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: SHEBOYGAN, WI **COOP ID: 477725**

Climate Division: WI 6 **NWS Call Sign:** **Elevation: 648 Feet** **Lat: 43˚45N** **Lon: 87˚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	28.6	13.2	20.9	58	1973	25	31.7	1990	-26+	1985	20	9.1	1977	1368	0	.0	.0	.2	18.6	29.5	6.0
Feb	33.0	18.1	25.6	63	1984	23	35.3	1998	-25+	1996	3	16.7	1979	1105	0	.0	.0	.9	12.5	25.4	2.6
Mar	42.0	26.6	34.3	80	2000	7	40.5	2000	-12	1962	1	28.3	1996	952	0	.0	.0	5.2	4.4	22.5	.2
Apr	52.7	35.8	44.3	92	1980	22	48.8	1977	10	1954	3	39.8	1975	623	0	.0	.1	17.0	.2	8.2	.0
May	64.7	45.2	55.0	92+	1998	20	61.1	1998	27	1966	9	49.7	1997	326	15	.0	.1	29.7	.0	.4	.0
Jun	75.6	54.5	65.1	99	1987	14	71.5	1988	36	2001	1	60.6	1993	91	92	.0	1.7	30.0	.0	.0	.0
Jul	81.4	61.4	71.4	108	1995	14	76.3	1983	45	1968	4	67.1	1992	13	212	.1	4.0	31.0	.0	.0	.0
Aug	79.7	61.3	70.5	107	1948	25	75.6	1995	43	1986	28	66.4	1992	19	189	.0	2.4	31.0	.0	.0	.0
Sep	71.9	53.6	62.8	99	1953	2	68.4	1998	28	1950	24	57.4	1993	117	50	.0	.6	30.0	.0	@	.0
Oct	59.4	42.7	51.1	90	1963	6	57.0	1971	21+	1996	31	47.2+	1988	434	1	.0	.0	27.5	.0	2.8	.0
Nov	45.0	31.3	38.2	79	1950	2	44.8	1999	-5	1976	29	30.2	1995	806	0	.0	.0	9.3	2.0	15.9	.1
Dec	33.1	19.3	26.2	65	1998	3	33.7	1982	-21	1983	24	16.3	1983	1202	0	.0	.0	1.3	12.1	27.2	3.0
Ann	55.6	38.6	47.1	108	Jul 1995	14	76.3	Jul 1983	-26+	Jan 1985	20	9.1	Jan 1977	7056	559	.1	8.9	213.1	49.8	131.9	11.9

\+ 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

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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	1.76	1.67	1.08	1974	27	3.61	2000	.05	1981
Feb	1.33	1.26	1.45	2001	9	3.46	1971	.02	1987
Mar	2.25	1.91	2.60	1998	31	6.26	1976	.20	1978
Apr	2.99	3.01	2.12	2001	11	5.49	1993	.72	1989
May	2.90	2.88	4.21	1989	30	5.92	1983	.53	1981
Jun	3.28	3.17	4.07	1997	21	7.51	1996	.55	1995
Jul	3.19	2.99	3.57	1985	25	6.13	1977	1.30	1971
Aug	4.08	3.35	10.84	1998	6	13.30	1998	.80	1976
Sep	3.29	2.67	5.19	1986	11	13.20	1986	.13	1979
Oct	2.51	2.43	2.08	1954	4	5.09	1991	.42	1975
Nov	2.43	2.33	2.10	1992	2	6.54	1985	.38	1976
Dec	1.89	1.87	1.92	1971	15	5.06	1971	.30	1993
Ann	31.90	31.60	10.84	Aug 1998	6	13.30	Aug 1998	.02	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.8	5.3	.8	.1
Feb	7.9	3.9	.6	.0
Mar	9.6	5.4	1.3	.3
Apr	11.1	6.3	2.2	.6
May	10.2	5.9	1.8	.6
Jun	10.5	6.5	2.0	.4
Jul	9.6	6.0	2.2	.7
Aug	10.0	6.7	2.4	.9
Sep	9.7	6.3	2.0	.9
Oct	9.8	5.7	1.7	.4
Nov	9.7	5.6	1.7	.3
Dec	9.7	5.4	.8	.3
Ann	117.6	69.0	19.5	5.5

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	.34	.50	.75	.99	1.24	1.50	1.79	2.15	2.62	3.38	4.11
Feb	.18	.29	.47	.66	.85	1.07	1.32	1.62	2.03	2.71	3.36
Mar	.45	.65	.98	1.29	1.59	1.92	2.29	2.74	3.34	4.29	5.19
Apr	1.32	1.59	1.96	2.26	2.54	2.83	3.13	3.48	3.92	4.59	5.20
May	.82	1.09	1.51	1.87	2.23	2.60	3.01	3.49	4.12	5.11	6.03
Jun	.79	1.10	1.58	2.00	2.43	2.87	3.37	3.96	4.74	5.97	7.13
Jul	1.23	1.53	1.95	2.30	2.63	2.97	3.34	3.76	4.31	5.14	5.89
Aug	1.09	1.47	2.06	2.58	3.09	3.62	4.22	4.92	5.84	7.28	8.63
Sep	.52	.80	1.27	1.73	2.20	2.71	3.30	4.01	4.98	6.54	8.04
Oct	.79	1.02	1.38	1.68	1.97	2.28	2.61	3.00	3.51	4.29	5.02
Nov	.52	.75	1.10	1.42	1.75	2.09	2.48	2.95	3.56	4.54	5.46
Dec	.40	.58	.86	1.11	1.36	1.63	1.93	2.30	2.78	3.54	4.27
Ann	25.24	26.58	28.27	29.53	30.64	31.70	32.78	33.97	35.40	37.44	39.18

\+ 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)

Extremes (2)

Mean Number of Days (1)

Snow Fall >= Thresholds

Snow Depth >= Thresholds

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	12.7	12.2	5	5	10.5	1993	13	40.0	1979	31	1979	24	19	1979	7.6	4.8	1.8	.7	.1	21.7	16.6	13.9	5.3
Feb	9.9	10.0	6	4	8.0	1983	3	26.4	1994	28	1979	16	24	1979	5.5	3.3	1.2	.4	.0	21.3	16.9	12.7	5.3
Mar	8.4	6.7	2	1	15.3	1971	19	22.6	1989	18	1979	3	9	1979	3.9	2.6	.9	.4	@	10.3	7.0	4.8	1.7
Apr	2.0	.6	#	0	6.2	1973	9	11.5	1973	11	1973	10	1	1982	1.1	.7	.2	.1	.0	.9	.4	.2	@
May	#	.0	0	0	#	1990	10	#+	1990	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.1	.0	0	0	2.0	1987	24	2.0	1987	0	0	0	0	0	.1	.1	.0	.0	.0	.0	.0	.0	.0
Nov	3.5	1.7	#	#	7.5	1995	27	16.5	1995	11	1995	28	2	1995	1.9	.9	.3	.2	.0	1.3	.6	.4	.1
Dec	9.7	8.8	2	1	12.0	1971	30	22.0	1972	36	2000	30	18	2000	5.5	3.4	1.1	.5	@	14.0	7.8	4.3	.7
Ann	46.3	40.0	N/A	N/A	15.3	Mar 1971	19	40.0	Jan 1979	36	Dec 2000	30	24	Feb 1979	25.6	15.8	5.5	2.3	.1	69.5	49.3	36.3	13.1

+ 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	5/19	5/15	5/11	5/09	5/06	5/03	4/30	4/27	4/23
32	5/07	5/02	4/28	4/25	4/22	4/19	4/16	4/13	4/07
28	4/24	4/19	4/16	4/14	4/11	4/09	4/06	4/03	3/29
24	4/14	4/10	4/06	4/04	4/01	3/30	3/27	3/24	3/20
20	4/09	4/04	4/01	3/29	3/27	3/24	3/21	3/18	3/13
16	4/03	3/27	3/22	3/18	3/14	3/10	3/06	3/01	2/22

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	164	160	156	153	149	146	142	136
32	201	194	189	184	180	176	172	166	159
28	223	216	212	208	204	201	197	192	186
24	244	236	231	227	222	218	213	208	201
20	263	254	248	243	238	233	228	222	214
16	288	278	271	265	260	254	248	241	231

***** 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	1368	1105	952	623	326	91	13	19	117	434	806	1202	7056
60	1213	965	797	474	203	35	1	2	44	286	656	1047	5723
57	1120	881	704	387	143	16	0	0	20	208	566	954	4999
55	1058	825	642	331	109	9	0	0	10	161	507	892	4544
50	903	685	489	204	47	2	0	0	1	72	368	741	3512
32	394	245	87	4	0	0	0	0	0	0	51	276	1057

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	49	64	158	371	712	992	1222	1193	923	589	235	97	6605
55	0	0	0	7	108	311	509	480	242	37	1	0	1695
57	0	0	0	4	80	258	447	418	192	22	0	0	1421
60	0	0	0	1	47	186	355	328	126	8	0	0	1051
65	0	0	0	0	15	92	212	189	50	1	0	0	559
70	0	0	0	0	3	33	100	86	12	0	0	0	234

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	3	41	165	462	749	973	947	690	353	82	6	0	3	44	209	671	1420	2393	3340	4030	4383	4465	4471
45	0	0	12	84	312	599	818	792	540	219	32	1	0	0	12	96	408	1007	1825	2617	3157	3376	3408	3409
50	0	0	6	31	183	449	663	637	396	111	7	0	0	0	6	37	220	669	1332	1969	2365	2476	2483	2483
55	0	0	0	12	93	305	508	482	255	46	1	0	0	0	0	12	105	410	918	1400	1655	1701	1702	1702
60	0	0	0	1	42	178	355	328	139	10	0	0	0	0	0	1	43	221	576	904	1043	1053	1053	1053
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	23	80	240	452	645	629	409	170	28	1	0	0	23	103	343	795	1440	2069	2478	2648	2676	2677

(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

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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