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: ANKENY, IA **COOP ID: 130241**

Climate Division: IA 5 **NWS Call Sign:** **Elevation: 940 Feet** **Lat: 41˚43N** **Lon: 93˚34W**

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	27.7	8.7	18.2	63+	1989	31	30.9	1989	-25+	1957	14	5.6	1979	1450	0	.0	.0	1.5	18.2	30.4	8.8
Feb	33.9	14.1	24.0	69	1990	13	34.6	1987	-34	1996	3	8.7	1979	1148	0	.0	.0	4.2	13.1	26.5	4.4
Mar	46.6	25.7	36.2	90	1986	29	43.5	2000	-23	1962	1	26.2	1975	894	0	.0	@	12.7	4.3	22.1	.6
Apr	60.3	36.8	48.6	93	1980	22	56.0	1981	8	1982	6	42.5	1983	497	4	.0	.2	24.0	.3	8.6	.0
May	72.0	49.4	60.7	98	1967	25	67.8	1977	28	1954	7	53.6	1997	199	65	.0	.4	30.7	.0	.4	.0
Jun	81.5	59.1	70.3	102+	1977	6	76.1	1971	40+	1969	3	65.5	1982	26	185	.2	3.7	30.0	.0	.0	.0
Jul	85.8	63.7	74.8	103	1999	30	79.3	1977	43	1972	5	69.5	1992	6	307	.5	8.7	31.0	.0	.0	.0
Aug	83.3	60.8	72.1	106	1983	16	79.4	1983	39	1950	20	66.6	1992	23	243	.2	5.8	31.0	.0	.0	.0
Sep	75.9	51.1	63.5	99	1955	9	69.0	1998	22	1999	21	57.3	1993	120	75	.0	2.2	29.9	.0	.6	.0
Oct	63.2	39.1	51.2	94	1963	5	56.9	1971	12	1999	24	45.5	1976	431	2	.0	.1	27.7	@	7.7	.0
Nov	45.8	26.5	36.2	83	1968	1	44.3	1999	-7	1991	8	28.6	1991	866	0	.0	.0	12.0	4.3	21.4	.3
Dec	31.8	14.2	23.0	70	1984	28	29.6	1998	-25+	1989	23	6.9	1983	1301	0	.0	.0	2.7	14.2	29.8	5.0
Ann	59.0	37.4	48.2	106	Aug 1983	16	79.4	Aug 1983	-34	Feb 1996	3	5.6	Jan 1979	6961	881	.9	21.1	237.4	54.4	147.5	19.1

\+ 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: 1950-2001

(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	.72	.58	1.23	1980	16	2.40	1982	.02	1991
Feb	.95	.84	1.59	1976	21	2.54	1976	.07	1991
Mar	2.10	1.90	2.52	1990	13	7.87	1990	.13	1994
Apr	3.18	2.65	4.50	1986	30	8.17	1986	.33	1985
May	4.36	4.06	2.65	1970	11	8.47	1996	1.05	1992
Jun	4.97	4.33	5.25	1954	20	10.08	1983	1.51	1992
Jul	4.13	3.56	3.70	1993	9	11.13	1993	.49	1974
Aug	4.32	3.94	4.59	1977	28	12.87	1993	.66	1976
Sep	3.18	2.43	3.69	1961	12	7.59	1973	.55	1976
Oct	2.50	2.60	2.55	1974	31	5.27	1983	.20	1999
Nov	1.94	1.71	2.01	1991	1	5.88	1983	.00+	1989
Dec	1.03	.87	1.19	1982	5	3.68	1982	.05	1998
Ann	33.38	31.39	5.25	Jun 1954	20	12.87	Aug 1993	.00+	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	2.4	.2	@
Feb	6.1	2.9	.4	.1
Mar	8.1	4.6	1.3	.3
Apr	10.0	6.3	2.2	.7
May	11.4	7.8	2.9	1.1
Jun	10.2	7.0	3.5	1.5
Jul	9.3	6.5	2.6	1.0
Aug	9.2	6.2	2.9	1.4
Sep	8.0	5.6	1.9	.8
Oct	7.6	4.7	1.8	.5
Nov	7.0	4.0	1.2	.3
Dec	6.6	3.0	.6	.1
Ann	99.3	61.0	21.5	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	.08	.13	.23	.33	.44	.56	.70	.87	1.11	1.51	1.90
Feb	.18	.26	.40	.53	.66	.81	.97	1.16	1.42	1.84	2.24
Mar	.21	.37	.65	.95	1.26	1.62	2.04	2.57	3.28	4.48	5.64
Apr	.57	.85	1.32	1.75	2.19	2.67	3.22	3.88	4.76	6.18	7.54
May	1.56	1.97	2.56	3.06	3.54	4.02	4.56	5.17	5.96	7.18	8.30
Jun	1.73	2.20	2.88	3.45	4.01	4.57	5.19	5.91	6.83	8.26	9.57
Jul	.71	1.08	1.68	2.25	2.82	3.45	4.17	5.04	6.20	8.07	9.86
Aug	.80	1.19	1.82	2.40	3.00	3.64	4.38	5.26	6.44	8.33	10.13
Sep	.74	1.04	1.50	1.92	2.33	2.77	3.27	3.86	4.63	5.86	7.02
Oct	.33	.53	.88	1.23	1.60	2.00	2.47	3.05	3.84	5.13	6.37
Nov	.00	.35	.74	1.05	1.35	1.67	2.02	2.43	2.98	3.85	4.68
Dec	.09	.16	.30	.44	.59	.77	.98	1.25	1.62	2.23	2.83
Ann	20.21	22.60	25.76	28.20	30.42	32.59	34.87	37.41	40.55	45.17	49.24

\+ 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: 1950-2001
(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	5.7	4.5	4	3
Feb	6.4	5.8	3	2
Mar	3.8	1.7	1	#
Apr	1.2	.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	.4	.0	#	0
Nov	2.2	1.9	#	#
Dec	6.4	4.7	2	1
Ann	26.1	18.6	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	6.5	1982	2	20.8	1982	18	1979	31	12	1979
Feb	6.5	1997	4	17.3	1983	20	1979	12	15	1979
Mar	6.0	1983	26	17.8	1984	12	1998	11	4	1978
Apr	6.5	1982	5	14.5	1982	6	1997	12	1	1982
May	#	1984	8	#	1984	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	6.9	1980	27	6.9	1980	5	1980	27	#+	1997
Nov	5.0	1971	29	7.0	1974	5	1975	27	1	1991
Dec	11.5	1985	1	21.8	1985	25	2000	29	12	2000
Ann	11.5	Dec 1985	1	21.8	Dec 1985	25	Dec 2000	29	15	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.0	2.2	.5	.1	.0
Feb	3.6	2.0	.8	.2	.0
Mar	1.9	1.2	.5	.1	.0
Apr	.6	.3	.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	.2	.1	@	@	.0
Nov	1.3	.8	.2	.1	.0
Dec	3.5	2.0	.6	.2	.1
Ann	15.1	8.6	2.7	.8	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	14.8	8.3	4.6	1.7
Feb	13.1	8.6	5.0	1.0
Mar	3.7	1.6	.7	@
Apr	.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	.2	.1	@	.0
Nov	2.0	.5	.2	.0
Dec	10.1	6.1	4.2	1.1
Ann	44.2	25.3	14.7	3.8

+ 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	5/08	5/06	5/03	4/30	4/27	4/23
32	5/07	5/03	4/30	4/27	4/25	4/23	4/20	4/17	4/13
28	4/23	4/19	4/16	4/13	4/11	4/09	4/06	4/03	3/31
24	4/17	4/13	4/10	4/07	4/05	4/02	3/30	3/27	3/23
20	4/12	4/06	4/03	3/31	3/28	3/25	3/22	3/18	3/13
16	4/01	3/27	3/23	3/19	3/16	3/12	3/09	3/05	2/27

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	9/16	9/20	9/23	9/25	9/27	9/29	10/02	10/04	10/08
32	9/21	9/26	9/30	10/03	10/06	10/09	10/12	10/16	10/21
28	10/02	10/07	10/11	10/14	10/17	10/20	10/24	10/28	11/02
24	10/11	10/17	10/22	10/26	10/29	11/02	11/06	11/10	11/17
20	10/22	10/28	11/01	11/04	11/07	11/10	11/14	11/18	11/23
16	11/01	11/07	11/11	11/15	11/19	11/22	11/26	11/30	12/07

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	162	156	151	148	144	140	137	132	126
32	181	175	170	167	163	160	156	152	146
28	208	201	196	192	189	185	181	176	169
24	230	222	216	211	207	202	198	192	184
20	246	238	233	228	224	219	215	209	201
16	272	264	257	252	247	242	237	230	222

***** 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	1450	1148	894	497	199	26	6	23	120	431	866	1301	6961
60	1295	1008	739	360	113	6	0	5	51	287	716	1146	5726
57	1202	924	649	285	74	2	0	1	26	212	626	1053	5054
55	1140	872	593	239	54	1	0	0	15	167	568	991	4640
50	986	741	451	143	21	0	0	0	2	81	430	840	3695
32	484	328	104	5	0	0	0	0	0	1	89	361	1372

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	57	104	233	502	889	1149	1324	1243	945	595	213	82	7336
55	0	4	9	46	230	460	611	530	270	48	3	0	2211
57	0	0	2	32	188	401	549	469	221	31	1	0	1894
60	0	0	0	17	134	315	456	380	156	13	0	0	1471
65	0	0	0	4	65	185	307	243	75	2	0	0	881
70	0	0	0	0	25	87	173	134	28	0	0	0	447

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	17	102	316	657	917	1081	997	728	377	91	7	0	17	119	435	1092	2009	3090	4087	4815	5192	5283	5290
45	0	3	55	202	502	767	926	842	579	248	41	4	0	3	58	260	762	1529	2455	3297	3876	4124	4165	4169
50	0	0	28	120	358	617	771	687	432	146	17	0	0	0	28	148	506	1123	1894	2581	3013	3159	3176	3176
55	0	0	7	60	225	468	616	532	296	72	3	0	0	0	7	67	292	760	1376	1908	2204	2276	2279	2279
60	0	0	1	29	122	323	464	379	181	27	0	0	0	0	1	30	152	475	939	1318	1499	1526	1526	1526
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	17	70	197	402	608	736	665	460	234	57	6	0	17	87	284	686	1294	2030	2695	3155	3389	3446	3452

(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