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: MILWAUKEE MT MARY COL, WI **COOP ID: 475474**

Climate Division: WI 9 **NWS Call Sign:** **Elevation: 726 Feet** **Lat: 43˚04N** **Lon: 88˚02W**

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	28.4	11.5	20.0	59	1950	25	30.3	1990	-27	1951	30	7.1	1977	1397	0	.0	.0	.6	19.1	29.1	6.1
Feb	33.2	15.8	24.5	67	1999	12	35.2	1998	-25	1996	3	14.6	1979	1135	0	.0	.0	1.9	12.4	25.2	2.5
Mar	44.2	25.6	34.9	85+	1986	31	42.9	2000	-15	1962	1	28.1	1984	933	0	.0	.0	8.3	4.0	21.9	.2
Apr	56.7	36.6	46.7	90	1980	22	53.3	1985	11	1954	3	40.5	1975	553	2	.0	@	21.2	.2	8.4	.0
May	69.7	47.8	58.8	95	1988	31	66.5	1977	25	1966	10	51.3	1997	245	51	.0	1.0	30.5	.0	.6	.0
Jun	80.1	57.3	68.7	104+	1988	25	74.0	1988	32	1956	2	63.4	1982	42	153	.2	4.4	30.0	.0	.0	.0
Jul	85.1	63.4	74.3	108	1995	13	78.9	1983	40	1965	6	69.0	1992	6	293	.4	8.0	31.0	.0	.0	.0
Aug	82.3	61.6	72.0	108	1988	1	78.2	1988	41+	1963	18	67.6	1997	15	231	.2	4.5	31.0	.0	.0	.0
Sep	74.2	52.6	63.4	100	1953	1	68.4	1998	27	1956	20	57.7	1993	105	57	.0	1.0	30.0	.0	.1	.0
Oct	61.6	41.4	51.5	90	1963	6	58.3	1971	16+	1952	29	46.0	1988	423	4	.0	.0	27.5	.0	3.8	.0
Nov	46.0	29.2	37.6	78	1950	1	44.0	1999	-8	1950	25	30.1	1976	821	0	.0	.0	10.7	2.5	17.0	.1
Dec	33.8	18.1	26.0	68	2001	6	34.0	1982	-22	1983	24	15.2	1983	1211	0	.0	.0	1.4	12.6	27.1	2.8
Ann	57.9	38.4	48.2	108+	Jul 1995	13	78.9	Jul 1983	-27	Jan 1951	30	7.1	Jan 1977	6886	791	.8	18.9	224.1	50.8	133.2	11.7

\+ 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	1.60	1.49	1.50+	1965	24	4.12	1979	.33	1981
Feb	1.31	1.26	1.60	1997	21	2.87	1994	.02	1987
Mar	1.95	1.77	2.22	1960	30	6.02	1976	.29	1978
Apr	3.41	3.16	3.85	1973	21	8.53	1973	1.04	1997
May	2.85	2.85	2.91	1978	13	7.50	2000	.35	1988
Jun	3.71	3.33	5.55	1997	21	9.71	1997	.64	1988
Jul	3.46	3.28	6.37	1964	18	7.14	1989	.66	1988
Aug	3.98	3.70	3.80	1998	7	7.59	1998	1.31	1973
Sep	3.38	3.33	3.08	1972	18	8.67	1986	.02	1979
Oct	2.28	2.37	2.35	1991	4	5.71	1991	.28	1993
Nov	2.35	2.14	2.46	1982	1	8.10	1985	.47	1996
Dec	1.81	1.83	1.64	1971	15	5.26	1973	.25	1993
Ann	32.09	31.58	6.37	Jul 1964	18	9.71	Jun 1997	.02+	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.6	4.3	.8	.2
Feb	7.3	3.4	.7	.1
Mar	8.5	4.6	1.1	.3
Apr	10.7	6.2	2.1	.8
May	10.4	5.7	2.0	.5
Jun	9.6	6.3	2.5	.8
Jul	9.5	5.9	2.4	.8
Aug	9.6	6.5	2.8	1.0
Sep	8.9	5.3	2.3	1.0
Oct	9.1	4.6	1.6	.3
Nov	9.3	5.1	1.6	.3
Dec	9.1	4.7	.8	.3
Ann	111.6	62.6	20.7	6.4

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	.33	.48	.71	.93	1.14	1.37	1.63	1.94	2.35	3.01	3.63
Feb	.13	.22	.40	.58	.78	1.00	1.27	1.60	2.05	2.80	3.53
Mar	.31	.47	.76	1.02	1.30	1.60	1.95	2.38	2.94	3.86	4.75
Apr	1.04	1.36	1.85	2.26	2.67	3.09	3.55	4.09	4.79	5.89	6.90
May	.63	.89	1.31	1.69	2.06	2.46	2.91	3.45	4.17	5.30	6.37
Jun	.92	1.27	1.81	2.29	2.77	3.27	3.83	4.49	5.36	6.73	8.02
Jul	1.20	1.53	2.00	2.40	2.79	3.18	3.61	4.11	4.75	5.75	6.66
Aug	1.45	1.82	2.36	2.81	3.24	3.68	4.16	4.72	5.43	6.52	7.53
Sep	.37	.63	1.10	1.57	2.08	2.64	3.30	4.13	5.25	7.11	8.91
Oct	.45	.65	.99	1.29	1.61	1.94	2.32	2.78	3.38	4.35	5.27
Nov	.49	.70	1.05	1.36	1.68	2.02	2.40	2.86	3.46	4.43	5.35
Dec	.33	.49	.75	1.00	1.25	1.52	1.83	2.21	2.70	3.51	4.27
Ann	25.57	26.89	28.54	29.78	30.86	31.90	32.96	34.12	35.51	37.50	39.19

\+ 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	11.3	9.9	5	4	13.0	1999	3	31.6	1982	31	1979	24	21	1979	7.5	4.1	1.3	.5	.1	22.8	17.7	11.9	4.6
Feb	8.4	7.3	5	4	12.0	1994	23	36.3	1994	23	1979	12	21	1979	5.3	2.6	.9	.3	@	16.1	10.7	8.1	3.3
Mar	5.4	3.8	1	#	9.0	1971	19	15.5	1971	16	1994	1	9	1994	3.5	1.7	.5	.2	.0	4.5	2.8	1.4	.2
Apr	1.8	.1	#	#	9.0	1973	9	12.0	1973	10	1973	10	2	1973	.9	.5	.3	.1	.0	.7	.4	.3	@
May	.1	.0	#	0	2.0	1990	10	2.0	1990	2	1990	10	#+	1994	.1	@	.0	.0	.0	.1	.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	1.7	1989	20	2.0	1989	2	1989	20	#+	1995	.1	.1	.0	.0	.0	.1	.0	.0	.0
Nov	2.8	2.2	#	#	7.3	1977	25	14.5	1995	11	1995	29	2	1995	1.9	.7	.3	.1	.0	1.6	.6	.3	.1
Dec	8.1	7.5	2	1	9.5	1987	15	17.2	1978	19	2000	31	8	2000	5.9	3.0	.6	.3	.0	10.5	4.3	2.0	.1
Ann	38.0	30.8	N/A	N/A	13.0	Jan 1999	3	36.3	Feb 1994	31	Jan 1979	24	21+	Feb 1979	25.2	12.7	3.9	1.5	.1	56.4	36.5	24.0	8.3

+ 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	5/19	5/15	5/12	5/09	5/06	5/03	4/30	4/25
32	5/10	5/05	5/02	4/29	4/27	4/24	4/21	4/18	4/13
28	4/25	4/21	4/18	4/15	4/13	4/10	4/08	4/05	4/01
24	4/15	4/11	4/08	4/06	4/04	4/02	3/30	3/28	3/24
20	4/08	4/03	3/30	3/28	3/25	3/22	3/19	3/15	3/11
16	3/31	3/25	3/21	3/17	3/13	3/10	3/06	3/02	2/23

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	163	158	154	150	147	144	140	136	130
32	191	184	178	174	170	166	162	156	149
28	217	211	207	203	199	196	192	188	181
24	234	228	224	221	217	214	210	206	200
20	262	254	248	243	239	234	229	224	216
16	286	276	269	263	258	252	246	239	230

***** 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	1397	1135	933	553	245	42	6	15	105	423	821	1211	6886
60	1242	995	778	410	148	11	0	2	39	284	671	1056	5636
57	1149	911	685	329	103	5	0	0	17	211	582	963	4955
55	1087	855	624	279	78	2	0	0	9	169	523	901	4527
50	932	715	478	171	34	0	0	0	1	86	384	750	3551
32	422	279	97	5	0	0	0	0	0	1	57	283	1144

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	68	187	444	829	1101	1310	1238	941	604	225	95	7090
55	0	0	1	28	194	414	597	525	260	59	2	0	2080
57	0	0	0	18	157	356	535	463	209	40	1	0	1779
60	0	0	0	8	109	273	442	372	140	19	0	0	1363
65	0	0	0	2	51	153	293	231	57	4	0	0	791
70	0	0	0	0	19	67	161	118	15	0	0	0	380

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	8	77	257	594	872	1063	1002	729	386	97	8	0	8	85	342	936	1808	2871	3873	4602	4988	5085	5093
45	0	0	40	154	440	722	908	847	579	254	44	2	0	0	40	194	634	1356	2264	3111	3690	3944	3988	3990
50	0	0	20	81	303	572	753	692	433	143	19	0	0	0	20	101	404	976	1729	2421	2854	2997	3016	3016
55	0	0	9	42	186	422	598	537	292	67	4	0	0	0	9	51	237	659	1257	1794	2086	2153	2157	2157
60	0	0	1	17	103	285	443	385	179	26	0	0	0	0	1	18	121	406	849	1234	1413	1439	1439	1439
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	46	153	355	565	717	675	452	207	44	2	0	2	48	201	556	1121	1838	2513	2965	3172	3216	3218

(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