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: GREEN BAY STRBL INTL AP, WI **COOP ID: 473269**

Climate Division: WI 6 **NWS Call Sign: GRB** **Elevation: 687 Feet** **Lat: 44˚29N** **Lon: 88˚08W**

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	24.1	7.1	15.6	50	1961	13	26.4	1990	-31	1951	30	3.4	1977	1537	0	.0	.0	.0	23.0	30.5	10.7
Feb	28.9	12.1	20.5	61	2000	26	31.3	1998	-28	1996	3	9.5	1979	1262	0	.0	.0	.4	17.3	27.0	6.2
Mar	40.0	22.6	31.3	78	2000	7	39.9	1973	-29	1962	1	24.8	1975	1060	0	.0	.0	5.2	7.5	26.1	1.1
Apr	54.6	33.9	44.2	89	1980	22	49.7	1987	7	1954	3	39.5	1975	638	3	.0	.0	19.0	.4	13.8	.0
May	68.0	44.7	56.4	91	1959	2	63.9	1977	21	1966	9	49.1	1997	301	24	.0	.1	30.0	.0	2.0	.0
Jun	76.8	54.0	65.4	98+	1988	21	70.8	1995	32	1958	6	59.5	1982	85	95	.0	1.9	30.0	.0	.0	.0
Jul	81.2	58.6	69.9	103	1995	13	73.4	1988	40	1965	6	64.7	1992	19	177	.1	2.9	31.0	.0	.0	.0
Aug	78.5	56.5	67.5	100	1948	24	73.9	1995	38+	1967	22	63.7	1997	38	126	.0	1.4	31.0	.0	.0	.0
Sep	70.2	47.5	58.8	95+	1955	9	63.7	1994	24	1949	29	53.9	1974	208	36	.0	.2	29.9	.0	.7	.0
Oct	57.9	36.9	47.4	88	1963	6	54.0	1971	15	1966	30	42.1	1988	540	2	.0	.0	24.7	.0	8.7	.0
Nov	42.4	25.6	34.0	74	1999	9	40.0	1999	-9+	1976	29	26.3	1976	925	0	.0	.0	6.9	5.3	22.6	.3
Dec	29.0	13.3	21.2	64	2001	5	29.7	1994	-27	1983	19	9.2	1976	1350	0	.0	.0	.6	17.8	29.5	5.4
Ann	54.3	34.4	44.4	103	Jul 1995	13	73.9	Aug 1995	-31	Jan 1951	30	3.4	Jan 1977	7963	463	.1	6.5	208.7	71.3	160.9	23.7

\+ 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	1.21	1.34	.98	1967	24	2.37	1999	.12	1981
Feb	1.01	.90	1.78	1966	8	2.76	1981	.14	1982
Mar	2.06	1.94	1.61	1949	31	4.68	1977	.15	1999
Apr	2.56	2.40	1.86	1994	25	5.91	1994	.49	1989
May	2.75	2.58	2.22	1973	27	8.21	1973	.06	1988
Jun	3.43	2.70	4.90	1990	22	10.29	1990	.31	1976
Jul	3.44	3.07	4.12	2000	8	7.00	1994	.83	1981
Aug	3.77	3.38	3.83	1975	28	9.04	1975	1.05	1989
Sep	3.11	3.05	2.99	1964	3	7.51	1986	.28	1976
Oct	2.17	1.93	3.44	1954	2	4.92	1984	.36	1975
Nov	2.27	1.88	2.23	1985	1	5.32	1992	.16	1976
Dec	1.41	1.29	1.16	1971	15	3.15	1971	.30	1998
Ann	29.19	28.96	4.90	Jun 1990	22	10.29	Jun 1990	.06	May 1988

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.7	4.0	.2	.0
Feb	8.5	2.8	.4	.1
Mar	10.8	5.0	1.5	.2
Apr	11.1	6.3	1.6	.3
May	10.1	5.9	1.7	.5
Jun	10.1	6.1	2.4	.9
Jul	10.4	5.9	2.3	.9
Aug	11.3	7.1	2.6	.8
Sep	10.0	6.0	2.0	.8
Oct	9.7	4.9	1.1	.3
Nov	10.3	5.5	1.2	.4
Dec	10.6	4.0	.5	.1
Ann	123.6	63.5	17.5	5.3

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	.31	.42	.60	.75	.91	1.07	1.24	1.46	1.73	2.17	2.57
Feb	.21	.30	.45	.59	.72	.87	1.03	1.22	1.48	1.90	2.29
Mar	.40	.58	.89	1.17	1.45	1.75	2.09	2.51	3.06	3.94	4.78
Apr	1.00	1.24	1.57	1.85	2.12	2.39	2.68	3.02	3.45	4.11	4.71
May	.52	.77	1.17	1.54	1.92	2.33	2.79	3.35	4.09	5.29	6.42
Jun	.70	1.01	1.52	1.98	2.44	2.94	3.50	4.17	5.06	6.49	7.84
Jul	1.12	1.44	1.92	2.33	2.73	3.13	3.58	4.10	4.78	5.82	6.79
Aug	1.05	1.41	1.95	2.42	2.89	3.37	3.91	4.54	5.37	6.66	7.87
Sep	.67	.96	1.41	1.83	2.24	2.68	3.18	3.78	4.56	5.81	7.00
Oct	.51	.72	1.03	1.32	1.60	1.90	2.23	2.63	3.16	3.99	4.77
Nov	.46	.67	1.00	1.31	1.61	1.94	2.32	2.76	3.36	4.31	5.21
Dec	.36	.49	.70	.88	1.06	1.24	1.45	1.70	2.03	2.54	3.02
Ann	21.35	22.88	24.84	26.32	27.62	28.89	30.19	31.62	33.36	35.86	38.02

\+ 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	13.7	10.7	6	6	11.3	1996	26	31.5	1996	25	1979	25	15	1971	10.0	4.5	1.4	.5	@	27.1	21.6	17.4	6.0
Feb	8.4	7.4	5	5	6.7	1974	3	19.5	1975	24+	1979	22	19	1979	7.4	2.8	.8	.3	.0	22.3	17.0	13.2	5.8
Mar	9.2	7.7	2	2	13.0	1997	13	24.2	1989	17+	1997	16	9	1971	6.9	2.8	1.0	.3	.1	14.1	8.3	6.3	2.7
Apr	2.9	2.1	#	1	9.8	1977	4	11.8	1977	11	1977	5	1+	1977	2.4	1.0	.3	@	.0	2.2	.6	.2	@
May	.2	.0	#	0	4.3	1990	10	4.3	1990	2	1990	11	#	2000	.1	.0	@	.0	.0	.1	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1990	.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	#	1995	22	#	1995	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.2	#	#	0	1.2	1992	20	1.6	1989	4	1984	31	#	1992	.2	.1	.0	.0	.0	.1	@	.0	.0
Nov	5.4	3.1	#	0	9.7	1995	27	17.1	1995	11	1977	28	2	1985	4.6	1.5	.5	.2	.0	4.6	1.8	.7	.2
Dec	11.9	11.8	3	2	14.4	1990	3	27.0	1977	19	1985	27	15	1985	9.1	3.2	1.2	.5	.1	20.0	12.1	7.9	2.4
Ann	51.9	42.8	N/A	N/A	14.4	Dec 1990	3	31.5	Jan 1996	25	Jan 1979	25	19	Feb 1979	40.7	15.9	5.2	1.8	.2	90.5	61.4	45.7	17.1

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	142	136	132	129	126	122	119	115	110
32	166	161	157	153	150	147	144	140	134
28	193	186	180	176	171	167	162	157	149
24	220	213	209	205	201	198	194	189	183
20	235	230	226	223	220	217	214	210	205
16	262	255	249	245	240	236	231	226	218

***** 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	1537	1262	1060	638	301	85	19	38	208	540	925	1350	7963
60	1376	1106	889	476	192	29	2	12	98	397	780	1204	6561
57	1283	1022	796	390	139	13	0	4	55	313	690	1111	5816
55	1221	966	734	335	109	7	0	1	36	261	630	1049	5349
50	1066	826	583	212	51	1	0	0	8	152	483	894	4276
32	541	362	157	8	0	0	0	0	0	3	95	399	1565

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	6	19	108	365	746	998	1178	1110	817	489	146	21	6003
55	0	0	2	21	124	315	465	397	172	30	1	0	1527
57	0	0	1	15	94	262	404	336	133	19	1	0	1265
60	0	0	0	9	61	189	312	248	86	9	0	0	914
65	0	0	0	3	24	95	177	126	36	2	0	0	463
70	0	0	0	1	6	35	73	45	10	0	0	0	170

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	36	179	507	769	938	871	586	265	46	3	0	2	38	217	724	1493	2431	3302	3888	4153	4199	4202
45	0	0	14	96	360	619	783	716	439	154	19	1	0	0	14	110	470	1089	1872	2588	3027	3181	3200	3201
50	0	0	7	51	227	469	628	561	298	78	4	0	0	0	7	58	285	754	1382	1943	2241	2319	2323	2323
55	0	0	1	21	129	322	473	407	177	34	0	0	0	0	1	22	151	473	946	1353	1530	1564	1564	1564
60	0	0	0	10	63	196	320	258	95	8	0	0	0	0	0	10	73	269	589	847	942	950	950	950
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	23	113	305	479	619	565	349	147	25	1	0	1	24	137	442	921	1540	2105	2454	2601	2626	2627

(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