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: ELLSWORTH 1 E, WI **COOP ID: 472556**

Climate Division: WI 4 **NWS Call Sign:** **Elevation: 1,030 Feet** **Lat: 44˚44N** **Lon: 92˚28W**

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	21.6	2.7	12.2	53+	1981	25	25.1	1990	-37	1994	19	-.1	1977	1638	0	.0	.0	.1	24.2	31.0	13.9
Feb	28.7	9.3	19.0	59	1981	18	30.8	1998	-37	1996	2	7.4	1979	1288	0	.0	.0	.6	16.0	27.6	8.4
Mar	40.4	21.2	30.8	80	1986	29	39.7	2000	-25	1962	1	22.7	1975	1059	0	.0	.0	6.8	6.6	26.6	2.3
Apr	56.6	33.5	45.1	88+	1970	29	53.1	1977	3	1995	4	37.4	1975	599	1	.0	@	22.2	.4	14.4	.0
May	69.3	45.8	57.6	92+	1969	28	66.6	1977	19	1967	3	51.9	1983	267	36	.0	@	30.5	.0	2.1	.0
Jun	77.6	54.8	66.2	98	1985	9	72.1	1988	33	1987	4	59.3	1982	72	108	.0	2.1	30.0	.0	.0	.0
Jul	81.9	59.3	70.6	105	1995	14	76.0	1974	38	1984	7	64.0	1992	24	196	.1	4.1	31.0	.0	.0	.0
Aug	79.6	56.8	68.2	97+	1996	7	72.8	1995	36+	1982	11	63.6	1987	41	140	.0	1.4	31.0	.0	.0	.0
Sep	71.5	48.0	59.8	94+	1976	7	65.4	1998	22+	1985	27	53.7	1993	186	28	.0	.4	29.6	.0	1.3	.0
Oct	59.4	36.9	48.2	89	1997	4	55.3	1973	12	1984	31	43.4	1987	523	1	.0	.0	26.0	.1	11.1	.0
Nov	40.2	23.2	31.7	77	1999	9	40.9	1999	-15+	1977	26	23.1	1991	999	0	.0	.0	6.7	7.5	24.6	1.2
Dec	25.9	9.2	17.6	63	1998	2	25.9	1997	-40	1983	19	2.3	1983	1472	0	.0	.0	.4	21.3	30.6	8.5
Ann	54.4	33.4	43.9	105	Jul 1995	14	76.0	Jul 1974	-40	Dec 1983	19	-.1	Jan 1977	8168	510	.1	8.0	214.9	76.1	169.3	34.3

\+ 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	1.06	.99	1.50	2001	26	2.59	1975	.17+	1981
Feb	.76	.61	1.20	1961	18	2.58	1981	.05	1987
Mar	1.97	1.77	2.17	1998	30	6.96	1998	.27	1981
Apr	2.99	2.77	4.13	1975	27	7.73	1975	.37	1987
May	3.88	3.48	3.33	1959	5	7.46	1973	.88	1992
Jun	4.51	4.38	3.88	1957	22	8.52	1990	.54	1988
Jul	4.55	3.95	5.23	1978	1	14.26	1987	.84	1975
Aug	4.79	4.59	3.92	1977	31	8.54	1993	1.53	1971
Sep	3.93	3.12	7.10	1992	16	10.35	1992	1.03	1974
Oct	2.49	2.34	2.85	1970	9	5.33	1995	.41	1976
Nov	2.37	1.76	2.10	2000	1	6.19	1975	.13	1976
Dec	1.12	1.14	1.31	1982	28	2.75	1982	.15	1998
Ann	34.42	34.13	7.10	Sep 1992	16	14.26	Jul 1987	.05	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.2	3.7	.2	@
Feb	5.4	2.6	.2	.0
Mar	8.4	5.0	1.1	.3
Apr	10.1	6.2	1.9	.4
May	11.1	7.9	2.7	.8
Jun	12.1	8.0	2.8	1.3
Jul	10.4	7.1	2.8	1.2
Aug	10.8	6.9	3.1	1.2
Sep	10.0	6.4	2.5	1.1
Oct	9.2	5.2	1.4	.4
Nov	8.3	4.8	1.5	.5
Dec	7.3	3.6	.3	.1
Ann	111.3	67.4	20.5	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	.19	.28	.44	.58	.73	.89	1.07	1.30	1.59	2.07	2.52
Feb	.13	.19	.30	.41	.52	.63	.77	.93	1.15	1.50	1.84
Mar	.38	.56	.85	1.12	1.38	1.67	2.00	2.40	2.92	3.76	4.56
Apr	.69	.97	1.40	1.80	2.19	2.61	3.07	3.63	4.36	5.53	6.62
May	1.48	1.84	2.36	2.79	3.19	3.61	4.06	4.58	5.24	6.26	7.19
Jun	1.40	1.83	2.47	3.01	3.54	4.09	4.69	5.39	6.31	7.73	9.04
Jul	1.00	1.42	2.08	2.69	3.29	3.93	4.65	5.52	6.66	8.47	10.19
Aug	2.05	2.49	3.09	3.59	4.05	4.52	5.03	5.60	6.34	7.45	8.46
Sep	.95	1.32	1.89	2.40	2.91	3.45	4.05	4.76	5.70	7.18	8.57
Oct	.61	.85	1.21	1.53	1.85	2.19	2.56	3.01	3.60	4.52	5.39
Nov	.37	.57	.91	1.24	1.58	1.95	2.37	2.89	3.59	4.73	5.81
Dec	.23	.33	.49	.64	.79	.96	1.14	1.36	1.65	2.12	2.56
Ann	23.83	25.86	28.47	30.46	32.23	33.95	35.72	37.69	40.09	43.57	46.59

\+ 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	12.2	12.0	10	12	13.5	1988	20	24.9	1975	44	1982	25	21	1982	6.4	4.6	1.4	.7	.1	-9.9	-9.9	-9.9	-9.9
Feb	8.1	6.4	10	9	6.5	1971	5	18.8	1986	36	1971	15	26	1975	3.6	2.5	.9	.3	.0	-9.9	-9.9	-9.9	-9.9
Mar	8.5	7.2	4	0	13.5	1985	3	22.4	1984	29	1975	12	17+	1985	3.2	2.9	1.3	.6	.2	-9.9	-9.9	-9.9	-9.9
Apr	2.2	.0	#	0	10.0	1983	14	15.5	1983	15	1975	2	3	1975	.8	.7	.2	.1	@	1.7	.7	.5	.2
May	.0	.0	0	0	.5	1976	2	.5	1976	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	.4	.0	#	0	2.0	1982	20	2.0+	1989	#	1995	21	#	1995	.3	.3	.0	.0	.0	.0	.0	.0	.0
Nov	5.3	3.1	1	#	10.0	1971	26	14.2	1977	19	1983	30	9	1985	2.8	2.3	.9	.3	.1	2.2	.8	.6	.5
Dec	11.5	12.0	4	1	10.0	1985	1	21.1	1985	24	1983	27	21	1983	5.9	3.8	1.3	.4	@	-9.9	-9.9	-9.9	-9.9
Ann	48.2	40.7	N/A	N/A	13.5+	Jan 1988	20	24.9	Jan 1975	44	Jan 1982	25	26	Feb 1975	23.0	17.1	6.0	2.4	.4	-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	6/06	5/31	5/26	5/23	5/19	5/15	5/12	5/07	5/01
32	5/21	5/16	5/13	5/10	5/07	5/04	5/01	4/28	4/23
28	5/10	5/05	5/01	4/28	4/25	4/22	4/19	4/16	4/11
24	4/29	4/24	4/20	4/17	4/14	4/11	4/08	4/04	3/30
20	4/19	4/15	4/11	4/08	4/06	4/03	3/31	3/27	3/23
16	4/12	4/07	4/03	3/31	3/28	3/25	3/21	3/17	3/12

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	9/05	9/10	9/13	9/16	9/19	9/22	9/25	9/28	10/03
32	9/16	9/21	9/24	9/27	9/30	10/03	10/06	10/10	10/14
28	9/19	9/25	9/30	10/04	10/07	10/11	10/15	10/20	10/26
24	10/04	10/10	10/15	10/18	10/22	10/25	10/29	11/02	11/08
20	10/15	10/20	10/24	10/27	10/30	11/02	11/05	11/09	11/15
16	10/25	10/30	11/03	11/06	11/09	11/11	11/15	11/18	11/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	150	140	134	128	122	117	111	104	95
32	166	159	154	149	145	141	137	132	125
28	190	181	175	169	164	159	154	148	139
24	215	206	200	195	190	185	179	173	165
20	229	222	216	211	207	203	198	192	185
16	248	240	235	230	225	221	216	210	202

***** 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	1638	1288	1059	599	267	72	24	41	186	523	999	1472	8168
60	1483	1148	904	455	163	23	5	9	91	376	849	1317	6823
57	1390	1064	811	373	114	10	0	2	52	294	759	1224	6093
55	1328	1008	749	322	86	5	0	1	33	245	699	1162	5638
50	1173	868	601	209	38	1	0	0	8	142	554	1007	4601
32	641	410	176	13	0	0	0	0	0	4	152	493	1889

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	26	46	140	405	792	1027	1196	1122	832	506	143	44	6279
55	0	0	0	25	166	342	483	409	175	33	1	0	1634
57	0	0	0	16	131	287	421	349	134	21	0	0	1359
60	0	0	0	7	87	210	333	263	83	9	0	0	992
65	0	0	0	1	36	108	196	140	28	1	0	0	510
70	0	0	0	0	12	41	98	57	6	0	0	0	214

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	1	39	222	566	810	969	889	602	285	37	1	0	1	40	262	828	1638	2607	3496	4098	4383	4420	4421
45	0	1	13	129	416	660	814	734	457	174	16	0	0	1	14	143	559	1219	2033	2767	3224	3398	3414	3414
50	0	0	4	65	277	510	659	579	313	90	4	0	0	0	4	69	346	856	1515	2094	2407	2497	2501	2501
55	0	0	0	29	166	362	504	427	193	39	0	0	0	0	0	29	195	557	1061	1488	1681	1720	1720	1720
60	0	0	0	10	82	230	349	277	99	12	0	0	0	0	0	10	92	322	671	948	1047	1059	1059	1059
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	26	152	350	524	641	581	372	178	25	0	0	1	27	179	529	1053	1694	2275	2647	2825	2850	2850

(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