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: SHAWANO 2 SSW, WI **COOP ID: 477708**

Climate Division: WI 3 **NWS Call Sign:** **Elevation: 810 Feet** **Lat: 44˚45N** **Lon: 88˚37W**

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	23.0	3.2	13.1	53	1973	25	24.1	1990	-35	1982	17	2.8	1977	1610	0	.0	.0	.1	23.8	30.8	13.1
Feb	28.3	7.6	18.0	59	2000	27	29.2	1998	-33+	1996	3	8.3	1979	1317	0	.0	.0	.5	17.0	27.5	9.0
Mar	39.3	20.0	29.7	78	2000	8	38.4	2000	-28	1962	1	22.9	1984	1096	0	.0	.0	5.6	7.0	27.0	2.5
Apr	54.5	32.4	43.5	93	1980	22	49.1	1977	4	1977	6	37.8	1975	647	1	.0	@	20.2	.4	15.9	.0
May	68.4	43.6	56.0	95	1959	2	64.1	1977	19	1956	1	48.8	1997	315	35	.0	.3	29.8	.0	4.0	.0
Jun	77.1	52.7	64.9	99	1988	22	69.8	1995	31+	1990	4	59.8	1982	84	81	.0	2.7	30.0	.0	.1	.0
Jul	81.5	57.6	69.6	104	1995	14	73.5	1977	33	1972	4	64.3	1992	27	168	.2	4.3	31.0	.0	.0	.0
Aug	78.5	55.5	67.0	104	1955	21	72.1	1995	34	1977	24	62.8	1971	50	112	@	1.8	31.0	.0	.0	.0
Sep	69.7	46.2	58.0	97	1953	2	63.1	1998	20	1974	23	53.5	1993	223	11	.0	.3	29.8	.0	1.9	.0
Oct	57.7	35.5	46.6	88+	1976	1	54.0	1971	12	1972	19	41.5	1987	571	0	.0	.0	24.8	.0	12.3	.0
Nov	41.0	23.6	32.3	74	1999	10	39.8	1999	-10	1976	29	25.2	1995	982	0	.0	.0	6.7	5.5	24.4	.5
Dec	27.5	10.1	18.8	62	2001	6	27.0	1982	-26+	1983	19	6.8	1983	1433	0	.0	.0	.4	19.1	30.2	7.6
Ann	53.9	32.3	43.1	104+	Jul 1995	14	73.5	Jul 1977	-35	Jan 1982	17	2.8	Jan 1977	8355	408	.2	9.4	209.9	72.8	174.1	32.7

\+ 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

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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	1.31	1.08	1.48	1967	25	3.72	1976	.11	1981
Feb	.95	.82	1.43	1981	22	3.04	1976	.15	1987
Mar	1.85	1.71	1.93	1973	7	4.40	1973	.07	1978
Apr	2.81	2.59	2.75	1994	25	5.18	1973	.54	1997
May	3.50	3.29	3.45	1992	17	9.17	1973	.90	1988
Jun	3.39	2.77	2.54	1968	21	7.36	1996	.89	1988
Jul	3.97	3.46	3.00	1983	20	8.55	1971	1.19	1981
Aug	3.90	3.81	2.36	1995	10	10.61	1995	1.47	1976
Sep	3.65	3.64	3.15	1984	25	6.95	1986	.42	1976
Oct	2.42	2.18	2.02	1967	25	5.37	1995	.29	2000
Nov	2.42	2.16	2.48	1992	21	5.76	1985	.00	1976
Dec	1.31	1.40	1.71	1959	28	2.71	1972	.21	1994
Ann	31.48	33.15	3.45	May 1992	17	10.61	Aug 1995	.00	Nov 1976

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.7	4.3	.5	.1
Feb	6.0	2.7	.4	.1
Mar	7.8	5.1	1.0	.3
Apr	9.8	6.2	1.7	.4
May	10.3	6.5	2.1	.9
Jun	10.5	6.8	2.2	.8
Jul	10.6	6.9	2.7	1.2
Aug	10.3	7.5	2.7	1.0
Sep	10.4	6.3	2.5	.9
Oct	9.0	4.9	1.6	.5
Nov	8.8	5.2	1.5	.6
Dec	8.7	4.1	.5	.1
Ann	110.9	66.5	19.4	6.9

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	.21	.33	.52	.70	.88	1.08	1.31	1.60	1.97	2.58	3.17
Feb	.13	.20	.34	.47	.61	.76	.94	1.16	1.45	1.93	2.40
Mar	.25	.39	.66	.92	1.19	1.48	1.83	2.26	2.83	3.78	4.69
Apr	.89	1.15	1.55	1.89	2.21	2.55	2.92	3.36	3.92	4.80	5.60
May	1.07	1.40	1.90	2.33	2.74	3.17	3.64	4.19	4.91	6.03	7.06
Jun	.89	1.22	1.71	2.14	2.56	3.01	3.51	4.09	4.86	6.06	7.19
Jul	1.36	1.73	2.28	2.75	3.19	3.65	4.15	4.73	5.47	6.63	7.69
Aug	1.13	1.50	2.06	2.54	3.01	3.50	4.04	4.68	5.51	6.80	8.00
Sep	.71	1.04	1.58	2.07	2.57	3.10	3.71	4.44	5.41	6.96	8.44
Oct	.62	.85	1.20	1.51	1.81	2.14	2.49	2.92	3.48	4.35	5.17
Nov	.33	.65	1.06	1.40	1.74	2.10	2.50	2.98	3.62	4.62	5.57
Dec	.34	.46	.65	.82	.98	1.16	1.35	1.58	1.88	2.36	2.80
Ann	22.57	24.30	26.51	28.18	29.67	31.11	32.59	34.23	36.21	39.09	41.57

+ 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	12.6	8.3	9	8	16.6	1971	4	35.9	1976	27	1982	31	24	1982	7.6	4.7	1.3	.7	.1	29.0	25.7	19.5	10.4
Feb	8.2	7.2	9	8	8.0	1974	3	18.0	1976	38	1979	22	29	1979	5.3	2.9	.9	.2	.0	24.7	21.6	16.2	7.8
Mar	7.8	6.7	4	2	15.0	1997	14	25.5	1989	21+	1986	2	14	1971	4.2	2.9	1.1	.4	@	11.9	7.8	4.8	1.5
Apr	3.1	2.0	#	#	8.0	1973	9	9.6	1977	9	1973	10	4	1972	1.3	1.0	.3	.1	.0	1.8	.7	.3	.0
May	.2	.0	#	0	4.5	1990	11	4.5	1990	4	1990	11	#+	1990	@	@	@	.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	1.5	1990	11	1.5	1990	1+	1992	20	#+	1992	.2	.1	.0	.0	.0	.1	.0	.0	.0
Nov	4.9	3.9	1	#	11.0	1971	26	15.0	1971	13	1971	29	2+	2000	2.7	1.9	.6	.2	@	5.3	2.3	.9	.2
Dec	11.8	10.3	5	4	13.0	1985	2	32.5	1985	29	1985	9	21	1985	6.7	4.4	1.2	.5	.1	22.8	17.2	12.0	4.7
Ann	48.7	38.4	N/A	N/A	16.6	Jan 1971	4	35.9	Jan 1976	38	Feb 1979	22	29	Feb 1979	28.0	17.9	5.4	2.1	.2	95.6	75.3	53.7	24.6

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	128	120	114	109	104	99	94	88	79
32	147	141	137	133	130	126	123	118	112
28	169	163	159	155	151	148	144	139	133
24	207	199	192	187	182	177	172	165	156
20	229	221	215	210	206	201	196	190	182
16	251	243	237	232	228	223	218	213	205

***** 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	1610	1317	1096	647	315	84	27	50	223	571	982	1433	8355
60	1455	1177	941	500	206	29	6	11	111	420	832	1278	6966
57	1362	1093	848	415	153	13	0	3	64	334	742	1185	6212
55	1300	1037	786	361	122	7	0	1	42	281	682	1123	5742
50	1145	897	632	239	62	1	0	0	10	166	534	968	4654
32	602	417	182	14	0	0	0	0	0	5	124	459	1803

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	15	24	109	358	743	987	1164	1086	779	457	133	49	5904
55	0	0	0	15	152	304	451	373	130	20	0	0	1445
57	0	0	0	9	121	250	389	313	93	11	0	0	1186
60	0	0	0	4	81	176	302	229	50	4	0	0	846
65	0	0	0	1	35	81	168	112	11	0	0	0	408
70	0	0	0	0	13	24	76	40	1	0	0	0	154

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	26	189	513	764	929	851	563	252	39	2	0	0	26	215	728	1492	2421	3272	3835	4087	4126	4128
45	0	0	10	108	369	614	774	696	416	143	16	0	0	0	10	118	487	1101	1875	2571	2987	3130	3146	3146
50	0	0	4	55	236	465	619	541	279	71	3	0	0	0	4	59	295	760	1379	1920	2199	2270	2273	2273
55	0	0	0	25	135	323	465	387	162	28	0	0	0	0	0	25	160	483	948	1335	1497	1525	1525	1525
60	0	0	0	10	67	192	311	244	83	6	0	0	0	0	0	10	77	269	580	824	907	913	913	913
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	22	131	327	485	607	555	346	159	24	0	0	0	22	153	480	965	1572	2127	2473	2632	2656	2656

(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