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: PORT WASHINGTON, WI **COOP ID: 476764**

Climate Division: WI 9 **NWS Call Sign:** **Elevation: 600 Feet** **Lat: 43˚23N** **Lon: 87˚52W**

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	27.4	13.2	20.3	57	1973	25	30.5	1989	-26	1963	15	7.6	1977	1386	0	.0	.0	.4	18.9	29.3	6.7
Feb	31.4	17.5	24.5	61+	1984	23	33.1	1984	-29	1996	3	14.6	1979	1135	0	.0	.0	.7	13.3	25.8	3.0
Mar	40.2	27.6	33.9	79	2000	7	40.2	1973	-15	1962	1	26.9	1996	963	0	.0	.0	4.7	5.6	23.4	.2
Apr	50.0	37.5	43.8	92	1980	22	49.1	1985	11+	1982	7	39.3	1996	638	0	.0	@	14.5	.4	9.6	.0
May	61.6	47.2	54.4	90+	1998	18	59.6	1985	23	1966	10	48.4	1997	341	13	.0	.1	27.8	.0	.6	.0
Jun	71.8	56.5	64.2	102	1988	21	71.2	1988	37+	2001	6	59.4	1992	109	83	.1	1.2	29.9	.0	.0	.0
Jul	78.0	63.5	70.8	106	1995	13	75.7	1988	40	1965	6	65.9	1996	22	200	.1	3.0	31.0	.0	.0	.0
Aug	76.8	63.5	70.2	103	1988	17	75.0	1983	42+	1986	27	65.9	1992	24	184	.1	1.8	31.0	.0	.0	.0
Sep	69.6	55.3	62.5	96	1976	8	67.6	1971	28	1995	23	57.5	1993	125	49	.0	.4	30.0	.0	.1	.0
Oct	58.2	44.1	51.2	89	1963	6	58.8	1971	16	1988	29	46.4	1988	432	3	.0	.0	26.1	.0	3.9	.0
Nov	44.5	31.5	38.0	76	1978	3	44.0	1975	-10	1976	29	26.2	1995	811	0	.0	.0	8.9	3.2	18.1	.2
Dec	32.6	19.3	26.0	68	2001	6	33.5	1982	-20	1983	24	14.3	1989	1211	0	.0	.0	1.5	12.7	27.6	3.4
Ann	53.5	39.7	46.7	106	Jul 1995	13	75.7	Jul 1988	-29	Feb 1996	3	7.6	Jan 1977	7197	532	.3	6.5	206.5	54.1	138.4	13.5

\+ 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	1.47	1.42	2.10	2001	29	5.50	1999	.12	1981
Feb	1.18	1.04	1.60	1997	21	3.26+	1994	.00	1987
Mar	1.90	1.54	1.75	1984	21	4.91	1998	.20	1981
Apr	3.15	2.94	3.25	1955	24	5.81	1984	.41	1989
May	2.93	2.67	3.12	1978	13	8.01	2000	.64	1975
Jun	3.58	3.10	9.87	1996	18	18.33	1996	.91	1976
Jul	3.81	3.49	4.15	1981	12	8.88	1981	1.09	1973
Aug	4.21	4.26	2.80	1989	4	9.01	1989	.99	1976
Sep	3.48	2.96	3.50	2000	2	14.13	1986	.01	1979
Oct	2.30	1.88	2.88	1954	3	6.41	1985	.12	1975
Nov	2.25	1.91	2.00	1985	1	6.52	1985	.40	1996
Dec	1.82	1.71	2.50	1990	3	4.53	1971	.21	1986
Ann	32.08	31.01	9.87	Jun 1996	18	18.33	Jun 1996	.00	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.9	4.0	.9	.1
Feb	6.1	3.2	.5	.2
Mar	7.0	4.9	1.4	.3
Apr	8.8	6.0	2.2	.7
May	8.6	6.0	2.0	.5
Jun	9.3	6.1	2.3	.7
Jul	8.5	6.6	2.4	.9
Aug	8.7	6.6	2.8	1.4
Sep	8.4	5.9	2.4	1.0
Oct	7.7	4.9	1.4	.6
Nov	7.9	5.0	1.3	.5
Dec	8.1	3.9	1.1	.4
Ann	97.0	63.1	20.7	7.3

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	.26	.39	.61	.81	1.01	1.24	1.49	1.80	2.21	2.87	3.50
Feb	.04	.12	.28	.45	.64	.85	1.11	1.44	1.89	2.66	3.41
Mar	.25	.40	.67	.94	1.21	1.52	1.88	2.32	2.92	3.89	4.84
Apr	1.08	1.38	1.81	2.18	2.53	2.90	3.29	3.75	4.35	5.27	6.11
May	.72	.99	1.42	1.80	2.17	2.57	3.01	3.54	4.23	5.32	6.34
Jun	.82	1.16	1.68	2.15	2.62	3.12	3.68	4.34	5.22	6.61	7.91
Jul	1.25	1.61	2.14	2.59	3.03	3.48	3.97	4.55	5.29	6.44	7.51
Aug	1.57	1.96	2.53	3.00	3.45	3.91	4.41	4.99	5.72	6.86	7.89
Sep	.30	.54	1.00	1.48	2.01	2.62	3.34	4.24	5.49	7.57	9.62
Oct	.42	.63	.96	1.28	1.60	1.94	2.33	2.81	3.44	4.45	5.42
Nov	.47	.67	1.00	1.30	1.61	1.93	2.29	2.73	3.31	4.24	5.11
Dec	.25	.40	.66	.91	1.17	1.47	1.80	2.22	2.78	3.70	4.58
Ann	24.03	25.62	27.64	29.16	30.51	31.80	33.13	34.59	36.35	38.90	41.09

\+ 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	10.9	10.8	5	4	11.0	1999	2	28.4	1979	31	1979	25	19	1979	5.6	3.5	1.3	.6	.1	19.1	12.9	9.4	3.3
Feb	8.0	6.0	4	2	8.5	1974	22	32.8	1974	28	1979	14	23	1979	3.9	2.5	.9	.5	.0	15.3	9.4	5.6	2.4
Mar	5.7	4.3	1	1	7.5	1971	18	14.8	1971	12	1994	2	5	1979	2.8	2.0	.7	.2	.0	6.3	2.9	1.2	.1
Apr	1.6	.0	#	#	9.2	1973	9	13.6	1973	9	1982	5	1	1993	.6	.4	.2	.1	.0	.8	.5	.3	.0
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	.2	.0	#	0	3.0	1976	26	3.0	1976	2	1989	19	#+	2000	.1	.1	@	.0	.0	@	.0	.0	.0
Nov	1.4	.3	#	#	5.5	1977	25	10.0	1977	9	1977	29	2	1995	1.2	.6	.2	@	.0	1.1	.6	.3	.0
Dec	6.8	5.6	2	2	11.0	2000	18	23.5	1978	33	2000	30	14	2000	4.4	2.5	.7	.4	.1	10.4	5.1	2.1	.6
Ann	34.6	27.0	N/A	N/A	11.0+	Dec 2000	18	32.8	Feb 1974	33	Dec 2000	30	23	Feb 1979	18.6	11.6	4.0	1.8	.2	53.0	31.4	18.9	6.4

+ 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	5/24	5/20	5/17	5/14	5/11	5/09	5/06	5/03	4/28
32	5/10	5/06	5/02	4/29	4/27	4/24	4/21	4/18	4/13
28	4/28	4/23	4/20	4/17	4/14	4/11	4/08	4/05	3/31
24	4/17	4/13	4/10	4/07	4/05	4/02	3/30	3/27	3/23
20	4/07	4/03	3/30	3/28	3/25	3/23	3/20	3/16	3/12
16	4/01	3/26	3/22	3/18	3/15	3/12	3/08	3/04	2/27

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	164	159	155	151	148	144	141	137	131
32	198	189	183	178	173	168	163	156	148
28	216	209	204	199	195	191	187	182	174
24	235	228	224	220	217	213	209	205	199
20	264	256	249	244	239	234	228	222	213
16	281	272	266	260	255	250	244	238	229

***** 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	1386	1135	963	638	341	109	22	24	125	432	811	1211	7197
60	1231	995	808	488	214	46	4	4	51	291	661	1056	5849
57	1138	911	715	400	152	23	0	0	25	217	573	963	5117
55	1076	855	653	342	117	14	0	0	13	173	516	901	4660
50	921	715	499	211	51	3	0	0	2	88	379	753	3622
32	411	268	87	4	0	0	0	0	0	1	63	294	1128

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	57	147	356	695	963	1201	1183	914	594	242	106	6506
55	0	0	0	5	99	287	488	470	238	54	4	0	1645
57	0	0	0	2	72	236	426	409	189	35	2	0	1371
60	0	0	0	0	42	169	337	320	125	16	0	0	1009
65	0	0	0	0	13	83	200	184	49	3	0	0	532
70	0	0	0	0	3	29	98	87	12	0	0	0	229

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	40	144	422	699	925	899	643	327	73	5	0	2	42	186	608	1307	2232	3131	3774	4101	4174	4179
45	0	0	18	68	276	549	770	744	493	197	34	2	0	0	18	86	362	911	1681	2425	2918	3115	3149	3151
50	0	0	5	25	157	402	615	589	349	96	9	0	0	0	5	30	187	589	1204	1793	2142	2238	2247	2247
55	0	0	1	10	76	262	460	434	215	39	0	0	0	0	1	11	87	349	809	1243	1458	1497	1497	1497
60	0	0	0	0	31	148	307	281	112	11	0	0	0	0	0	0	31	179	486	767	879	890	890	890
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	26	69	208	409	600	580	370	153	30	1	0	0	26	95	303	712	1312	1892	2262	2415	2445	2446

(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