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: WASHBURN, ND **COOP ID: 329195**

Climate Division: ND 4 **NWS Call Sign:** **Elevation: 1,735 Feet** **Lat: 47˚17N** **Lon: 101˚02W**

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	20.0	-.7	9.7	57	1981	23	24.9	1990	-35	1968	5	-6.9	1982	1718	0	.0	.0	.4	22.6	30.9	15.0
Feb	27.3	6.5	16.9	69	1958	25	30.1	1998	-34	1962	28	-.3	1979	1347	0	.0	.0	2.0	16.1	27.7	9.5
Mar	39.5	17.9	28.7	81	1967	29	38.4	1986	-25	1962	1	19.4	1996	1126	0	.0	.0	8.2	8.4	28.4	2.9
Apr	55.6	30.7	43.2	98	1980	21	51.7	1977	-5	1975	1	34.2	1975	658	1	.0	.2	21.3	1.1	17.2	.1
May	69.2	43.2	56.2	99	1980	21	65.4	1977	12	1967	3	50.1	1979	296	22	.0	.8	29.9	.0	3.2	.0
Jun	77.6	52.2	64.9	107	1988	28	76.0	1988	29+	1969	20	60.0	1993	104	100	.3	3.2	30.0	.0	.0	.0
Jul	83.3	56.7	70.0	106	1973	11	74.7	1989	35	1969	1	63.3	1993	30	186	.8	7.5	31.0	.0	.0	.0
Aug	82.8	54.9	68.9	108	1983	7	75.9	1983	34	1982	27	63.2	1974	63	182	.8	8.2	31.0	.0	.0	.0
Sep	72.0	44.7	58.4	104	1978	5	65.0	1998	18	1974	30	53.4	1984	237	37	.3	1.8	29.2	.0	1.8	.0
Oct	58.0	32.9	45.5	96	1963	4	49.0	1973	0	1991	31	41.5	1972	607	0	.0	.1	24.0	.5	14.2	@
Nov	37.0	18.4	27.7	77+	1999	8	39.9	1999	-20	1964	29	15.5	1985	1119	0	.0	.0	6.1	10.3	27.2	2.0
Dec	24.0	5.5	14.8	61+	1979	4	28.0	1997	-34+	1983	23	-1.8	1983	1559	0	.0	.0	.9	20.2	30.8	10.6
Ann	53.9	30.2	42.1	108	Aug 1983	7	76.0	Jun 1988	-35	Jan 1968	5	-6.9	Jan 1982	8864	528	2.2	21.8	214.0	79.2	181.4	40.1

\+ 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: 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	.45	.38	.81	1950	24	1.60	1999	.00	1973
Feb	.48	.33	1.53	1951	28	2.82	1998	.00	1978
Mar	.75	.61	.98	1968	19	1.81	1987	.09	1991
Apr	1.64	1.17	2.35	1970	29	5.03	1984	.08	1988
May	2.26	1.85	2.32	1985	12	5.86	1999	.33	1984
Jun	3.28	2.82	3.90	1964	18	7.27	1990	1.05	1989
Jul	2.75	2.29	3.95	1956	30	8.42	1993	.55	1984
Aug	1.99	1.76	2.55	1999	12	5.61	1980	.00	1971
Sep	1.67	1.46	3.02	1978	12	5.58	1977	.30	1974
Oct	1.44	1.02	1.76	1998	5	5.69	1971	.10	1987
Nov	.68	.59	1.00	1956	2	2.22	1998	.00	1990
Dec	.41	.37	.80	1950	25	1.44	1996	.02+	1991
Ann	17.80	17.78	3.95	Jul 1956	30	8.42	Jul 1993	.00+	Nov 1990

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	1.5	.1	.0
Feb	4.9	1.5	.1	.1
Mar	5.6	2.2	.2	.0
Apr	6.8	3.6	1.1	.2
May	8.6	5.4	1.5	.3
Jun	10.4	6.5	2.4	.6
Jul	9.1	5.5	1.5	.6
Aug	7.7	4.2	1.2	.3
Sep	6.8	3.7	.9	.4
Oct	5.3	2.8	.9	.4
Nov	4.6	2.2	.4	.0
Dec	4.9	1.3	.0	.0
Ann	79.0	40.4	10.3	2.9

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	.01	.05	.11	.17	.24	.32	.42	.54	.71	1.00	1.28
Feb	.01	.04	.10	.17	.24	.33	.44	.58	.78	1.11	1.43
Mar	.11	.17	.28	.38	.49	.61	.74	.91	1.14	1.50	1.85
Apr	.11	.21	.41	.64	.89	1.18	1.53	1.98	2.61	3.67	4.72
May	.50	.71	1.04	1.34	1.64	1.96	2.32	2.75	3.32	4.22	5.08
Jun	1.09	1.40	1.86	2.25	2.62	3.00	3.42	3.91	4.54	5.52	6.42
Jul	.72	.98	1.38	1.73	2.08	2.44	2.84	3.32	3.94	4.93	5.84
Aug	.18	.41	.74	1.03	1.33	1.65	2.01	2.46	3.05	4.01	4.93
Sep	.37	.52	.77	.99	1.21	1.44	1.71	2.03	2.44	3.11	3.73
Oct	.09	.17	.35	.54	.76	1.02	1.34	1.74	2.30	3.26	4.21
Nov	.03	.08	.18	.28	.39	.51	.66	.84	1.09	1.51	1.93
Dec	.04	.07	.12	.18	.25	.32	.40	.51	.65	.89	1.13
Ann	11.87	12.99	14.44	15.55	16.54	17.51	18.51	19.63	20.99	22.97	24.71

\+ 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	6.4	6.0	5	5
Feb	6.2	5.5	6	4
Mar	6.8	6.0	3	2
Apr	3.4	1.0	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	2.1	.1	#	0
Nov	4.8	3.6	2	1
Dec	5.8	7.0	4	3
Ann	35.8	29.2	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	6.0	1988	12	26.0	1999	25	1982	31	14	1982
Feb	8.0	1981	27	22.5	1979	36	1979	28	25	1982
Mar	8.0	1983	7	18.0	1975	39	1979	2	26	1979
Apr	10.0	1997	5	18.0	1997	21	1979	1	6	1979
May	4.3	1991	3	4.3	1991	4	1991	3	#+	1996
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	25	4.0	1984	2+	1984	25	#+	1984
Oct	10.0	1991	28	15.0	1991	10	1991	29	2	1991
Nov	10.0	1986	8	23.0	1998	14	1996	25	7	1986
Dec	6.0	1973	14	12.0+	1977	13	1978	31	9	1996
Ann	10.0+	Apr 1997	5	26.0	Jan 1999	39	Mar 1979	2	26	Mar 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.0	2.8	.8	.2	.0
Feb	3.8	2.8	.7	.2	.0
Mar	3.4	2.6	1.3	.4	.0
Apr	.9	.9	.5	.3	@
May	.1	.1	@	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	@	.0	.0
Oct	.9	.5	.3	.2	@
Nov	3.2	2.4	1.0	.4	@
Dec	4.3	3.0	.5	.1	.0
Ann	20.7	15.2	5.1	1.8	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.3	16.8	10.1	2.4
Feb	17.6	13.1	8.6	3.0
Mar	8.9	5.9	4.1	1.4
Apr	1.9	1.4	1.1	.6
May	.1	@	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.0	.0	.0
Oct	.7	.5	.4	.1
Nov	10.4	5.8	3.9	1.4
Dec	18.2	12.1	7.3	1.8
Ann	81.2	55.6	35.5	10.7

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	138	132	127	123	120	116	112	108	101
32	158	151	146	141	137	133	129	124	117
28	176	169	164	159	155	151	147	142	135
24	197	189	184	179	175	170	166	160	153
20	222	214	208	202	197	193	187	181	173
16	241	233	226	221	216	211	206	199	191

***** 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	1718	1347	1126	658	296	104	30	63	237	607	1119	1559	8864
60	1563	1207	971	515	181	43	7	23	135	452	969	1404	7470
57	1470	1123	878	433	127	22	1	12	87	360	879	1311	6703
55	1408	1067	817	381	97	13	0	7	61	301	819	1249	6220
50	1253	935	671	264	43	2	0	1	20	169	676	1094	5128
32	744	488	230	31	0	0	0	0	0	4	242	591	2330

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	49	65	127	365	749	987	1179	1143	790	421	113	55	6043
55	0	0	0	24	133	310	466	436	162	4	0	0	1535
57	0	0	0	16	101	258	405	379	127	2	0	0	1288
60	0	0	0	8	63	189	318	298	85	0	0	0	961
65	0	0	0	1	22	100	186	182	37	0	0	0	528
70	0	0	0	0	5	40	92	97	13	0	0	0	247

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	28	195	532	766	957	921	571	245	31	0	0	2	30	225	757	1523	2480	3401	3972	4217	4248	4248
45	0	0	9	110	389	616	802	766	425	142	11	0	0	0	9	119	508	1124	1926	2692	3117	3259	3270	3270
50	0	0	0	55	252	467	647	611	290	69	1	0	0	0	0	55	307	774	1421	2032	2322	2391	2392	2392
55	0	0	0	24	146	322	492	458	174	24	0	0	0	0	0	24	170	492	984	1442	1616	1640	1640	1640
60	0	0	0	9	69	196	339	308	94	6	0	0	0	0	0	9	78	274	613	921	1015	1021	1021	1021
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	33	150	335	478	613	589	357	173	24	0	0	1	34	184	519	997	1610	2199	2556	2729	2753	2753

(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