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: FOREST CITY 2 NNE, IA **COOP ID: 132977**

Climate Division: IA 2 **NWS Call Sign:** **Elevation: 1,300 Feet** **Lat: 43˚17N** **Lon: 93˚38W**

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	23.3	3.1	13.2	58	1981	24	26.7	1990	-30+	1970	20	.4	1979	1606	0	.0	.0	.2	23.1	31.0	12.3
Feb	29.5	9.9	19.7	65	1981	17	31.2	1987	-32	1996	2	7.7	1979	1268	0	.0	.0	1.2	16.1	27.3	6.4
Mar	42.2	22.7	32.5	83+	1968	30	40.5	2000	-26	1962	1	23.9	1975	1010	0	.0	.0	7.9	6.9	25.0	1.6
Apr	57.4	34.1	45.8	91	1980	21	53.2	1977	6	1982	6	38.9	1975	578	2	.0	.1	21.4	.5	11.1	.0
May	71.2	47.8	59.5	94	1948	20	67.3	1977	22	1967	3	54.0	1997	227	57	.0	.6	30.5	.0	.8	.0
Jun	80.4	57.4	68.9	100+	1953	18	73.6	1991	37	1964	1	63.5	1982	33	150	.1	3.3	30.0	.0	.0	.0
Jul	83.3	61.7	72.5	102	1948	6	76.5	1974	45+	1967	3	66.2	1992	12	243	.1	5.3	31.0	.0	.0	.0
Aug	80.7	59.1	69.9	100	1955	21	76.0	1983	36	1950	20	65.1	1992	32	183	.0	2.8	31.0	.0	.0	.0
Sep	73.0	48.7	60.9	96+	1948	19	66.9	1998	20	1949	29	55.2	1993	162	38	.0	1.0	29.7	.0	.8	.0
Oct	61.0	37.5	49.3	97	1963	5	55.2	1973	13	1949	31	44.1	1976	490	1	.0	.1	26.2	.1	8.8	.0
Nov	41.9	23.0	32.5	79	1999	9	42.1	1999	-13	1977	26	23.6	1985	978	0	.0	.0	7.9	7.5	24.1	1.1
Dec	27.5	9.5	18.5	69	1998	2	26.5	1982	-25+	1950	27	3.0	1983	1443	0	.0	.0	.6	20.5	30.5	7.5
Ann	56.0	34.5	45.3	102	Jul 1948	6	76.5	Jul 1974	-32	Feb 1996	2	.4	Jan 1979	7839	674	.2	13.2	217.6	74.7	159.4	28.9

\+ 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	.87	.79	1.35	1971	4	2.22	1975	.00	1985
Feb	.75	.62	2.00	1998	28	3.66	1971	.00+	1995
Mar	1.90	1.64	1.81	1956	28	4.08	1973	.04	1994
Apr	3.31	2.95	2.51	1975	28	7.10	1999	1.25	1980
May	3.88	3.50	6.12	1959	21	7.85	1991	.85	1989
Jun	4.73	4.27	4.83	1978	15	9.67	1993	1.08	1980
Jul	4.32	3.71	4.08	2000	12	9.86	1979	.85	1974
Aug	4.48	3.78	7.51	1962	31	16.17	1979	.65	1984
Sep	2.93	2.57	5.76	1964	8	7.40+	1985	.43	1979
Oct	2.33	2.40	2.12	1961	11	5.00	1971	.07	1988
Nov	1.72	1.46	1.95	1991	30	4.92	1991	.00	1976
Dec	.98	.90	1.70	1982	5	3.10	1982	.00+	1994
Ann	32.20	33.10	7.51	Aug 1962	31	16.17	Aug 1979	.00+	Feb 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.5	2.8	.4	.1
Feb	4.2	2.6	.4	.1
Mar	6.8	4.2	1.4	.3
Apr	9.3	6.9	2.1	.6
May	9.7	7.2	2.6	.8
Jun	10.1	7.5	3.8	1.4
Jul	8.6	6.0	2.9	1.4
Aug	9.0	6.3	2.9	1.3
Sep	8.3	5.5	1.8	.7
Oct	7.0	4.8	1.5	.5
Nov	6.0	4.1	1.1	.5
Dec	5.4	2.7	.7	.1
Ann	89.9	60.6	21.6	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	.04	.12	.25	.38	.52	.67	.85	1.07	1.38	1.88	2.37
Feb	.00	.00	.14	.28	.42	.57	.74	.96	1.25	1.72	2.18
Mar	.36	.53	.81	1.06	1.33	1.61	1.93	2.31	2.82	3.65	4.43
Apr	1.26	1.57	2.01	2.38	2.72	3.08	3.46	3.91	4.47	5.34	6.14
May	1.46	1.82	2.34	2.78	3.19	3.60	4.06	4.59	5.26	6.29	7.24
Jun	1.51	1.96	2.62	3.19	3.74	4.30	4.93	5.65	6.59	8.05	9.40
Jul	1.11	1.52	2.15	2.70	3.25	3.82	4.46	5.22	6.21	7.77	9.23
Aug	.83	1.23	1.88	2.49	3.11	3.78	4.54	5.46	6.68	8.65	10.52
Sep	.64	.91	1.34	1.72	2.11	2.53	2.99	3.55	4.29	5.46	6.57
Oct	.48	.70	1.04	1.35	1.66	2.00	2.38	2.83	3.44	4.40	5.31
Nov	.11	.28	.55	.80	1.07	1.37	1.71	2.13	2.70	3.63	4.54
Dec	.00	.10	.27	.43	.59	.77	.97	1.22	1.56	2.11	2.65
Ann	21.59	23.60	26.19	28.18	29.96	31.69	33.48	35.47	37.90	41.44	44.53

\+ 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	7.9	5.2	6	7
Feb	6.3	5.8	6	5
Mar	5.5	5.0	2	1
Apr	1.9	.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	0
Oct	.2	.0	#	0
Nov	4.9	4.3	1	#
Dec	10.3	10.3	4	2
Ann	37.0	30.6	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	13.5	1971	4	20.0	1973	25	1979	19	18	1979
Feb	9.0	1971	5	17.6	1971	22	1979	18	21	1979
Mar	10.0	1995	7	16.0	1975	25	1979	4	14	1979
Apr	10.0	1973	9	12.5	1973	13	1973	9	1	1985
May	#	1989	6	#	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	2.0	1976	24	2.0	1976	1	1989	31	#+	1997
Nov	7.0	1978	17	16.5	1985	11	1986	21	3	1985
Dec	9.5	1987	28	27.0	1990	21	1985	22	18	1985
Ann	13.5	Jan 1971	4	27.0	Dec 1990	25+	Mar 1979	4	21	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.7	3.0	1.1	.5	.1
Feb	2.3	1.9	.5	.2	.0
Mar	1.8	1.4	.7	.3	@
Apr	.9	.7	.2	.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	.1	.1	.0	.0	.0
Nov	2.0	1.7	.6	.1	.0
Dec	2.8	2.3	1.0	.6	.0
Ann	13.6	11.1	4.1	1.8	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.9	14.1	12.4	4.4
Feb	17.8	15.0	13.5	5.5
Mar	6.3	4.3	2.9	1.4
Apr	.6	.3	.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	.1	.0	.0	.0
Nov	4.3	2.4	1.6	.1
Dec	20.4	17.0	13.2	6.7
Ann	68.4	53.1	43.7	18.1

+ 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	5/19	5/14	5/11	5/08	5/06	5/03	5/01	4/28	4/23
32	5/11	5/07	5/04	5/01	4/29	4/26	4/24	4/21	4/17
28	4/25	4/21	4/18	4/16	4/14	4/12	4/09	4/06	4/03
24	4/16	4/12	4/10	4/07	4/05	4/03	4/01	3/29	3/25
20	4/12	4/08	4/05	4/02	3/30	3/28	3/25	3/21	3/17
16	4/06	4/01	3/28	3/25	3/22	3/19	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	9/14	9/18	9/21	9/23	9/25	9/27	9/30	10/03	10/06
32	9/21	9/25	9/27	9/30	10/02	10/04	10/07	10/09	10/13
28	9/27	10/02	10/06	10/10	10/13	10/17	10/20	10/24	10/30
24	10/11	10/16	10/20	10/23	10/26	10/29	11/01	11/05	11/10
20	10/18	10/24	10/27	10/31	11/03	11/06	11/09	11/13	11/18
16	10/26	11/01	11/05	11/09	11/12	11/16	11/19	11/23	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	160	153	149	145	141	138	134	130	123
32	169	165	161	158	155	153	150	146	142
28	201	194	189	185	182	178	174	169	163
24	222	215	211	207	203	199	195	190	184
20	241	233	227	222	217	212	207	201	193
16	258	250	244	239	234	230	225	219	211

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1606	1268	1010	578	227	33	12	32	162	490	978	1443	7839
60	1451	1128	855	436	135	7	0	7	74	343	828	1288	6552
57	1358	1044	762	356	92	3	0	2	40	263	738	1195	5853
55	1296	988	700	306	70	1	0	0	24	215	679	1133	5412
50	1141	848	555	197	30	0	0	0	5	118	538	978	4410
32	616	401	151	11	0	0	0	0	0	3	150	473	1805

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	34	57	164	425	853	1107	1255	1174	866	537	162	54	6688
55	0	0	1	30	209	418	542	461	200	36	1	0	1898
57	0	0	0	20	170	359	480	401	156	22	0	0	1608
60	0	0	0	10	119	274	387	313	100	9	0	0	1212
65	0	0	0	2	57	150	243	183	38	1	0	0	674
70	0	0	0	0	21	62	126	89	9	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	5	60	252	614	875	1013	937	657	327	53	1	0	5	65	317	931	1806	2819	3756	4413	4740	4793	4794
45	0	0	24	149	461	725	858	782	510	206	22	1	0	0	24	173	634	1359	2217	2999	3509	3715	3737	3738
50	0	0	6	82	317	575	703	627	367	116	5	0	0	0	6	88	405	980	1683	2310	2677	2793	2798	2798
55	0	0	2	36	194	426	548	472	237	53	1	0	0	0	2	38	232	658	1206	1678	1915	1968	1969	1969
60	0	0	0	13	106	280	393	323	139	22	0	0	0	0	0	13	119	399	792	1115	1254	1276	1276	1276
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	2	37	155	372	569	683	625	408	195	32	1	0	2	39	194	566	1135	1818	2443	2851	3046	3078	3079

(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