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 AP, ND **COOP ID: 325988**

Climate Division: ND 1 **NWS Call Sign: MOT** **Elevation: 1,715 Feet** **Lat: 48˚16N** **Lon: 101˚17W**

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	18.2	1.4	9.8	56	1987	12	24.6	1990	-34+	1996	19	-7.1	1982	1711	0	.0	.0	.1	24.1	30.7	15.3
Feb	25.2	9.1	17.2	66	1958	25	29.0	1998	-34	1996	1	1.3	1979	1340	0	.0	.0	.8	17.9	27.4	9.2
Mar	36.6	19.4	28.0	79	1966	30	37.1+	1986	-29	1962	1	19.4	1996	1147	0	.0	.0	5.3	11.1	27.6	2.9
Apr	53.7	31.8	42.8	94	1980	21	51.9	1987	-5	1975	2	33.3	1979	670	2	.0	.1	18.4	1.5	15.6	.2
May	67.2	44.0	55.6	99	1980	22	62.8	1977	19	1967	3	48.1	1979	316	24	.0	.6	29.2	@	2.8	.0
Jun	75.6	53.1	64.4	102	1988	20	75.4	1988	32	1969	12	58.9	1993	112	92	.2	2.1	30.0	.0	.0	.0
Jul	81.2	57.9	69.6	105+	1988	27	74.4	1975	39	1951	10	62.5	1993	33	174	.4	4.2	31.0	.0	.0	.0
Aug	80.6	55.7	68.2	107	1949	7	74.5	1983	34	1982	27	61.6	1977	73	172	.2	5.5	31.0	.0	.0	.0
Sep	68.4	45.5	57.0	106	1978	4	63.2	1998	21	1965	26	51.2	1985	269	28	.1	1.1	28.3	.0	1.6	.0
Oct	55.2	34.2	44.7	94	1963	4	48.7	1973	0	1991	31	39.6	1972	630	0	.0	.1	20.6	1.0	12.5	@
Nov	35.0	19.4	27.2	79	1999	7	39.6	1999	-20	1964	29	13.2	1985	1134	0	.0	.0	4.7	12.6	26.7	2.3
Dec	23.0	6.7	14.9	58	1979	4	28.8	1997	-36	1983	23	-.9	1983	1555	0	.0	.0	.4	21.5	30.4	10.8
Ann	51.7	31.5	41.6	107	Aug 1949	7	75.4	Jun 1988	-36	Dec 1983	23	-7.1	Jan 1982	8990	492	.9	13.7	199.8	89.7	175.3	40.7

\+ 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/normals/usnormals.html

(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

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	.65	.47	.94	1952	14	2.11	1982	.05	1992
Feb	.53	.39	.75	1961	22	1.98	1998	.08	1992
Mar	1.05	.86	2.18	1985	28	2.77	1985	.09	1991
Apr	1.55	1.02	3.89	1984	27	8.06	1984	.03	1987
May	2.31	1.87	2.69	1953	28	6.75	1999	.02	1984
Jun	3.15	3.08	2.54	1975	9	5.02	1982	.62	1979
Jul	2.70	2.35	3.89	1971	6	7.39	1993	.40	1984
Aug	1.95	1.33	5.73	1987	14	6.34	1987	.41	1988
Sep	1.74	1.44	3.14	1971	4	6.11	1971	.12	1976
Oct	1.32	.82	1.89	1994	18	5.54	1994	.00	1987
Nov	.86	.91	1.71	1986	8	2.71	1986	.00	1999
Dec	.63	.50	1.11	1967	17	1.88	1977	.04	1987
Ann	18.44	19.03	5.73	Aug 1987	14	8.06	Apr 1984	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.6	1.9	.2	.0
Feb	6.3	1.8	.1	.0
Mar	6.7	2.9	.5	@
Apr	6.9	3.5	.8	.3
May	9.0	5.1	1.5	.4
Jun	10.9	6.7	2.0	.7
Jul	9.2	5.2	1.6	.6
Aug	7.8	4.2	.9	.3
Sep	7.1	3.8	1.0	.4
Oct	5.4	2.8	.9	.3
Nov	6.0	2.4	.4	.1
Dec	7.3	1.5	.2	.0
Ann	90.2	41.8	10.1	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	.10	.16	.25	.34	.43	.54	.65	.79	.98	1.29	1.58
Feb	.08	.13	.20	.28	.35	.44	.53	.65	.81	1.06	1.31
Mar	.11	.19	.34	.48	.64	.82	1.03	1.28	1.63	2.22	2.78
Apr	.05	.12	.29	.49	.72	1.01	1.37	1.84	2.52	3.69	4.88
May	.17	.32	.61	.93	1.28	1.69	2.18	2.80	3.66	5.12	6.55
Jun	1.35	1.63	2.03	2.36	2.66	2.97	3.31	3.69	4.17	4.91	5.57
Jul	.64	.89	1.29	1.64	1.99	2.36	2.78	3.28	3.93	4.96	5.93
Aug	.37	.54	.83	1.09	1.36	1.65	1.98	2.38	2.91	3.76	4.56
Sep	.17	.29	.53	.77	1.03	1.33	1.68	2.12	2.72	3.73	4.71
Oct	.02	.09	.25	.43	.64	.89	1.19	1.59	2.15	3.11	4.07
Nov	.04	.12	.24	.37	.51	.66	.84	1.06	1.37	1.87	2.37
Dec	.06	.10	.18	.27	.37	.48	.61	.77	.99	1.36	1.73
Ann	12.16	13.34	14.87	16.05	17.10	18.13	19.20	20.38	21.83	23.95	25.80

\+ 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

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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	8.1	6.8	6	4
Feb	5.1	5.0	4	3
Mar	8.2	7.0	3	2
Apr	4.1	3.1	1	1
May	.8	.0	#	1
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	2.7	.7	#	0
Nov	8.0	6.4	2	1
Dec	6.6	6.2	3	3
Ann	43.8	35.2	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	15.5	1989	6	26.6	1989	22+	1994	13	18	1994
Feb	8.0	1998	25	15.2	1979	25	1998	28	18	1994
Mar	13.0	1985	28	21.6	1975	25+	1998	2	15	1998
Apr	12.3	1997	5	15.1	1997	25	1984	28	7	1975
May	7.0	1974	13	7.0	1974	7	1984	1	1	1984
Jun	.2	1998	2	.2	1998	0	0	0	#	1991
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	2.6	1972	25	2.6	1972	1+	1984	24	#	1984
Oct	13.0	1991	29	15.9	1985	15+	1991	31	2	1991
Nov	12.0	1985	19	25.9	1985	19+	1993	29	7	1991
Dec	7.4	1975	31	14.9	1977	15+	1996	31	10	1996
Ann	15.5	Jan 1989	6	26.6	Jan 1989	25+	Mar 1998	2	18+	Feb 1994

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	7.3	2.4	.6	.2	.1
Feb	6.0	1.9	.4	.2	.0
Mar	5.3	2.6	1.0	.4	@
Apr	2.3	1.1	.4	.2	.1
May	.5	.2	.1	.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	.0
Oct	1.2	.9	.3	.2	.1
Nov	5.1	2.3	.9	.3	.1
Dec	7.3	2.3	.5	.2	.0
Ann	35.2	13.8	4.2	1.8	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	26.9	21.6	15.9	6.5
Feb	20.8	14.6	9.9	3.1
Mar	15.7	9.5	6.3	2.0
Apr	3.9	2.5	1.9	.8
May	.3	.2	.1	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.0	.0	.0
Oct	1.6	.6	.3	.2
Nov	11.7	7.2	4.6	1.6
Dec	22.8	14.1	8.9	2.1
Ann	103.8	70.3	47.9	16.3

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

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	9/06	9/10	9/13	9/15	9/17	9/20	9/22	9/25	9/29
32	9/14	9/19	9/22	9/25	9/28	9/30	10/03	10/07	10/11
28	9/20	9/26	9/30	10/04	10/07	10/11	10/14	10/18	10/24
24	10/03	10/08	10/12	10/15	10/18	10/21	10/25	10/28	11/03
20	10/04	10/10	10/15	10/18	10/22	10/25	10/29	11/02	11/08
16	10/13	10/20	10/24	10/28	11/01	11/05	11/09	11/13	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	139	133	129	126	122	119	115	111	105
32	161	154	149	145	141	137	132	127	120
28	180	173	168	164	160	156	152	147	140
24	206	198	193	188	183	179	174	169	161
20	218	211	205	200	196	192	187	182	174
16	239	230	224	219	214	208	203	197	188

***** 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	1711	1340	1147	670	316	112	33	73	269	630	1134	1555	8990
60	1556	1200	992	528	200	48	8	29	160	475	984	1400	7580
57	1463	1116	899	446	145	25	1	15	107	383	894	1307	6801
55	1401	1060	838	395	113	16	0	9	78	324	834	1245	6313
50	1246	921	692	278	54	3	0	2	28	192	691	1090	5197
32	729	475	249	38	0	0	0	0	0	8	256	580	2335

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	40	58	125	360	731	970	1164	1121	750	401	112	48	5880
55	0	0	1	26	131	295	451	417	138	5	0	0	1464
57	0	0	0	18	101	245	390	362	106	2	0	0	1224
60	0	0	0	10	63	178	304	282	69	0	0	0	906
65	0	0	0	2	24	92	174	172	28	0	0	0	492
70	0	0	0	0	6	35	84	91	9	0	0	0	225

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	23	175	500	738	925	880	522	215	22	0	0	2	25	200	700	1438	2363	3243	3765	3980	4002	4002
45	0	0	2	101	355	588	770	725	379	121	9	0	0	0	2	103	458	1046	1816	2541	2920	3041	3050	3050
50	0	0	0	48	230	442	615	570	253	56	0	0	0	0	0	48	278	720	1335	1905	2158	2214	2214	2214
55	0	0	0	22	129	298	460	420	149	20	0	0	0	0	0	22	151	449	909	1329	1478	1498	1498	1498
60	0	0	0	7	61	170	308	276	77	4	0	0	0	0	0	7	68	238	546	822	899	903	903	903
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	15	121	297	445	596	560	304	134	17	0	0	1	16	137	434	879	1475	2035	2339	2473	2490	2490

(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