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: FERGUS FALLS, MN **COOP ID: 212768**

Climate Division: MN 4 **NWS Call Sign:** **Elevation: 1,250 Feet** **Lat: 46˚18N** **Lon: 96˚07W**

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	16.2	-3.4	6.4	55	1981	25	20.7	1990	-38	1977	16	-7.8	1977	1818	0	.0	.0	@	26.8	31.0	17.7
Feb	23.1	3.6	13.4	57	1958	25	28.2	1998	-40	1982	5	-1.0	1979	1446	0	.0	.0	.3	19.6	27.8	11.7
Mar	35.2	17.0	26.1	78+	1967	30	36.1	2000	-27	1962	1	17.1	1996	1205	0	.0	.0	3.9	11.0	27.7	4.0
Apr	53.3	32.0	42.7	94	1980	22	51.0	1987	-2	1979	6	34.7	1979	672	1	.0	.1	18.2	.9	15.6	.1
May	67.9	45.6	56.8	97+	1969	27	64.0	1977	19	1967	2	49.6	1979	285	29	.0	.2	29.5	.0	2.1	.0
Jun	75.9	54.9	65.4	99	1995	18	72.7	1988	31	1992	21	59.4	1985	93	105	.0	1.7	30.0	.0	@	.0
Jul	80.4	59.6	70.0	101	1988	28	74.9	1989	37	1969	1	62.9	1992	27	181	.1	3.6	31.0	.0	.0	.0
Aug	79.2	57.3	68.3	102	1988	16	73.6	1983	36	1950	20	60.8	1977	57	158	.2	3.0	31.0	.0	.0	.0
Sep	69.2	46.6	57.9	96+	1998	11	64.9	1998	22+	1974	22	52.5	1993	240	27	.0	.8	29.2	.0	1.6	.0
Oct	55.9	34.3	45.1	93	1963	5	50.8	1973	6	1951	31	40.0	1976	617	0	.0	.0	22.1	.4	12.5	.0
Nov	35.8	19.5	27.7	74+	2001	6	39.3	1999	-20	1985	29	17.6	1985	1120	0	.0	.0	4.4	12.1	26.6	1.9
Dec	21.5	4.1	12.8	55+	1962	3	23.5	1997	-35	1983	19	-1.7	1983	1618	0	.0	.0	.3	24.3	30.9	12.4
Ann	51.1	30.9	41.1	102	Aug 1988	16	74.9	Jul 1989	-40	Feb 1982	5	-7.8	Jan 1977	9198	501	.3	9.4	199.9	95.1	175.8	47.8

\+ 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	.99	.56	1.85	1996	18	4.80	1997	.09	1978
Feb	.58	.59	.89	1977	24	1.27	1979	.00	1993
Mar	1.45	1.16	2.25	1997	4	7.52	1997	.09	1994
Apr	1.58	1.51	2.30	1997	6	4.24	1986	.05+	1996
May	2.66	2.58	2.76	1985	31	6.90	1985	.48	1980
Jun	3.75	3.47	3.84	1984	8	9.52	1984	.72	1987
Jul	3.34	2.97	3.02	1972	12	5.86	1993	.66	1996
Aug	3.14	3.11	4.30	1992	7	5.30	1989	.96	1998
Sep	2.19	1.97	2.00	1962	8	6.56	1986	.31	1979
Oct	2.02	1.62	2.58	1979	31	6.33	1984	.11	1978
Nov	1.17	.86	1.68	1977	9	4.43	1977	.00	1999
Dec	.50	.44	1.41	1949	11	1.49	1972	.04	1986
Ann	23.37	23.75	4.30	Aug 1992	7	9.52	Jun 1984	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	2.3	.4	.1
Feb	4.7	2.1	.2	.0
Mar	6.4	3.6	.7	.2
Apr	7.3	4.2	.8	.2
May	9.0	6.1	1.9	.3
Jun	10.3	6.7	2.6	1.0
Jul	8.9	6.0	2.3	1.0
Aug	8.9	5.4	2.2	.8
Sep	7.2	4.2	1.5	.5
Oct	6.7	3.9	1.4	.4
Nov	6.2	2.7	.7	.2
Dec	5.5	1.9	@	.0
Ann	87.5	49.1	14.7	4.7

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	.11	.23	.36	.51	.69	.91	1.19	1.59	2.27	2.94
Feb	.03	.08	.17	.26	.35	.45	.56	.71	.91	1.23	1.55
Mar	.20	.32	.53	.73	.94	1.17	1.44	1.77	2.22	2.95	3.66
Apr	.13	.24	.45	.67	.91	1.18	1.51	1.92	2.49	3.44	4.37
May	.61	.86	1.25	1.60	1.95	2.32	2.73	3.23	3.88	4.92	5.89
Jun	1.07	1.43	1.96	2.43	2.89	3.36	3.89	4.51	5.31	6.58	7.75
Jul	1.10	1.42	1.88	2.28	2.66	3.05	3.48	3.98	4.62	5.62	6.55
Aug	1.14	1.44	1.86	2.22	2.56	2.90	3.28	3.72	4.28	5.14	5.93
Sep	.33	.52	.83	1.14	1.45	1.80	2.19	2.68	3.33	4.39	5.40
Oct	.13	.25	.50	.78	1.09	1.45	1.89	2.44	3.22	4.54	5.85
Nov	.03	.11	.26	.43	.61	.83	1.09	1.42	1.89	2.68	3.46
Dec	.07	.11	.19	.26	.33	.41	.50	.62	.77	1.02	1.26
Ann	15.46	16.95	18.88	20.36	21.68	22.97	24.31	25.80	27.62	30.27	32.59

\+ 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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Climate Division: MN 4 **NWS Call Sign:** **Elevation: 1,250 Feet** **Lat: 46°18N** **Lon: 96°07W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	14.0	13.5	10	7
Feb	6.4	5.9	10	9
Mar	8.8	6.5	5	3
Apr	1.8	1.2	#	#
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.3	.0	#	0
Nov	5.6	2.9	2	1
Dec	6.8	6.0	5	3
Ann	43.7	36.0	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	13.0	1996	18	38.5	1975	62	1997	30	52	1997
Feb	7.5	1991	24	14.0	1974	64	1997	8	58	1997
Mar	12.0	1975	24	29.1	1975	68	1997	16	56	1997
Apr	5.0	1992	10	8.0	1990	30	1997	1	5	1997
May	#	1990	1	#	1990	#	1990	1	#	1990
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	.0	0	0	.0	0	0	0	0	0	0
Oct	2.0	1981	21	3.1	1981	2+	1992	16	#+	1997
Nov	15.0	1993	25	22.5	1977	22	1993	30	7	1993
Dec	6.0	1985	1	18.8	1972	32	1996	31	22	1996
Ann	15.0	Nov 1993	25	38.5	Jan 1975	68	Mar 1997	16	58	Feb 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.1	3.9	1.4	.6	.1
Feb	3.6	2.2	.6	.2	.0
Mar	3.2	2.5	.9	.5	.1
Apr	.8	.6	.2	.1	.0
May	.0	.0	.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	.0
Oct	.2	.1	.0	.0	.0
Nov	3.9	2.5	.9	.3	@
Dec	4.9	3.0	.6	.1	.0
Ann	22.7	14.8	4.6	1.8	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	29.8	25.6	21.6	9.3
Feb	-9.9	-9.9	-9.9	-9.9
Mar	11.3	7.1	4.9	1.5
Apr	1.3	.6	.3	.1
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.2	.0	.0	.0
Nov	6.6	3.4	2.2	.6
Dec	18.7	12.6	9.2	3.5
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	5/31	5/26	5/22	5/19	5/16	5/13	5/10	5/07	5/02
32	5/23	5/17	5/12	5/09	5/05	5/02	4/28	4/24	4/18
28	5/09	5/04	4/30	4/27	4/24	4/20	4/17	4/13	4/08
24	4/24	4/20	4/17	4/14	4/12	4/09	4/07	4/04	3/30
20	4/18	4/13	4/09	4/06	4/04	4/01	3/29	3/25	3/21
16	4/11	4/06	4/03	3/31	3/28	3/25	3/22	3/19	3/14

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	147	141	136	133	129	125	121	117	111
32	169	161	155	150	146	141	136	130	122
28	190	182	177	172	167	163	158	152	145
24	212	205	199	194	190	186	181	175	168
20	229	222	217	213	209	205	201	196	189
16	245	237	232	227	223	219	214	209	202

***** 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	1818	1446	1205	672	285	93	27	57	240	617	1120	1618	9198
60	1663	1306	1050	528	176	36	6	19	135	464	970	1463	7816
57	1570	1222	957	444	124	18	1	8	86	373	880	1370	7053
55	1508	1166	895	392	95	10	0	4	61	316	820	1308	6575
50	1353	1026	742	272	42	2	0	0	20	190	674	1153	5474
32	817	567	279	32	0	0	0	0	0	7	238	633	2573

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	22	45	97	351	767	1002	1178	1125	777	413	108	38	5923
55	0	0	0	21	149	322	465	416	148	8	0	0	1529
57	0	0	0	13	116	270	403	357	113	4	0	0	1276
60	0	0	0	6	75	198	316	275	72	1	0	0	943
65	0	0	0	1	29	105	181	158	27	0	0	0	501
70	0	0	0	0	9	41	87	76	8	0	0	0	221

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	15	175	543	778	944	894	558	223	21	0	0	1	16	191	734	1512	2456	3350	3908	4131	4152	4152
45	0	0	2	98	394	629	789	739	415	126	10	0	0	0	2	100	494	1123	1912	2651	3066	3192	3202	3202
50	0	0	0	49	264	479	634	584	280	59	0	0	0	0	0	49	313	792	1426	2010	2290	2349	2349	2349
55	0	0	0	20	156	333	480	430	168	23	0	0	0	0	0	20	176	509	989	1419	1587	1610	1610	1610
60	0	0	0	7	77	203	329	280	87	7	0	0	0	0	0	7	84	287	616	896	983	990	990	990
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	10	112	322	487	625	576	331	138	14	0	0	0	10	122	444	931	1556	2132	2463	2601	2615	2615

(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