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: CHARITON 1 E, IA **COOP ID: 131394**

Climate Division: IA 8 **NWS Call Sign:** **Elevation: 940 Feet** **Lat: 41˚00N** **Lon: 93˚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	29.9	9.9	19.9	64	1952	14	32.9	1989	-28+	1957	14	6.0	1979	1399	0	.0	.0	2.3	15.5	29.9	7.4
Feb	36.0	14.5	25.3	73	1972	29	36.5	1998	-38	1996	3	10.8	1978	1113	0	.0	.0	5.4	10.7	25.8	4.2
Mar	48.2	25.9	37.1	87	1986	29	43.4	1973	-32	1962	1	29.6	1975	866	0	.0	.0	15.1	3.3	20.6	.5
Apr	60.4	36.3	48.4	90+	1954	6	55.1	1981	8+	1975	3	42.4	1983	502	2	.0	.0	25.3	.2	9.1	.0
May	71.2	48.0	59.6	94+	1953	25	65.1	1977	26+	1950	1	53.8	1997	211	43	.0	.1	30.9	.0	1.0	.0
Jun	80.7	57.8	69.3	102	1988	25	75.0	1971	34	1969	3	64.7	1982	30	158	.1	3.5	30.0	.0	.0	.0
Jul	85.9	63.2	74.6	106	1956	27	79.1	1983	39	1972	5	70.9	1992	3	298	.6	10.3	31.0	.0	.0	.0
Aug	83.9	60.9	72.4	104	1954	4	80.8	1983	35	1950	20	66.3	1992	22	252	.4	7.3	31.0	.0	.0	.0
Sep	75.9	50.9	63.4	100	1953	28	68.1	1998	23+	1949	29	57.5	1993	120	73	.0	2.2	29.9	.0	.8	.0
Oct	64.4	38.8	51.6	95	1963	5	57.9	1973	11+	1980	29	45.3	1976	419	3	.0	.1	28.6	.0	7.5	.0
Nov	47.1	26.7	36.9	80	1950	1	44.4	1999	-13+	1964	30	29.2	1991	843	0	.0	.0	14.1	2.7	20.0	.3
Dec	33.8	15.5	24.7	69	1984	28	31.7	1982	-31	1989	23	10.2	1983	1252	0	.0	.0	3.9	11.7	28.7	4.1
Ann	59.8	37.4	48.6	106	Jul 1956	27	80.8	Aug 1983	-38	Feb 1996	3	6.0	Jan 1979	6780	829	1.1	23.5	247.5	44.1	143.4	16.5

\+ 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	.91	.77	1.31	1980	16	2.30	1973	.00	1986
Feb	1.19	1.00	1.95	1997	21	2.99	1997	.21	1991
Mar	2.26	1.98	1.78	1953	30	5.13	1998	.19	1989
Apr	3.52	3.04	2.82	1964	19	8.99	1991	.44	1985
May	4.65	4.17	3.80	1950	9	10.47	1996	1.08	1980
Jun	4.76	4.52	3.45	1952	21	11.47	1980	.63	1992
Jul	4.70	3.81	5.50	1993	5	17.54	1993	.08	1983
Aug	3.96	3.55	5.81	1970	8	10.84	1977	.57	1984
Sep	4.31	3.34	8.03	1961	13	12.55	1992	.90	1979
Oct	2.94	2.96	4.00	1982	9	6.74	1998	.35	1992
Nov	2.37	2.17	4.95	1952	17	6.91	1983	.03	1989
Dec	1.19	1.16	1.96	1980	8	2.85	1982	.05	1976
Ann	36.76	36.21	8.03	Sep 1961	13	17.54	Jul 1993	.00	Jan 1986

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.3	2.7	.3	@
Feb	7.1	3.5	.6	.1
Mar	8.7	4.6	1.5	.5
Apr	11.0	6.8	2.6	.9
May	12.9	8.2	3.2	1.3
Jun	11.3	7.5	3.1	1.3
Jul	9.9	6.9	2.9	1.2
Aug	9.5	6.2	2.7	1.1
Sep	9.3	6.2	2.8	1.2
Oct	8.4	5.3	1.8	.8
Nov	8.5	4.9	1.6	.4
Dec	7.8	3.3	.5	.1
Ann	111.7	66.1	23.6	8.9

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	.08	.19	.34	.47	.61	.75	.92	1.13	1.40	1.84	2.27
Feb	.28	.40	.57	.73	.88	1.04	1.23	1.44	1.73	2.18	2.61
Mar	.35	.54	.87	1.18	1.51	1.86	2.27	2.76	3.43	4.51	5.55
Apr	.88	1.21	1.72	2.17	2.62	3.10	3.63	4.26	5.08	6.38	7.60
May	1.34	1.78	2.44	3.02	3.59	4.17	4.82	5.59	6.58	8.14	9.59
Jun	1.17	1.62	2.31	2.93	3.54	4.19	4.91	5.77	6.89	8.67	10.33
Jul	.47	.81	1.46	2.11	2.82	3.62	4.56	5.74	7.35	10.02	12.63
Aug	.92	1.29	1.87	2.39	2.90	3.45	4.06	4.80	5.76	7.28	8.72
Sep	.89	1.28	1.92	2.49	3.07	3.69	4.40	5.24	6.35	8.13	9.81
Oct	.45	.70	1.12	1.53	1.95	2.41	2.95	3.60	4.47	5.88	7.24
Nov	.23	.40	.73	1.06	1.41	1.82	2.30	2.89	3.71	5.07	6.41
Dec	.20	.31	.48	.64	.81	.99	1.20	1.45	1.79	2.33	2.85
Ann	24.37	26.70	29.73	32.06	34.14	36.16	38.26	40.60	43.45	47.62	51.26

\+ 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	6.7	5.4	2	1	10.0	1996	27	21.5	1973	17	1979	15	12	1979	6.7	3.4	1.1	.3	.1	24.2	19.2	14.9	5.9
Feb	6.3	5.3	2	2	7.9	1971	5	20.1	1978	19	1979	10	17	1979	4.9	2.3	.7	.2	.0	23.0	17.9	13.2	6.5
Mar	3.6	1.6	1	#	9.0	1998	9	17.3	1984	13	1998	12	4	1998	3.8	2.0	.7	.2	.0	12.7	8.0	5.9	2.0
Apr	1.8	.0	#	#	8.0	1973	10	12.5	1973	13	1973	10	1	1982	1.8	1.1	.3	.1	.0	1.8	.8	.3	@
May	#	.0	#	0	#	1994	31	#	1994	#	1994	31	#	1994	@	.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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.2	.0	#	0	5.0	1997	27	6.0	1997	6	1997	27	1+	1997	.2	.1	.0	.0	.0	@	.0	.0	.0
Nov	2.4	.4	#	#	7.0	1972	14	9.2	1991	8	1972	14	2	1972	3.5	1.6	.5	.1	.0	4.7	2.8	1.5	.1
Dec	4.0	2.1	1	1	7.0	2000	12	14.0	1985	16	2000	23	11	2000	6.5	3.0	.8	.2	.0	21.6	13.9	9.1	2.2
Ann	25.0	14.8	N/A	N/A	10.0	Jan 1996	27	21.5	Jan 1973	19	Feb 1979	10	17	Feb 1979	27.4	13.5	4.1	1.1	.1	88.0	62.6	44.9	16.7

+ 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	5/28	5/23	5/19	5/15	5/12	5/09	5/05	5/01	4/26
32	5/17	5/11	5/08	5/04	5/01	4/28	4/25	4/22	4/16
28	5/04	4/29	4/25	4/22	4/19	4/16	4/13	4/09	4/04
24	4/19	4/15	4/13	4/10	4/08	4/06	4/04	4/01	3/28
20	4/16	4/11	4/08	4/06	4/03	4/01	3/29	3/26	3/22
16	4/09	4/02	3/28	3/24	3/20	3/16	3/12	3/08	3/01

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	9/18	9/21	9/24	9/26	9/29	10/03	10/08
32	9/20	9/24	9/27	9/30	10/02	10/05	10/07	10/10	10/15
28	9/27	10/03	10/08	10/11	10/15	10/19	10/22	10/27	11/02
24	10/07	10/12	10/16	10/20	10/23	10/26	10/30	11/03	11/08
20	10/18	10/24	10/28	11/01	11/04	11/08	11/11	11/15	11/21
16	10/28	11/03	11/07	11/10	11/13	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	155	148	143	138	134	130	125	120	113
32	170	164	160	156	153	150	146	142	136
28	198	191	186	182	178	174	170	165	158
24	210	206	202	200	197	195	192	189	184
20	233	227	222	218	214	210	206	202	195
16	263	254	248	242	237	232	227	220	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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1399	1113	866	502	211	30	3	22	120	419	843	1252	6780
60	1244	973	711	361	116	7	0	5	50	278	693	1097	5535
57	1151	889	619	283	74	2	0	1	25	205	604	1004	4857
55	1089	838	563	235	53	1	0	0	15	163	545	942	4444
50	937	707	419	135	18	0	0	0	2	80	407	795	3500
32	445	302	81	2	0	0	0	0	0	1	73	326	1230

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	69	113	237	492	855	1118	1318	1253	943	608	220	98	7324
55	0	5	7	35	194	428	605	540	268	57	2	0	2141
57	0	0	1	22	154	370	543	480	219	38	1	0	1828
60	0	0	0	10	103	284	450	390	154	18	0	0	1409
65	0	0	0	2	43	158	298	252	73	3	0	0	829
70	0	0	0	0	13	67	161	141	26	0	0	0	408

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	4	26	127	341	647	911	1092	1027	747	413	110	11	4	30	157	498	1145	2056	3148	4175	4922	5335	5445	5456
45	0	8	72	223	495	761	937	872	597	281	57	5	0	8	80	303	798	1559	2496	3368	3965	4246	4303	4308
50	0	0	36	131	348	611	782	717	450	172	23	0	0	0	36	167	515	1126	1908	2625	3075	3247	3270	3270
55	0	0	12	66	218	461	627	562	320	88	3	0	0	0	12	78	296	757	1384	1946	2266	2354	2357	2357
60	0	0	3	29	115	319	472	408	202	37	1	0	0	0	3	32	147	466	938	1346	1548	1585	1586	1586
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	25	95	219	406	605	741	688	484	269	73	9	0	25	120	339	745	1350	2091	2779	3263	3532	3605	3614

(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