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: SUPERIOR, NE **COOP ID: 258320**

Climate Division: NE 9 **NWS Call Sign:** **Elevation: 1,580 Feet** **Lat: 40˚01N** **Lon: 98˚04W**

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	37.1	15.3	26.2	78	1990	10	36.5	1992	-20	1974	12	13.7	1979	1203	0	.0	.0	5.9	11.1	29.8	4.4
Feb	43.7	20.5	32.1	83	1972	29	41.5	1999	-17+	1981	11	18.7	1978	923	0	.0	.0	10.4	7.2	24.6	2.5
Mar	54.6	30.0	42.3	92	1978	31	49.5	1986	-10	1978	4	35.0	1975	703	0	.0	@	19.6	1.8	18.6	.4
Apr	66.3	40.5	53.4	99	1989	22	60.8	1981	10	1975	3	45.9	1983	357	9	.0	.6	27.1	.1	5.8	.0
May	75.5	51.5	63.5	100+	2000	29	68.9	1977	26	1967	2	57.8	1995	127	81	.1	1.4	31.0	.0	.3	.0
Jun	86.0	61.2	73.6	106	1988	21	78.5	1988	40+	1983	1	68.4	1982	10	267	1.0	9.9	30.0	.0	.0	.0
Jul	90.7	66.1	78.4	107+	1995	12	82.7	1980	44	1971	30	73.6	1992	0	416	3.2	17.5	31.0	.0	.0	.0
Aug	88.7	64.3	76.5	108	2000	8	83.6	2000	46+	1988	28	71.4	1992	7	363	2.2	14.6	31.0	.0	.0	.0
Sep	80.5	54.5	67.5	106	2000	2	73.6	1998	25	1984	29	62.3	1974	58	133	.2	6.3	29.9	.0	.3	.0
Oct	68.2	42.2	55.2	95	1997	2	58.3	2000	12	1993	31	49.9	1976	309	4	.0	.4	29.0	.1	5.0	.0
Nov	51.0	28.8	39.9	82+	1999	13	48.6	1999	-7	1976	28	32.1	1985	753	0	.0	.0	16.6	2.3	19.7	.2
Dec	39.9	19.1	29.5	71+	1998	3	35.5	1979	-30	1989	23	11.6	1983	1102	0	.0	.0	7.0	7.8	29.5	2.1
Ann	65.2	41.2	53.2	108	Aug 2000	8	83.6	Aug 2000	-30	Dec 1989	23	11.6	Dec 1983	5552	1273	6.7	50.7	268.5	30.4	133.6	9.6

\+ 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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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	.68	.70	.99	1965	23	1.74	1993	.00	1986
Feb	.74	.66	1.38	1958	27	2.25	1971	.00	1996
Mar	2.28	1.93	3.10	1987	17	10.01	1987	.07	1994
Apr	2.68	2.62	3.13	1987	14	5.90	1986	.24	1989
May	4.36	4.28	4.06	2001	5	9.52	1995	1.08	1992
Jun	3.40	3.37	4.40	1997	24	7.98	1975	.78	1976
Jul	3.62	3.34	3.49	1951	11	11.03	1993	.11	1983
Aug	3.10	3.18	3.53	1985	3	7.83	1977	.51	1971
Sep	2.59	1.72	5.18	1973	3	13.24	1973	.57	1990
Oct	1.99	1.37	3.04	1949	10	5.39	1979	.00	1999
Nov	1.71	1.41	4.95	1996	16	7.50	1996	.00	1989
Dec	.91	.79	1.22	1968	19	3.22	1984	.00+	1996
Ann	28.06	27.40	5.18	Sep 1973	3	13.24	Sep 1973	.00+	Oct 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.1	2.3	.2	.0
Feb	4.8	2.2	.4	@
Mar	7.7	4.5	1.6	.5
Apr	9.3	5.4	1.8	.5
May	11.4	7.8	3.1	1.2
Jun	9.0	6.0	2.6	.8
Jul	9.1	5.8	2.3	1.0
Aug	8.7	5.3	2.2	.9
Sep	6.8	4.3	1.5	.6
Oct	5.8	3.4	1.1	.4
Nov	5.6	3.3	1.0	.5
Dec	4.7	2.4	.5	.1
Ann	88.0	52.7	18.3	6.5

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	.05	.12	.22	.32	.43	.54	.67	.83	1.05	1.41	1.75
Feb	.02	.07	.17	.28	.39	.53	.70	.90	1.19	1.68	2.17
Mar	.19	.34	.64	.95	1.30	1.70	2.17	2.77	3.59	4.98	6.34
Apr	.68	.93	1.32	1.67	2.01	2.37	2.77	3.24	3.86	4.84	5.76
May	1.16	1.57	2.20	2.76	3.30	3.87	4.51	5.26	6.24	7.78	9.22
Jun	1.08	1.40	1.88	2.29	2.68	3.09	3.54	4.07	4.74	5.80	6.77
Jul	.45	.74	1.25	1.76	2.29	2.88	3.57	4.42	5.57	7.46	9.29
Aug	.86	1.16	1.60	1.99	2.37	2.77	3.21	3.73	4.41	5.47	6.46
Sep	.29	.49	.85	1.21	1.60	2.03	2.53	3.16	4.01	5.42	6.79
Oct	.06	.21	.48	.77	1.09	1.45	1.88	2.43	3.19	4.46	5.72
Nov	.05	.17	.41	.65	.92	1.24	1.62	2.09	2.76	3.88	4.98
Dec	.00	.08	.24	.38	.53	.70	.89	1.13	1.45	1.99	2.52
Ann	17.18	19.16	21.77	23.79	25.62	27.41	29.28	31.37	33.95	37.74	41.07

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.1	4.9	2	2
Feb	5.5	4.0	2	#
Mar	4.4	2.6	#	#
Apr	1.2	.0	#	#
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	#	0
Aug	.0	.0	0	0
Sep	.1	.0	#	0
Oct	.5	.0	#	0
Nov	3.6	1.3	#	#
Dec	5.5	4.7	1	1
Ann	26.9	17.5	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	7.0	1971	3	18.2	1993	15	1974	13	8	1993
Feb	13.5	1971	22	18.6	1971	17	1971	23	7	1978
Mar	13.0	1987	29	16.5+	1998	16	1987	29	4	1998
Apr	5.2	1997	11	10.3	1997	8	1997	12	1	1997
May	#	1994	1	#	1994	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	#	1993	27	#	1993
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	4.3	1985	30	4.3	1985	#	1985	30	#	1985
Oct	8.0	1997	26	8.4	1997	8	1997	27	1	1997
Nov	9.1	1991	1	13.9	1991	10	1991	3	3	1991
Dec	10.0	1984	14	16.5	1973	13	1983	28	7	1983
Ann	13.5	Feb 1971	22	18.6	Feb 1971	17	Feb 1971	23	8	Jan 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.3	2.3	.5	.1	.0
Feb	3.4	1.8	.5	.2	@
Mar	2.6	1.0	.5	.2	.1
Apr	.8	.5	.1	@	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	@	@	@	.0	.0
Oct	.3	.1	.1	@	.0
Nov	2.3	1.0	.5	.2	.0
Dec	3.2	1.7	.7	.2	@
Ann	16.9	8.4	2.9	.9	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	14.1	7.7	4.1	1.1
Feb	9.5	5.9	3.4	.6
Mar	3.4	1.8	1.1	.3
Apr	.7	.2	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.3	.1	.1	.0
Nov	3.0	1.5	.8	.1
Dec	9.3	4.6	2.1	.3
Ann	40.3	21.8	11.7	2.4

+ 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	5/17	5/12	5/09	5/06	5/03	4/30	4/27	4/24	4/19
32	5/06	5/02	4/29	4/26	4/23	4/21	4/18	4/15	4/10
28	4/22	4/17	4/14	4/12	4/09	4/07	4/04	4/01	3/28
24	4/12	4/08	4/05	4/02	3/31	3/28	3/26	3/23	3/18
20	4/06	3/31	3/26	3/23	3/19	3/16	3/12	3/08	3/02
16	3/31	3/23	3/18	3/13	3/08	3/04	2/27	2/21	2/14

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	9/15	9/19	9/22	9/25	9/27	9/30	10/02	10/05	10/10
32	9/23	9/28	10/02	10/05	10/09	10/12	10/15	10/19	10/24
28	10/05	10/10	10/14	10/17	10/20	10/23	10/26	10/30	11/04
24	10/19	10/24	10/27	10/30	11/01	11/04	11/06	11/10	11/14
20	10/21	10/28	11/02	11/06	11/10	11/14	11/18	11/23	11/30
16	11/03	11/09	11/14	11/17	11/21	11/24	11/28	12/03	12/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	166	159	155	151	147	143	139	134	128
32	189	181	176	172	168	163	159	154	147
28	212	205	201	197	193	189	185	180	174
24	235	228	223	219	215	211	206	201	194
20	264	254	247	241	235	229	223	216	206
16	286	276	269	262	257	251	245	238	228

***** 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	1203	923	703	357	127	10	0	7	58	309	753	1102	5552
60	1048	790	550	231	57	1	0	1	17	176	603	947	4421
57	955	712	464	167	31	0	0	0	6	113	517	854	3819
55	895	660	406	131	19	0	0	0	2	80	462	792	3447
50	745	534	276	61	5	0	0	0	0	29	329	647	2626
32	288	195	32	0	0	0	0	0	0	0	48	213	776

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	108	197	352	642	977	1247	1439	1379	1065	718	285	134	8543
55	2	17	14	83	283	557	726	666	377	85	8	0	2818
57	1	13	9	59	233	497	664	604	321	56	4	0	2461
60	0	8	2	33	166	409	571	512	241	26	0	0	1968
65	0	0	0	9	81	267	416	363	133	4	0	0	1273
70	0	0	0	2	29	147	266	228	61	0	0	0	733

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	13	57	183	421	738	1014	1199	1138	831	484	124	20	13	70	253	674	1412	2426	3625	4763	5594	6078	6202	6222
45	1	21	106	285	583	864	1044	983	682	346	60	3	1	22	128	413	996	1860	2904	3887	4569	4915	4975	4978
50	0	4	53	175	430	714	889	828	536	219	22	0	0	4	57	232	662	1376	2265	3093	3629	3848	3870	3870
55	0	0	17	99	286	565	734	673	394	115	6	0	0	0	17	116	402	967	1701	2374	2768	2883	2889	2889
60	0	0	3	44	164	416	579	518	265	53	0	0	0	0	3	47	211	627	1206	1724	1989	2042	2042	2042
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	20	60	139	271	463	673	797	761	540	313	94	24	20	80	219	490	953	1626	2423	3184	3724	4037	4131	4155

(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