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: DRAKE 9 NE, ND **COOP ID: 322304**

Climate Division: ND 2 **NWS Call Sign:** **Elevation: 1,530 Feet** **Lat: 48˚03N** **Lon: 100˚19W**

Temperature (˚F)

Month	Mean (1) Daily Max	Mean (1) Daily Min	Mean (1) Mean	Extremes Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Degree Days (1) Base Temp 65 Heating	Cooling	Mean Number of Days (3) Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	15.8	-5.8	5.0	52	1990	10	19.7	1990	-40	1968	4	-11.2	1982	1862	0	.0	.0	@	24.8	31.0	17.6
Feb	23.0	2.0	12.5	63	1988	27	26.4	1998	-43	1996	1	-4.3	1979	1471	0	.0	.0	.7	17.9	28.1	11.4
Mar	34.6	14.4	24.5	75	1967	29	35.3	1973	-33	1972	2	14.5	1996	1255	0	.0	.0	4.7	11.0	29.5	5.1
Apr	52.8	29.2	41.0	99	1980	21	51.1	1987	-12	1975	1	29.7	1979	723	3	.0	.2	19.3	1.7	19.1	.4
May	67.6	43.2	55.4	100	1980	22	65.6	1977	8	1967	3	48.8	1979	321	23	@	1.2	29.8	.0	3.6	.0
Jun	75.9	52.3	64.1	105	1988	27	74.6	1988	29	1969	2	58.1+	1993	117	89	.3	2.9	30.0	.0	.0	.0
Jul	80.9	56.3	68.6	108	1988	27	74.4	1989	34	1967	3	61.1	1993	50	162	.5	5.1	31.0	.0	.0	.0
Aug	80.1	53.9	67.0	106	1988	6	73.3	1983	28	1982	27	61.1	1977	79	142	.5	6.1	31.0	.0	@	.0
Sep	69.1	43.4	56.3	107	1978	5	62.5	1998	18	1965	26	50.8	1984	282	20	.1	1.4	28.9	.0	2.6	.0
Oct	55.3	30.7	43.0	93	1992	1	47.3	1973	-8	1991	30	37.6	1972	682	0	.0	@	21.9	.8	15.5	.1
Nov	33.9	14.8	24.4	78	1975	5	36.5	1999	-32	1985	29	10.9	1985	1221	0	.0	.0	4.3	12.5	28.2	3.6
Dec	20.7	.4	10.6	58	1969	1	24.9	1997	-41	1983	23	-5.1	1983	1688	0	.0	.0	.2	22.8	31.0	13.9
Ann	50.8	27.9	39.4	108	Jul 1988	27	74.6	Jun 1988	-43	Feb 1996	1	-11.2	Jan 1982	9751	439	1.4	16.9	201.8	91.5	188.6	52.1

\+ 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: 1964-2001

(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	.36	.32	.47	1996	18	1.15	1996	.00+	1990
Feb	.39	.23	.76	2000	26	2.92	1998	.00	1992
Mar	.60	.40	1.05	1985	28	1.88	1995	.09	1978
Apr	1.25	.93	2.15	1997	6	4.52	1997	.00	1988
May	2.26	1.99	3.70	1994	20	7.35	1999	.18	1984
Jun	3.04	3.04	2.38	1990	27	6.15	1994	.93	1974
Jul	2.75	2.49	2.35+	1992	25	5.97	1993	.41	1976
Aug	1.97	1.55	2.83	1968	24	5.99	2000	.45	1984
Sep	1.48	1.34	1.88	1994	4	3.16	1977	.10	1993
Oct	1.24	.73	2.82	1994	7	6.76	1994	.02	1987
Nov	.68	.61	.58	1994	18	2.81	2000	.00	1976
Dec	.34	.30	.73	1982	2	.99	1977	.05+	1987
Ann	16.36	15.37	3.70	May 1994	20	7.35	May 1999	.00+	Feb 1992

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.3	1.3	.0	.0
Feb	4.6	1.0	.1	.0
Mar	4.5	1.8	.3	@
Apr	6.1	3.1	.5	.2
May	8.1	4.7	1.3	.3
Jun	10.0	6.3	1.9	.5
Jul	8.2	5.5	1.8	.5
Aug	7.3	4.6	1.1	.4
Sep	6.3	3.7	.7	.1
Oct	5.1	2.5	.7	.2
Nov	4.5	2.4	.4	.0
Dec	5.1	1.1	@	.0
Ann	75.1	38.0	8.8	2.2

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	.00	.07	.14	.20	.25	.31	.37	.45	.55	.70	.85
Feb	.00	.02	.06	.11	.18	.25	.35	.47	.64	.95	1.26
Mar	.07	.12	.20	.28	.37	.47	.58	.73	.92	1.24	1.55
Apr	.03	.12	.28	.46	.66	.89	1.17	1.52	2.02	2.85	3.68
May	.34	.54	.86	1.17	1.50	1.85	2.26	2.76	3.43	4.52	5.56
Jun	1.02	1.31	1.73	2.09	2.43	2.78	3.17	3.62	4.20	5.10	5.92
Jul	.64	.90	1.30	1.66	2.02	2.40	2.83	3.33	4.00	5.06	6.06
Aug	.39	.56	.85	1.12	1.39	1.68	2.00	2.40	2.92	3.75	4.55
Sep	.24	.37	.58	.79	1.00	1.23	1.49	1.81	2.23	2.92	3.58
Oct	.03	.07	.18	.33	.52	.75	1.05	1.45	2.03	3.06	4.11
Nov	.01	.06	.14	.24	.35	.47	.63	.83	1.11	1.58	2.06
Dec	.06	.09	.13	.18	.23	.28	.34	.41	.51	.67	.82
Ann	9.65	10.85	12.45	13.69	14.82	15.93	17.09	18.40	20.01	22.39	24.49

\+ 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: 1964-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Snow (inches)

Snow Totals

Means/Medians (1)

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	4.3	3.0	7	6	6.0	1996	18	12.0	1989	22	1997	28	20	1997	4.8	2.8	.5	.1	.0	25.6	17.5	13.5	6.7
Feb	4.0	2.3	6	5	6.0	1996	11	15.0	1996	22	1994	2	19	1994	4.0	2.1	.6	.2	.0	19.1	13.7	9.1	4.6
Mar	4.2	3.3	4	4	11.0	1971	14	15.2	1971	23	1979	4	17	1979	2.9	1.9	.7	.2	@	14.2	10.0	5.6	1.7
Apr	2.0	.6	1	#	15.0	1999	2	15.0	1999	20	1997	8	9	1979	1.1	.8	.4	.3	.1	2.8	1.3	.9	.6
May	.2	.0	#	0	5.0	1991	3	5.0	1991	5	1991	3	#+	1991	@	@	@	@	.0	.1	@	@	.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	.1	.0	#	0	3.0	1972	26	3.0	1972	1	1995	21	#+	1995	.1	.1	@	.0	.0	@	.0	.0	.0
Oct	1.9	.0	#	#	6.0	1991	23	14.0	1991	8	1991	31	2	1991	.7	.7	.3	.1	.0	1.2	.6	.4	.0
Nov	4.7	3.0	2	1	10.0	1998	10	13.0	1986	20	1998	19	7+	2000	2.7	2.3	.9	.3	.1	10.8	6.0	3.7	.9
Dec	4.5	3.0	4	3	5.0	1992	13	18.0	1996	19	1996	31	17	1996	3.8	2.1	.4	@	.0	21.7	12.1	8.1	2.1
Ann	25.9	15.2	N/A	N/A	15.0	Apr 1999	2	18.0	Dec 1996	23	Mar 1979	4	20	Jan 1997	20.1	12.8	3.8	1.2	.2	95.5	61.2	41.3	16.6

+ 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	6/03	5/29	5/26	5/23	5/20	5/18	5/15	5/12	5/07
32	5/23	5/18	5/15	5/13	5/10	5/08	5/05	5/02	4/28
28	5/20	5/15	5/11	5/08	5/06	5/03	4/30	4/26	4/22
24	5/08	5/03	4/29	4/26	4/23	4/19	4/16	4/12	4/07
20	4/26	4/21	4/18	4/14	4/11	4/09	4/05	4/02	3/27
16	4/16	4/12	4/09	4/06	4/04	4/01	3/30	3/27	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	8/27	9/01	9/04	9/07	9/10	9/13	9/16	9/20	9/25
32	9/07	9/11	9/15	9/17	9/20	9/23	9/26	9/29	10/04
28	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/09	10/14
24	9/22	9/27	10/01	10/05	10/08	10/11	10/15	10/19	10/25
20	10/02	10/08	10/13	10/17	10/20	10/24	10/28	11/02	11/08
16	10/10	10/17	10/21	10/25	10/29	11/01	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	130	124	120	116	112	109	105	100	94
32	152	145	140	136	132	128	124	119	112
28	169	161	156	151	146	142	137	132	124
24	191	183	177	172	168	163	159	153	145
20	215	207	201	196	191	186	181	175	167
16	228	221	215	211	207	203	198	193	186

***** 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	1862	1471	1255	723	321	117	50	79	282	682	1221	1688	9751
60	1707	1331	1100	581	205	51	15	30	168	527	1071	1533	8319
57	1614	1247	1007	500	149	26	7	15	113	435	981	1440	7534
55	1552	1191	946	448	117	16	2	8	83	375	921	1378	7037
50	1397	1051	796	328	58	3	0	1	30	238	772	1223	5897
32	867	591	331	62	1	0	0	0	0	14	314	699	2879

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	27	45	99	331	726	962	1135	1085	728	356	84	35	5613
55	0	0	1	27	130	289	423	381	121	3	0	0	1375
57	0	0	0	19	100	239	366	325	91	1	0	0	1141
60	0	0	0	10	62	173	282	247	56	0	0	0	830
65	0	0	0	3	23	89	162	142	20	0	0	0	439
70	0	0	0	0	6	34	79	67	6	0	0	0	192

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	10	166	516	755	916	881	522	204	18	0	0	1	11	177	693	1448	2364	3245	3767	3971	3989	3989
45	0	0	2	94	370	605	761	726	379	113	6	0	0	0	2	96	466	1071	1832	2558	2937	3050	3056	3056
50	0	0	0	46	247	455	606	571	255	50	0	0	0	0	0	46	293	748	1354	1925	2180	2230	2230	2230
55	0	0	0	18	143	311	451	418	147	16	0	0	0	0	0	18	161	472	923	1341	1488	1504	1504	1504
60	0	0	0	6	74	183	301	276	71	3	0	0	0	0	0	6	80	263	564	840	911	914	914	914
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	12	131	322	466	589	557	324	146	17	0	0	1	13	144	466	932	1521	2078	2402	2548	2565	2565

(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