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: ALBERT LEA 3 SE, MN **COOP ID: 210075**

Climate Division: MN 8 **NWS Call Sign:** **Elevation: 1,230 Feet** **Lat: 43˚37N** **Lon: 93˚18W**

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	20.9	2.1	11.5	58	1981	25	25.0	1990	-29+	1977	16	-4.3	1979	1659	0	.0	.0	.2	24.0	30.9	13.5
Feb	27.3	8.9	18.1	64	1981	18	30.7	1987	-33	1996	2	2.5	1979	1314	0	.0	.0	1.0	17.1	27.6	8.3
Mar	39.4	21.8	30.6	82	1986	30	40.1	2000	-29	1962	1	22.5	1979	1066	0	.0	.0	6.3	8.6	25.9	2.2
Apr	54.9	34.3	44.6	92	1980	22	51.5	1987	3	1979	6	37.2	1979	614	2	.0	.1	19.9	.7	11.4	.0
May	68.9	47.1	58.0	94+	1980	29	64.5	1977	21	1966	9	51.6	1997	260	42	.0	.5	30.3	.0	1.3	.0
Jun	78.7	56.7	67.7	102+	1988	22	73.2	1988	34	1979	1	62.4	1982	46	128	.1	3.4	30.0	.0	.0	.0
Jul	82.2	61.2	71.7	101+	1995	14	77.8	1983	44	1992	21	64.9	1992	20	227	.1	5.2	31.0	.0	.0	.0
Aug	79.7	58.6	69.2	101+	1988	17	75.9	1983	37	1950	20	64.4	1992	37	166	.2	2.5	31.0	.0	.0	.0
Sep	71.5	48.7	60.1	98	1978	8	66.4	1998	27+	1992	29	54.8	1993	175	28	.0	.9	29.6	.0	.7	.0
Oct	58.9	36.4	47.7	94	1997	4	53.4	1975	13	1988	30	42.3	1977	539	1	.0	.1	24.5	.2	10.4	.0
Nov	40.2	22.7	31.5	78	1999	9	41.1	1999	-18	1977	27	24.1	1991	1006	0	.0	.0	7.1	8.4	24.9	1.2
Dec	25.6	8.4	17.0	67+	1998	3	25.8	1998	-29	1983	19	2.7	1983	1487	0	.0	.0	.5	21.1	30.6	8.6
Ann	54.0	33.9	44.0	102+	Jun 1988	22	77.8	Jul 1983	-33	Feb 1996	2	-4.3	Jan 1979	8223	594	.4	12.7	211.4	80.1	163.7	33.8

\+ 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

Issue Date: February 2004

(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	.87	.91	1.50	1949	4	2.57	1975	.08+	1995
Feb	.67	.54	1.50	1969	21	3.19	1971	.00	1987
Mar	2.02	1.85	1.77	1950	26	4.44	1983	.19	1994
Apr	3.39	3.04	3.82	1990	24	7.76	1999	.56	2000
May	4.18	4.24	4.20	1980	30	9.16	1982	1.21	1989
Jun	4.79	4.35	7.50	1978	15	10.09	1993	1.40	1988
Jul	4.15	4.13	6.70	1961	31	9.78	1999	1.10+	1996
Aug	4.51	4.09	5.06	1993	15	11.74	1980	.87	1971
Sep	3.05	2.65	3.90	1993	14	7.96	1973	.50	1990
Oct	2.52	2.28	2.14	1966	14	6.84	1984	.23	1975
Nov	2.00	1.59	2.02	1991	30	5.47	1991	.05	1980
Dec	1.00	.96	1.47	1982	28	3.02	1982	.12	1998
Ann	33.15	33.35	7.50	Jun 1978	15	11.74	Aug 1980	.00	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.3	2.7	.4	@
Feb	4.9	2.3	.3	.0
Mar	7.9	4.6	1.3	.4
Apr	10.5	6.9	2.2	.7
May	11.7	7.7	2.9	.8
Jun	11.1	7.6	3.3	1.4
Jul	10.1	7.0	3.1	1.4
Aug	10.1	6.8	2.9	1.3
Sep	9.2	5.7	1.9	.7
Oct	8.1	5.2	1.7	.5
Nov	7.7	4.2	1.2	.5
Dec	6.3	2.9	.4	.1
Ann	103.9	63.6	21.6	7.8

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	.10	.16	.28	.40	.53	.68	.85	1.06	1.34	1.82	2.28
Feb	.03	.10	.20	.29	.40	.52	.65	.82	1.05	1.44	1.81
Mar	.35	.53	.82	1.10	1.38	1.69	2.04	2.47	3.04	3.96	4.84
Apr	.92	1.24	1.73	2.15	2.57	3.01	3.50	4.08	4.84	6.02	7.12
May	1.45	1.84	2.42	2.90	3.37	3.84	4.36	4.97	5.75	6.95	8.06
Jun	1.69	2.14	2.80	3.35	3.87	4.41	5.00	5.69	6.56	7.92	9.16
Jul	1.06	1.45	2.06	2.59	3.12	3.67	4.28	5.02	5.97	7.48	8.89
Aug	1.34	1.77	2.42	2.97	3.51	4.07	4.69	5.42	6.36	7.83	9.20
Sep	.62	.90	1.35	1.76	2.17	2.61	3.11	3.71	4.51	5.78	6.98
Oct	.50	.73	1.10	1.44	1.78	2.15	2.56	3.06	3.72	4.79	5.79
Nov	.15	.28	.54	.81	1.12	1.47	1.89	2.43	3.17	4.41	5.64
Dec	.16	.24	.39	.52	.67	.82	1.00	1.22	1.51	1.98	2.43
Ann	22.35	24.40	27.04	29.07	30.87	32.63	34.45	36.47	38.94	42.53	45.66

\+ 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	9.6	8.0	9	5
Feb	6.6	6.2	9	5
Mar	6.9	6.0	4	1
Apr	3.5	2.5	#	#
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.5	.0	#	0
Nov	4.6	2.3	1	#
Dec	9.1	8.2	5	3
Ann	40.8	33.2	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	11.0	1971	4	23.6	1975	44	1979	31	33	1979
Feb	6.5	1983	3	14.6	1971	48	1979	20	46	1979
Mar	8.5	1999	9	17.8	1975	40	1979	1	25	1979
Apr	8.0	1973	9	15.6	1983	12	1985	1	1	1985
May	#	1976	2	#+	1976	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	4.0	1999	2	4.0	1999	4	1999	2	#+	1999
Nov	7.5	1978	17	16.5	1978	13	1983	30	5	1978
Dec	13.0	1987	28	18.1	1987	37	2000	29	23	1983
Ann	13.0	Dec 1987	28	23.6	Jan 1975	48	Feb 1979	20	46	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.2	3.7	1.3	.4	@
Feb	4.2	2.1	.7	.1	.0
Mar	3.7	2.2	.9	.4	.0
Apr	1.4	1.1	.5	.2	.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	.0	.0	.0
Oct	.3	.3	.1	.0	.0
Nov	3.2	1.7	.5	.1	.0
Dec	5.2	3.0	1.0	.5	@
Ann	24.2	14.1	5.0	1.7	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	24.7	19.2	16.6	12.9
Feb	18.7	15.4	12.0	6.7
Mar	12.1	8.2	6.3	3.5
Apr	1.5	.5	.2	.1
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	.2	@	.0	.0
Nov	5.4	3.3	1.9	.5
Dec	18.7	12.8	9.8	4.7
Ann	81.3	59.4	46.8	28.4

+ 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	5/22	5/18	5/14	5/12	5/09	5/06	5/04	4/30	4/26
32	5/16	5/11	5/07	5/03	4/30	4/27	4/23	4/19	4/14
28	5/03	4/27	4/23	4/20	4/17	4/13	4/10	4/06	3/31
24	4/20	4/15	4/12	4/09	4/07	4/04	4/01	3/29	3/24
20	4/15	4/10	4/07	4/04	4/01	3/29	3/26	3/23	3/18
16	4/08	4/02	3/29	3/26	3/23	3/20	3/17	3/13	3/08

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	9/20	9/23	9/25	9/27	9/29	10/02	10/05
32	9/23	9/26	9/29	10/01	10/03	10/05	10/08	10/10	10/14
28	9/29	10/04	10/08	10/11	10/14	10/17	10/21	10/25	10/30
24	10/09	10/14	10/18	10/21	10/25	10/28	10/31	11/04	11/09
20	10/23	10/28	10/31	11/02	11/05	11/08	11/10	11/13	11/18
16	10/28	11/03	11/07	11/10	11/14	11/17	11/21	11/25	11/30

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	156	150	145	141	138	134	130	126	120
32	175	168	164	159	156	152	147	143	136
28	201	194	189	184	180	176	171	166	159
24	217	211	207	204	200	197	193	189	183
20	236	229	225	221	217	214	210	205	199
16	261	252	245	240	235	230	224	218	209

***** 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	1659	1314	1066	614	260	46	20	37	175	539	1006	1487	8223
60	1504	1174	911	472	159	12	5	9	81	391	856	1332	6906
57	1411	1090	818	391	112	4	0	2	45	309	766	1239	6187
55	1349	1034	757	341	86	2	0	0	28	258	707	1177	5739
50	1194	896	612	229	39	0	0	0	6	153	564	1022	4715
32	673	449	190	20	0	0	0	0	0	6	163	515	2016

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	37	59	147	398	805	1072	1230	1152	843	491	147	51	6432
55	0	0	1	29	178	383	517	439	181	30	1	0	1759
57	0	0	0	20	142	326	455	379	137	18	0	0	1477
60	0	0	0	10	96	244	367	293	84	7	0	0	1101
65	0	0	0	2	42	128	227	166	28	1	0	0	594
70	0	0	0	0	14	51	121	77	5	0	0	0	268

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	2	41	220	576	851	1001	920	621	281	41	3	0	2	43	263	839	1690	2691	3611	4232	4513	4554	4557
45	0	0	17	130	427	701	846	765	475	171	18	0	0	0	17	147	574	1275	2121	2886	3361	3532	3550	3550
50	0	0	6	64	287	551	691	610	335	93	4	0	0	0	6	70	357	908	1599	2209	2544	2637	2641	2641
55	0	0	0	33	174	404	536	455	210	44	0	0	0	0	0	33	207	611	1147	1602	1812	1856	1856	1856
60	0	0	0	12	90	265	382	305	118	14	0	0	0	0	0	12	102	367	749	1054	1172	1186	1186	1186
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	28	131	343	546	668	601	381	174	28	1	0	1	29	160	503	1049	1717	2318	2699	2873	2901	2902

(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