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: MINOCQUA DAM, WI **COOP ID: 475516**

Climate Division: WI 2 **NWS Call Sign:** **Elevation: 1,580 Feet** **Lat: 45˚52N** **Lon: 89˚43W**

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	19.7	-2.0	8.9	56	1944	24	18.4	1990	-48	1915	28	-2.2	1977	1742	0	.0	.0	.1	27.3	31.0	16.6
Feb	26.5	2.1	14.3	60	1930	19	28.2	1998	-48	1996	3	5.1	1989	1420	0	.0	.0	.4	19.3	28.1	12.9
Mar	36.9	13.0	25.0	78	1910	29	34.9	1973	-36	1962	1	18.8	1996	1242	0	.0	.0	3.8	10.3	29.4	6.6
Apr	51.0	26.9	39.0	90	1952	28	44.8	1987	-18	1924	1	31.0	1995	781	0	.0	.0	15.9	1.5	22.3	.3
May	65.9	40.0	53.0	99	1934	31	62.3	1977	15	1966	10	45.1	1997	398	24	.0	@	28.2	.0	7.6	.0
Jun	73.3	49.5	61.4	99	1910	29	65.9	1991	25+	1929	3	56.1	1982	147	40	.0	.5	29.9	.0	.4	.0
Jul	77.3	54.0	65.7	106	1936	13	71.0	1983	30	1945	1	59.7	1992	69	89	.0	1.1	31.0	.0	.0	.0
Aug	75.3	51.8	63.6	99+	1947	5	68.6	1983	30	1934	28	59.4	1977	104	59	.0	.4	31.0	.0	.0	.0
Sep	65.8	43.7	54.8	95+	1976	8	60.7	1998	19	1945	29	50.1	1974	311	3	.0	.1	28.8	.0	3.1	.0
Oct	53.5	32.8	43.2	86	1976	2	51.6	1971	3	1925	30	37.1	1987	677	0	.0	.0	19.6	.4	16.6	.0
Nov	36.8	20.2	28.5	75	1944	1	36.3	1999	-18+	1976	29	19.3	1995	1095	0	.0	.0	4.4	10.9	27.5	1.6
Dec	23.6	5.5	14.6	57	1982	3	22.5	1997	-36+	1983	20	2.5	1989	1564	0	.0	.0	.1	24.8	30.9	11.0
Ann	50.5	28.1	39.3	106	Jul 1936	13	71.0	Jul 1983	-48+	Feb 1996	3	-2.2	Jan 1977	9550	215	.0	2.1	193.2	94.5	196.9	49.0

\+ 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: 1905-2001

(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	1.24	1.01	1.06	1996	18	3.33	1996	.12	1977
Feb	.90	.73	1.20	1908	5	2.90	1971	.02	1993
Mar	1.81	1.67	1.93	1973	12	4.71	1973	.42	1978
Apr	2.35	2.32	1.96	1938	14	5.35	1982	.31	1971
May	3.29	3.17	3.20	1951	16	7.87	1999	.35	1986
Jun	3.83	3.73	4.32	1946	24	7.53	1981	1.56	1976
Jul	3.99	3.83	5.68	1909	22	6.90	1999	1.09	1975
Aug	4.54	3.92	3.59	1978	27	13.77	1978	1.31	1981
Sep	3.88	3.82	4.65	1907	15	7.16	1985	.51	1976
Oct	2.69	2.49	3.40	1966	15	5.87	1995	.21	1976
Nov	2.30	2.07	3.00	1908	25	5.87	1991	.43	1981
Dec	1.28	1.23	.91	1950	8	2.61	1982	.14	1976
Ann	32.10	31.40	5.68	Jul 1909	22	13.77	Aug 1978	.02	Feb 1993

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.2	3.9	.4	@
Feb	6.9	2.9	.3	.0
Mar	9.2	4.5	1.0	.1
Apr	9.9	5.9	1.3	.2
May	10.6	6.9	2.2	.6
Jun	12.1	8.3	2.4	.6
Jul	10.5	7.8	2.9	.6
Aug	10.5	7.5	2.6	1.1
Sep	12.2	7.9	2.6	.7
Oct	11.6	5.9	1.5	.4
Nov	11.0	5.6	1.3	.3
Dec	10.8	4.2	.3	.0
Ann	125.5	71.3	18.8	4.6

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	.22	.33	.51	.68	.85	1.04	1.25	1.51	1.86	2.41	2.95
Feb	.10	.16	.29	.41	.55	.70	.88	1.10	1.40	1.89	2.37
Mar	.43	.60	.87	1.10	1.34	1.59	1.87	2.20	2.63	3.32	3.96
Apr	.67	.89	1.23	1.53	1.81	2.11	2.44	2.83	3.34	4.13	4.87
May	.84	1.15	1.63	2.05	2.47	2.91	3.40	3.98	4.73	5.93	7.05
Jun	1.75	2.09	2.55	2.93	3.28	3.64	4.01	4.44	4.99	5.81	6.55
Jul	1.42	1.79	2.34	2.80	3.23	3.68	4.17	4.74	5.47	6.60	7.63
Aug	1.54	1.97	2.60	3.13	3.64	4.16	4.74	5.41	6.27	7.60	8.83
Sep	.96	1.32	1.89	2.39	2.89	3.41	3.99	4.69	5.60	7.03	8.38
Oct	.78	1.04	1.42	1.76	2.08	2.42	2.80	3.24	3.81	4.70	5.54
Nov	.53	.75	1.08	1.38	1.68	2.00	2.36	2.78	3.34	4.23	5.06
Dec	.28	.40	.59	.76	.93	1.11	1.31	1.56	1.88	2.38	2.87
Ann	22.25	24.14	26.57	28.42	30.07	31.67	33.32	35.15	37.38	40.62	43.42

\+ 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: 1905-2001
(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	23.9	24.0	15	14
Feb	15.3	14.8	18	17
Mar	16.6	17.1	14	12
Apr	9.2	7.5	3	1
May	1.3	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	#	0
Oct	2.8	1.5	#	#
Nov	14.0	13.5	2	2
Dec	23.3	23.8	8	7
Ann	106.4	102.2	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	12.0	1980	7	43.2	1975	39	1971	30	30	1997
Feb	13.0	1971	5	42.4	1971	46	1971	6	38	1971
Mar	12.0	1996	25	35.5	1997	40+	1997	15	32	1971
Apr	14.0	1985	1	33.0	1993	28	1971	4	15	1996
May	6.0	1973	3	8.5	1997	4	1996	1	#+	1997
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	1.0	1995	22	1.0	1995	1	1995	22	#	1995
Oct	7.0	2000	7	12.0	1987	5	2000	7	#+	2000
Nov	9.0	1993	5	27.0	1985	11+	1991	30	5	1978
Dec	10.0	1972	13	39.5	1972	25	1996	31	20	1985
Ann	14.0	Apr 1985	1	43.2	Jan 1975	46	Feb 1971	6	38	Feb 1971

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	10.3	6.5	3.1	1.2	.1
Feb	6.5	4.0	2.1	.8	@
Mar	7.1	4.9	2.2	1.2	.1
Apr	3.9	3.1	1.2	.5	.1
May	.7	.5	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	@	@	.0	.0	.0
Oct	1.7	1.1	.4	.1	.0
Nov	6.7	5.1	1.8	.6	.0
Dec	9.7	6.4	3.3	1.0	.1
Ann	46.6	31.6	14.2	5.5	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	29.1	29.1	28.9	24.8
Feb	27.6	27.6	27.6	26.4
Mar	28.6	27.2	25.5	19.1
Apr	8.8	6.4	4.4	1.9
May	.3	.1	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	.0	.0	.0
Oct	1.3	.2	@	.0
Nov	13.9	7.4	3.9	.5
Dec	28.3	26.6	22.2	9.9
Ann	137.9	124.6	112.5	82.6

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	118	112	107	103	99	96	92	87	81
32	142	135	130	126	122	118	114	109	102
28	172	164	158	153	148	143	138	132	124
24	203	195	189	183	178	174	168	162	154
20	214	208	203	200	196	192	189	184	178
16	228	222	218	214	211	208	204	200	194

***** 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	1742	1420	1242	781	398	147	69	104	311	677	1095	1564	9550
60	1587	1280	1087	634	276	67	17	34	181	525	945	1409	8042
57	1494	1196	994	546	215	36	6	14	118	437	855	1316	7227
55	1432	1140	932	490	179	22	1	7	84	381	795	1254	6717
50	1277	1000	777	355	104	5	0	0	30	254	647	1099	5548
32	724	517	273	47	4	0	0	0	0	21	198	566	2350

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	4	21	54	256	653	883	1043	978	682	367	92	25	5058
55	0	0	0	9	116	215	331	272	77	14	0	0	1034
57	0	0	0	5	90	168	274	217	50	8	0	0	812
60	0	0	0	2	58	110	192	144	23	3	0	0	532
65	0	0	0	0	24	40	89	59	3	0	0	0	215
70	0	0	0	0	9	9	25	14	0	0	0	0	57

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	10	111	419	649	806	743	450	171	19	0	0	0	10	121	540	1189	1995	2738	3188	3359	3378	3378
45	0	0	2	56	287	501	651	588	304	89	4	0	0	0	2	58	345	846	1497	2085	2389	2478	2482	2482
50	0	0	0	26	178	357	496	434	186	39	0	0	0	0	0	26	204	561	1057	1491	1677	1716	1716	1716
55	0	0	0	10	99	229	343	283	95	11	0	0	0	0	0	10	109	338	681	964	1059	1070	1070	1070
60	0	0	0	1	46	118	196	151	43	1	0	0	0	0	0	1	47	165	361	512	555	556	556	556
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	10	91	280	398	505	458	264	107	12	0	0	0	10	101	381	779	1284	1742	2006	2113	2125	2125

(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