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: MINOT EXPERIMENT STN, ND **COOP ID: 325993**

Climate Division: ND 1 **NWS Call Sign:** **Elevation: 1,769 Feet** **Lat: 48˚11N** **Lon: 101˚18W**

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	16.8	-1.8	7.5	59	1906	28	22.0	1990	-47	1916	13	-10.1	1982	1785	0	.0	.0	.1	24.5	30.9	17.2
Feb	23.6	5.6	14.6	64	1958	26	26.9	1998	-49	1936	15	-1.6	1979	1410	0	.0	.0	.5	18.6	27.8	11.3
Mar	35.2	16.6	25.9	80	1910	22	36.2	1986	-35	1919	5	16.4	1996	1212	0	.0	.0	4.4	11.9	29.3	4.8
Apr	52.5	29.7	41.1	98	1915	21	50.0	1987	-12+	1975	3	30.8	1979	718	1	.0	.1	17.5	2.2	19.3	.4
May	67.2	42.7	55.0	105	1934	30	63.9	1977	9	1909	1	48.1	1979	334	22	.0	.6	28.9	.0	4.5	.0
Jun	75.5	52.3	63.9	109	1910	20	75.0	1988	24	1915	16	57.6	1985	122	89	.1	1.9	29.9	.0	.1	.0
Jul	80.4	56.3	68.4	109	1936	11	73.4	1975	30	1922	7	61.3	1993	48	152	.3	3.5	31.0	.0	.0	.0
Aug	80.0	53.9	67.0	106	1949	7	72.9	1983	26	1915	26	60.8	1977	80	141	.1	4.7	31.0	.0	.1	.0
Sep	67.7	43.5	55.6	104	1915	1	61.1	1998	4	1919	26	49.8	1984	299	17	@	.9	28.5	.0	2.5	.0
Oct	54.4	31.9	43.2	91+	1992	2	48.2	1973	-16	1919	26	38.2	1991	677	0	.0	.1	20.1	1.1	16.4	.1
Nov	34.4	17.3	25.9	77	1999	8	37.8	1999	-27	1905	30	12.9	1985	1176	0	.0	.0	4.2	12.9	28.0	3.3
Dec	21.8	3.8	12.8	66	1939	6	26.0	1997	-44+	1916	21	-3.7	1983	1618	0	.0	.0	.3	22.4	30.9	13.1
Ann	50.8	29.3	40.1	109+	Jul 1936	11	75.0	Jun 1988	-49	Feb 1936	15	-10.1	Jan 1982	9479	422	.5	11.8	196.4	93.6	189.8	50.2

\+ 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: 1905-2001

(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	.77	.72	1.00	1916	10	2.05	1989	.08	1990
Feb	.60	.38	1.92	1998	27	3.91	1998	.11	1988
Mar	1.03	1.07	1.60	1920	16	2.45	1987	.15	1981
Apr	1.56	1.26	2.32	1953	24	5.53	1975	.05	1987
May	2.28	2.15	3.10	1953	28	6.40	1999	.01	1980
Jun	3.01	3.04	3.70	1914	4	5.71	1990	.59	1974
Jul	2.52	2.09	3.15	1935	21	7.56	1993	.51	1984
Aug	2.01	1.82	3.47	1964	30	4.37	1980	.46	1979
Sep	1.78	1.46	4.08	1971	5	5.42	1971	.19	1992
Oct	1.40	.90	1.75	1998	5	5.72	1994	.00	1987
Nov	1.05	.94	2.20	1922	5	3.53	2000	.05	1987
Dec	.64	.63	1.20	1918	29	1.79	1977	.01	1987
Ann	18.65	18.38	4.08	Sep 1971	5	7.56	Jul 1993	.00	Oct 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.1	2.6	.1	.0
Feb	7.0	1.9	.1	@
Mar	7.0	3.2	.4	.0
Apr	6.9	3.5	.9	.2
May	9.2	4.6	1.5	.5
Jun	12.1	6.7	1.8	.5
Jul	9.5	5.4	1.7	.4
Aug	9.1	4.8	1.2	.4
Sep	8.3	3.8	.8	.4
Oct	5.9	3.1	.9	.3
Nov	6.5	2.9	.5	.1
Dec	7.5	1.8	.2	.0
Ann	97.1	44.3	10.1	2.8

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	.15	.22	.33	.44	.54	.66	.79	.94	1.15	1.48	1.80
Feb	.07	.11	.20	.28	.37	.47	.59	.74	.94	1.27	1.59
Mar	.19	.29	.44	.58	.72	.87	1.05	1.26	1.54	1.98	2.41
Apr	.12	.21	.42	.63	.87	1.14	1.47	1.89	2.47	3.44	4.41
May	.20	.36	.66	.98	1.33	1.72	2.19	2.78	3.58	4.94	6.26
Jun	.99	1.27	1.69	2.05	2.40	2.75	3.14	3.60	4.18	5.09	5.93
Jul	.79	1.03	1.39	1.69	1.99	2.29	2.63	3.02	3.52	4.31	5.04
Aug	.59	.78	1.06	1.31	1.55	1.81	2.08	2.41	2.84	3.50	4.12
Sep	.24	.38	.64	.88	1.14	1.43	1.77	2.18	2.73	3.64	4.52
Oct	.03	.11	.29	.48	.71	.97	1.29	1.70	2.28	3.27	4.25
Nov	.08	.14	.28	.42	.58	.77	.99	1.27	1.66	2.31	2.96
Dec	.07	.12	.21	.30	.39	.50	.62	.78	1.00	1.35	1.69
Ann	11.90	13.15	14.79	16.05	17.19	18.29	19.45	20.74	22.31	24.63	26.65

\+ 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: 1905-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	8.7	7.1	6	5
Feb	7.3	4.7	5	4
Mar	8.9	7.9	4	3
Apr	3.3	3.0	1	#
May	.3	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.3	.0	#	0
Oct	3.1	.0	#	#
Nov	8.8	6.7	2	1
Dec	7.9	7.9	4	3
Ann	48.6	37.3	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	11.5	1989	7	30.8	1989	22	1982	23	15	1994
Feb	17.0	1998	27	30.9	1998	22	1979	23	17	1982
Mar	13.0	1976	2	23.7	1976	20	1979	5	15	1998
Apr	8.0	1980	8	10.4	2000	14	1975	3	7	1975
May	5.0	1991	4	5.0	1991	8	1984	1	1	1984
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	4.2	1972	26	4.2	1972	4	1972	26	#+	1991
Oct	12.0	1991	29	17.5	1991	16	1991	30	2	1991
Nov	13.3	1986	8	26.2	1993	17	1986	10	7	1991
Dec	9.0	1983	13	15.2	1977	14+	1996	31	11	1977
Ann	17.0	Feb 1998	27	30.9	Feb 1998	22+	Jan 1982	23	17	Feb 1982

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	7.7	3.6	.9	.2	.1
Feb	6.2	3.0	.6	.1	@
Mar	5.2	2.9	1.1	.4	@
Apr	1.7	1.2	.4	.2	.0
May	.3	.2	.1	@	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.1	@	.0	.0
Oct	1.0	.9	.5	.1	.1
Nov	4.8	3.1	1.0	.4	@
Dec	6.6	3.1	.6	.2	.0
Ann	33.7	18.1	5.2	1.6	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	28.4	20.7	13.2	8.0
Feb	21.5	16.2	10.5	4.1
Mar	15.8	10.3	6.8	3.0
Apr	3.3	1.7	1.2	.0
May	.2	.1	@	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	@	.0	.0
Oct	1.4	.8	.3	.2
Nov	12.0	5.8	3.8	1.3
Dec	22.4	12.4	8.1	1.6
Ann	105.1	68.0	43.9	18.2

+ 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	6/05	6/01	5/29	5/26	5/23	5/21	5/18	5/15	5/11
32	5/25	5/21	5/17	5/15	5/12	5/10	5/07	5/04	4/30
28	5/16	5/11	5/08	5/05	5/03	4/30	4/27	4/24	4/19
24	5/07	5/02	4/29	4/26	4/23	4/20	4/18	4/14	4/09
20	4/24	4/20	4/16	4/13	4/11	4/08	4/05	4/02	3/28
16	4/18	4/13	4/10	4/07	4/05	4/02	3/31	3/27	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	9/01	9/06	9/09	9/12	9/14	9/17	9/20	9/23	9/27
32	9/05	9/10	9/15	9/18	9/21	9/25	9/28	10/03	10/08
28	9/19	9/24	9/27	9/30	10/03	10/06	10/09	10/12	10/17
24	9/28	10/04	10/08	10/12	10/15	10/18	10/22	10/26	11/01
20	10/04	10/10	10/13	10/17	10/20	10/23	10/26	10/30	11/04
16	10/09	10/15	10/20	10/24	10/28	10/31	11/05	11/09	11/16

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	127	122	117	113	109	104	99	92
32	153	146	140	136	131	127	123	117	110
28	172	166	161	156	152	149	144	139	132
24	192	186	182	178	174	171	167	162	156
20	209	203	198	195	191	188	184	180	174
16	231	222	215	210	205	200	195	188	180

***** 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	1785	1410	1212	718	334	122	48	80	299	677	1176	1618	9479
60	1630	1270	1057	574	217	55	13	31	180	522	1026	1463	8038
57	1537	1186	964	491	159	29	6	15	122	430	936	1370	7245
55	1475	1130	903	439	126	19	1	9	90	369	876	1308	6745
50	1320	990	758	317	63	5	0	1	33	231	731	1153	5602
32	801	537	303	53	0	0	0	0	0	12	284	639	2629

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	39	51	114	326	711	957	1128	1083	708	357	98	44	5616
55	0	0	1	22	124	286	416	379	108	2	0	0	1338
57	0	0	0	15	95	237	358	324	80	1	0	0	1110
60	0	0	0	7	59	172	272	246	48	0	0	0	804
65	0	0	0	1	22	89	152	141	17	0	0	0	422
70	0	0	0	0	6	34	70	66	4	0	0	0	180

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	1	15	148	473	717	884	842	480	185	18	0	0	1	16	164	637	1354	2238	3080	3560	3745	3763	3763
45	0	0	0	84	334	567	729	687	344	97	8	0	0	0	0	84	418	985	1714	2401	2745	2842	2850	2850
50	0	0	0	39	213	419	574	534	217	46	1	0	0	0	0	39	252	671	1245	1779	1996	2042	2043	2043
55	0	0	0	18	120	280	421	381	122	12	0	0	0	0	0	18	138	418	839	1220	1342	1354	1354	1354
60	0	0	0	4	54	159	271	241	57	3	0	0	0	0	0	4	58	217	488	729	786	789	789	789
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	12	112	292	436	556	533	291	127	15	0	0	0	12	124	416	852	1408	1941	2232	2359	2374	2374

(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