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: GRAND FORKS UNIV NWS, ND **COOP ID: 323621**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 47˚55N** **Lon: 97˚06W**

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	14.5	-4.0	5.3	54	1990	10	19.2	1990	-39	1936	22	-8.0	1982	1854	0	.0	.0	@	27.0	30.9	18.5
Feb	22.3	3.5	12.9	67	2000	22	25.0	1987	-42	1936	16	-4.3	1979	1459	0	.0	.0	.3	20.4	27.7	12.1
Mar	34.3	16.9	25.6	82	1946	27	35.3	1973	-36	1948	10	17.5	1975	1221	0	.0	.0	3.1	11.9	28.0	4.1
Apr	53.4	31.0	42.2	98	1980	21	52.1	1987	-5	1936	7	33.1	1979	689	4	.0	.1	19.4	1.3	16.0	.1
May	69.1	43.8	56.5	105	1934	30	66.2	1977	5	1967	3	47.7	1979	304	39	.0	1.1	29.6	.0	3.2	.0
Jun	76.9	53.6	65.3	105	1933	18	73.7	1988	29	1964	1	59.0	1982	93	100	.0	2.1	30.0	.0	.0	.0
Jul	80.7	57.7	69.2	109	1936	12	75.4	1989	39+	1954	1	62.0	1992	44	174	.1	3.9	31.0	.0	.0	.0
Aug	80.0	55.5	67.8	104	1983	7	73.8	1983	32	1935	31	60.1	1977	69	155	.1	4.4	31.0	.0	.0	.0
Sep	68.8	45.2	57.0	102	1978	5	62.1	1978	18	1942	28	51.9	1993	259	19	.1	1.2	29.3	.0	1.6	.0
Oct	54.7	33.8	44.3	93	1992	1	50.2	1973	1+	1936	26	38.4	1991	644	0	.0	@	22.0	.5	11.5	.0
Nov	33.2	17.9	25.6	73+	1975	5	36.4	1981	-24+	1985	30	14.5	1985	1184	0	.0	.0	3.6	13.6	27.2	2.2
Dec	19.3	2.7	11.0	58	1939	6	22.6	1997	-37	1933	28	-.7	1983	1674	0	.0	.0	.1	24.8	30.9	13.1
Ann	50.6	29.8	40.2	109	Jul 1936	12	75.4	Jul 1989	-42	Feb 1936	16	-8.0	Jan 1982	9494	491	.3	12.8	199.4	99.5	177.0	50.1

\+ 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: 1932-2001

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

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: GRAND FORKS UNIV NWS, ND **COOP ID: 323621**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 47˚55N** **Lon: 97˚06W**

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	.78	.56	1.21	1989	7	2.65	1989	.06	1973
Feb	.62	.48	.92	2000	25	1.73	2000	.04	1993
Mar	.89	.73	1.29	1950	27	2.42	1990	.06	1986
Apr	1.17	.81	2.10	1974	21	3.60	1979	.00+	1988
May	2.11	2.12	3.70	1991	31	5.17	1999	.40	1972
Jun	2.98	2.74	2.88	1964	11	5.47	1984	1.18	1972
Jul	2.89	2.51	2.93	1960	1	7.40	1987	.38	1976
Aug	2.92	2.36	3.85	1951	30	5.51	1980	1.11	1982
Sep	1.95	1.94	3.03	1957	2	5.37	1973	.20	1993
Oct	1.59	1.42	2.73	1934	16	4.58	1982	.03	1992
Nov	.86	.79	1.45	1958	18	2.75	1977	.00+	1999
Dec	.59	.52	.72	1995	13	2.05	1996	.00	1994
Ann	19.35	19.09	3.85	Aug 1951	30	7.40	Jul 1987	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.3	2.1	.2	.1
Feb	5.8	2.2	.1	.0
Mar	6.6	2.8	.4	.0
Apr	6.4	3.2	.5	.1
May	8.6	4.8	1.3	.4
Jun	10.4	6.1	2.2	.7
Jul	9.5	5.7	1.8	.6
Aug	9.1	5.7	1.9	.5
Sep	7.4	4.0	1.2	.4
Oct	6.7	3.7	1.1	.3
Nov	5.5	2.6	.4	@
Dec	5.9	1.9	.1	.0
Ann	88.2	44.8	11.2	3.1

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	.06	.11	.21	.32	.44	.58	.74	.95	1.23	1.71	2.19
Feb	.07	.12	.21	.30	.39	.49	.61	.76	.96	1.29	1.61
Mar	.11	.18	.31	.43	.56	.71	.87	1.08	1.37	1.83	2.28
Apr	.00	.09	.29	.47	.67	.88	1.14	1.45	1.89	2.61	3.31
May	.49	.69	1.00	1.28	1.55	1.84	2.17	2.56	3.07	3.89	4.65
Jun	1.07	1.35	1.75	2.09	2.42	2.75	3.12	3.54	4.08	4.91	5.67
Jul	.59	.85	1.27	1.66	2.05	2.47	2.94	3.51	4.26	5.47	6.61
Aug	1.16	1.43	1.81	2.13	2.43	2.73	3.06	3.44	3.92	4.67	5.34
Sep	.29	.45	.73	1.00	1.29	1.59	1.95	2.38	2.97	3.92	4.83
Oct	.10	.19	.38	.60	.84	1.13	1.47	1.92	2.54	3.59	4.64
Nov	.00	.05	.18	.31	.45	.62	.81	1.06	1.41	1.99	2.57
Dec	.07	.14	.24	.33	.41	.50	.60	.72	.88	1.14	1.38
Ann	14.41	15.39	16.62	17.55	18.38	19.17	19.98	20.88	21.96	23.53	24.87

\+ 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: 1932-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: GRAND FORKS UNIV NWS, ND **COOP ID: 323621**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 47°55N** **Lon: 97°06W**

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	9.3	5.5	8	6	14.0	1989	7	37.9	1996	42	1989	11	30	1989	6.6	2.8	1.0	.5	.1	27.5	20.5	13.9	8.0
Feb	5.7	3.8	7	5	12.0	1996	27	18.8	1996	29	1979	23	22	1979	5.0	2.3	.4	.1	@	21.5	15.2	11.1	8.4
Mar	5.9	6.5	3	2	18.0	1995	6	18.0	1995	30	1979	5	24	1979	4.2	1.9	.7	.2	@	12.8	7.6	6.1	2.3
Apr	1.2	.0	#	0	3.3	1992	10	5.9	1979	20	1979	9	8	1979	.9	.5	.1	.0	.0	1.8	1.2	.9	.6
May	#	.0	#	0	#	1976	2	#+	1976	1	1991	1	#	1991	.0	.0	.0	.0	.0	.1	.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	.5	1972	26	.5	1972	0	0	0	0	0	@	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.8	.0	#	0	4.2	1974	6	5.2	1971	4	1971	31	#+	2000	.6	.4	.1	.0	.0	.5	@	.0	.0
Nov	5.9	4.5	1	#	12.4	1998	18	22.4	1998	16+	1998	20	5	1985	3.6	1.8	.6	.1	@	9.3	4.5	1.4	.3
Dec	8.4	5.4	4	3	9.0	1995	8	46.4	1996	19	1977	8	17	1985	5.7	2.7	.7	.3	.0	23.8	12.2	8.1	2.8
Ann	37.2	25.7	N/A	N/A	18.0	Mar 1995	6	46.4	Dec 1996	42	Jan 1989	11	30	Jan 1989	26.6	12.4	3.6	1.2	.1	97.3	61.2	41.5	22.4

+ 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: GRAND FORKS UNIV NWS, ND **COOP ID: 323621**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 47˚55N** **Lon: 97˚06W**

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	6/03	5/30	5/27	5/24	5/21	5/18	5/16	5/12	5/08
32	5/22	5/17	5/15	5/12	5/10	5/07	5/05	5/02	4/28
28	5/14	5/09	5/06	5/02	4/30	4/27	4/24	4/20	4/15
24	5/06	4/30	4/25	4/21	4/18	4/14	4/10	4/05	3/30
20	4/25	4/19	4/16	4/12	4/09	4/06	4/03	3/30	3/24
16	4/13	4/09	4/07	4/04	4/02	3/31	3/28	3/26	3/22

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	9/04	9/08	9/11	9/13	9/15	9/17	9/20	9/23	9/26
32	9/17	9/20	9/23	9/25	9/27	9/29	10/01	10/03	10/07
28	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/15	10/20
24	9/29	10/04	10/09	10/13	10/16	10/19	10/23	10/27	11/02
20	10/07	10/13	10/17	10/20	10/23	10/26	10/30	11/03	11/08
16	10/22	10/27	10/31	11/03	11/06	11/09	11/12	11/15	11/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	135	129	124	120	117	113	109	104	98
32	156	150	146	143	139	136	133	128	123
28	179	172	167	163	159	155	150	146	139
24	208	198	192	186	181	175	169	163	153
20	222	213	207	201	196	191	186	179	171
16	237	230	225	221	217	213	209	204	197

***** 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: GRAND FORKS UNIV NWS, ND **COOP ID: 323621**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 47˚55N** **Lon: 97˚06W**

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	1854	1459	1221	689	304	93	44	69	259	644	1184	1674	9494
60	1699	1319	1066	547	198	35	13	24	146	489	1034	1519	8089
57	1606	1235	973	467	147	17	6	12	93	398	944	1426	7324
55	1544	1179	911	416	117	10	0	6	65	339	884	1364	6835
50	1389	1039	759	300	61	2	0	0	20	208	735	1209	5722
32	850	576	293	47	1	0	0	0	0	10	281	680	2738

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	19	41	96	352	760	998	1153	1109	749	390	87	29	5783
55	0	0	0	31	163	318	440	402	124	5	0	0	1483
57	0	0	0	22	130	265	384	346	92	2	0	0	1241
60	0	0	0	12	89	193	298	265	56	0	0	0	913
65	0	0	0	4	39	100	174	155	19	0	0	0	491
70	0	0	0	0	15	38	88	77	5	0	0	0	223

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	0	11	182	559	790	939	897	549	222	21	0	0	0	11	193	752	1542	2481	3378	3927	4149	4170	4170
45	0	0	0	103	413	640	784	742	406	120	8	0	0	0	0	103	516	1156	1940	2682	3088	3208	3216	3216
50	0	0	0	53	282	491	629	587	271	58	0	0	0	0	0	53	335	826	1455	2042	2313	2371	2371	2371
55	0	0	0	19	172	343	474	433	160	22	0	0	0	0	0	19	191	534	1008	1441	1601	1623	1623	1623
60	0	0	0	9	88	209	323	286	78	6	0	0	0	0	0	9	97	306	629	915	993	999	999	999
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	6	125	350	503	615	583	332	135	11	0	0	0	6	131	481	984	1599	2182	2514	2649	2660	2660

(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/normals/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.
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