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: MASON CITY, IA **COOP ID: 135230**

Climate Division: IA 2 **NWS Call Sign:** **Elevation: 1,090 Feet** **Lat: 43˚10N** **Lon: 93˚12W**

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	22.5	3.2	12.9	62	1944	25	25.4	1990	-34	1899	31	.2	1979	1617	0	.0	.0	.3	22.7	30.9	12.4
Feb	28.7	9.9	19.3	67	1981	17	30.4	1998	-35+	1899	9	6.5	1979	1279	0	.0	.0	1.5	15.7	27.2	6.6
Mar	41.0	22.1	31.6	84	1986	30	40.7	2000	-32	1962	1	23.1	1975	1037	0	.0	.0	8.3	6.5	25.6	1.4
Apr	55.8	33.7	44.8	95	1980	22	51.8	1977	5	1982	6	37.8	1983	608	1	.0	.1	21.7	.5	11.9	.0
May	69.7	46.5	58.1	104	1934	31	67.0	1977	23+	1945	9	51.1	1997	262	48	.0	.7	30.5	.0	1.5	.0
Jun	79.7	56.4	68.1	104	1934	27	73.9	1988	31	1928	2	62.2	1982	50	141	.1	3.5	30.0	.0	.0	.0
Jul	82.9	60.8	71.9	107	1936	14	76.5	1987	38	1899	30	65.7	1992	15	227	.2	6.2	31.0	.0	.0	.0
Aug	80.3	58.2	69.3	103	1930	3	75.3	1988	30	1915	30	64.6	1992	34	165	.2	3.7	31.0	.0	.0	.0
Sep	72.4	48.3	60.4	103	1922	6	66.1	1998	15	1899	30	54.9	1993	175	36	.0	1.4	29.7	.0	1.0	.0
Oct	60.2	36.6	48.4	94	1963	5	55.7	1973	-4+	1925	29	43.1	1976	515	1	.0	.2	26.6	.1	10.0	.0
Nov	41.5	22.9	32.2	78+	1933	1	41.2	1999	-14	1897	28	24.1	1985	984	0	.0	.0	8.8	6.6	24.0	.7
Dec	27.2	9.9	18.6	65+	1899	1	26.5	1998	-26+	1914	26	4.2	1983	1440	0	.0	.0	.9	19.1	30.5	6.7
Ann	55.2	34.0	44.6	107	Jul 1936	14	76.5	Jul 1987	-35+	Feb 1899	9	.2	Jan 1979	8016	619	.5	15.8	220.3	71.2	162.6	27.8

\+ 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

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1896-2001

(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	.90	.88	1.80	1922	4	2.29	1982	.02	1976
Feb	.77	.65	1.48	1961	18	3.02	1971	.01	1995
Mar	2.02	1.96	2.02	1906	26	5.46	1990	.05	1994
Apr	3.35	3.45	3.00	1975	28	8.02	1999	.68	1996
May	4.37	4.22	3.92	1963	10	8.63	1991	.90	1989
Jun	5.14	4.90	7.00	1900	1	12.74	1984	2.05	1986
Jul	4.45	3.80	4.25	1907	3	12.08	1999	1.15	1975
Aug	4.67	3.66	6.25	1980	10	15.73	1980	1.30	1971
Sep	3.34	3.44	5.20	1964	8	8.01	1985	1.02	1976
Oct	2.47	2.37	2.27	1896	29	4.99	1984	.44	1988
Nov	2.07	1.44	2.73	1991	1	5.03	1991	.08	1976
Dec	1.03	.83	1.50	1982	28	3.26	1982	.14	1989
Ann	34.58	33.09	7.00	Jun 1900	1	15.73	Aug 1980	.01	Feb 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	2.6	.4	.1
Feb	4.5	2.2	.3	@
Mar	6.9	4.7	1.4	.4
Apr	9.3	6.8	2.3	.8
May	10.8	7.8	3.1	1.2
Jun	9.8	7.7	3.8	1.4
Jul	9.3	6.3	2.9	1.3
Aug	9.2	6.8	3.2	1.5
Sep	8.1	5.8	2.0	.6
Oct	6.7	4.7	1.8	.5
Nov	6.5	4.0	1.4	.5
Dec	5.9	2.9	.6	@
Ann	92.8	62.3	23.2	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	.11	.18	.30	.43	.56	.71	.89	1.10	1.39	1.87	2.34
Feb	.06	.11	.21	.31	.43	.57	.73	.94	1.22	1.70	2.18
Mar	.39	.57	.87	1.14	1.42	1.72	2.06	2.47	3.01	3.88	4.71
Apr	.92	1.24	1.72	2.15	2.56	2.99	3.47	4.04	4.78	5.93	7.01
May	1.35	1.77	2.39	2.92	3.43	3.96	4.55	5.24	6.12	7.51	8.79
Jun	1.90	2.38	3.07	3.65	4.20	4.76	5.37	6.08	6.99	8.38	9.66
Jul	1.06	1.48	2.13	2.70	3.28	3.89	4.57	5.39	6.45	8.14	9.73
Aug	1.01	1.44	2.12	2.74	3.37	4.03	4.77	5.67	6.85	8.73	10.50
Sep	.73	1.04	1.53	1.97	2.42	2.89	3.42	4.06	4.90	6.24	7.50
Oct	.60	.83	1.19	1.51	1.83	2.17	2.54	2.99	3.57	4.49	5.36
Nov	.22	.37	.66	.94	1.25	1.60	2.01	2.53	3.23	4.38	5.51
Dec	.18	.27	.42	.56	.71	.86	1.04	1.26	1.54	2.00	2.44
Ann	21.92	24.26	27.32	29.69	31.81	33.89	36.06	38.47	41.43	45.78	49.59

\+ 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: 1896-2001
(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	7.3	5.3	6	5
Feb	5.0	5.4	4	2
Mar	5.7	4.5	2	#
Apr	1.2	.2	#	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	2.5	.0	#	0
Dec	7.2	5.8	4	3
Ann	29.1	21.2	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	12.5	1982	23	17.0	1971	23	1982	31	22	1982
Feb	10.0	1997	4	15.0	1971	23	1971	15	18	1971
Mar	8.0	1971	18	15.2	1984	16	1975	14	9	1975
Apr	4.0	2000	8	5.0+	2000	6	1975	3	1	1975
May	.0	0	0	.0	0	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	3.0	1976	19	3.0	1976	3	1976	19	#+	1995
Nov	7.0	1983	28	10.6	1983	8	1991	26	3	1991
Dec	8.0	1990	3	16.0	1973	18	2000	31	9	1973
Ann	12.5	Jan 1982	23	17.0	Jan 1971	23+	Jan 1982	31	22	Jan 1982

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.1	3.2	.8	.5	.1
Feb	2.7	1.9	.7	.3	@
Mar	2.3	1.8	.6	.4	.0
Apr	.6	.5	.2	.0	.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	.1	.1	@	.0	.0
Nov	1.3	.8	.4	.1	.0
Dec	4.2	2.8	.8	.2	.0
Ann	15.3	11.1	3.5	1.5	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	18.5	10.8	6.9	2.8
Mar	5.2	2.7	2.1	.5
Apr	.3	.1	.0	.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	.1	@	.0	.0
Nov	1.4	.8	.1	.0
Dec	20.7	12.8	6.8	2.2
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	5/29	5/24	5/21	5/17	5/15	5/12	5/09	5/05	4/30
32	5/15	5/10	5/07	5/04	5/01	4/28	4/25	4/22	4/17
28	5/07	5/01	4/27	4/23	4/20	4/17	4/13	4/09	4/04
24	4/18	4/15	4/12	4/10	4/08	4/06	4/04	4/01	3/29
20	4/15	4/10	4/07	4/04	4/01	3/29	3/26	3/23	3/18
16	4/07	4/02	3/29	3/25	3/22	3/18	3/15	3/11	3/05

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	9/09	9/13	9/16	9/19	9/21	9/24	9/26	9/29	10/04
32	9/18	9/23	9/26	9/29	10/01	10/04	10/07	10/10	10/15
28	9/26	10/01	10/05	10/08	10/11	10/14	10/17	10/21	10/26
24	10/04	10/10	10/14	10/18	10/21	10/24	10/28	11/01	11/07
20	10/15	10/21	10/25	10/29	11/01	11/05	11/09	11/13	11/19
16	10/26	11/01	11/06	11/09	11/13	11/16	11/20	11/24	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	149	142	137	133	129	125	121	116	109
32	171	164	160	156	153	149	145	141	134
28	200	191	184	178	173	168	162	155	146
24	217	210	204	200	195	191	186	181	173
20	235	228	222	218	214	210	205	200	193
16	262	253	246	241	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	1617	1279	1037	608	262	50	15	34	175	515	984	1440	8016
60	1462	1139	882	464	162	15	1	8	84	366	834	1285	6702
57	1369	1055	789	382	115	6	0	2	47	284	744	1192	5985
55	1307	999	727	330	88	3	0	1	30	235	685	1130	5535
50	1152	859	581	215	41	0	0	0	7	131	541	975	4502
32	625	413	164	13	0	0	0	0	0	3	145	464	1827

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	31	58	151	396	809	1081	1235	1154	851	512	151	47	6476
55	0	0	0	23	184	394	522	442	191	31	1	0	1788
57	0	0	0	15	149	337	460	381	148	18	0	0	1508
60	0	0	0	7	103	256	367	294	95	7	0	0	1129
65	0	0	0	1	48	141	227	165	36	1	0	0	619
70	0	0	0	0	17	61	116	75	9	0	0	0	278

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	247	598	869	1013	937	654	320	55	3	0	1	57	304	902	1771	2784	3721	4375	4695	4750	4753
45	0	0	22	145	446	719	858	782	505	204	23	1	0	0	22	167	613	1332	2190	2972	3477	3681	3704	3705
50	0	0	7	80	307	570	703	627	366	111	6	0	0	0	7	87	394	964	1667	2294	2660	2771	2777	2777
55	0	0	3	40	188	423	548	472	238	49	1	0	0	0	3	43	231	654	1202	1674	1912	1961	1962	1962
60	0	0	0	13	102	279	394	318	136	18	0	0	0	0	0	13	115	394	788	1106	1242	1260	1260	1260
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	39	159	369	565	675	613	413	200	35	2	0	1	40	199	568	1133	1808	2421	2834	3034	3069	3071

(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