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: ROSEMOUNT AGRI EXP STN, MN **COOP ID: 217107**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 950 Feet** **Lat: 44˚43N** **Lon: 93˚06W**

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	20.1	.0	10.1	57	1981	24	22.7	1990	-38	1977	9	-3.6	1977	1706	0	.0	.0	.1	23.6	30.9	13.9
Feb	26.9	7.2	17.1	61	2000	29	28.7	1998	-37	1996	2	6.1	1979	1343	0	.0	.0	.8	15.9	27.4	8.7
Mar	39.5	21.0	30.3	81+	1986	29	40.3	2000	-34	1962	1	21.3	1975	1076	0	.0	.0	7.4	6.3	25.9	2.4
Apr	56.4	34.1	45.3	93	1980	21	52.2	1977	4+	1995	4	37.2	1975	594	2	.0	.1	22.7	.4	12.8	.0
May	68.7	46.3	57.5	97	1969	27	65.0	1977	20	1967	3	52.4	1971	268	36	.0	1.1	30.6	.0	1.7	.0
Jun	77.9	56.1	67.0	100+	1988	25	72.6	1988	36+	1985	2	62.1	1982	53	114	.1	3.2	30.0	.0	.0	.0
Jul	81.3	60.7	71.0	105	1988	31	75.1	1988	41	1969	1	64.9	1992	20	205	.2	5.4	31.0	.0	.0	.0
Aug	78.7	58.5	68.6	103+	1988	2	73.7	1983	37	1964	14	64.3	1992	36	147	.1	2.6	31.0	.0	.0	.0
Sep	70.6	49.1	59.9	97	1976	7	65.6	1998	24+	1974	22	53.8	1993	183	28	.0	.8	29.8	.0	.9	.0
Oct	59.2	37.2	48.2	91	1997	3	54.0	1973	11	1952	20	42.8	1976	522	1	.0	@	26.1	.1	9.7	.0
Nov	39.6	22.2	30.9	77	1999	8	41.0	1999	-18+	1977	26	22.0	1991	1023	0	.0	.0	7.0	7.6	24.2	1.2
Dec	24.6	7.2	15.9	66+	1998	2	25.2	1997	-31	1990	23	.1	1983	1521	0	.0	.0	.5	20.3	30.6	8.8
Ann	53.6	33.3	43.5	105	Jul 1988	31	75.1	Jul 1988	-38	Jan 1977	9	-3.6	Jan 1977	8345	533	.4	13.2	217.0	74.2	164.1	35.0

+ 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: 1950-2001

(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	1.22	1.02	1.44	1996	18	3.77	1975	.13	1981
Feb	.86	.79	1.15	1977	23	2.72	1981	.00	1987
Mar	2.25	1.89	1.51	1996	24	5.12	1977	.37	1994
Apr	2.87	2.81	3.45	1975	27	6.74	1975	.15	1987
May	4.00	3.97	2.27	1985	31	7.54	1991	.81	1976
Jun	4.60	4.35	5.47	1994	5	9.38	1998	.11	1988
Jul	4.68	4.14	5.80	1987	24	12.08	1987	1.45	1974
Aug	4.63	4.55	4.16	1978	27	8.08	1981	1.50	1990
Sep	3.50	3.31	4.35	1992	16	8.72	1986	.56	2000
Oct	2.52	2.22	3.40	1996	17	6.07	1984	.33	1978
Nov	2.34	2.01	2.06	1991	1	5.85	1991	.07	1976
Dec	1.13	1.16	1.40	1982	28	3.45	1982	.25	1989
Ann	34.60	34.85	5.80	Jul 1987	24	12.08	Jul 1987	.00	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.0	3.7	.4	.1
Feb	5.0	3.1	.2	.1
Mar	7.4	5.2	1.5	.3
Apr	9.6	6.5	2.0	.5
May	10.7	7.9	2.6	1.0
Jun	11.1	7.6	3.0	1.3
Jul	10.1	6.9	2.7	1.3
Aug	10.1	7.2	3.1	1.5
Sep	9.8	6.2	2.4	.8
Oct	8.1	5.4	1.5	.7
Nov	7.5	4.6	1.6	.6
Dec	6.8	3.3	.5	.1
Ann	103.2	67.6	21.5	8.3

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	.18	.28	.46	.62	.80	.99	1.21	1.49	1.85	2.44	3.02
Feb	.11	.22	.37	.49	.61	.74	.89	1.06	1.29	1.66	2.01
Mar	.58	.79	1.12	1.41	1.69	1.99	2.33	2.72	3.24	4.05	4.81
Apr	.63	.89	1.31	1.69	2.08	2.48	2.94	3.49	4.21	5.37	6.46
May	1.52	1.89	2.42	2.87	3.29	3.72	4.18	4.72	5.41	6.46	7.43
Jun	1.04	1.47	2.14	2.75	3.35	4.00	4.72	5.59	6.72	8.53	10.24
Jul	1.31	1.75	2.42	3.01	3.59	4.19	4.85	5.64	6.66	8.26	9.75
Aug	2.04	2.45	3.03	3.50	3.93	4.38	4.85	5.39	6.08	7.12	8.06
Sep	.81	1.13	1.65	2.11	2.56	3.05	3.60	4.25	5.10	6.46	7.74
Oct	.40	.61	.98	1.33	1.69	2.08	2.53	3.08	3.82	5.02	6.17
Nov	.35	.55	.89	1.21	1.55	1.91	2.34	2.85	3.55	4.68	5.76
Dec	.25	.35	.52	.67	.82	.98	1.16	1.37	1.66	2.11	2.54
Ann	24.60	26.54	29.02	30.90	32.58	34.20	35.87	37.71	39.95	43.20	46.01

\+ 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: 1950-2001
(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	11.2	10.1	8	8	12.0	1988	20	32.0	1982	32	1982	26	20	1984	6.2	4.0	1.4	.3	.1	27.3	24.2	20.0	8.8
Feb	6.5	5.1	9	9	5.0	1971	5	16.0	1971	26+	1982	9	24	1979	3.8	2.7	.9	.1	.0	23.4	20.9	18.6	8.6
Mar	8.7	8.5	4	2	11.0	1984	4	23.0	1989	18+	1979	11	14	1975	3.6	2.9	1.3	.4	.1	14.4	11.1	8.8	3.7
Apr	2.3	.5	#	#	10.0	1983	14	16.0	1983	13	1975	2	5	1984	.9	.7	.3	.1	@	1.4	.7	.4	.2
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	.3	.0	#	0	3.1	1991	31	3.1	1991	3	1991	31	#	1991	.2	.1	@	.0	.0	@	@	.0	.0
Nov	5.2	5.2	1	1	12.0	1991	1	15.5	1988	14	1991	2	7	1991	3.0	2.4	1.0	.3	.1	7.7	4.5	2.8	.9
Dec	9.7	11.0	4	2	12.0	1982	28	19.0	1996	19	1996	26	12	1985	5.3	3.4	.8	.3	@	22.6	13.2	8.0	2.2
Ann	43.9	40.4	N/A	N/A	12.0+	Nov 1991	1	32.0	Jan 1982	32	Jan 1982	26	24	Feb 1979	23.0	16.2	5.7	1.5	.3	96.8	74.6	58.6	24.4

+ 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	5/29	5/24	5/21	5/18	5/15	5/13	5/10	5/06	5/02
32	5/17	5/12	5/09	5/06	5/03	4/30	4/27	4/24	4/19
28	5/08	5/02	4/28	4/25	4/22	4/19	4/16	4/12	4/07
24	4/25	4/20	4/16	4/14	4/11	4/08	4/05	4/02	3/28
20	4/15	4/11	4/08	4/05	4/02	3/31	3/28	3/25	3/20
16	4/11	4/06	4/02	3/30	3/27	3/24	3/21	3/17	3/11

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	9/12	9/16	9/19	9/22	9/24	9/26	9/29	10/02	10/06
32	9/18	9/22	9/25	9/27	9/30	10/02	10/04	10/07	10/11
28	9/27	10/02	10/06	10/09	10/12	10/15	10/18	10/22	10/27
24	10/07	10/12	10/17	10/20	10/23	10/27	10/30	11/03	11/09
20	10/17	10/22	10/26	10/29	11/02	11/05	11/08	11/12	11/17
16	10/26	11/01	11/05	11/08	11/12	11/15	11/18	11/23	11/28

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	144	139	135	131	127	123	118	112
32	169	162	157	153	149	145	141	136	129
28	197	188	182	177	172	167	162	155	147
24	218	210	204	199	195	190	185	179	171
20	235	227	222	217	213	208	203	198	190
16	255	246	240	234	229	224	219	212	204

***** 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	1706	1343	1076	594	268	53	20	36	183	522	1023	1521	8345
60	1551	1203	921	451	164	15	4	8	88	373	873	1366	7017
57	1458	1119	828	370	115	5	0	2	50	290	783	1273	6293
55	1396	1063	767	319	88	3	0	0	31	241	723	1211	5842
50	1241	923	620	208	39	0	0	0	7	135	578	1056	4807
32	705	462	195	13	0	0	0	0	0	4	166	537	2082

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	22	44	141	411	791	1051	1209	1135	835	505	133	39	6316
55	0	0	1	27	166	364	496	422	176	29	0	0	1681
57	0	0	0	17	131	306	434	361	135	17	0	0	1401
60	0	0	0	8	87	226	345	274	83	6	0	0	1029
65	0	0	0	2	36	114	205	147	28	1	0	0	533
70	0	0	0	0	12	42	103	61	6	0	0	0	224

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	3	39	242	605	849	1000	930	641	309	43	2	0	3	42	284	889	1738	2738	3668	4309	4618	4661	4663
45	0	1	18	140	453	699	845	775	495	189	18	0	0	1	19	159	612	1311	2156	2931	3426	3615	3633	3633
50	0	0	6	75	311	550	690	620	349	102	5	0	0	0	6	81	392	942	1632	2252	2601	2703	2708	2708
55	0	0	0	34	187	402	535	465	223	47	0	0	0	0	0	34	221	623	1158	1623	1846	1893	1893	1893
60	0	0	0	12	100	261	382	312	126	16	0	0	0	0	0	12	112	373	755	1067	1193	1209	1209	1209
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	28	162	377	550	671	614	399	190	25	0	0	1	29	191	568	1118	1789	2403	2802	2992	3017	3017

(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