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: SWEA CITY 1 NE, IA **COOP ID: 138026**

Climate Division: IA 2 **NWS Call Sign:** **Elevation: 1,230 Feet** **Lat: 43˚24N** **Lon: 94˚17W**

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	22.4	3.4	12.9	55+	1981	23	26.3	1990	-32	1970	21	.0	1979	1614	0	.0	.0	.3	22.6	30.8	11.8
Feb	28.8	11.2	20.0	66	1981	17	31.9	1987	-28	1996	2	7.4	1979	1261	0	.0	.0	1.3	15.9	27.3	6.7
Mar	41.3	24.4	32.9	83	1986	29	40.2	2000	-20	1962	1	22.3	1984	996	0	.0	.0	8.4	6.6	25.1	1.3
Apr	56.7	35.8	46.3	93	1980	21	53.9	1977	0	1975	3	39.5	1975	566	2	.0	.1	22.2	.7	11.4	@
May	70.8	48.6	59.7	95+	1967	26	67.1	1977	10	1967	3	54.0	1997	220	55	.0	.8	30.6	.0	1.1	.0
Jun	79.6	57.9	68.8	105	1985	8	74.0	1988	35+	1969	3	63.8	1982	33	145	.1	4.0	30.0	.0	.0	.0
Jul	82.8	61.3	72.1	104	1955	31	75.9	1983	37	1971	23	64.6	1992	15	233	.1	5.7	31.0	.0	.0	.0
Aug	80.2	58.3	69.3	101+	1988	15	75.7	1983	39	1986	28	64.5	1992	32	163	.1	2.4	31.0	.0	.0	.0
Sep	73.1	49.0	61.1	98	1984	19	66.9	1978	22	1967	28	55.1	1993	158	39	.0	1.3	29.8	.0	1.0	.0
Oct	60.5	36.6	48.6	94	1963	5	55.4	1971	12	1972	19	43.5	1976	510	1	.0	.1	26.7	.1	9.0	.0
Nov	41.3	23.4	32.4	80+	1999	9	41.9	1999	-14	1977	26	22.3	1985	979	0	.0	.0	8.8	6.9	23.7	.9
Dec	26.4	9.2	17.8	69	1998	2	26.2	1979	-28+	1983	19	.9	1983	1464	0	.0	.0	.9	19.6	30.4	8.3
Ann	55.3	34.9	45.2	105	Jun 1985	8	75.9	Jul 1983	-32	Jan 1970	21	.0	Jan 1979	7848	638	.3	14.4	221.0	72.4	159.8	29.0

\+ 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: 1954-2001

(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	.81	.55	1.25	1975	21	3.10	1975	.00	1984
Feb	.66	.55	1.70	1971	19	3.40	1971	.00	1986
Mar	1.93	1.80	1.88	1983	15	5.30	1983	.04	1994
Apr	2.95	2.78	2.32	1955	23	7.24	1999	.75	1971
May	3.86	3.89	3.85	1960	20	7.60	1982	.86	1989
Jun	4.38	3.33	4.00	1991	4	10.85	1991	.51	1980
Jul	4.11	3.59	2.61	1957	21	9.23	1993	1.40	1975
Aug	4.06	3.16	4.50	1993	30	15.06	1979	.12	1984
Sep	2.78	2.32	2.63	1985	5	7.02	1985	.33	2000
Oct	2.19	1.68	2.84	1992	7	5.68	1971	.10	1975
Nov	1.79	1.76	2.00	1973	15	5.25	1973	.00	1976
Dec	.82	.69	1.18	1982	28	1.94	2000	.05	1998
Ann	30.34	30.66	4.50	Aug 1993	30	15.06	Aug 1979	.00+	Feb 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	2.3	.5	.1
Feb	3.5	2.4	.3	.1
Mar	6.1	4.6	1.4	.4
Apr	8.1	6.7	2.0	.6
May	9.5	7.6	2.6	.8
Jun	8.8	6.9	3.0	1.2
Jul	8.2	6.6	3.2	1.4
Aug	6.8	5.7	3.0	1.4
Sep	6.3	4.9	1.9	.9
Oct	5.8	4.5	1.4	.5
Nov	5.4	3.8	1.1	.4
Dec	4.4	2.5	.4	@
Ann	77.7	58.5	20.8	7.8

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	.03	.09	.20	.32	.45	.60	.77	.99	1.30	1.81	2.32
Feb	.03	.09	.19	.28	.39	.50	.64	.81	1.04	1.42	1.80
Mar	.30	.46	.74	1.01	1.28	1.58	1.93	2.35	2.92	3.84	4.72
Apr	.95	1.23	1.64	1.99	2.33	2.68	3.07	3.52	4.10	5.01	5.84
May	1.35	1.71	2.24	2.69	3.12	3.56	4.04	4.59	5.31	6.41	7.42
Jun	1.22	1.63	2.26	2.81	3.35	3.91	4.54	5.27	6.23	7.73	9.13
Jul	1.23	1.62	2.21	2.71	3.20	3.71	4.27	4.93	5.78	7.11	8.34
Aug	.56	.90	1.48	2.04	2.63	3.28	4.03	4.96	6.20	8.23	10.19
Sep	.52	.77	1.18	1.56	1.94	2.35	2.82	3.39	4.14	5.35	6.50
Oct	.25	.42	.73	1.04	1.36	1.73	2.15	2.68	3.40	4.58	5.73
Nov	.11	.29	.57	.83	1.11	1.41	1.77	2.21	2.81	3.79	4.74
Dec	.12	.19	.31	.42	.54	.67	.82	1.00	1.24	1.64	2.02
Ann	19.01	21.09	23.82	25.94	27.84	29.70	31.64	33.81	36.47	40.39	43.82

\+ 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: 1954-2001
(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	7.9	6.5	7	5
Feb	5.5	5.7	6	3
Mar	5.7	4.8	3	1
Apr	1.8	.8	#	0
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.3	.0	#	0
Nov	5.0	3.1	1	#
Dec	7.4	6.9	3	2
Ann	33.6	27.8	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	9.0	1993	12	19.7	1979	29	1982	30	18	1979
Feb	7.0	1984	19	13.0	1971	35	1979	22	32	1979
Mar	12.0	1977	3	19.0	1983	36	1979	4	25	1979
Apr	4.0	1973	9	8.0	1984	7+	1988	26	1	1983
May	#	1989	5	#	1989	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	24	3.0	1976	3	1976	24	#+	1999
Nov	12.1	1991	1	18.5	1985	13+	1991	3	6	1991
Dec	14.0	1982	28	18.5	1985	19	1983	31	17	1983
Ann	14.0	Dec 1982	28	19.7	Jan 1979	36	Mar 1979	4	32	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.4	3.2	1.1	.5	.0
Feb	2.9	2.4	.8	.2	.0
Mar	2.5	1.9	.9	.3	@
Apr	.9	.7	.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	.2	.2	@	.0	.0
Nov	2.7	2.0	.6	.2	@
Dec	4.0	3.0	.9	.4	.1
Ann	17.6	13.4	4.5	1.6	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	24.0	19.9	14.4	6.8
Feb	18.1	13.1	7.4	2.9
Mar	9.6	5.4	3.5	1.3
Apr	1.1	.3	.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	.1	@	.0	.0
Nov	4.8	2.7	1.3	.5
Dec	19.0	9.9	5.0	.6
Ann	76.7	51.3	31.7	12.1

+ 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	5/18	5/14	5/11	5/09	5/06	5/04	5/02	4/29	4/25
32	5/14	5/09	5/05	5/02	4/29	4/27	4/24	4/20	4/15
28	4/30	4/25	4/22	4/19	4/16	4/13	4/10	4/07	4/02
24	4/15	4/11	4/09	4/06	4/04	4/02	3/31	3/28	3/24
20	4/12	4/08	4/04	4/02	3/30	3/28	3/25	3/22	3/17
16	4/06	4/01	3/28	3/25	3/22	3/19	3/16	3/12	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	9/12	9/16	9/19	9/21	9/23	9/26	9/28	10/01	10/04
32	9/17	9/21	9/25	9/27	9/30	10/02	10/05	10/08	10/13
28	9/29	10/03	10/07	10/10	10/12	10/15	10/18	10/21	10/26
24	10/08	10/14	10/17	10/20	10/23	10/26	10/29	11/02	11/07
20	10/19	10/24	10/27	10/31	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	157	151	146	143	139	136	132	128	122
32	172	165	160	156	153	149	145	140	134
28	200	193	187	183	179	175	170	165	158
24	217	212	208	204	201	198	195	191	186
20	237	230	225	221	217	212	208	203	196
16	257	249	243	239	234	230	225	219	212

***** 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	1614	1261	996	566	220	33	15	32	158	510	979	1464	7848
60	1459	1121	841	424	128	7	1	7	71	363	829	1309	6560
57	1366	1037	749	345	86	2	0	1	38	282	739	1216	5861
55	1304	981	688	295	64	1	0	0	23	233	682	1154	5425
50	1149	841	544	188	26	0	0	0	5	132	543	1000	4428
32	623	393	148	10	0	0	0	0	0	4	158	494	1830

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	32	56	175	437	858	1103	1242	1154	872	518	170	53	6670
55	0	0	2	32	210	413	529	442	205	33	3	0	1869
57	0	0	0	21	170	355	467	381	160	21	1	0	1576
60	0	0	0	10	118	269	374	294	103	8	0	0	1176
65	0	0	0	2	55	145	233	163	39	1	0	0	638
70	0	0	0	0	20	59	121	73	9	0	0	0	282

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	56	250	629	882	1015	935	660	331	54	2	0	5	61	311	940	1822	2837	3772	4432	4763	4817	4819
45	0	1	23	152	477	732	860	780	514	208	22	1	0	1	24	176	653	1385	2245	3025	3539	3747	3769	3770
50	0	0	9	82	332	582	705	625	374	113	9	0	0	0	9	91	423	1005	1710	2335	2709	2822	2831	2831
55	0	0	2	40	209	434	550	470	245	53	2	0	0	0	2	42	251	685	1235	1705	1950	2003	2005	2005
60	0	0	0	16	111	288	396	318	140	18	0	0	0	0	0	16	127	415	811	1129	1269	1287	1287	1287
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	39	161	383	572	683	619	412	204	35	2	0	2	41	202	585	1157	1840	2459	2871	3075	3110	3112

(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