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: DRAYTON, ND **COOP ID: 322312**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 800 Feet** **Lat: 48˚34N** **Lon: 97˚11W**

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	.0	.0	.0	42	1992	29	.0	0	-38	1996	20	.0	0	0	0	.0	.0	.0	28.3	31.0	21.7
Feb	.0	.0	.0	67	2000	22	.0	0	-42	1996	1	.0	0	0	0	.0	.0	.2	22.3	28.0	14.9
Mar	.0	.0	.0	60	1991	20	.0	0	-29	1972	2	.0	0	0	0	.0	.0	2.0	14.3	29.1	5.8
Apr	.0	.0	.0	84	1998	30	.0	0	-15	1975	1	.0	0	0	0	.0	.1	16.9	2.2	20.0	.5
May	.0	.0	.0	94	1991	13	.0	0	22+	1976	6	.0	0	0	0	.0	1.2	29.0	.0	4.2	.0
Jun	.0	.0	.0	100	1995	18	.0	0	37+	1998	7	.0+	0	0	0	@	1.6	30.0	.0	.1	.0
Jul	.0	.0	.0	99	1975	30	.0	0	42	1972	4	.0	0	0	0	.0	2.4	31.0	.0	.0	.0
Aug	.0	.0	.0	100	1991	28	.0	0	38	1992	26	.0	0	0	0	.1	3.4	31.0	.0	@	.0
Sep	.0	.0	.0	97	1976	7	.0	0	24	1974	28	.0	0	0	0	.1	.6	28.6	.0	2.7	.0
Oct	.0	.0	.0	93	1992	2	.0	0	6	1991	31	.0	0	0	0	.0	@	19.7	.8	16.2	.0
Nov	.0	.0	.0	77	1975	6	.0	0	-17+	1996	26	.0	0	0	0	.0	.0	2.8	15.3	28.7	3.7
Dec	.0	.0	.0	54	1990	8	.0	0	-31	1990	30	.0	0	0	0	.0	.0	.1	26.5	31.0	15.9
Ann	.0	.0	.0	100+	Jun 1995	18	-99.9	0	-42	Feb 1996	1	99.9	0	0	0	.2	9.3	191.3	109.7	191.0	62.5

\+ 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

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1967-2000

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

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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	.50	.48	.63	1996	18	1.72	1996	.02	1973
Feb	.34	.23	.46	1996	23	1.03	1995	.00	1978
Mar	.76	.84	1.08	1970	3	1.60	1995	.04	1999
Apr	1.16	.92	1.47	1971	19	3.07	1986	.04	1983
May	2.25	2.10	2.77	1996	17	5.06	1977	.37	1984
Jun	3.33	3.32	2.00	1980	28	5.96	1993	1.39	1974
Jul	2.80	2.47	3.65	1975	2	6.36	1993	.93	1981
Aug	2.47	2.16	4.49	1974	15	6.90	1974	.34	1996
Sep	2.23	2.11	1.80	1980	4	5.25	1977	.31	1998
Oct	1.59	1.35	1.86	1980	17	4.87	1984	.16	1999
Nov	.69	.46	1.02	1996	6	2.52	1995	.00	1997
Dec	.52	.46	.63	1977	18	1.57	1995	.00+	1998
Ann	18.64	18.05	4.49	Aug 1974	15	6.90	Aug 1974	.00+	Dec 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.1	1.7	.1	.0
Feb	4.9	1.3	.0	.0
Mar	6.1	2.7	.2	.0
Apr	5.9	3.1	.6	.1
May	9.9	4.9	1.3	.4
Jun	11.9	6.8	1.9	.7
Jul	10.7	6.3	1.3	.4
Aug	9.4	5.2	1.2	.5
Sep	8.8	4.5	1.2	.4
Oct	7.7	3.5	1.0	.2
Nov	5.7	2.7	.3	.1
Dec	5.6	1.8	.1	.0
Ann	93.7	44.5	9.2	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	.08	.12	.20	.27	.34	.42	.51	.61	.76	1.00	1.22
Feb	.02	.05	.10	.15	.20	.26	.33	.42	.53	.72	.91
Mar	.14	.21	.32	.42	.53	.64	.77	.93	1.14	1.48	1.80
Apr	.11	.20	.35	.51	.69	.89	1.12	1.41	1.81	2.47	3.12
May	.54	.76	1.09	1.38	1.67	1.98	2.32	2.73	3.27	4.12	4.91
Jun	1.48	1.77	2.19	2.52	2.84	3.16	3.50	3.88	4.38	5.12	5.79
Jul	1.03	1.29	1.67	1.99	2.29	2.60	2.93	3.32	3.82	4.59	5.29
Aug	.54	.77	1.13	1.46	1.78	2.13	2.52	2.99	3.61	4.59	5.52
Sep	.40	.60	.93	1.23	1.54	1.88	2.26	2.72	3.34	4.33	5.28
Oct	.19	.31	.54	.76	.99	1.26	1.56	1.94	2.46	3.31	4.13
Nov	.01	.05	.14	.24	.35	.47	.63	.83	1.12	1.60	2.09
Dec	.00	.00	.15	.24	.33	.43	.53	.67	.83	1.11	1.38
Ann	12.56	13.72	15.21	16.35	17.37	18.36	19.39	20.54	21.93	23.96	25.73

\+ 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: 1967-2000
(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	6.3	6.0	7	6
Feb	4.4	3.2	6	4
Mar	5.1	4.0	4	3
Apr	2.0	1.0	1	#
May	.1	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	#	0
Oct	1.3	.0	#	0
Nov	4.5	3.0	2	1
Dec	6.9	5.5	3	2
Ann	30.6	22.7	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	10.5	1996	18	24.5	1996	29	1996	18	21	1996
Feb	7.0	1976	29	13.6	1995	24	1996	4	21	1996
Mar	7.0	1976	2	15.0	1972	21	1979	3	18	1996
Apr	5.0	1991	14	8.5	1991	19	1996	5	7	1996
May	1.0	1974	3	1.0	1974	3	1991	1	#+	1991
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	.5	1972	26	.5	1972	1	1972	26	#+	1995
Oct	6.0	1972	30	9.8	1991	6	1991	24	1	1991
Nov	6.0	1996	17	12.8	1992	12	1995	30	6	1995
Dec	7.0	1996	18	20.6	1992	20	1995	20	16	1995
Ann	10.5	Jan 1996	18	24.5	Jan 1996	29	Jan 1996	18	21+	Feb 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.1	2.9	.5	.1	.1
Feb	4.0	1.6	.4	.1	.0
Mar	3.4	1.8	.5	.2	.0
Apr	1.5	.8	.4	@	.0
May	.2	.1	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	@	.0	.0	.0	.0
Oct	.8	.5	.2	.1	.0
Nov	3.6	2.5	.6	.1	.0
Dec	5.0	2.6	.6	.2	.0
Ann	24.6	12.8	3.2	.8	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	27.1	24.5	18.1	8.4
Feb	24.5	18.8	12.5	9.2
Mar	14.5	7.0	4.3	3.1
Apr	4.1	2.5	1.0	.4
May	.2	.1	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	.0	.0	.0
Oct	.7	.4	.1	.0
Nov	11.2	5.4	2.8	.0
Dec	24.2	14.6	9.4	1.9
Ann	106.5	73.3	48.2	23.0

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

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	8/30	9/03	9/07	9/09	9/12	9/14	9/17	9/20	9/25
32	9/10	9/14	9/18	9/20	9/23	9/25	9/28	10/01	10/05
28	9/17	9/21	9/25	9/27	9/30	10/02	10/05	10/08	10/12
24	9/27	10/02	10/05	10/09	10/11	10/14	10/17	10/21	10/26
20	10/07	10/13	10/17	10/20	10/24	10/27	10/30	11/03	11/09
16	10/15	10/20	10/23	10/27	10/30	11/02	11/05	11/09	11/14

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	133	126	120	116	111	107	102	97	89
32	152	145	140	135	131	127	122	117	110
28	170	163	158	154	150	145	141	136	129
24	194	186	180	175	171	166	161	155	147
20	218	210	204	199	194	189	184	178	170
16	230	222	216	211	206	201	196	190	182

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0

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	6	140	503	727	868	827	476	167	10	0	0	0	6	146	649	1376	2244	3071	3547	3714	3724	3724
45	0	0	0	73	362	577	713	672	334	85	4	0	0	0	0	73	435	1012	1725	2397	2731	2816	2820	2820
50	0	0	0	31	241	430	558	517	212	39	0	0	0	0	0	31	272	702	1260	1777	1989	2028	2028	2028
55	0	0	0	15	146	287	403	365	119	8	0	0	0	0	0	15	161	448	851	1216	1335	1343	1343	1343
60	0	0	0	3	78	168	252	231	55	1	0	0	0	0	0	3	81	249	501	732	787	788	788	788
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	1	104	313	449	556	525	292	111	8	0	0	0	1	105	418	867	1423	1948	2240	2351	2359	2359

(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

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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