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: ASHLAND EXP FARM, WI **COOP ID: 470349**

Climate Division: WI 1 **NWS Call Sign:** **Elevation: 650 Feet** **Lat: 46˚34N** **Lon: 90˚58W**

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	19.9	-.4	9.8	52	1973	25	20.4	1990	-41	1982	17	-1.2	1979	1715	0	.0	.0	.1	25.1	31.0	14.9
Feb	27.1	4.8	16.0	59	1984	23	30.9	1998	-40	1979	17	3.3	1979	1374	0	.0	.0	.9	17.4	27.7	10.6
Mar	36.8	17.0	26.9	80	1986	31	34.5	2000	-30+	1984	7	19.1	1984	1182	0	.0	.0	4.0	8.8	28.7	4.2
Apr	50.2	28.6	39.4	90+	1952	28	46.7	1987	-2+	1972	8	32.1	1975	768	0	.0	.0	15.4	1.0	20.7	.1
May	64.8	39.3	52.1	93+	1986	31	57.9	1998	16+	1978	1	45.6	1983	412	10	.0	.3	28.3	.0	7.8	.0
Jun	73.9	49.0	61.5	97+	1995	19	66.5	1988	28+	1982	3	56.0	1982	138	31	.0	1.1	29.8	.0	.6	.0
Jul	79.3	55.1	67.2	103	1988	27	72.5	1988	33	1969	6	61.6	1992	48	116	.2	2.6	31.0	.0	.0	.0
Aug	77.1	53.7	65.4	103	1948	24	69.4	1983	30	1967	22	60.4	1977	71	83	.0	1.8	31.0	.0	.0	.0
Sep	67.8	45.1	56.5	100	1976	7	61.4	1998	23+	1967	29	50.8	1993	267	10	@	.3	29.6	.0	2.2	.0
Oct	56.2	34.2	45.2	88	1992	2	50.8	1973	10	1988	30	39.3	1976	614	0	.0	.0	22.9	.1	12.9	.0
Nov	38.2	22.2	30.2	74+	1999	9	38.2	1999	-16	1976	28	22.2	1995	1044	0	.0	.0	5.1	8.0	25.5	.9
Dec	24.8	7.3	16.1	60+	1982	3	25.4	1997	-28+	1983	19	3.4	1983	1517	0	.0	.0	.3	20.9	30.5	8.8
Ann	51.3	29.7	40.5	103+	Jul 1988	27	72.5	Jul 1988	-41	Jan 1982	17	-1.2	Jan 1979	9150	250	.2	6.1	198.4	81.3	187.6	39.5

\+ 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	1.26	1.31	1.30	1997	10	4.41	1996	.03	1981
Feb	.81	.62	1.50	2001	26	2.90	1981	.09	1993
Mar	1.86	1.53	2.44	1977	12	5.87	1977	.46	1999
Apr	2.07	2.14	4.25	2001	23	4.15	1981	.56	1988
May	2.74	2.58	2.61	1953	21	5.29	1993	.62	1990
Jun	3.65	3.47	3.25	1952	25	6.58	1998	1.41	1987
Jul	4.03	3.57	3.48	1951	4	8.99	1982	.56	1989
Aug	3.93	3.78	4.88	1978	23	8.77	1972	1.28	1996
Sep	3.70	3.21	4.70	1985	3	10.00	1985	.86	1976
Oct	2.51	2.15	2.83	1950	2	5.96	1971	.65	1999
Nov	2.36	1.74	2.36	1975	20	8.45	1975	.51	1981
Dec	1.10	1.14	1.85	1970	3	2.80	1996	.13	1979
Ann	30.02	30.31	4.88	Aug 1978	23	10.00	Sep 1985	.03	Jan 1981

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.0	3.2	.4	@
Feb	7.1	2.4	.3	.0
Mar	8.1	3.8	1.0	.3
Apr	8.7	5.2	.8	.3
May	10.5	5.8	1.8	.4
Jun	11.9	7.8	2.3	.7
Jul	10.8	6.7	2.8	1.0
Aug	11.1	6.5	2.3	1.0
Sep	12.0	7.3	1.9	.7
Oct	10.9	5.5	1.7	.4
Nov	9.3	4.6	1.3	.5
Dec	9.6	3.4	.4	@
Ann	119.0	62.2	17.0	5.3

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	.16	.26	.44	.61	.80	1.00	1.24	1.54	1.94	2.60	3.24
Feb	.13	.20	.32	.43	.55	.67	.81	.98	1.21	1.59	1.94
Mar	.50	.68	.95	1.18	1.41	1.66	1.93	2.25	2.66	3.32	3.93
Apr	.72	.92	1.20	1.44	1.67	1.91	2.16	2.46	2.85	3.44	3.99
May	.79	1.05	1.44	1.78	2.11	2.46	2.84	3.29	3.88	4.80	5.65
Jun	1.56	1.89	2.35	2.73	3.08	3.44	3.83	4.27	4.83	5.68	6.45
Jul	.91	1.28	1.87	2.41	2.94	3.50	4.13	4.89	5.88	7.47	8.96
Aug	1.45	1.82	2.35	2.79	3.21	3.64	4.11	4.65	5.34	6.40	7.37
Sep	1.08	1.44	1.96	2.42	2.87	3.33	3.84	4.44	5.22	6.44	7.58
Oct	.65	.89	1.25	1.57	1.89	2.22	2.59	3.02	3.60	4.50	5.34
Nov	.38	.59	.93	1.26	1.59	1.96	2.37	2.88	3.56	4.67	5.73
Dec	.20	.30	.46	.61	.77	.93	1.12	1.35	1.65	2.13	2.59
Ann	21.46	23.12	25.24	26.86	28.29	29.67	31.10	32.67	34.59	37.36	39.75

\+ 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	14.7	15.0	12	11	9.5	1988	12	28.3	1975	36	1996	19	23	1996	8.7	4.6	1.7	.6	.0	26.5	24.8	23.2	14.8
Feb	8.6	8.1	12	12	16.0	1990	16	21.4	1971	34+	1996	2	30	1996	6.6	3.2	.8	.3	@	23.9	22.7	21.6	16.4
Mar	9.8	8.7	8	5	13.0	1985	4	25.5	1975	30+	1996	8	25	1996	4.6	2.6	1.1	.6	.1	17.9	16.4	14.3	10.2
Apr	3.9	2.8	1	2	11.5	1985	1	12.5	1985	25	1996	4	10	1996	1.7	1.3	.5	.3	@	3.8	3.0	2.5	1.4
May	.0	.0	#	0	.3	1996	1	.3	1996	#+	1997	12	#	2000	.1	.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	2.0	1989	17	2.0	1989	1+	1982	21	#	1982	.2	.1	.0	.0	.0	.1	.0	.0	.0
Nov	6.2	5.4	1	1	12.0	1991	30	25.5	1975	17	1991	30	5	1991	4.2	2.2	.7	.2	@	7.1	3.8	2.3	.4
Dec	11.4	10.8	5	3	13.0	1995	14	20.6	1989	20+	1983	27	15+	1984	8.0	4.4	1.0	.4	@	21.0	16.4	11.4	4.6
Ann	54.8	50.8	N/A	N/A	16.0	Feb 1990	16	28.3	Jan 1975	36	Jan 1996	19	30	Feb 1996	34.1	18.4	5.8	2.4	.1	100.3	87.1	75.3	47.8

+ 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	6/23	6/18	6/14	6/12	6/09	6/06	6/03	5/31	5/26
32	6/17	6/12	6/07	6/04	6/01	5/28	5/25	5/21	5/15
28	6/01	5/26	5/22	5/19	5/16	5/13	5/09	5/05	4/30
24	5/15	5/09	5/05	5/02	4/29	4/26	4/23	4/19	4/13
20	5/03	4/28	4/24	4/21	4/18	4/15	4/11	4/08	4/02
16	4/19	4/14	4/11	4/08	4/05	4/02	3/30	3/27	3/22

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	8/28	9/02	9/06	9/09	9/12	9/15	9/18	9/22	9/27
32	9/12	9/16	9/18	9/21	9/23	9/25	9/28	9/30	10/04
28	9/19	9/23	9/26	9/29	10/02	10/04	10/07	10/10	10/15
24	10/02	10/07	10/11	10/15	10/18	10/21	10/25	10/29	11/03
20	10/14	10/18	10/22	10/25	10/27	10/30	11/02	11/06	11/10
16	10/26	10/30	11/02	11/05	11/07	11/10	11/12	11/16	11/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	115	108	103	99	95	91	86	81	74
32	133	126	122	118	114	110	106	101	94
28	159	152	147	142	138	134	130	124	117
24	194	186	181	176	171	167	162	156	149
20	217	209	203	197	192	187	182	176	167
16	234	228	223	219	215	212	207	203	196

***** 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	1715	1374	1182	768	412	138	48	71	267	614	1044	1517	9150
60	1560	1234	1027	620	279	55	10	19	149	461	894	1362	7670
57	1467	1150	934	532	212	27	3	6	95	372	804	1269	6871
55	1405	1094	872	475	173	15	0	2	67	315	744	1207	6369
50	1250	954	717	339	95	3	0	0	21	192	595	1052	5218
32	704	481	233	39	2	0	0	0	0	6	161	526	2152

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	13	31	75	261	623	884	1091	1035	733	415	107	32	5300
55	0	0	0	6	81	208	378	325	109	11	0	0	1118
57	0	0	0	3	59	160	318	267	78	6	0	0	891
60	0	0	0	1	33	99	233	186	42	2	0	0	596
65	0	0	0	0	10	31	116	83	10	0	0	0	250
70	0	0	0	0	1	5	41	24	1	0	0	0	72

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	14	110	388	663	856	809	524	221	26	0	0	0	14	124	512	1175	2031	2840	3364	3585	3611	3611
45	0	0	5	58	252	514	701	654	378	120	10	0	0	0	5	63	315	829	1530	2184	2562	2682	2692	2692
50	0	0	0	27	148	366	546	499	244	59	2	0	0	0	0	27	175	541	1087	1586	1830	1889	1891	1891
55	0	0	0	8	81	235	394	345	136	23	0	0	0	0	0	8	89	324	718	1063	1199	1222	1222	1222
60	0	0	0	4	33	125	245	203	67	3	0	0	0	0	0	4	37	162	407	610	677	680	680	680
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	12	92	255	416	547	513	319	142	16	0	0	0	12	104	359	775	1322	1835	2154	2296	2312	2312

(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