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: WILTON, ND **COOP ID: 329455**

Climate Division: ND 8 **NWS Call Sign:** **Elevation: 2,170 Feet** **Lat: 47˚09N** **Lon: 100˚47W**

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	17.1	-1.0	8.1	53	1981	24	23.3	1992	-37	1950	18	-7.1	1982	1767	0	.0	.0	.1	24.8	30.8	16.2
Feb	23.8	6.6	15.2	65	1958	25	27.7	1998	-36	1996	1	-.8	1979	1395	0	.0	.0	.7	18.3	28.0	10.3
Mar	36.1	18.5	27.3	79	1967	30	36.9	1986	-24+	1998	9	17.6	1996	1169	0	.0	.0	5.8	11.6	29.1	3.8
Apr	52.4	30.9	41.7	93	1980	22	50.6	1977	-4+	1979	6	30.9	1979	703	2	.0	.1	18.5	1.9	18.1	.3
May	66.7	42.8	54.8	95+	1988	30	63.4	1977	12	1967	3	47.6	1979	338	20	.0	.3	28.9	@	3.6	.0
Jun	74.6	51.7	63.2	103	1988	28	73.5	1988	31	1953	6	56.7	1985	129	74	.1	1.6	30.0	.0	@	.0
Jul	80.4	56.1	68.3	106	1988	28	72.7	1989	40+	1967	3	62.1	1993	42	143	.3	4.2	31.0	.0	.0	.0
Aug	80.1	54.4	67.3	107	1958	8	72.6	1983	31	1950	20	60.7	1985	83	153	.3	4.6	31.0	.0	.0	.0
Sep	69.0	44.3	56.7	103+	1978	6	64.6	1978	19	1965	26	51.4	1984	279	29	.1	1.1	28.7	.0	2.7	.0
Oct	55.2	32.5	43.9	95	1963	4	48.3	1973	-6	1991	31	38.8	1976	655	0	.0	.1	21.4	1.3	16.2	@
Nov	34.3	17.2	25.8	75	1999	7	38.0	1999	-24	1985	29	13.8	1985	1177	0	.0	.0	5.0	12.7	28.3	2.8
Dec	22.0	4.4	13.2	60	1979	5	25.0	1997	-38	1967	31	-2.7	1983	1605	0	.0	.0	.3	22.9	30.9	12.0
Ann	51.0	29.9	40.5	107	Aug 1958	8	73.5	Jun 1988	-38	Dec 1967	31	-7.1	Jan 1982	9342	421	.8	12.0	201.4	93.5	187.7	45.4

\+ 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	.47	.47	.42+	1994	3	1.02	1996	.00	1998
Feb	.36	.32	.65	1951	28	1.26	1979	.00	2000
Mar	.58	.48	1.42	1950	27	1.53	1983	.00	1998
Apr	1.44	.95	1.84	1964	27	4.48	1984	.02	1988
May	2.32	2.06	3.40	1985	12	7.68	1999	.10	1997
Jun	3.65	3.58	4.40	2000	13	7.54	2000	.69	1988
Jul	3.06	2.54	4.00	1993	22	14.80	1993	.36	1976
Aug	2.15	1.68	4.21	1951	30	9.29	1999	.11	1971
Sep	1.72	1.46	3.10	1977	24	6.27	1977	.22	1976
Oct	1.43	.88	1.85	1994	18	6.23	1994	.00+	1999
Nov	.67	.63	1.50	1998	9	2.26	2000	.00+	1999
Dec	.43	.37	.40+	2000	28	1.25	1977	.00+	1997
Ann	18.28	17.74	4.40	Jun 2000	13	14.80	Jul 1993	.00+	Feb 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.5	1.6	.0	.0
Feb	4.2	1.5	.0	.0
Mar	5.2	1.9	.1	.0
Apr	5.9	3.2	.8	.2
May	8.0	5.2	1.4	.4
Jun	10.4	6.8	2.4	1.0
Jul	8.5	5.4	1.9	.7
Aug	8.3	4.6	1.3	.3
Sep	6.3	3.7	.9	.3
Oct	5.1	3.0	.8	.3
Nov	4.5	2.1	.3	@
Dec	5.3	1.4	.0	.0
Ann	77.2	40.4	9.9	3.2

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	.05	.10	.18	.25	.32	.39	.48	.58	.71	.93	1.14
Feb	.04	.09	.15	.20	.25	.31	.37	.45	.55	.71	.86
Mar	.03	.08	.17	.26	.35	.45	.57	.72	.92	1.25	1.58
Apr	.08	.15	.33	.52	.74	1.00	1.32	1.73	2.32	3.31	4.30
May	.32	.51	.84	1.16	1.50	1.87	2.30	2.83	3.54	4.71	5.84
Jun	1.03	1.38	1.90	2.36	2.80	3.27	3.78	4.39	5.18	6.42	7.57
Jul	.54	.81	1.26	1.68	2.11	2.57	3.09	3.73	4.58	5.94	7.25
Aug	.22	.38	.67	.97	1.29	1.66	2.09	2.62	3.36	4.57	5.76
Sep	.22	.36	.60	.84	1.10	1.38	1.70	2.10	2.65	3.54	4.40
Oct	.00	.05	.22	.42	.66	.94	1.28	1.72	2.36	3.44	4.53
Nov	.00	.00	.13	.24	.36	.49	.65	.84	1.10	1.55	1.98
Dec	.00	.12	.21	.28	.34	.40	.46	.54	.63	.78	.92
Ann	10.27	11.69	13.57	15.05	16.40	17.73	19.13	20.71	22.67	25.57	28.15

\+ 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	7.0	5.0	7	4
Feb	6.4	4.8	5	3
Mar	5.5	4.5	3	2
Apr	2.5	.5	1	#
May	.3	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	2.1	.0	#	#
Nov	5.8	2.5	1	#
Dec	6.3	6.2	4	2
Ann	36.1	23.5	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	16.0	1999	1	32.3	1997	26	1994	19	24	1994
Feb	5.0	1982	24	21.6	1979	32	1979	26	25	1979
Mar	9.0	1992	21	15.6	1982	31	1979	3	19	1979
Apr	7.0	1984	28	17.0	1984	12	1979	4	9	1979
May	5.0	1991	3	5.0	1991	5	1991	3	#+	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	4.0	1984	24	4.0	1984	3	1972	26	#+	1995
Oct	9.0	1991	29	17.2	1991	10	1991	30	1	1991
Nov	15.0	1993	24	35.3	1996	23	1993	26	6	1986
Dec	12.0	1996	17	26.9	1996	19	1993	24	17	1993
Ann	16.0	Jan 1999	1	35.3	Nov 1996	32	Feb 1979	26	25	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.5	2.1	.8	.4	.1
Feb	4.0	2.0	.6	.1	.0
Mar	3.5	2.0	.5	.1	.0
Apr	1.4	.7	.3	.2	.0
May	.2	.1	@	@	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.1	.0	.0
Oct	.9	.6	.2	.1	.0
Nov	3.1	1.7	.6	.4	.1
Dec	4.3	1.8	.6	.2	@
Ann	22.0	11.1	3.7	1.5	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	21.4	14.8	10.0	3.6
Feb	15.6	10.1	4.3	.4
Mar	9.3	5.3	1.3	.3
Apr	2.8	1.8	1.6	.8
May	.2	.1	@	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	@	.0	.0
Oct	1.3	.5	.3	.1
Nov	8.4	4.3	3.0	.9
Dec	19.9	11.9	5.7	.9
Ann	79.0	48.8	26.2	7.0

+ 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	6/02	5/28	5/25	5/22	5/20	5/17	5/15	5/11	5/07
32	5/25	5/20	5/17	5/14	5/12	5/09	5/06	5/03	4/29
28	5/19	5/14	5/10	5/06	5/03	4/30	4/27	4/23	4/17
24	5/11	5/05	5/01	4/27	4/24	4/21	4/17	4/13	4/07
20	5/03	4/27	4/22	4/18	4/14	4/10	4/06	4/01	3/26
16	4/15	4/11	4/08	4/05	4/03	4/01	3/29	3/26	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	8/30	9/04	9/08	9/11	9/14	9/17	9/20	9/24	9/29
32	9/11	9/15	9/19	9/22	9/25	9/27	9/30	10/04	10/08
28	9/19	9/24	9/27	9/30	10/03	10/06	10/09	10/12	10/17
24	9/24	9/29	10/03	10/07	10/10	10/14	10/17	10/21	10/27
20	10/05	10/10	10/14	10/18	10/21	10/24	10/27	10/31	11/05
16	10/12	10/18	10/23	10/26	10/30	11/03	11/06	11/11	11/17

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	140	132	126	121	116	112	107	101	93
32	155	148	143	139	135	131	127	122	116
28	174	167	161	156	152	147	143	137	129
24	195	186	179	174	169	163	158	151	142
20	215	206	200	194	189	184	178	172	163
16	230	223	218	213	209	205	201	195	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	1767	1395	1169	703	338	129	42	83	279	655	1177	1605	9342
60	1612	1255	1014	560	218	59	10	33	169	501	1027	1450	7908
57	1519	1171	921	478	160	31	2	18	116	409	937	1357	7119
55	1457	1115	859	426	127	20	0	11	87	349	877	1295	6623
50	1302	975	708	307	63	5	0	2	34	215	734	1140	5485
32	785	524	255	48	1	0	0	0	0	11	289	625	2538

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	41	54	110	337	706	934	1123	1093	740	379	102	42	5661
55	0	0	0	25	119	264	411	391	137	4	0	0	1351
57	0	0	0	17	90	216	351	336	106	2	0	0	1118
60	0	0	0	9	55	153	266	258	70	0	0	0	811
65	0	0	0	2	20	74	143	153	29	0	0	0	421
70	0	0	0	0	5	25	61	76	10	0	0	0	177

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	14	158	481	707	886	846	505	197	21	0	0	0	14	172	653	1360	2246	3092	3597	3794	3815	3815
45	0	0	5	84	339	557	731	691	366	111	6	0	0	0	5	89	428	985	1716	2407	2773	2884	2890	2890
50	0	0	0	36	215	409	576	536	240	49	0	0	0	0	0	36	251	660	1236	1772	2012	2061	2061	2061
55	0	0	0	14	119	271	421	385	140	17	0	0	0	0	0	14	133	404	825	1210	1350	1367	1367	1367
60	0	0	0	4	52	152	270	243	68	3	0	0	0	0	0	4	56	208	478	721	789	792	792	792
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	17	111	293	429	558	530	308	139	20	0	0	0	17	128	421	850	1408	1938	2246	2385	2405	2405

(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