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: MC CLUSKY, ND **COOP ID: 325710**

Climate Division: ND 5 **NWS Call Sign:** **Elevation: 1,925 Feet** **Lat: 47˚29N** **Lon: 100˚26W**

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	18.3	.0	9.2	52	1990	10	23.8	1990	-38	1951	29	-6.9	1982	1731	0	.0	.0	.1	24.6	30.9	15.6
Feb	25.5	7.5	16.5	65	1958	25	28.8	1998	-36	1962	28	-.3	1979	1358	0	.0	.0	.6	17.4	27.7	9.6
Mar	37.5	18.7	28.1	79	1967	29	38.4	1986	-30	1962	1	19.0	1996	1143	0	.0	.0	5.7	10.1	28.4	3.4
Apr	55.4	31.2	43.3	95	1980	21	51.1	1987	-10	1975	1	33.1	1979	654	2	.0	.2	20.1	1.5	16.7	.3
May	69.9	43.9	56.9	97	1980	21	65.5	1977	9	1967	3	50.0	1979	281	30	.0	.8	29.6	@	3.1	.0
Jun	78.1	53.1	65.6	104	1988	27	76.9	1988	28	1950	3	60.1	1985	98	115	.2	2.9	30.0	.0	.0	.0
Jul	83.5	57.6	70.6	107	1973	11	75.1	1989	30	1949	19	63.6	1993	30	203	.5	6.2	31.0	.0	.0	.0
Aug	82.9	56.0	69.5	105+	1983	7	76.0	1983	33	1956	20	63.2	1977	48	187	.6	7.8	31.0	.0	.0	.0
Sep	71.3	45.6	58.5	106	1978	5	64.5	1998	17	1965	26	53.8	1984	228	32	.2	1.6	28.9	.0	1.8	.0
Oct	57.2	33.7	45.5	93	1953	1	49.3	1973	-3	1991	31	40.4	1976	605	0	.0	@	22.8	.8	13.1	@
Nov	35.8	18.6	27.2	75+	1999	7	38.9	1999	-23+	1985	29	14.7	1985	1135	0	.0	.0	4.7	11.6	27.6	2.3
Dec	22.7	5.3	14.0	57+	1979	5	26.2	1997	-36	1967	31	-2.0	1983	1581	0	.0	.0	.3	22.1	30.8	11.6
Ann	53.2	30.9	42.1	107	Jul 1973	11	76.9	Jun 1988	-38	Jan 1951	29	-6.9	Jan 1982	8892	569	1.5	19.5	204.8	88.1	180.1	42.8

\+ 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	.58	.56	.54	1980	6	1.32	1997	.06+	1990
Feb	.49	.34	1.10	1998	25	2.18	1998	.03	1973
Mar	.71	.63	1.36	1966	4	1.86	1983	.00	1981
Apr	1.49	.85	2.62	1953	24	7.97	1974	.04	1988
May	2.13	1.92	2.01	1960	25	5.61	1999	.50	1984
Jun	3.41	2.94	4.24	1975	30	8.61	1975	.73	1974
Jul	2.61	2.49	2.52	1963	26	7.72	1993	.83	1971
Aug	2.06	1.72	4.02	1999	12	6.42	1999	.02	1971
Sep	1.61	1.34	2.73	1977	24	5.77	1977	.05	1993
Oct	1.39	.75	1.90	1998	4	5.19	1994	.03	1976
Nov	.71	.56	.82	1986	8	1.75+	1993	.00	1990
Dec	.49	.45	.70	1950	25	1.26	1977	.04	1987
Ann	17.68	17.74	4.24	Jun 1975	30	8.61	Jun 1975	.00+	Nov 1990

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	2.1	@	.0
Feb	4.9	1.5	.1	@
Mar	5.8	2.1	.3	.0
Apr	6.8	3.5	.8	.3
May	9.0	5.1	1.3	.3
Jun	11.1	6.8	2.2	.6
Jul	9.0	5.8	1.8	.4
Aug	7.2	4.3	1.0	.4
Sep	7.4	3.6	.9	.2
Oct	5.5	2.9	.9	.3
Nov	5.4	2.2	.1	.0
Dec	5.7	1.7	.0	.0
Ann	84.2	41.6	9.4	2.5

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	.11	.16	.25	.32	.40	.49	.59	.70	.86	1.10	1.34
Feb	.04	.07	.13	.20	.28	.36	.46	.59	.77	1.07	1.36
Mar	.04	.11	.22	.32	.43	.55	.70	.87	1.11	1.51	1.89
Apr	.06	.13	.29	.49	.72	.99	1.34	1.78	2.42	3.52	4.63
May	.48	.68	.99	1.27	1.55	1.85	2.18	2.58	3.10	3.94	4.72
Jun	1.12	1.44	1.92	2.32	2.71	3.11	3.55	4.07	4.73	5.76	6.71
Jul	.73	.98	1.35	1.68	2.00	2.33	2.70	3.14	3.71	4.60	5.43
Aug	.17	.31	.58	.87	1.18	1.54	1.97	2.51	3.25	4.50	5.73
Sep	.28	.42	.65	.87	1.10	1.34	1.62	1.96	2.42	3.15	3.85
Oct	.04	.09	.22	.39	.60	.86	1.20	1.64	2.28	3.40	4.55
Nov	.02	.07	.16	.26	.38	.51	.66	.86	1.14	1.60	2.06
Dec	.07	.11	.18	.25	.32	.40	.49	.60	.75	.99	1.23
Ann	11.46	12.62	14.13	15.29	16.33	17.34	18.40	19.58	21.01	23.12	24.96

\+ 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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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	9.1	8.2	7	5
Feb	6.5	5.5	5	4
Mar	6.8	5.1	3	3
Apr	3.6	1.2	1	#
May	.2	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.1	.0	#	0
Oct	2.6	.0	#	#
Nov	7.6	3.8	3	2
Dec	7.2	7.4	4	3
Ann	43.7	31.2	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	8.0	1980	6	18.8	1997	26	1997	13	19	1997
Feb	6.0	1994	24	23.0	1979	24	1979	15	18	1979
Mar	10.0	1988	11	17.1	1982	21	1979	2	13+	1997
Apr	12.0	1999	1	18.0	1997	18	1997	6	4	1997
May	4.7	1991	3	4.7	1991	4	1991	3	#+	1998
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	2.0	1972	26	2.0	1972	2	1995	21	#	1995
Oct	8.0	1982	6	15.7	1991	11	1991	30	2	1991
Nov	8.0	1977	20	29.4	1993	17+	1993	26	9	1986
Dec	6.0	1978	28	14.8	1978	16+	1996	18	12	1996
Ann	12.0	Apr 1999	1	29.4	Nov 1993	26	Jan 1997	13	19	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.6	2.9	1.0	.2	.0
Feb	5.4	2.3	.6	.2	.0
Mar	4.0	2.1	.8	.2	@
Apr	1.2	.9	.4	.2	.1
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
Oct	.9	.6	.4	.2	.0
Nov	4.6	2.4	.9	.4	.0
Dec	5.4	2.4	.4	.2	.0
Ann	28.1	13.6	4.5	1.6	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	25.5	19.2	13.8	5.6
Feb	19.5	15.2	8.4	2.5
Mar	13.2	10.1	6.9	1.8
Apr	3.0	2.2	1.9	.7
May	.1	@	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	1.2	1.0	.6	.2
Nov	10.7	5.5	3.5	1.4
Dec	21.5	14.3	9.4	3.9
Ann	94.7	67.5	44.5	16.1

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

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	9/05	9/09	9/12	9/14	9/17	9/19	9/21	9/24	9/28
32	9/16	9/19	9/22	9/24	9/26	9/28	9/30	10/03	10/07
28	9/20	9/24	9/28	9/30	10/03	10/06	10/08	10/11	10/16
24	9/29	10/04	10/08	10/11	10/14	10/17	10/20	10/24	10/29
20	10/06	10/12	10/16	10/20	10/24	10/28	10/31	11/05	11/11
16	10/11	10/17	10/22	10/26	10/29	11/02	11/05	11/10	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	137	131	127	124	121	117	114	110	104
32	155	149	145	141	138	134	131	126	120
28	171	165	161	157	154	150	147	142	136
24	200	192	187	182	178	174	169	163	156
20	222	213	207	202	197	192	186	180	171
16	236	227	220	215	210	205	199	193	184

***** 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	1731	1358	1143	654	281	98	30	48	228	605	1135	1581	8892
60	1576	1218	988	512	173	40	8	16	124	451	985	1426	7517
57	1483	1134	895	431	121	21	2	6	77	360	895	1333	6758
55	1421	1078	834	379	92	13	0	3	53	301	835	1271	6280
50	1266	945	689	265	41	2	0	0	15	174	691	1116	5204
32	747	497	248	33	0	0	0	0	0	6	255	600	2386

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	38	63	128	371	772	1007	1195	1162	794	424	110	42	6106
55	0	0	1	28	151	330	482	452	157	6	0	0	1607
57	0	0	0	19	117	278	422	393	121	2	0	0	1352
60	0	0	0	10	76	207	335	309	78	0	0	0	1015
65	0	0	0	2	30	115	203	187	32	0	0	0	569
70	0	0	0	0	9	50	106	98	10	0	0	0	273

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	18	181	534	774	956	921	564	229	21	0	0	1	19	200	734	1508	2464	3385	3949	4178	4199	4199
45	0	0	4	99	390	624	801	766	419	130	7	0	0	0	4	103	493	1117	1918	2684	3103	3233	3240	3240
50	0	0	0	50	256	475	646	611	285	61	0	0	0	0	0	50	306	781	1427	2038	2323	2384	2384	2384
55	0	0	0	20	147	329	491	456	172	20	0	0	0	0	0	20	167	496	987	1443	1615	1635	1635	1635
60	0	0	0	6	74	199	337	306	89	4	0	0	0	0	0	6	80	279	616	922	1011	1015	1015	1015
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	16	132	331	482	618	585	344	153	16	0	0	1	17	149	480	962	1580	2165	2509	2662	2678	2678

(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