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: SIOUX RAPIDS 4 E, IA **COOP ID: 137726**

Climate Division: IA 1 **NWS Call Sign:** **Elevation: 1,420 Feet** **Lat: 42˚54N** **Lon: 95˚04W**

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	25.3	5.6	15.5	66	1981	25	28.6	1990	-32+	1970	19	1.8	1979	1536	0	.0	.0	.6	22.0	30.9	11.5
Feb	32.0	12.5	22.3	67	1981	18	33.2	1987	-32	1972	9	6.7	1979	1197	0	.0	.0	2.3	14.8	27.1	6.4
Mar	43.9	23.8	33.9	85	1968	30	41.6	2000	-22+	1960	5	24.2	1975	966	0	.0	.0	9.7	6.5	25.2	1.5
Apr	59.4	35.4	47.4	94	1980	23	54.5	1977	3	1975	3	41.2	1975	531	4	.0	.2	22.8	.6	11.1	.0
May	72.2	47.0	59.6	102	1967	25	67.4	1988	23	1967	3	53.7	1997	227	60	.0	.8	30.5	.0	1.2	.0
Jun	81.4	56.8	69.1	105	1985	8	73.8	1988	34	1969	3	63.5	1982	31	154	.1	4.1	30.0	.0	.0	.0
Jul	84.2	60.8	72.5	107	1955	31	76.8	1983	41+	1971	30	66.6	1992	9	240	.1	6.3	31.0	.0	.0	.0
Aug	81.8	58.2	70.0	104+	1955	1	77.5	1983	34	1950	20	64.5	1992	31	184	.1	3.7	31.0	.0	.0	.0
Sep	74.3	48.8	61.6	101	1970	6	67.3	1998	25	1949	29	55.4	1993	151	47	.0	.9	29.7	.0	1.1	.0
Oct	62.0	37.1	49.6	95	1963	5	54.2	1973	11+	1960	20	44.1	1988	480	1	.0	.1	26.2	.2	9.8	.0
Nov	42.9	23.4	33.2	81	1968	1	42.9	1999	-17	1959	14	24.9	1991	954	0	.0	.0	9.3	7.1	24.3	1.0
Dec	28.7	10.4	19.6	68	1998	1	27.3	1979	-26	1989	22	3.3	1983	1409	0	.0	.0	1.1	18.6	30.6	7.3
Ann	57.3	35.0	46.2	107	Jul 1955	31	77.5	Aug 1983	-32+	Feb 1972	9	1.8	Jan 1979	7522	690	.3	16.1	224.2	69.8	161.3	27.7

\+ 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

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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	.61	.53	.94	1996	17	1.49	1996	.00	1981
Feb	.63	.54	1.42	1954	20	2.31	1971	.05	1985
Mar	2.06	1.87	1.69	1961	27	5.23	1979	.05	1994
Apr	3.21	2.85	3.20	1993	19	7.11	1999	.92	1996
May	3.62	3.55	2.55	1991	17	7.55	1991	1.63	1989
Jun	4.65	4.09	3.85	1996	16	11.69	1993	.80	1987
Jul	3.85	3.71	3.93	1952	7	8.20	1987	.54	1974
Aug	4.71	4.35	6.33	1988	22	11.72	1975	.56	1976
Sep	3.04	2.92	3.17	1951	12	7.25	1983	.42	2000
Oct	2.41	2.01	3.48	1992	7	5.74	1992	.37	1975
Nov	1.69	1.29	2.56	1977	9	4.68	1991	.02	1976
Dec	.82	.71	1.17	1959	27	2.56	1982	.12	1998
Ann	31.30	31.55	6.33	Aug 1988	22	11.72	Aug 1975	.00	Jan 1981

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.9	1.7	.1	.0
Feb	4.9	1.7	.3	.0
Mar	7.7	4.5	1.4	.5
Apr	9.6	6.3	2.1	.8
May	11.1	7.5	2.4	.6
Jun	10.1	7.3	3.2	1.3
Jul	9.2	6.3	2.9	1.2
Aug	8.3	5.9	2.8	1.3
Sep	7.7	5.3	1.9	.8
Oct	7.2	4.6	1.4	.6
Nov	6.7	3.9	1.1	.3
Dec	5.0	2.2	.5	.1
Ann	92.4	57.2	20.1	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	.04	.11	.20	.29	.39	.49	.61	.75	.95	1.27	1.58
Feb	.07	.12	.21	.30	.39	.50	.62	.77	.97	1.31	1.64
Mar	.27	.44	.73	1.02	1.32	1.65	2.04	2.52	3.16	4.21	5.23
Apr	.91	1.21	1.67	2.08	2.47	2.88	3.33	3.87	4.56	5.65	6.66
May	1.62	1.94	2.38	2.75	3.09	3.43	3.79	4.21	4.74	5.54	6.26
Jun	1.24	1.68	2.36	2.95	3.53	4.13	4.81	5.61	6.65	8.29	9.82
Jul	.91	1.27	1.83	2.33	2.83	3.37	3.96	4.67	5.60	7.08	8.46
Aug	1.16	1.60	2.29	2.90	3.50	4.14	4.85	5.70	6.81	8.56	10.21
Sep	.60	.88	1.33	1.74	2.15	2.60	3.10	3.71	4.51	5.80	7.02
Oct	.45	.67	1.02	1.35	1.68	2.04	2.45	2.94	3.59	4.64	5.64
Nov	.18	.30	.53	.77	1.02	1.31	1.64	2.06	2.63	3.58	4.51
Dec	.16	.23	.35	.46	.58	.70	.84	1.00	1.22	1.58	1.92
Ann	19.24	21.45	24.34	26.59	28.62	30.61	32.68	35.01	37.86	42.07	45.77

\+ 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)

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	6.3	4.9	4	3	7.0	1975	10	19.5	1975	16	1975	17	10	1975	4.7	2.9	.9	.4	.0	17.6	11.0	8.5	2.1
Feb	4.3	4.5	2	1	9.2	1993	21	9.2	1993	17	1993	25	8	1975	3.2	1.8	.5	.2	.0	14.4	5.0	2.5	.6
Mar	6.4	5.8	1	#	15.0	1977	3	16.0	1979	12	1993	1	4	1999	2.6	1.5	.8	.3	.1	5.6	2.8	1.3	.2
Apr	1.8	.0	#	#	6.0	1983	14	13.0	1983	7	1982	4	1	1975	1.0	.6	.2	.1	.0	.8	.2	.0	.0
May	#	.0	0	0	#	1989	5	#	1989	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	#	1995	21	#+	1995	#	1995	21	#	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.3	.0	#	0	3.1	1991	31	3.7	1991	3	1991	31	#+	1999	.3	.1	@	.0	.0	.1	@	.0	.0
Nov	4.8	4.3	1	#	9.4	1991	1	14.0	1983	9+	1997	16	5	1991	3.0	1.7	.5	.2	.0	6.9	3.0	1.2	.0
Dec	6.1	5.5	3	2	8.0	1982	28	13.0+	1982	14	2000	31	8	1983	4.1	2.3	.6	.3	.0	18.3	9.4	4.6	1.1
Ann	30.0	25.0	N/A	N/A	15.0	Mar 1977	3	19.5	Jan 1975	17	Feb 1993	25	10	Jan 1975	18.9	10.9	3.5	1.5	.1	63.7	31.4	18.1	4.0

+ 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	5/18	5/14	5/11	5/08	5/05	5/02	4/28	4/23
32	5/13	5/08	5/05	5/02	4/29	4/27	4/24	4/20	4/16
28	5/04	4/29	4/25	4/22	4/20	4/17	4/14	4/10	4/05
24	4/20	4/16	4/13	4/10	4/08	4/05	4/02	3/30	3/26
20	4/14	4/09	4/06	4/03	4/01	3/29	3/26	3/23	3/18
16	4/08	4/03	3/30	3/26	3/23	3/20	3/16	3/12	3/07

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	9/10	9/14	9/17	9/19	9/21	9/23	9/26	9/28	10/02
32	9/17	9/22	9/25	9/27	9/29	10/02	10/04	10/07	10/11
28	9/23	9/29	10/02	10/06	10/09	10/12	10/15	10/19	10/24
24	10/06	10/11	10/15	10/18	10/21	10/24	10/28	11/01	11/06
20	10/17	10/22	10/26	10/30	11/02	11/05	11/09	11/13	11/18
16	10/25	10/31	11/05	11/09	11/13	11/17	11/20	11/25	12/02

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	157	149	144	140	135	131	126	121	114
32	169	163	159	156	152	149	145	141	135
28	191	184	179	175	171	167	163	158	152
24	218	210	205	200	196	192	187	182	175
20	237	229	224	219	215	210	205	200	192
16	261	252	245	239	234	229	223	216	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	1536	1197	966	531	227	31	9	31	151	480	954	1409	7522
60	1381	1057	811	391	135	7	0	7	68	332	804	1254	6247
57	1288	973	718	314	93	3	0	2	36	253	714	1161	5555
55	1226	917	657	266	70	1	0	0	22	205	656	1099	5119
50	1071	785	514	164	30	0	0	0	4	108	516	944	4136
32	559	356	129	6	0	0	0	0	0	2	136	446	1634

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	46	84	187	469	856	1113	1254	1177	886	546	171	60	6849
55	0	0	1	39	213	424	541	464	217	36	2	0	1937
57	0	0	0	27	174	366	479	403	172	22	0	0	1643
60	0	0	0	14	123	280	386	316	114	8	0	0	1241
65	0	0	0	4	60	154	240	184	47	1	0	0	690
70	0	0	0	0	23	65	120	89	13	0	0	0	310

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	8	66	258	617	880	1013	937	656	324	53	1	0	8	74	332	949	1829	2842	3779	4435	4759	4812	4813
45	0	0	26	159	467	730	858	782	510	202	21	0	0	0	26	185	652	1382	2240	3022	3532	3734	3755	3755
50	0	0	8	84	322	580	703	627	367	116	7	0	0	0	8	92	414	994	1697	2324	2691	2807	2814	2814
55	0	0	2	42	202	432	548	472	236	53	0	0	0	0	2	44	246	678	1226	1698	1934	1987	1987	1987
60	0	0	0	18	104	289	394	320	134	20	0	0	0	0	0	18	122	411	805	1125	1259	1279	1279	1279
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	6	49	169	378	573	681	618	415	207	34	1	0	6	55	224	602	1175	1856	2474	2889	3096	3130	3131

(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