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: GARRISON 1 NNW, ND **COOP ID: 323376**

Climate Division: ND 5 **NWS Call Sign:** **Elevation: 1,935 Feet** **Lat: 47˚39N** **Lon: 101˚25W**

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	18.1	-3.1	7.5	53	1981	24	23.3	1990	-38	1982	10	-10.0	1982	1783	0	.0	.0	.1	24.6	30.9	17.9
Feb	25.4	4.1	14.8	63	1958	26	28.7	1998	-37	1986	20	-3.5	1979	1407	0	.0	.0	1.1	17.7	28.1	11.4
Mar	36.9	16.2	26.6	75+	1986	29	36.4	1986	-29+	1995	8	16.4	1996	1192	0	.0	.0	5.2	10.9	30.0	4.3
Apr	53.5	29.4	41.5	93	1980	22	50.0	1977	-12	1982	3	32.5	1979	709	1	.0	.1	18.3	1.7	19.6	.4
May	67.3	41.9	54.6	96	1969	27	63.7	1977	12	1967	3	48.6	1979	337	15	.0	.4	29.1	.0	4.5	.0
Jun	75.4	50.9	63.2	101	1988	28	74.4	1988	26	1985	4	57.6	1985	132	77	.1	1.7	30.0	.0	.1	.0
Jul	81.2	55.2	68.2	105	1977	18	73.6	1989	35	1967	3	61.3	1993	55	154	.4	4.5	31.0	.0	.0	.0
Aug	81.0	53.7	67.4	108	1949	7	75.4	1983	29	1982	27	62.0	1985	79	152	.3	5.6	31.0	.0	@	.0
Sep	69.4	42.9	56.2	104	1978	6	62.1	1998	17	1974	30	50.2	1984	287	22	.1	1.2	28.6	.0	3.6	.0
Oct	56.1	30.7	43.4	95	1953	2	48.6	1973	-3	1991	31	38.6	1972	670	0	.0	.1	21.4	.9	18.2	@
Nov	36.3	16.6	26.5	75	1999	1	37.7	1999	-27	1985	29	14.2	1985	1157	0	.0	.0	5.4	11.3	28.4	3.2
Dec	23.5	3.7	13.6	61	1979	5	27.5	1997	-42+	1983	24	-4.6	1983	1593	0	.0	.0	.5	21.2	30.8	12.1
Ann	52.0	28.5	40.3	108	Aug 1949	7	75.4	Aug 1983	-42+	Dec 1983	24	-10.0	Jan 1982	9401	421	.9	13.6	201.7	88.3	194.2	49.3

\+ 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	.39	.35	.65	1949	8	.89	1976	.00+	1990
Feb	.36	.22	1.48	1951	28	2.42	1998	.00	1990
Mar	.63	.55	1.10	1983	6	1.95	1987	.00	1986
Apr	1.27	.83	1.49	1964	27	4.17	1984	.00	1988
May	2.10	2.13	1.67	1973	29	5.16	1999	.27	1984
Jun	3.12	2.89	4.35	1999	7	6.98	1990	.69	1974
Jul	2.62	2.05	2.98	1987	22	8.78	1993	.10	1971
Aug	1.91	1.61	2.83	1999	12	6.37	1999	.00	1971
Sep	1.44	1.28	2.50	1955	21	5.38	1977	.18	1993
Oct	1.22	.73	2.10	1994	7	6.48	1994	.01	1987
Nov	.57	.49	1.07	2000	2	1.87	2000	.03+	1987
Dec	.39	.37	.60	1959	27	1.39	1977	.00+	1997
Ann	16.02	15.40	4.35	Jun 1999	7	8.78	Jul 1993	.00+	Dec 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	1.3	.1	.0
Feb	3.6	1.2	.1	@
Mar	4.9	1.9	.2	@
Apr	6.3	3.6	.8	.1
May	8.1	4.8	1.4	.4
Jun	9.9	6.3	2.0	.6
Jul	7.7	5.3	1.9	.6
Aug	6.7	3.9	1.1	.4
Sep	5.8	3.2	.9	.2
Oct	4.8	2.9	.7	.2
Nov	4.1	2.0	.2	@
Dec	4.5	1.5	.1	.0
Ann	71.2	37.9	9.5	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	.00	.05	.12	.18	.25	.32	.40	.49	.62	.83	1.03
Feb	.01	.03	.07	.12	.18	.24	.33	.43	.58	.84	1.10
Mar	.02	.08	.17	.26	.36	.47	.61	.78	1.01	1.40	1.78
Apr	.05	.14	.32	.51	.71	.94	1.21	1.56	2.03	2.83	3.61
May	.58	.78	1.08	1.35	1.61	1.88	2.18	2.53	2.99	3.71	4.38
Jun	1.09	1.39	1.81	2.17	2.52	2.87	3.26	3.71	4.28	5.17	5.98
Jul	.35	.56	.94	1.30	1.68	2.11	2.60	3.20	4.02	5.35	6.64
Aug	.10	.28	.58	.86	1.16	1.49	1.88	2.36	3.01	4.09	5.14
Sep	.26	.39	.60	.80	1.00	1.21	1.46	1.76	2.16	2.80	3.41
Oct	.05	.10	.24	.40	.58	.81	1.09	1.46	1.98	2.89	3.80
Nov	.04	.08	.15	.23	.32	.42	.54	.69	.90	1.26	1.61
Dec	.00	.00	.14	.22	.28	.35	.42	.51	.62	.78	.94
Ann	10.17	11.26	12.67	13.77	14.75	15.71	16.71	17.83	19.20	21.21	22.97

\+ 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	5.0	4.6	7	6
Feb	4.0	2.6	6	5
Mar	4.1	4.0	4	3
Apr	3.1	.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	1.8	.0	#	#
Nov	5.2	5.6	1	#
Dec	2.3	2.6	4	3
Ann	25.8	19.4	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	9.5	1999	3	18.0	1989	26	1997	9	23	1997
Feb	6.0	1998	26	13.0	1998	20+	1997	16	18	1997
Mar	9.0	1997	13	11.8	1997	18	1979	1	15	1998
Apr	9.3	1984	28	17.3	1984	18	1984	28	7	1996
May	5.0	1991	4	5.0	1991	6	1984	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	4.0	1972	26	4.0	1972	4	1984	24	#+	1995
Oct	7.0	1985	8	10.0	1985	7	1991	30	1	1991
Nov	13.0	1986	8	14.7	1996	18	1993	30	7	2000
Dec	5.0	1998	27	6.5	1995	24	1996	31	17+	1996
Ann	13.0	Nov 1986	8	18.0	Jan 1989	26	Jan 1997	9	23	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.9	1.4	.9	.3	.0
Feb	2.9	1.6	.2	.1	.0
Mar	2.4	1.1	.5	.1	.0
Apr	1.0	.8	.4	.2	.0
May	.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	.6	.6	.3	.1	.0
Nov	2.2	1.4	.8	.2	.1
Dec	2.0	1.3	.3	.1	.0
Ann	14.0	8.2	3.4	1.1	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	.9	.6	.3	.2
May	.1	.1	@	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	@	.0	.0
Oct	.7	.4	.1	.0
Nov	5.6	4.6	2.7	1.5
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	127	119	113	109	104	100	95	89	81
32	144	137	133	129	125	122	118	113	107
28	162	155	150	146	141	137	133	128	121
24	184	178	173	169	165	161	157	152	146
20	207	199	194	189	184	180	175	169	161
16	227	219	214	209	204	200	195	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	1783	1407	1192	709	337	132	55	79	287	670	1157	1593	9401
60	1628	1267	1037	565	213	61	16	30	173	516	1007	1438	7951
57	1535	1183	944	483	154	33	7	16	117	424	917	1345	7158
55	1473	1127	882	430	120	21	2	9	87	364	857	1283	6655
50	1318	993	737	309	57	5	0	1	33	227	711	1128	5519
32	798	541	284	49	0	0	0	0	0	11	267	619	2569

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	38	58	115	331	702	935	1122	1097	725	363	100	49	5635
55	0	0	1	22	109	265	411	393	122	3	0	0	1326
57	0	0	0	15	80	217	354	337	92	1	0	0	1096
60	0	0	0	7	47	156	270	259	58	0	0	0	797
65	0	0	0	1	15	77	154	152	22	0	0	0	421
70	0	0	0	0	3	28	72	76	6	0	0	0	185

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	12	150	460	703	882	848	484	184	20	0	0	1	13	163	623	1326	2208	3056	3540	3724	3744	3744
45	0	0	4	84	323	553	727	693	348	98	8	0	0	0	4	88	411	964	1691	2384	2732	2830	2838	2838
50	0	0	0	37	204	407	572	539	224	44	0	0	0	0	0	37	241	648	1220	1759	1983	2027	2027	2027
55	0	0	0	14	111	266	417	388	125	10	0	0	0	0	0	14	125	391	808	1196	1321	1331	1331	1331
60	0	0	0	5	50	149	269	245	59	2	0	0	0	0	0	5	55	204	473	718	777	779	779	779
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	14	116	289	431	559	536	308	140	20	0	0	1	15	131	420	851	1410	1946	2254	2394	2414	2414

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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