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: MILFORD 4 NW, IA **COOP ID: 135493**

Climate Division: IA 1 **NWS Call Sign:** **Elevation: 1,402 Feet** **Lat: 43˚23N** **Lon: 95˚11W**

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	22.3	4.9	13.6	63	1981	24	28.0	1990	-31	1970	21	.3	1979	1593	0	.0	.0	.4	22.9	30.9	12.6
Feb	29.3	12.2	20.8	64+	1981	16	32.8	1987	-28+	1962	28	7.3	1979	1239	0	.0	.0	1.6	15.6	27.3	6.9
Mar	41.4	23.5	32.5	85	1968	30	40.5	2000	-22	1960	5	23.6	1975	1009	0	.0	.0	7.9	6.9	25.0	1.7
Apr	57.3	35.6	46.5	91+	1960	22	54.1	1977	4	1975	3	39.1	1975	561	4	.0	@	22.0	.7	11.5	.0
May	70.7	47.8	59.3	97	1967	25	66.4	1977	18	1967	3	53.2	1997	229	51	.0	.6	30.5	.0	1.1	.0
Jun	79.7	57.3	68.5	102	1985	8	74.0	1988	35	1969	3	63.0	1982	39	144	.1	3.1	30.0	.0	.0	.0
Jul	83.2	61.5	72.4	103	1955	31	77.5	1974	41	1971	30	64.9	1992	14	242	.2	5.8	31.0	.0	.0	.0
Aug	80.6	59.7	70.2	102	1965	13	75.8	1983	35	1950	20	64.6	1992	26	186	@	3.0	31.0	.0	.0	.0
Sep	72.6	50.6	61.6	100	1976	6	68.1	1978	24+	1983	23	55.8	1993	151	49	@	.8	29.7	.0	.7	.0
Oct	60.1	39.0	49.6	92	1963	5	56.0	1973	12	1993	31	44.9	1976	480	1	.0	@	25.9	.2	8.7	.0
Nov	40.5	24.4	32.5	78	1999	8	42.4	1999	-14	1959	14	23.0	1985	978	0	.0	.0	7.6	8.0	24.7	.9
Dec	26.4	11.0	18.7	65	1998	1	27.0	1979	-27	1983	23	2.1	1983	1434	0	.0	.0	.7	20.6	30.6	8.0
Ann	55.3	35.6	45.5	103	Jul 1955	31	77.5	Jul 1974	-31	Jan 1970	21	.3	Jan 1979	7753	677	.3	13.3	218.3	74.9	160.5	30.1

\+ 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	.60	.48	.87	1996	17	1.73	1996	.06+	1995
Feb	.60	.55	1.78	1951	28	2.86	1971	.02	1986
Mar	1.91	1.71	2.61	1987	23	4.43	1987	.10	1994
Apr	3.05	3.04	2.63	1985	22	6.96	1991	.43	1987
May	3.85	3.44	3.00	1964	6	9.61	1982	1.63	1994
Jun	4.67	3.95	3.95	1993	30	11.43	1993	1.77	1988
Jul	3.61	3.09	6.17	1962	4	10.55	1987	.21	1975
Aug	3.83	3.77	5.05	1962	30	8.93	1979	.41	1976
Sep	2.79	2.34	4.00	1964	8	7.69	1977	.53	1999
Oct	2.06	1.66	2.60	1992	7	5.35	1971	.00+	1989
Nov	1.79	1.36	3.00	1977	9	4.21	1996	.17	1976
Dec	.79	.68	1.13	1982	26	3.00	1982	.05	1988
Ann	29.55	29.18	6.17	Jul 1962	4	11.43	Jun 1993	.00+	Oct 1989

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.4	2.0	.1	.0
Feb	4.6	2.1	.3	.0
Mar	7.4	4.5	1.2	.3
Apr	9.2	6.4	2.1	.8
May	10.2	7.3	2.5	.9
Jun	9.9	7.3	3.4	1.5
Jul	9.1	5.8	2.3	1.1
Aug	8.3	5.5	2.4	1.2
Sep	7.4	5.0	1.9	.8
Oct	6.1	4.1	1.3	.6
Nov	6.3	3.8	1.1	.3
Dec	5.2	2.4	.3	@
Ann	89.1	56.2	18.9	7.5

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	.08	.13	.21	.30	.38	.48	.60	.74	.93	1.24	1.54
Feb	.07	.11	.20	.28	.37	.47	.59	.73	.93	1.26	1.58
Mar	.32	.48	.76	1.02	1.29	1.59	1.93	2.34	2.88	3.77	4.62
Apr	.67	.96	1.40	1.81	2.21	2.64	3.13	3.71	4.47	5.69	6.84
May	1.45	1.81	2.33	2.76	3.16	3.58	4.03	4.55	5.22	6.24	7.18
Jun	1.44	1.88	2.54	3.11	3.66	4.23	4.86	5.59	6.54	8.02	9.40
Jul	.58	.90	1.42	1.92	2.43	2.99	3.63	4.41	5.45	7.14	8.76
Aug	.87	1.23	1.79	2.29	2.80	3.33	3.93	4.65	5.59	7.09	8.51
Sep	.58	.83	1.24	1.61	1.99	2.39	2.84	3.39	4.11	5.26	6.35
Oct	.00	.26	.65	.98	1.31	1.67	2.08	2.57	3.24	4.32	5.36
Nov	.27	.42	.68	.93	1.18	1.47	1.79	2.18	2.71	3.57	4.40
Dec	.13	.20	.31	.42	.53	.65	.79	.97	1.19	1.57	1.92
Ann	18.47	20.51	23.18	25.25	27.11	28.94	30.84	32.96	35.57	39.40	42.76

\+ 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

Complete documentation available from:
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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	6.6	4.9	4	3
Feb	6.4	5.9	3	1
Mar	7.1	7.5	1	#
Apr	.6	.0	#	0
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.5	.0	#	0
Nov	2.1	2.0	1	#
Dec	6.1	7.8	2	1
Ann	29.4	28.1	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	8.0	1975	10	19.1	1975	24	1994	29	13	1997
Feb	6.8	1971	26	13.3	1972	28	1994	13	22	1994
Mar	8.2	1971	18	18.7	1979	18	1994	1	6	1993
Apr	5.0	1997	10	5.0	1997	5	1997	11	#+	1997
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	#	1985	28	#+	1985	0	0	0	0	0
Oct	3.0	1991	31	5.0	1991	3	1991	31	#+	1995
Nov	9.0	1991	1	9.0	1991	9	1991	8	4	1991
Dec	8.0	1972	12	13.5	1972	18	2000	31	10	2000
Ann	9.0	Nov 1991	1	19.1	Jan 1975	28	Feb 1994	13	22	Feb 1994

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	2.8	.7	.2	.0
Feb	3.0	2.2	.8	.3	.0
Mar	1.9	1.8	.9	.4	.0
Apr	.4	.3	.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	.0	.0	.0
Oct	.3	.3	@	.0	.0
Nov	1.6	1.3	.6	.1	.0
Dec	2.9	2.2	1.1	.2	.0
Ann	13.9	10.9	4.2	1.2	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	5.2	3.1	1.9	.3
Apr	.5	.1	.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	.2	@	.0	.0
Nov	4.1	2.1	.9	.0
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-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	5/24	5/19	5/16	5/13	5/11	5/08	5/05	5/02	4/28
32	5/13	5/08	5/05	5/02	4/30	4/27	4/24	4/21	4/17
28	5/07	5/01	4/27	4/24	4/21	4/18	4/14	4/10	4/05
24	4/22	4/17	4/13	4/10	4/07	4/04	4/01	3/29	3/24
20	4/14	4/09	4/06	4/03	3/31	3/29	3/26	3/22	3/18
16	4/10	4/04	3/31	3/28	3/25	3/21	3/18	3/14	3/09

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	9/13	9/17	9/19	9/22	9/24	9/26	9/29	10/02	10/05
32	9/19	9/24	9/27	9/30	10/02	10/05	10/07	10/11	10/15
28	9/27	10/02	10/05	10/08	10/11	10/13	10/16	10/20	10/24
24	10/04	10/10	10/14	10/18	10/21	10/25	10/29	11/02	11/08
20	10/20	10/25	10/28	10/31	11/03	11/06	11/09	11/13	11/18
16	10/27	11/02	11/05	11/09	11/12	11/15	11/18	11/22	11/27

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	149	144	140	136	132	127	122	115
32	173	167	162	158	155	151	147	143	136
28	192	186	180	176	172	168	164	159	152
24	219	211	206	201	197	192	188	182	174
20	240	232	226	221	216	212	207	201	193
16	256	247	241	236	231	227	221	215	207

***** 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	1593	1239	1009	561	229	39	14	26	151	480	978	1434	7753
60	1438	1099	854	421	135	9	0	5	68	331	828	1279	6467
57	1345	1015	761	344	93	3	0	1	37	250	738	1186	5773
55	1283	959	701	296	69	1	0	0	22	202	679	1124	5336
50	1128	825	556	192	29	0	0	0	4	105	540	969	4348
32	613	386	153	12	0	0	0	0	0	2	154	468	1788

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	43	71	166	446	845	1095	1251	1184	888	546	167	57	6759
55	0	0	1	40	201	407	538	471	220	33	2	0	1913
57	0	0	0	28	163	348	476	410	174	20	0	0	1619
60	0	0	0	15	112	264	383	320	116	7	0	0	1217
65	0	0	0	4	51	144	242	186	49	1	0	0	677
70	0	0	0	0	18	60	127	88	14	0	0	0	307

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	56	244	606	862	1010	937	648	316	52	2	0	1	57	301	907	1769	2779	3716	4364	4680	4732	4734
45	0	0	24	144	453	712	855	782	501	203	19	0	0	0	24	168	621	1333	2188	2970	3471	3674	3693	3693
50	0	0	8	77	314	563	700	627	358	110	5	0	0	0	8	85	399	962	1662	2289	2647	2757	2762	2762
55	0	0	1	39	191	415	545	472	232	50	1	0	0	0	1	40	231	646	1191	1663	1895	1945	1946	1946
60	0	0	1	14	100	274	390	321	131	19	0	0	0	0	1	15	115	389	779	1100	1231	1250	1250	1250
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	41	156	370	554	678	619	401	190	31	0	0	1	42	198	568	1122	1800	2419	2820	3010	3041	3041

(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