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: WASHINGTON ISLAND, WI **COOP ID: 478905**

Climate Division: WI 6 **NWS Call Sign:** **Elevation: 600 Feet** **Lat: 45˚22N** **Lon: 86˚56W**

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	23.6	9.2	16.4	47	1975	11	25.2	1990	-27	1982	17	5.0	1977	1508	0	.0	.0	.0	22.6	30.7	7.0
Feb	26.1	9.8	18.0	52	1984	23	29.0	1998	-26	1996	3	7.9	1979	1317	0	.0	.0	@	17.4	27.4	5.9
Mar	35.4	19.9	27.7	71	2000	8	36.0	2000	-26	1962	1	21.4	1972	1159	0	.0	.0	2.3	7.8	27.5	1.4
Apr	46.4	30.7	38.6	77+	1952	29	43.2	1986	2	1982	6	32.3	1972	794	0	.0	.0	13.6	.7	16.8	.0
May	58.9	41.0	50.0	87+	1986	29	57.3	1998	20	1950	8	44.5	1983	468	2	.0	.0	29.1	.0	4.6	.0
Jun	67.7	51.0	59.4	92+	1988	6	64.5	1987	26	1949	8	54.3	1982	194	24	.0	.1	30.0	.0	.2	.0
Jul	73.8	58.3	66.1	94	1983	14	70.4	1983	35	1972	4	61.0	1992	52	86	.0	.3	31.0	.0	.0	.0
Aug	72.5	58.0	65.3	97	1955	21	70.6	1995	32	1950	22	61.1	1977	77	85	.0	.1	31.0	.0	.0	.0
Sep	64.7	51.4	58.1	94	1953	1	63.8	1998	26	1976	28	54.0	1993	219	11	.0	.0	29.9	.0	.5	.0
Oct	53.3	40.7	47.0	84	1963	6	52.9	1973	18	1989	9	42.3	1981	557	0	.0	.0	24.9	.0	5.3	.0
Nov	40.6	29.5	35.1	71+	1999	9	41.4	1999	1	1950	23	28.7	1995	900	0	.0	.0	6.0	3.2	19.3	.0
Dec	29.1	18.3	23.7	58	2001	6	30.6	1994	-21	1976	29	13.0	1989	1281	0	.0	.0	.3	15.5	29.0	1.8
Ann	49.3	34.8	42.1	97	Aug 1955	21	70.6	Aug 1995	-27	Jan 1982	17	5.0	Jan 1977	8526	208	.0	.5	198.1	67.2	161.3	16.1

\+ 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	1.58	1.25	2.00	1996	18	4.06	1999	.43	1986
Feb	.84	.82	.91	1953	6	1.57	1973	.00	1982
Mar	1.67	1.61	1.25	1998	31	4.01	1977	.06	1999
Apr	2.26	2.33	1.62	1965	12	4.42	1996	.26	1989
May	2.65	2.71	3.21	1965	16	5.42	1983	.69	1980
Jun	3.20	2.94	2.56	1969	26	9.92	1990	.47	1995
Jul	3.06	2.73	2.94	1950	30	7.26	1999	1.12	1987
Aug	3.27	2.91	3.03	1956	4	5.64	1974	1.09	1991
Sep	3.34	3.53	3.33	1959	8	5.83	2000	.65	1989
Oct	2.79	2.74	2.22	1979	22	5.56	1995	.56	1975
Nov	2.43	2.27	2.11	1984	1	5.50	1988	.43	1976
Dec	1.45	1.40	1.63	1959	28	3.17	1971	.20	1994
Ann	28.54	28.99	3.33	Sep 1959	8	9.92	Jun 1990	.00	Feb 1982

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.3	5.3	.6	.1
Feb	5.8	3.2	.2	.0
Mar	6.7	4.3	1.0	.3
Apr	7.8	5.3	1.5	.2
May	8.3	6.1	1.8	.4
Jun	8.8	6.5	2.2	.7
Jul	9.3	6.2	2.2	.6
Aug	9.3	6.3	2.4	.6
Sep	9.7	6.9	2.5	.7
Oct	8.7	5.9	1.9	.5
Nov	9.1	6.2	1.3	.4
Dec	8.2	5.0	.5	.0
Ann	100.0	67.2	18.1	4.5

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	.40	.55	.78	.98	1.19	1.40	1.63	1.91	2.28	2.85	3.39
Feb	.14	.25	.40	.51	.62	.74	.88	1.03	1.23	1.56	1.86
Mar	.19	.32	.55	.79	1.03	1.31	1.63	2.03	2.58	3.48	4.35
Apr	.67	.89	1.21	1.49	1.75	2.04	2.34	2.71	3.18	3.92	4.60
May	.89	1.14	1.51	1.82	2.12	2.43	2.76	3.15	3.66	4.44	5.16
Jun	.79	1.09	1.56	1.97	2.38	2.81	3.30	3.87	4.62	5.80	6.92
Jul	1.08	1.37	1.79	2.14	2.48	2.82	3.20	3.63	4.19	5.06	5.85
Aug	1.33	1.63	2.06	2.41	2.74	3.07	3.43	3.85	4.37	5.18	5.91
Sep	1.15	1.47	1.93	2.32	2.69	3.07	3.49	3.98	4.61	5.58	6.47
Oct	.93	1.20	1.58	1.91	2.23	2.55	2.91	3.32	3.86	4.69	5.45
Nov	.65	.88	1.23	1.54	1.84	2.16	2.52	2.93	3.48	4.33	5.13
Dec	.39	.53	.73	.92	1.10	1.29	1.50	1.75	2.07	2.58	3.05
Ann	22.85	24.00	25.45	26.53	27.48	28.38	29.31	30.32	31.53	33.26	34.74

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	13.6	11.0	8	6
Feb	8.3	7.6	11	7
Mar	9.7	7.8	6	4
Apr	2.4	2.0	1	#
May	.2	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.1	.0	#	0
Nov	3.8	2.8	#	#
Dec	12.3	12.2	3	1
Ann	50.4	43.4	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	1971	4	30.8	1971	36	1971	31	24	1971
Feb	8.0	1985	13	21.0	1985	40	1979	21	36	1979
Mar	12.0	1972	29	28.5	1989	30	1979	1	20	1971
Apr	6.0	1996	15	7.0	1993	16	1971	1	9	1971
May	4.0	1979	5	4.0	1979	4	1979	5	#	1979
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	.0	0	0	.0	0	0	0	0	0	0
Oct	3.0	1976	19	3.0	1976	1	1976	19	#+	1999
Nov	5.0	1971	29	20.3	1995	5	1995	30	2	1995
Dec	8.0	1976	27	23.0	1996	19	1985	23	15	1985
Ann	12.0+	Mar 1972	29	30.8	Jan 1971	40	Feb 1979	21	36	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	7.8	6.3	1.9	.5	.1
Feb	5.0	3.6	.9	.1	.0
Mar	4.5	3.0	1.1	.4	.1
Apr	1.5	1.1	.3	.1	.0
May	.1	.1	@	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.1	.1	@	.0	.0
Nov	2.7	1.8	.3	@	.0
Dec	6.1	4.8	1.3	.3	.0
Ann	27.8	20.8	5.8	1.4	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	2.0	1.2	.8	.6
May	@	@	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	@	.0	.0	.0
Nov	2.7	.8	.2	.0
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	6/15	6/10	6/06	6/03	5/30	5/26	5/22	5/15
32	6/04	5/30	5/26	5/23	5/20	5/17	5/14	5/10	5/05
28	5/19	5/15	5/11	5/08	5/05	5/03	4/30	4/26	4/21
24	5/07	5/02	4/29	4/26	4/23	4/21	4/18	4/15	4/10
20	4/22	4/17	4/14	4/11	4/08	4/05	4/02	3/30	3/25
16	4/13	4/08	4/04	4/01	3/29	3/26	3/23	3/20	3/15

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	9/08	9/15	9/19	9/23	9/27	9/30	10/04	10/08	10/15
32	9/20	9/26	9/30	10/04	10/08	10/11	10/15	10/19	10/25
28	10/01	10/07	10/11	10/15	10/19	10/22	10/26	10/30	11/05
24	10/17	10/23	10/28	10/31	11/04	11/07	11/11	11/15	11/21
20	10/30	11/05	11/09	11/13	11/16	11/20	11/23	11/28	12/03
16	11/07	11/14	11/19	11/23	11/27	11/30	12/04	12/09	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	141	132	126	120	115	110	105	98	90
32	163	155	149	144	140	135	130	124	116
28	189	181	175	170	165	161	156	150	142
24	216	208	203	198	193	189	184	178	170
20	246	237	231	226	222	217	212	206	198
16	266	257	251	246	241	237	232	226	217

***** 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	1508	1317	1159	794	468	194	52	77	219	557	900	1281	8526
60	1353	1177	1004	644	324	97	10	21	106	405	750	1126	7017
57	1260	1093	911	554	246	56	2	8	59	318	660	1033	6200
55	1198	1037	849	495	199	37	1	3	37	263	600	971	5690
50	1043	897	694	351	104	9	0	0	7	148	451	816	4520
32	504	415	200	27	0	0	0	0	0	2	62	315	1525

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	19	22	65	223	557	820	1056	1031	782	468	153	57	5253
55	0	0	0	1	43	167	344	322	129	16	0	0	1022
57	0	0	0	0	27	126	283	264	91	9	0	0	800
60	0	0	0	0	13	76	198	184	48	3	0	0	522
65	0	0	0	0	2	24	86	85	11	0	0	0	208
70	0	0	0	0	0	4	21	25	1	0	0	0	51

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	11	84	338	605	828	814	556	261	50	2	0	0	11	95	433	1038	1866	2680	3236	3497	3547	3549
45	0	0	0	29	206	455	673	659	409	141	13	0	0	0	0	29	235	690	1363	2022	2431	2572	2585	2585
50	0	0	0	7	99	305	518	504	267	53	2	0	0	0	0	7	106	411	929	1433	1700	1753	1755	1755
55	0	0	0	0	36	176	364	351	151	14	0	0	0	0	0	0	36	212	576	927	1078	1092	1092	1092
60	0	0	0	0	6	81	216	204	64	0	0	0	0	0	0	0	6	87	303	507	571	571	571	571
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	5	46	186	351	526	510	312	111	12	0	0	0	5	51	237	588	1114	1624	1936	2047	2059	2059

(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