

Climatography of the United States

No. 20

1971-2000

Station: WINONA, MN

COOP ID: 219067

Climate Division: MN 9

NWS Call Sign:

Elevation: 652 Feet Lat: 44°03N Lon: 91°38W

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	25.9	9.2	17.6	64	1944	25	30.6	1990	-32	1951	30	5.4	1977	1472	0	.0	.0	.3	21.5	30.6	12.4
Feb	32.8	15.8	24.3	68	1981	19	35.7	1998	-31+	1996	4	12.2	1979	1139	0	.0	.0	1.4	14.2	26.8	7.3
Mar	44.3	27.0	35.7	82+	1986	29	44.0	1973	-28+	1962	2	26.0	1975	910	0	.0	.0	9.2	5.1	24.7	1.6
Apr	59.7	39.8	49.8	96	1952	30	58.3	1977	4+	1982	6	41.7	1975	468	11	.0	.3	22.7	.2	9.7	.0
May	73.0	51.3	62.2	107	1934	31	72.8	1977	21	1956	1	56.9	1997	176	88	.0	.7	30.7	.0	.9	.0
Jun	81.2	60.9	71.1	104+	1988	21	76.2	1988	35	1937	9	64.6	1982	22	203	.1	3.8	30.0	.0	.0	.0
Jul	85.3	66.3	75.8	108	1936	12	80.9	1983	44+	1972	6	68.6	1992	5	339	.2	6.7	31.0	.0	.0	.0
Aug	82.6	63.7	73.2	103	1948	24	78.3	1995	40+	1958	26	68.5	1986	8	259	.1	3.5	31.0	.0	.0	.0
Sep	74.4	54.4	64.4	100+	1978	8	70.4	1998	25	1942	28	58.5	1993	102	84	@	.9	29.8	.0	.7	.0
Oct	61.8	42.8	52.3	93+	1997	3	59.7	1971	13+	1972	20	47.5	1980	400	6	.0	.1	26.6	.0	7.7	.0
Nov	44.3	29.8	37.1	84	1950	1	44.8	1999	-11	1977	26	27.9	1991	839	0	.0	.0	8.7	4.9	21.9	.6
Dec	30.3	15.9	23.1	65+	2001	5	33.7	1987	-28+	1983	20	7.2	1985	1298	0	.0	.0	.8	17.1	29.8	7.0
Ann	58.0	39.7	48.9	108	Jul 1936	12	80.9	Jul 1983	-32	Jan 1951	30	5.4	Jan 1977	6839	990	.4	16.0	222.2	63.0	152.8	28.9

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1932-2001

(3) Derived from 1971-2000 serially complete daily data

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: WINONA, MN

COOP ID: 219067

Climate Division: MN 9

NWS Call Sign:

Elevation: 652 Feet Lat: 44°03N

Lon: 91°38W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	1.44	1.17	2.25	1998	22	6.73	1998	.03	1991	7.4	3.6	.5	.2	.16	.27	.47	.67	.88	1.12	1.40	1.75	2.23	3.01	3.78
Feb	.74	.49	1.23	1948	28	3.50	1971	.00+	1997	5.9	2.8	.5	.0	.00	.00	.00	.16	.31	.48	.68	.93	1.28	1.86	2.43
Mar	1.78	1.85	2.00	1996	25	3.60	1976	.00	1999	7.3	4.5	1.1	.3	.27	.50	.81	1.05	1.30	1.56	1.85	2.19	2.64	3.35	4.02
Apr	3.53	2.91	3.10	1995	11	10.30	1999	.46	1996	9.8	6.5	2.2	.6	.79	1.12	1.64	2.10	2.57	3.06	3.61	4.28	5.15	6.54	7.85
May	3.93	4.16	3.83	1936	1	6.98	1973	.83	1996	10.9	7.5	2.5	1.0	1.54	1.90	2.42	2.85	3.26	3.67	4.12	4.64	5.29	6.30	7.22
Jun	4.16	3.56	3.55	1968	21	8.78	2000	.97	1982	11.0	7.7	3.1	1.0	1.52	1.91	2.47	2.94	3.39	3.85	4.35	4.93	5.68	6.82	7.87
Jul	4.39	4.25	4.30	1978	1	10.01	1978	.71	1975	9.9	7.3	2.9	1.3	1.41	1.82	2.44	2.96	3.47	3.99	4.57	5.24	6.11	7.46	8.70
Aug	4.72	4.09	4.22	1972	19	10.95	1998	.88	1976	10.4	7.6	3.3	1.0	1.27	1.72	2.40	3.00	3.59	4.20	4.88	5.69	6.75	8.39	9.93
Sep	3.85	3.39	3.70	1992	16	11.04	1986	.24	1979	10.4	6.5	2.2	1.0	.57	.89	1.44	1.98	2.53	3.14	3.84	4.70	5.86	7.74	9.56
Oct	2.18	1.96	2.64	1986	11	4.90	1979	.15	1992	8.4	5.2	1.2	.4	.35	.53	.85	1.15	1.46	1.80	2.19	2.67	3.30	4.33	5.32
Nov	2.18	1.98	3.45	1945	8	5.80	1991	.04	1976	8.3	4.6	1.5	.5	.22	.37	.67	.98	1.30	1.67	2.11	2.66	3.41	4.65	5.86
Dec	1.30	1.04	1.50+	1997	3	2.88	1982	.25	1986	7.8	4.2	.5	.1	.33	.46	.64	.81	.97	1.15	1.34	1.57	1.87	2.34	2.78
Ann	34.20	33.61	4.30	Jul 1978	1	11.04	Sep 1986	.00+	Mar 1999	107.5	68.0	21.5	7.4	24.02	25.98	28.50	30.41	32.11	33.76	35.46	37.35	39.64	42.96	45.84

+ 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: 1932-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: WINONA, MN

COOP ID: 219067

Climate Division: MN 9

NWS Call Sign:

Elevation: 652 Feet

Lat: 44°03N

Lon: 91°38W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	11.8	11.5	8	5	12.5	1973	4	25.1	1979	32	1971	31	26	1984	5.7	3.7	1.0	.2	.1	-9.9	-9.9	-9.9	-9.9
Feb	8.2	7.5	7	5	9.5	1983	3	25.4	1971	32	1971	2	25	1971	3.3	2.0	.5	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	6.9	5.5	2	#	11.0	1997	13	19.9	1997	15+	1978	6	9	1975	2.6	1.7	.7	.3	@	9.7	7.7	5.3	2.6
Apr	1.6	.0	#	0	6.5	1973	10	15.6	1973	12	1973	10	1	1975	.8	.7	.2	.1	.0	1.5	.5	.1	.1
May	.0	.0	0	0	.0	0	0	.0	0	0	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	4.8	1991	31	6.2	1991	1+	1982	20	#+	1982	.2	.2	@	.0	.0	.2	.0	.0	.0
Nov	2.6	.8	#	#	5.5	1983	28	10.3	1977	9	1983	29	2	1981	1.4	1.1	.2	.1	.0	3.2	1.0	.1	.0
Dec	12.3	10.0	3	2	16.0	1985	1	33.0	1985	16	2000	29	10	1983	5.5	3.0	.9	.3	@	-9.9	-9.9	-9.9	-9.9
Ann	43.8	35.3	N/A	N/A	16.0	Dec 1985	1	33.0	Dec 1985	32+	Feb 1971	2	26	Jan 1984	19.5	12.4	3.5	1.2	.1	-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

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Climatography of the United States

No. 20 1971-2000

Station: WINONA, MN

COOP ID: 219067

Climate Division: MN 9

NWS Call Sign:

Elevation: 652 Feet

Lat: 44° 03N

Lon: 91° 38W

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	5/25	5/19	5/15	5/11	5/08	5/05	5/01	4/27	4/21
32	5/10	5/04	4/30	4/27	4/24	4/20	4/17	4/13	4/07
28	4/29	4/24	4/21	4/18	4/15	4/12	4/09	4/05	3/31
24	4/22	4/17	4/14	4/11	4/08	4/05	4/02	3/29	3/24
20	4/12	4/07	4/04	4/01	3/29	3/26	3/23	3/19	3/14
16	4/06	4/01	3/28	3/24	3/21	3/18	3/14	3/10	3/04
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	9/14	9/18	9/21	9/24	9/26	9/29	10/02	10/05	10/09
32	9/21	9/26	9/29	10/02	10/05	10/08	10/11	10/14	10/19
28	10/01	10/06	10/10	10/14	10/17	10/20	10/23	10/27	11/02
24	10/15	10/20	10/23	10/26	10/29	11/01	11/04	11/08	11/13
20	10/22	10/28	11/01	11/05	11/09	11/12	11/16	11/20	11/26
16	10/28	11/04	11/09	11/14	11/18	11/22	11/26	12/01	12/08
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	164	156	150	145	141	136	131	125	117
32	187	179	173	168	164	159	154	148	140
28	207	199	194	189	184	180	175	169	161
24	227	219	213	208	204	199	194	188	180
20	248	240	234	229	224	219	214	208	200
16	270	260	253	247	241	235	229	222	212

* 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

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

**Climatography
of the United States
No. 20
1971-2000**

Station: WINONA, MN

COOP ID: 219067

Climate Division: MN 9

NWS Call Sign:

Elevation: 652 Feet Lat: 44°03N Lon: 91°38W

Degree Days to Selected Base Temperatures (°F)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1472	1139	910	468	176	22	5	8	102	400	839	1298	6839
60	1317	999	756	338	98	4	0	0	42	265	689	1143	5651
57	1224	915	664	268	64	1	0	0	20	196	602	1050	5004
55	1162	859	605	226	46	0	0	0	12	155	547	988	4600
50	1007	724	464	138	18	0	0	0	2	78	411	843	3685
32	497	298	103	6	0	0	0	0	0	1	89	374	1368

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	83	216	538	935	1172	1357	1275	972	630	240	99	7565
55	0	0	5	69	268	482	644	562	293	72	8	0	2403
57	0	0	2	51	224	423	582	500	242	50	3	0	2077
60	0	0	0	30	165	336	489	407	173	26	0	0	1626
65	0	0	0	11	88	203	339	259	84	6	0	0	990
70	0	0	0	3	37	101	202	133	30	1	0	0	507

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	59	276	620	878	1051	966	664	338	67	3	0	7	66	342	962	1840	2891	3857	4521	4859	4926	4929
45	0	1	25	176	466	728	896	811	516	213	29	1	0	1	26	202	668	1396	2292	3103	3619	3832	3861	3862
50	0	0	10	97	324	578	741	656	373	120	6	0	0	0	10	107	431	1009	1750	2406	2779	2899	2905	2905
55	0	0	2	48	200	428	586	501	243	56	2	0	0	0	2	50	250	678	1264	1765	2008	2064	2066	2066
60	0	0	0	21	107	286	431	346	138	22	0	0	0	0	0	21	128	414	845	1191	1329	1351	1351	1351
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	44	171	382	572	717	645	413	201	36	0	0	1	45	216	598	1170	1887	2532	2945	3146	3182	3182

(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:

www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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