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: CLARION, IA **COOP ID: 131541**

Climate Division: IA 2 **NWS Call Sign:** **Elevation: 1,190 Feet** **Lat: 42˚44N** **Lon: 93˚44W**

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	23.4	5.4	14.4	62	1981	25	27.1	1990	-32	1970	21	1.4	1979	1569	0	.0	.0	.4	22.7	30.9	11.8
Feb	29.8	11.8	20.8	67	1981	18	32.9	1987	-30	1972	9	7.2	1979	1238	0	.0	.0	1.9	15.8	27.5	7.1
Mar	42.2	24.0	33.1	86	1986	30	42.1	2000	-25+	1960	5	24.8	1975	990	0	.0	.0	8.8	6.8	25.0	1.4
Apr	57.2	35.3	46.3	96	1980	23	53.9	1977	3	1982	6	40.6	1975	564	2	.0	.2	21.7	.7	11.5	.0
May	70.7	48.0	59.4	100	1967	25	67.5	1977	24+	1961	1	51.9	1997	239	63	.0	.8	30.4	.0	1.5	.0
Jun	80.3	58.3	69.3	102	1985	9	74.2	1991	36	1993	1	63.6	1982	33	161	.1	3.9	30.0	.0	.0	.0
Jul	83.3	62.4	72.9	103	1955	31	77.0	1974	42	1967	5	67.0	1992	11	254	.2	5.9	31.0	.0	.0	.0
Aug	80.7	59.6	70.2	102+	1988	16	77.1	1983	32	1950	20	65.3	1986	30	189	.2	2.9	31.0	.0	.0	.0
Sep	73.8	49.6	61.7	98	2000	12	68.0	1998	21	1984	29	56.9	1993	145	46	.0	1.2	29.8	.0	1.2	.0
Oct	61.5	37.5	49.5	94+	1963	5	55.0	1973	12+	1967	28	44.3	1976	483	1	.0	.2	26.8	.1	11.2	.0
Nov	42.6	24.8	33.7	76+	1980	7	42.3	1999	-18	1977	26	24.9	1991	940	0	.0	.0	9.2	6.2	23.8	1.0
Dec	27.8	10.9	19.4	67	1998	2	27.3	1998	-26+	1958	9	4.5	1983	1416	0	.0	.0	1.1	19.5	30.5	7.5
Ann	56.1	35.6	45.9	103	Jul 1955	31	77.1	Aug 1983	-32	Jan 1970	21	1.4	Jan 1979	7658	716	.5	15.1	222.1	71.8	163.1	28.8

\+ 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	.71	.74	1.45	1967	25	1.64	1982	.00+	2000
Feb	.75	.62	1.35	1971	19	3.55	1971	.01	1987
Mar	1.98	1.87	2.60	1966	23	4.79	1991	.08	1994
Apr	3.33	3.02	3.48	1963	29	7.02	1991	.82	1996
May	4.22	3.89	3.65	2001	21	10.29	1991	.81	1988
Jun	5.03	4.85	5.15	1951	26	9.92	1984	.98	1987
Jul	4.34	3.53	5.28	1968	17	9.75	1993	1.04	1985
Aug	4.14	4.05	3.25	1962	30	11.60	1993	.59	1971
Sep	3.19	2.96	5.74	1983	20	7.97	1983	.85	1976
Oct	2.40	2.22	2.54	1961	11	4.84	1971	.18	1975
Nov	1.93	1.29	2.75	1975	10	4.93	1992	.00	1976
Dec	1.01	.71	1.10	1970	11	4.04	1982	.09	1989
Ann	33.03	33.52	5.74	Sep 1983	20	11.60	Aug 1993	.00+	Jan 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.0	2.0	.3	.0
Feb	5.1	2.4	.3	.1
Mar	7.8	4.7	1.3	.4
Apr	10.3	6.6	2.2	.7
May	12.4	8.5	2.7	.9
Jun	11.0	7.6	3.4	1.5
Jul	9.9	6.7	2.9	1.2
Aug	9.8	6.7	3.0	1.1
Sep	8.6	5.7	2.2	.8
Oct	8.1	4.7	1.6	.6
Nov	7.9	4.3	1.1	.3
Dec	6.4	3.0	.4	.0
Ann	103.3	62.9	21.4	7.6

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	.00	.00	.25	.37	.49	.61	.74	.90	1.10	1.43	1.74
Feb	.06	.11	.21	.31	.42	.56	.71	.91	1.18	1.64	2.10
Mar	.34	.52	.81	1.08	1.35	1.65	2.00	2.41	2.96	3.86	4.71
Apr	1.13	1.44	1.90	2.29	2.67	3.05	3.48	3.97	4.60	5.58	6.48
May	1.56	1.96	2.53	3.00	3.45	3.91	4.42	5.00	5.74	6.88	7.93
Jun	1.45	1.93	2.65	3.28	3.88	4.52	5.22	6.05	7.12	8.80	10.36
Jul	1.22	1.63	2.25	2.79	3.32	3.88	4.49	5.22	6.16	7.64	9.02
Aug	1.06	1.45	2.05	2.58	3.11	3.66	4.27	5.00	5.95	7.44	8.85
Sep	.96	1.26	1.71	2.10	2.48	2.88	3.31	3.82	4.48	5.51	6.47
Oct	.58	.81	1.16	1.47	1.78	2.11	2.47	2.91	3.48	4.38	5.23
Nov	.20	.42	.74	1.02	1.31	1.62	1.96	2.38	2.94	3.84	4.70
Dec	.17	.26	.40	.54	.69	.84	1.02	1.23	1.52	1.98	2.43
Ann	23.16	25.06	27.49	29.35	31.00	32.59	34.24	36.07	38.29	41.51	44.30

\+ 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

Complete documentation available from:
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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	8.5	7.5	5	5
Feb	6.1	4.8	5	5
Mar	5.7	6.0	1	1
Apr	2.1	1.0	#	#
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.3	.0	#	0
Nov	3.6	2.3	1	#
Dec	6.9	6.3	3	2
Ann	33.2	27.9	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	1973	4	20.0+	1982	26	1971	19	19	1971
Feb	7.0	1971	5	15.0	1971	22	1979	20	20	1979
Mar	10.0	1971	19	14.5	1971	17	1979	5	8	1979
Apr	7.0	1979	2	9.0	1983	7	1979	2	1	1983
May	#	1997	1	#+	1997	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	#	1995	22	#	1995	0	0	0	0	0
Oct	2.0	1979	23	2.0	1979	2	1979	23	#+	1997
Nov	6.0	1997	15	13.3	1991	8	1991	29	3	1991
Dec	8.0	1985	1	15.1	1990	16	1985	21	13	1985
Ann	10.0	Mar 1971	19	20.0+	Jan 1982	26	Jan 1971	19	20	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.7	3.2	.9	.3	.1
Feb	3.8	2.4	.7	.2	.0
Mar	2.2	1.1	.3	.1	.0
Apr	.5	.4	.1	.1	.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	.1	.1	.0	.0	.0
Nov	1.7	.9	.2	@	.0
Dec	5.4	2.6	.8	.3	.1
Ann	20.4	10.7	3.0	1.0	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.6	13.5	8.3	1.8
Feb	14.7	11.1	6.6	1.4
Mar	4.4	2.4	1.1	.5
Apr	.5	.3	.2	.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	.0
Nov	1.7	.7	.1	.0
Dec	11.7	7.5	3.7	.7
Ann	51.7	35.5	20.0	4.4

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	5/16	5/13	5/11	5/08	5/05	5/02	4/27
32	5/16	5/11	5/07	5/04	5/01	4/28	4/24	4/21	4/16
28	5/03	4/28	4/24	4/21	4/18	4/15	4/11	4/08	4/02
24	4/24	4/19	4/15	4/11	4/08	4/05	4/02	3/29	3/24
20	4/15	4/11	4/07	4/05	4/02	3/30	3/27	3/24	3/19
16	4/08	4/02	3/29	3/26	3/23	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	9/08	9/12	9/15	9/18	9/20	9/22	9/25	9/28	10/02
32	9/14	9/18	9/22	9/25	9/27	9/30	10/03	10/07	10/11
28	9/25	9/29	10/03	10/06	10/09	10/11	10/14	10/18	10/23
24	10/04	10/09	10/13	10/16	10/19	10/22	10/26	10/29	11/04
20	10/16	10/21	10/25	10/28	10/31	11/03	11/06	11/09	11/14
16	10/24	10/30	11/03	11/07	11/10	11/14	11/17	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	151	145	140	135	131	128	123	118	112
32	170	163	157	153	149	145	141	136	128
28	195	188	182	178	173	169	164	159	151
24	213	206	201	197	193	189	185	181	174
20	233	226	220	216	211	207	202	197	189
16	256	247	242	236	232	227	222	216	208

***** 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	1569	1238	990	564	239	33	11	30	145	483	940	1416	7658
60	1414	1098	835	421	146	8	0	7	63	335	790	1261	6378
57	1321	1014	742	341	103	3	0	2	33	255	701	1168	5683
55	1259	958	681	292	79	1	0	0	19	207	643	1106	5245
50	1104	823	537	183	36	0	0	0	3	110	504	951	4251
32	585	384	142	7	0	0	0	0	0	2	132	449	1701

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	40	70	175	436	847	1118	1266	1182	891	543	182	57	6807
55	0	0	1	30	213	429	553	469	220	35	3	0	1953
57	0	0	0	19	175	371	491	408	174	21	0	0	1659
60	0	0	0	9	125	286	398	321	114	8	0	0	1261
65	0	0	0	2	63	161	254	189	46	1	0	0	716
70	0	0	0	0	25	71	134	94	12	0	0	0	336

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	63	247	608	877	1016	931	655	319	60	3	0	5	68	315	923	1800	2816	3747	4402	4721	4781	4784
45	0	0	27	149	455	727	861	776	507	202	27	0	0	0	27	176	631	1358	2219	2995	3502	3704	3731	3731
50	0	0	9	78	315	577	706	621	369	110	7	0	0	0	9	87	402	979	1685	2306	2675	2785	2792	2792
55	0	0	3	40	197	431	551	466	241	54	0	0	0	0	3	43	240	671	1222	1688	1929	1983	1983	1983
60	0	0	0	18	102	289	396	315	138	21	0	0	0	0	0	18	120	409	805	1120	1258	1279	1279	1279
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	5	42	159	367	569	686	613	415	205	42	2	0	5	47	206	573	1142	1828	2441	2856	3061	3103	3105

(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