	1.35	1982	19	2.32	1982	.00+	1999	4.3	1.9	.3	@	.00	.00	.15	.27	.38	.51	.65	.83	1.07	1.46	1.85
Apr	1.60	1.40	2.30	1971	20	4.10	1971	.06	1990	5.6	3.4	.9	.2	.18	.31	.53	.75	.99	1.26	1.57	1.96	2.48	3.35	4.20
May	2.49	1.89	2.80	1991	22	6.97	1991	.16	1997	6.9	5.3	1.9	.4	.38	.60	.96	1.30	1.66	2.04	2.49	3.04	3.77	4.96	6.10
Jun	2.92	2.76	2.73	1964	9	8.50	1984	.25	1974	7.9	5.9	1.7	.6	.58	.84	1.27	1.67	2.06	2.49	2.97	3.55	4.32	5.56	6.73
Jul	2.69	2.21	2.41	1993	16	8.92	1993	.46	1984	7.0	5.0	1.7	.5	.54	.78	1.18	1.54	1.90	2.29	2.74	3.27	3.97	5.10	6.17
Aug	1.77	1.65	2.75	1951	30	4.04	1989	.00	1971	5.2	3.6	1.1	.4	.28	.52	.82	1.06	1.31	1.56	1.84	2.18	2.62	3.31	3.96
Sep	1.48	.90	3.28	1994	15	7.43	1977	.14	1974	4.7	3.3	.7	.3	.12	.22	.41	.61	.84	1.10	1.41	1.80	2.34	3.24	4.13
Oct	1.32	.88	1.76	1982	9	4.10	1998	.00	1990	4.2	2.5	.7	.3	.03	.11	.27	.46	.67	.91	1.21	1.60	2.13	3.05	3.96
Nov	.52	.47	1.32	1977	20	1.67	1977	.00+	1999	3.9	1.7	.2	@	.00	.00	.09	.17	.26	.36	.49	.64	.85	1.21	1.57
Dec	.35	.38	.55	1949	11	.72	1988	.00	1986	3.9	1.1	.0	.0	.03	.07	.13	.18	.23	.28	.35	.43	.53	.70	.86
Ann	16.53	16.96	3.28	Sep 1994	15	8.92	Jul 1993	.00+	Nov 1999	62.0	36.2	9.4	2.7	10.39	11.52	13.00	14.14	15.16	16.17	17.22	18.39	19.82	21.93	23.77

+ 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: 1948-2001

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

Complete documentation available from:  
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Station: BREIEN, ND

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Climate Division: ND 8

NWS Call Sign:

Elevation: 1,720 Feet

Lat: 46° 24N

Lon: 100° 56W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	4.3	5.0	2	0	7.0	1980	6	8.2	1980	9	1976	15	5	1976	2.5	1.8	.7	.2	.0	-9.9	-9.9	-9.9	-9.9
Feb	4.0	3.5	2	#	6.0	1979	20	13.5	1979	18	1972	16	14	1972	2.7	1.8	.4	@	.0	-9.9	-9.9	-9.9	-9.9
Mar	5.7	5.1	1	0	10.0	1997	14	14.0	1984	24	1975	31	5	1975	2.8	2.1	.9	.4	@	-9.9	-9.9	-9.9	-9.9
Apr	.6	.0	#	0	8.0	1994	26	8.0	1994	24	1975	5	6	1975	.4	.3	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
May	.3	.0	0	0	7.0	1991	3	7.0	1991	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	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.7	.0	#	0	5.5	1991	23	7.5	1992	6	1991	23	#+	1997	.3	.3	.1	@	.0	.6	.5	.1	.0
Nov	4.1	2.5	#	0	16.0	1993	24	16.0	1993	6	1996	23	2	1996	2.0	1.7	.7	.3	.1	-9.9	-9.9	-9.9	-9.9
Dec	4.6	3.0	1	0	10.5	1988	26	16.5	1988	8	1973	21	5	1973	2.8	1.5	.5	.1	@	-9.9	-9.9	-9.9	-9.9
Ann	24.3	19.1	N/A	N/A	16.0	Nov 1993	24	16.5	Dec 1988	24+	Apr 1975	5	14	Feb 1972	13.5	9.5	3.5	1.1	.1	-9.9	-9.9	-9.9	-9.9

+ 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

Complete documentation available from:

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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	6/24	6/16	6/10	6/06	6/01	5/27	5/23	5/17	5/09
32	6/04	5/29	5/24	5/20	5/17	5/14	5/10	5/06	4/30
28	5/24	5/19	5/16	5/12	5/09	5/06	5/03	4/30	4/24
24	5/16	5/10	5/06	5/02	4/29	4/25	4/22	4/17	4/11
20	5/04	4/28	4/24	4/20	4/17	4/13	4/10	4/06	3/31
16	4/22	4/17	4/13	4/10	4/07	4/04	4/01	3/28	3/23
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	8/15	8/21	8/25	8/29	9/01	9/05	9/08	9/13	9/19
32	9/05	9/08	9/11	9/14	9/16	9/18	9/20	9/23	9/27
28	9/11	9/15	9/17	9/20	9/22	9/24	9/27	9/30	10/04
24	9/17	9/22	9/26	9/30	10/03	10/06	10/09	10/13	10/19
20	9/26	10/01	10/05	10/08	10/11	10/14	10/17	10/21	10/26
16	10/02	10/08	10/13	10/17	10/20	10/24	10/27	11/01	11/07
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	122	112	104	98	92	86	79	72	61
32	142	135	130	125	121	117	112	107	100
28	155	148	143	139	135	131	127	121	114
24	181	172	166	161	156	152	146	140	132
20	199	191	185	181	176	172	167	161	154
16	223	213	207	201	196	190	184	178	168

\* 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

Complete documentation available from:

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**Elevation: 1,720 Feet    Lat: 46° 24N    Lon: 100° 56W**

Degree Days to Selected Base Temperatures (° F)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1678	1296	1075	627	284	100	39	49	230	608	1102	1525	8613
60	1523	1156	920	482	169	40	12	16	127	454	952	1370	7221
57	1430	1072	827	399	114	20	5	7	80	364	862	1277	6457
55	1368	1019	765	347	85	12	1	3	56	306	802	1215	5979
50	1215	890	621	230	34	2	0	0	17	180	660	1062	4911
32	704	458	196	18	0	0	0	0	0	6	230	562	2174

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	49	86	144	381	759	996	1200	1166	794	421	118	60	6174
55	0	3	0	21	131	318	489	456	160	8	0	0	1586
57	0	0	0	13	98	266	430	398	124	3	0	0	1332
60	0	0	0	6	60	196	345	314	81	1	0	0	1003
65	0	0	0	0	20	106	216	192	33	0	0	0	567
70	0	0	0	0	4	44	121	103	10	0	0	0	282

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	2	35	197	520	768	962	926	557	230	21	0	0	2	37	234	754	1522	2484	3410	3967	4197	4218	4218
45	0	0	7	109	373	618	807	771	415	129	6	0	0	0	7	116	489	1107	1914	2685	3100	3229	3235	3235
50	0	0	0	55	241	469	652	616	277	53	0	0	0	0	0	55	296	765	1417	2033	2310	2363	2363	2363
55	0	0	0	26	134	324	497	461	167	16	0	0	0	0	0	26	160	484	981	1442	1609	1625	1625	1625
60	0	0	0	7	61	192	345	315	88	4	0	0	0	0	0	7	68	260	605	920	1008	1012	1012	1012
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	4	46	169	350	486	612	591	376	198	32	0	0	4	50	219	569	1055	1667	2258	2634	2832	2864	2864

(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:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

## 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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)