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 AP, IA **COOP ID: 135235**

Climate Division: IA 2 **NWS Call Sign: MCW** **Elevation: 1,225 Feet** **Lat: 43˚09N** **Lon: 93˚20W**

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	22.7	5.1	13.9	59	1981	24	26.7	1990	-30	1967	18	.5	1979	1585	0	.0	.0	.3	23.0	30.8	11.9
Feb	28.9	12.2	20.6	66	1981	17	31.6	1987	-32	1996	2	6.8	1979	1245	0	.0	.0	1.5	16.0	27.0	6.5
Mar	41.7	24.0	32.9	84	1986	29	41.4	2000	-28	1962	1	23.5	1975	996	0	.0	.0	8.1	6.8	25.1	1.4
Apr	57.3	35.5	46.4	93+	1980	21	52.9	1977	6	1982	6	40.9	1975	560	1	.0	.1	21.3	.6	11.2	.0
May	70.6	47.3	59.0	94+	1967	25	65.6	1977	23	1967	3	53.2	1997	231	42	.0	.7	30.4	.0	1.2	.0
Jun	80.1	57.2	68.7	103	1985	8	73.2	1971	36	1993	1	62.3	1982	37	146	.2	3.9	30.0	.0	.0	.0
Jul	83.3	61.4	72.4	104	1980	7	77.1	1974	42	1967	5	65.9	1992	13	242	.3	5.9	31.0	.0	.0	.0
Aug	80.8	58.8	69.8	101+	1965	13	76.6	1983	35	1950	20	64.3	1992	37	184	.1	3.4	31.0	.0	.0	.0
Sep	72.9	49.0	61.0	97	1978	7	66.4	1998	24	1949	29	55.2	1993	160	39	.0	1.2	29.8	.0	1.0	.0
Oct	60.1	37.3	48.7	95+	1963	5	55.1	1973	12+	1967	28	42.9	1976	507	1	.0	.2	26.1	.1	10.4	.0
Nov	41.6	24.0	32.8	78	1999	8	41.5	1999	-16	1977	26	24.2	1985	966	0	.0	.0	8.3	7.1	24.1	1.1
Dec	27.0	10.9	19.0	67	1998	1	26.8	1998	-26+	1950	26	3.1	1983	1428	0	.0	.0	.7	20.1	30.4	7.3
Ann	55.6	35.2	45.4	104	Jul 1980	7	77.1	Jul 1974	-32	Feb 1996	2	.5	Jan 1979	7765	655	.6	15.4	218.5	73.7	161.2	28.2

\+ 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	.98	.98	1.12	1982	22	2.45	1982	.10	1986
Feb	.92	.87	1.35	1971	18	3.55	1971	.07	1995
Mar	2.24	2.11	1.58	1991	12	4.83	1990	.15	1994
Apr	3.36	3.12	2.42	2001	11	8.17	1999	.84	1980
May	4.34	4.26	3.68	1980	29	8.09	1980	.82	1989
Jun	4.96	5.07	5.36	1954	18	11.42	1984	.45	1980
Jul	4.34	3.48	3.98	1990	27	12.20	1990	.54	1975
Aug	4.52	4.05	6.33	1954	22	15.76	1980	.93	1976
Sep	3.28	3.10	5.20	1978	12	7.04	1978	.50	1979
Oct	2.50	2.39	2.75	1986	11	5.64	1984	.06	1975
Nov	1.96	1.48	2.35	1975	9	4.35	1996	.00	1976
Dec	1.08	.91	1.60	1982	27	3.95	1982	.19	1980
Ann	34.48	36.32	6.33	Aug 1954	22	15.76	Aug 1980	.00	Nov 1976

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.9	3.0	.4	.1
Feb	6.5	2.5	.4	.1
Mar	9.0	5.2	1.5	.4
Apr	11.0	6.9	2.1	.7
May	11.1	7.5	3.0	1.2
Jun	10.0	7.8	3.7	1.2
Jul	9.1	6.4	3.0	1.4
Aug	9.8	6.8	3.0	1.4
Sep	8.5	5.5	2.0	.7
Oct	7.9	4.9	1.8	.4
Nov	7.7	4.2	1.1	.4
Dec	7.7	3.0	.4	.1
Ann	106.2	63.7	22.4	8.1

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	.17	.26	.41	.54	.68	.82	.99	1.20	1.47	1.91	2.33
Feb	.12	.19	.32	.45	.59	.74	.91	1.12	1.41	1.88	2.34
Mar	.46	.67	.99	1.29	1.59	1.92	2.28	2.72	3.30	4.22	5.10
Apr	1.06	1.38	1.85	2.26	2.65	3.05	3.50	4.02	4.70	5.75	6.72
May	1.59	2.00	2.58	3.07	3.54	4.02	4.54	5.14	5.91	7.09	8.17
Jun	1.43	1.90	2.61	3.23	3.83	4.46	5.15	5.97	7.03	8.68	10.22
Jul	.86	1.25	1.89	2.47	3.07	3.70	4.42	5.29	6.43	8.27	10.02
Aug	1.00	1.41	2.08	2.67	3.27	3.91	4.63	5.48	6.61	8.41	10.11
Sep	.63	.93	1.41	1.85	2.30	2.79	3.33	4.00	4.87	6.28	7.62
Oct	.45	.67	1.03	1.37	1.72	2.10	2.53	3.05	3.74	4.85	5.92
Nov	.13	.32	.63	.92	1.22	1.56	1.94	2.41	3.05	4.10	5.12
Dec	.19	.28	.44	.59	.74	.90	1.09	1.31	1.61	2.09	2.56
Ann	23.41	25.51	28.23	30.30	32.16	33.96	35.82	37.89	40.41	44.09	47.29

\+ 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	10.5	10.6	5	4
Feb	6.5	6.2	5	3
Mar	6.2	6.8	1	2
Apr	2.6	1.0	#	1
May	#	.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	4.3	3.4	1	0
Dec	7.8	6.5	3	2
Ann	38.4	34.5	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	12.0	1982	22	27.3	1982	31+	1982	31	20	1979
Feb	10.1	1997	4	18.9	1993	33+	1979	13	29	1979
Mar	11.0	1971	18	14.0	1971	14+	1979	8	8	1971
Apr	11.0	1973	9	14.0	1973	13	1973	10	1	1973
May	#	1993	19	#+	1993	0	0	0	#	2000
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	#	1995	21	#	1995	0	0	0	0	0
Oct	3.0	1976	23	7.0	1976	2	1976	24	#	1995
Nov	6.0	1981	30	11.5	1983	11+	1983	30	3+	1985
Dec	9.6	1985	1	17.8	1990	20	1985	5	14	1985
Ann	12.0	Jan 1982	22	27.3	Jan 1982	33+	Feb 1979	13	29	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.0	3.7	1.1	.5	.1
Feb	4.3	2.4	.6	.3	@
Mar	3.6	2.1	.7	.3	.1
Apr	1.7	.9	.3	.1	@
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	.4	.2	.1	.0	.0
Nov	3.3	1.4	.7	.1	.0
Dec	5.6	3.1	.8	.2	.0
Ann	24.9	13.8	4.3	1.5	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.7	17.8	13.2	5.4
Feb	20.2	14.1	9.3	4.1
Mar	9.3	5.7	3.7	1.5
Apr	1.5	.4	.1	.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	.0
Nov	5.3	2.5	1.4	.1
Dec	18.3	12.4	7.9	2.2
Ann	78.5	52.9	35.6	13.4

+ 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	5/25	5/20	5/17	5/14	5/11	5/08	5/05	5/02	4/27
32	5/13	5/08	5/05	5/02	4/30	4/27	4/24	4/21	4/16
28	5/04	4/28	4/25	4/21	4/18	4/15	4/11	4/07	4/02
24	4/19	4/15	4/12	4/09	4/06	4/04	4/01	3/29	3/25
20	4/14	4/10	4/07	4/05	4/02	3/31	3/28	3/25	3/21
16	4/06	4/01	3/28	3/25	3/22	3/18	3/15	3/11	3/06

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	9/11	9/16	9/18	9/21	9/23	9/26	9/28	10/01	10/05
32	9/20	9/23	9/26	9/28	9/30	10/03	10/05	10/08	10/11
28	9/28	10/02	10/05	10/08	10/11	10/14	10/16	10/20	10/24
24	10/08	10/13	10/17	10/20	10/23	10/26	10/30	11/03	11/08
20	10/17	10/23	10/26	10/30	11/02	11/05	11/08	11/12	11/17
16	10/27	11/01	11/05	11/09	11/12	11/15	11/18	11/22	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	153	147	142	138	135	131	127	123	116
32	170	165	160	157	153	150	146	142	136
28	196	189	184	179	175	171	167	161	154
24	219	212	207	203	199	195	191	186	180
20	233	226	221	217	213	209	205	200	193
16	259	250	244	239	235	230	225	219	210

***** 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	1585	1245	996	560	231	37	13	37	160	507	966	1428	7765
60	1430	1105	841	416	133	9	0	10	72	359	816	1273	6464
57	1337	1021	748	336	89	3	0	3	39	279	726	1180	5761
55	1275	965	688	286	65	1	0	1	23	230	668	1118	5320
50	1120	828	544	177	25	0	0	0	4	129	526	963	4316
32	599	387	148	7	0	0	0	0	0	4	140	461	1746

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	38	66	174	439	834	1099	1252	1171	869	521	164	56	6683
55	0	0	1	27	186	410	539	458	202	34	1	0	1858
57	0	0	0	17	148	351	477	398	157	21	0	0	1569
60	0	0	0	8	99	267	384	312	101	8	0	0	1179
65	0	0	0	1	42	146	242	184	39	1	0	0	655
70	0	0	0	0	13	61	126	92	9	0	0	0	301

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	5	59	244	598	870	1012	931	639	303	52	2	0	5	64	308	906	1776	2788	3719	4358	4661	4713	4715
45	0	0	25	142	444	720	857	776	489	184	25	1	0	0	25	167	611	1331	2188	2964	3453	3637	3662	3663
50	0	0	6	76	301	570	702	621	349	102	6	0	0	0	6	82	383	953	1655	2276	2625	2727	2733	2733
55	0	0	4	32	177	420	547	466	224	45	2	0	0	0	4	36	213	633	1180	1646	1870	1915	1917	1917
60	0	0	0	11	93	278	392	315	127	16	0	0	0	0	0	11	104	382	774	1089	1216	1232	1232	1232
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	39	155	361	563	679	612	397	188	33	2	0	1	40	195	556	1119	1798	2410	2807	2995	3028	3030

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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