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: MADISON DANE CO AP, WI **COOP ID: 474961**

Climate Division: WI 8 **NWS Call Sign: MSN** **Elevation: 858 Feet** **Lat: 43˚08N** **Lon: 89˚21W**

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	25.2	9.3	17.3	56	1989	31	29.0	1990	-37	1951	30	4.0	1977	1490	0	.0	.0	.4	21.1	30.1	10.0
Feb	30.8	14.3	22.6	64	2000	25	33.5	1998	-29	1996	3	11.8	1979	1203	0	.0	.0	1.4	14.4	26.5	5.9
Mar	42.8	24.6	33.7	82+	1986	29	41.0	1973	-29	1962	1	25.6	1975	978	0	.0	.0	8.8	5.0	24.7	.9
Apr	56.6	35.2	45.9	94	1980	22	52.5	1985	0	1982	7	40.3	1975	576	6	.0	@	22.0	.5	12.7	@
May	69.4	46.0	57.7	93+	1975	19	65.0	1977	19	1978	1	51.3	1997	261	33	.0	.3	30.5	.0	2.5	.0
Jun	78.3	55.7	67.0	101	1988	20	72.0	1995	31	1972	10	59.6	1982	63	123	.1	2.9	30.0	.0	@	.0
Jul	82.1	61.0	71.6	104	1976	10	75.9	1983	36	1965	6	67.2	1992	12	214	.1	5.3	31.0	.0	.0	.0
Aug	79.4	58.7	69.1	102+	1988	17	76.9	1995	35+	1968	27	64.8	1977	33	154	.1	2.8	31.0	.0	.0	.0
Sep	71.4	49.9	60.7	99	1953	1	64.9	1994	25+	1974	22	56.7	1993	183	48	.0	.6	29.9	.0	1.0	.0
Oct	59.6	38.9	49.3	90+	1976	1	55.8	1971	13	1988	30	43.5	1976	504	4	.0	.1	26.1	.0	9.5	.0
Nov	43.3	27.7	35.5	76	1964	3	42.0	1999	-8	1950	25	28.0	1976	892	0	.0	.0	9.3	4.6	21.4	.2
Dec	30.2	15.8	23.0	64	2001	5	31.3	1998	-25	1983	19	11.2	2000	1298	0	.0	.0	1.3	15.8	28.8	4.9
Ann	55.8	36.4	46.1	104	Jul 1976	10	76.9	Aug 1995	-37	Jan 1951	30	4.0	Jan 1977	7493	582	.3	12.0	221.7	61.4	157.2	21.9

\+ 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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Climate Division: WI 8 **NWS Call Sign: MSN** **Elevation: 858 Feet** **Lat: 43°08N** **Lon: 89°21W**

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	1.25	1.21	1.15	1974	26	2.53	1996	.14	1981
Feb	1.28	1.19	1.56	1981	22	2.76	1994	.06	1995
Mar	2.28	2.05	2.78	1998	30	5.46	1998	.28	1978
Apr	3.35	2.97	1.91	1975	28	7.11	1973	1.52	1985
May	3.25	3.14	3.64	1966	23	9.63	2000	.64	1981
Jun	4.05	3.42	4.51	1996	17	9.95	1978	.81	1973
Jul	3.93	3.79	3.89	1975	3	9.34	1993	1.46	1976
Aug	4.33	4.31	3.40	2001	2	9.49	1980	1.63	1978
Sep	3.08	2.85	2.70	1961	12	7.84	1980	.11	1979
Oct	2.18	1.73	2.78	1984	18	5.63	1984	.64	1975
Nov	2.31	1.98	2.30	1971	1	5.13	1985	.11	1976
Dec	1.66	1.61	2.19	1990	3	4.09	1987	.26	1989
Ann	32.95	32.98	4.51	Jun 1996	17	9.95	Jun 1978	.06	Feb 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.1	3.6	.5	.1
Feb	8.7	3.6	.4	.2
Mar	10.6	5.2	1.4	.2
Apr	11.8	6.8	2.4	.7
May	11.5	6.6	2.0	.8
Jun	10.7	6.6	2.4	1.0
Jul	10.5	6.3	2.5	1.1
Aug	9.9	6.9	3.1	1.2
Sep	9.6	5.6	2.2	.8
Oct	9.3	5.0	1.2	.3
Nov	10.9	5.2	1.3	.5
Dec	10.3	4.2	.7	.2
Ann	124.9	65.6	20.1	7.1

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	.32	.44	.62	.78	.94	1.11	1.29	1.51	1.80	2.25	2.67
Feb	.19	.29	.48	.66	.84	1.04	1.28	1.56	1.95	2.58	3.18
Mar	.38	.58	.91	1.22	1.55	1.89	2.29	2.78	3.42	4.47	5.47
Apr	1.48	1.78	2.20	2.54	2.85	3.17	3.51	3.91	4.40	5.15	5.83
May	.86	1.17	1.64	2.05	2.46	2.89	3.36	3.92	4.66	5.81	6.89
Jun	.86	1.23	1.83	2.36	2.91	3.49	4.14	4.92	5.96	7.61	9.17
Jul	1.58	1.94	2.46	2.88	3.28	3.68	4.12	4.62	5.26	6.24	7.14
Aug	1.60	2.00	2.59	3.07	3.54	4.01	4.53	5.12	5.89	7.06	8.14
Sep	.45	.71	1.15	1.58	2.03	2.51	3.08	3.77	4.69	6.21	7.66
Oct	.52	.73	1.04	1.33	1.61	1.91	2.24	2.64	3.16	3.98	4.75
Nov	.54	.76	1.09	1.40	1.70	2.02	2.38	2.80	3.36	4.25	5.09
Dec	.28	.42	.67	.89	1.13	1.38	1.67	2.02	2.49	3.25	3.98
Ann	24.71	26.34	28.40	29.96	31.34	32.66	34.03	35.52	37.33	39.94	42.17

+ 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	11.9	10.5	5	3	12.6	1995	19	27.5	1995	32	1979	28	21	1979	10.0	3.3	1.1	.5	.1	23.7	17.6	13.1	7.1
Feb	8.8	7.5	5	3	11.6	1994	23	37.0	1994	28+	1979	6	24	1979	7.6	2.6	.8	.3	@	20.8	14.8	9.7	5.8
Mar	7.3	6.6	1	2	12.0	1971	18	21.6	1993	16+	1986	1	6	1979	6.3	2.1	.5	.3	.1	9.5	5.4	3.8	.6
Apr	3.5	1.6	#	1	12.9	1973	9	17.4	1973	14	1973	10	1+	1993	2.4	1.0	.3	.1	@	1.7	.9	.4	@
May	.1	.0	#	0	3.0	1990	10	3.0	1990	4	1994	1	#	2000	.1	.0	@	.0	.0	.1	.1	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1994	.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	.4	.0	#	0	3.8	1997	26	3.9	1997	1+	1992	20	#	1992	.5	.1	.1	.0	.0	.1	.0	.0	.0
Nov	4.8	3.9	#	0	7.6	1995	27	18.3	1985	9	1985	10	2	1985	4.8	1.7	.3	.1	.0	3.8	1.5	.5	.0
Dec	12.5	10.3	3	1	17.3	1990	3	35.0	2000	17+	1990	5	14	1985	9.0	3.4	1.1	.5	.1	18.7	11.2	5.9	2.7
Ann	49.3	40.4	N/A	N/A	17.3	Dec 1990	3	37.0	Feb 1994	32	Jan 1979	28	24	Feb 1979	40.7	14.2	4.2	1.8	.3	78.4	51.5	33.4	16.2

+ 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	6/13	6/06	6/01	5/28	5/24	5/21	5/16	5/12	5/05
32	5/27	5/21	5/17	5/14	5/10	5/07	5/04	4/30	4/24
28	5/12	5/06	5/02	4/28	4/25	4/22	4/18	4/14	4/08
24	5/01	4/25	4/22	4/18	4/15	4/12	4/09	4/05	3/31
20	4/19	4/14	4/11	4/08	4/05	4/02	3/31	3/27	3/23
16	4/09	4/04	4/01	3/29	3/26	3/23	3/20	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	9/11	9/15	9/17	9/19	9/21	9/23	9/26	9/28	10/02
32	9/21	9/25	9/27	9/30	10/02	10/04	10/06	10/08	10/12
28	9/24	9/30	10/04	10/07	10/10	10/13	10/17	10/21	10/26
24	10/09	10/15	10/19	10/22	10/25	10/29	11/01	11/05	11/10
20	10/19	10/25	10/29	11/02	11/05	11/08	11/12	11/16	11/22
16	10/29	11/04	11/08	11/12	11/15	11/19	11/22	11/26	12/02

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	133	128	124	119	115	111	105	98
32	161	155	151	147	143	140	136	132	126
28	192	183	177	172	167	163	157	151	143
24	217	208	202	197	193	188	183	177	169
20	237	229	223	218	213	209	204	198	189
16	260	251	245	239	234	229	223	216	207

***** 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	1490	1203	978	576	261	63	12	33	183	504	892	1298	7493
60	1326	1049	816	429	162	20	0	12	67	345	735	1148	6109
57	1233	965	723	346	113	9	0	4	34	266	645	1055	5393
55	1171	909	661	295	86	5	0	1	20	218	586	993	4945
50	1016	769	515	182	37	1	0	0	3	121	444	838	3926
32	502	326	120	6	0	0	0	0	0	2	83	356	1395

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	13	34	159	428	796	1049	1223	1145	856	529	173	33	6438
55	0	0	4	32	154	362	510	433	202	43	3	0	1743
57	0	0	3	23	120	307	448	372	162	30	1	0	1466
60	0	0	1	14	79	228	356	284	111	16	0	0	1089
65	0	0	0	6	33	123	214	154	48	4	0	0	582
70	0	0	0	1	9	50	99	65	17	1	0	0	242

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	7	61	232	557	820	982	910	623	305	67	5	0	7	68	300	857	1677	2659	3569	4192	4497	4564	4569
45	0	1	30	130	408	670	827	755	474	186	28	3	0	1	31	161	569	1239	2066	2821	3295	3481	3509	3512
50	0	0	12	71	269	520	672	600	333	102	9	0	0	0	12	83	352	872	1544	2144	2477	2579	2588	2588
55	0	0	4	36	157	372	517	445	211	46	2	0	0	0	4	40	197	569	1086	1531	1742	1788	1790	1790
60	0	0	0	13	81	237	362	291	117	16	0	0	0	0	0	13	94	331	693	984	1101	1117	1117	1117
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	42	153	351	527	656	597	384	186	41	3	0	2	44	197	548	1075	1731	2328	2712	2898	2939	2942

(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