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: ROCKWELL CITY, IA **COOP ID: 137161**

Climate Division: IA 4 **NWS Call Sign:** **Elevation: 1,195 Feet** **Lat: 42˚24N** **Lon: 94˚38W**

Temperature (˚F)

Month	Mean (1)			Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
	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	25.8	6.1	16.0	66	1944	25	29.4	1990	-35	1912	12	2.3	1979	1521	0	.0	.0	.9	20.2	30.6	9.9
Feb	32.2	12.1	22.2	88	1900	7	33.2	1987	-32+	1905	2	8.6	1979	1200	0	.0	.0	3.4	13.2	26.9	5.3
Mar	44.7	23.5	34.1	87	1986	29	41.5	2000	-22	1962	1	25.0	1975	957	0	.0	.0	11.9	5.0	23.4	.9
Apr	59.4	35.3	47.4	97	1980	22	54.1	1977	4	1936	3	41.0	1983	532	3	.0	.1	24.1	.3	9.1	.0
May	71.6	48.4	60.0	106	1934	30	66.6	1977	17	1907	3	52.7	1997	210	55	.0	.5	30.8	.0	.8	.0
Jun	81.4	58.5	70.0	105+	1933	10	75.5	1988	34	1945	3	65.3	1982	26	174	.2	4.6	30.0	.0	.0	.0
Jul	84.7	62.6	73.7	109+	1936	4	78.1	1974	42+	1897	12	67.7	1992	5	272	.2	7.7	31.0	.0	.0	.0
Aug	82.5	60.2	71.4	110	1936	18	78.1	1983	36	1915	30	65.9	1992	22	217	.2	4.9	31.0	.0	.0	.0
Sep	75.5	50.0	62.8	102+	1939	6	68.0	1978	20	1899	29	56.8	1993	127	59	.0	1.7	29.9	.0	.7	.0
Oct	62.8	37.7	50.3	94	1963	5	56.2	1973	-3	1925	29	45.1	1976	458	1	.0	.2	27.5	.1	7.4	.0
Nov	43.7	24.1	33.9	80	1999	9	43.5	1999	-16	1897	28	25.1	1991	933	0	.0	.0	10.6	5.5	22.7	.7
Dec	29.6	11.7	20.7	68	1998	2	28.6	1998	-32	1917	29	4.5	1983	1375	0	.0	.0	1.7	16.1	30.5	5.7
Ann	57.8	35.9	46.9	110	Aug 1936	18	78.1+	Aug 1983	-35	Jan 1912	12	2.3	Jan 1979	7366	781	.6	19.7	232.8	60.4	152.1	22.5

\+ 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: 1894-2001

(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	.76	.72	2.10	1918	28	2.17	1975	.04+	1986
Feb	.64	.52	1.58	1915	13	2.82	1971	.11	1996
Mar	1.98	1.54	2.04	1990	13	5.67	1991	.09	1994
Apr	3.13	2.88	3.19	1954	21	8.68	1999	.59	1971
May	4.35	4.23	5.87	1982	5	10.56	1982	1.64	1992
Jun	4.43	4.21	5.01	1954	21	8.98	1990	1.77	1985
Jul	4.09	3.79	6.06	1979	23	9.50	1979	.77	1976
Aug	3.80	3.79	4.49	1940	26	7.91	1981	.77	1997
Sep	3.25	2.24	5.25	1911	10	8.79	1973	.48	1998
Oct	2.36	2.23	2.53+	1970	8	5.65	1971	.13	1975
Nov	1.56	1.19	3.50	1909	13	4.61	1983	.00	1976
Dec	.91	.70	2.25	1911	10	2.72	1982	.00	1994
Ann	31.26	30.90	6.06	Jul 1979	23	10.56	May 1982	.00+	Dec 1994

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.3	2.1	.3	@
Feb	4.5	2.5	.1	@
Mar	7.2	4.5	1.4	.4
Apr	9.6	6.3	2.2	.7
May	11.8	8.4	3.0	1.0
Jun	9.8	7.4	3.4	1.2
Jul	9.3	6.4	2.8	1.0
Aug	8.2	5.9	2.6	1.1
Sep	7.5	5.6	2.4	.6
Oct	7.4	4.6	1.6	.6
Nov	6.3	3.9	1.1	.2
Dec	5.6	2.8	.4	.1
Ann	92.5	60.4	21.3	6.9

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	.06	.12	.22	.32	.44	.57	.73	.93	1.20	1.66	2.11
Feb	.15	.21	.30	.39	.47	.56	.66	.78	.93	1.18	1.41
Mar	.26	.42	.70	.98	1.27	1.59	1.96	2.42	3.04	4.06	5.04
Apr	.81	1.11	1.56	1.96	2.36	2.77	3.23	3.78	4.49	5.62	6.67
May	1.65	2.05	2.64	3.12	3.58	4.05	4.55	5.14	5.89	7.04	8.10
Jun	1.66	2.07	2.67	3.16	3.63	4.11	4.63	5.24	6.01	7.20	8.28
Jul	.95	1.33	1.93	2.47	3.00	3.57	4.21	4.96	5.96	7.54	9.02
Aug	.88	1.23	1.79	2.28	2.78	3.31	3.90	4.60	5.53	6.99	8.38
Sep	.62	.91	1.39	1.83	2.27	2.75	3.30	3.96	4.83	6.24	7.57
Oct	.48	.70	1.05	1.36	1.68	2.02	2.41	2.87	3.49	4.47	5.40
Nov	.18	.38	.64	.86	1.09	1.33	1.60	1.92	2.35	3.04	3.69
Dec	.09	.20	.35	.48	.62	.76	.93	1.13	1.39	1.82	2.23
Ann	19.83	21.95	24.71	26.85	28.77	30.64	32.60	34.78	37.45	41.38	44.82

\+ 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: 1894-2001
(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	7.1	5.6	4	4
Feb	5.8	5.2	4	3
Mar	6.0	4.8	1	#
Apr	2.7	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	.7	.0	#	0
Nov	4.8	4.3	1	#
Dec	6.5	6.0	3	2
Ann	33.6	26.9	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	10.5	1998	21	21.6	1975	22	1979	27	12	1979
Feb	6.5	1971	23	14.2	1971	25	1979	21	23	1979
Mar	8.0	1985	31	14.7	1984	26	1979	5	13	1979
Apr	6.0	1979	2	16.1	1983	8	1973	10	1	1973
May	#	1976	2	#	1976	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	#	1985	29	#+	1985	0	0	0	0	0
Oct	4.0	1979	22	4.0+	1991	4	1991	31	#+	1995
Nov	6.0	1983	28	19.3	1983	8	1983	30	3	1991
Dec	7.0	1990	17	17.9	1990	17	2000	29	10+	2000
Ann	10.5	Jan 1998	21	21.6	Jan 1975	26	Mar 1979	5	23	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.5	2.5	.9	.4	.1
Feb	3.3	2.4	.7	.1	.0
Mar	3.2	2.2	.6	.2	.0
Apr	1.2	.9	.4	.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	.3	.3	.1	.0	.0
Nov	2.5	1.9	.5	.1	.0
Dec	4.1	2.7	.8	.2	.0
Ann	19.1	12.9	4.0	1.1	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	22.2	15.9	11.3	3.4
Feb	17.3	12.3	8.2	3.0
Mar	6.8	4.0	1.9	.8
Apr	.8	.4	.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	.2	@	.0	.0
Nov	5.7	2.8	.4	.0
Dec	16.7	10.7	6.2	1.0
Ann	69.7	46.1	28.1	8.2

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

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	9/13	9/17	9/20	9/23	9/25	9/27	9/30	10/03	10/07
32	9/23	9/27	10/01	10/03	10/06	10/09	10/12	10/15	10/19
28	10/02	10/07	10/10	10/13	10/16	10/18	10/21	10/25	10/29
24	10/14	10/19	10/23	10/25	10/28	10/31	11/03	11/06	11/11
20	10/22	10/28	11/01	11/05	11/08	11/12	11/15	11/19	11/25
16	10/31	11/05	11/09	11/13	11/16	11/19	11/23	11/27	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	159	153	149	146	143	139	136	132	127
32	179	172	168	164	161	157	153	149	142
28	204	197	192	188	185	181	177	172	166
24	223	217	213	209	206	203	199	195	189
20	246	238	232	228	223	218	214	208	200
16	263	255	249	245	240	236	231	225	217

***** 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	1521	1200	957	532	210	26	5	22	127	458	933	1375	7366
60	1366	1060	802	391	119	5	0	4	52	311	783	1220	6113
57	1273	976	710	313	78	2	0	1	26	233	693	1127	5432
55	1211	920	649	265	57	1	0	0	14	186	635	1065	5003
50	1056	786	506	162	22	0	0	0	2	94	496	911	4035
32	545	353	125	6	0	0	0	0	0	1	125	417	1572

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	77	190	466	868	1138	1290	1218	923	567	182	66	7033
55	0	0	2	35	212	449	577	505	247	38	2	0	2067
57	0	0	0	23	172	390	515	444	198	23	0	0	1765
60	0	0	0	11	119	304	422	354	135	9	0	0	1354
65	0	0	0	3	55	174	272	217	59	1	0	0	781
70	0	0	0	0	19	78	140	111	18	0	0	0	366

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	11	85	307	655	925	1058	982	716	378	72	3	0	11	96	403	1058	1983	3041	4023	4739	5117	5189	5192
45	0	1	44	191	502	775	903	827	568	247	32	1	0	1	45	236	738	1513	2416	3243	3811	4058	4090	4091
50	0	0	17	109	355	625	748	672	424	143	11	0	0	0	17	126	481	1106	1854	2526	2950	3093	3104	3104
55	0	0	4	54	223	477	593	517	287	70	3	0	0	0	4	58	281	758	1351	1868	2155	2225	2228	2228
60	0	0	1	24	121	330	439	364	176	30	0	0	0	0	1	25	146	476	915	1279	1455	1485	1485	1485
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	12	63	196	401	611	718	659	457	231	48	3	0	12	75	271	672	1283	2001	2660	3117	3348	3396	3399

(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