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: LOGAN, IA **COOP ID: 134894**

Climate Division: IA 4 **NWS Call Sign:** **Elevation: 990 Feet** **Lat: 41˚38N** **Lon: 95˚47W**

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	29.8	9.6	19.7	69	1981	24	30.5	1990	-35	1912	12	5.8	1979	1405	0	.0	.0	2.4	16.3	30.5	8.6
Feb	36.0	15.4	25.7	74+	1896	27	35.6	1976	-34	1905	2	11.4	1979	1101	0	.0	.0	5.6	11.3	26.3	4.2
Mar	48.4	26.1	37.3	89	1907	25	43.5	1977	-21	1960	5	28.9	1975	861	0	.0	.0	14.7	3.6	21.9	.7
Apr	62.1	37.6	49.9	99	1994	19	57.4	1981	4	1936	3	43.3	1983	462	6	.0	.5	25.3	.2	8.6	.0
May	73.2	49.2	61.2	109	1934	30	67.3	1977	21	1907	4	55.4	1997	179	61	.0	1.2	30.8	.0	.6	.0
Jun	83.0	59.1	71.1	108	1936	29	76.2	1988	36+	1897	3	65.7	1982	20	202	.4	7.2	30.0	.0	.0	.0
Jul	86.8	63.9	75.4	117	1936	25	79.4	1980	35	1895	9	69.8	1992	4	324	1.3	11.6	31.0	.0	.0	.0
Aug	84.1	61.5	72.8	113	1934	5	80.7	1983	37+	1893	29	66.9	1992	19	261	.4	8.0	31.0	.0	.0	.0
Sep	76.8	51.6	64.2	107	1939	6	70.4	1998	19	1899	29	58.5	1993	103	80	.1	3.3	29.9	.0	.8	.0
Oct	65.1	38.8	52.0	96	1938	3	56.6	1973	-2	1925	28	46.6	1987	409	3	.0	.2	28.6	@	7.6	.0
Nov	46.9	26.3	36.6	83	1999	9	44.1	1999	-14	1937	21	26.4	1985	853	0	.0	.0	13.3	4.0	22.0	.5
Dec	33.1	14.4	23.8	72	1976	18	30.2	1979	-30	1989	22	5.8	1983	1279	0	.0	.0	3.8	13.2	30.1	4.9
Ann	60.4	37.8	49.1	117	Jul 1936	25	80.7	Aug 1983	-35	Jan 1912	12	5.8+	Dec 1983	6695	937	2.2	32.0	246.4	48.6	148.4	18.9

+ 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: 1893-2001

(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	.82	.86	1.40	1966	2	2.10	1975	.00	1986
Feb	.81	.68	1.35	1962	21	2.54	1971	.11	1996
Mar	2.23	2.01	1.92	1921	26	4.99	1973	.06	1994
Apr	3.13	2.57	3.10	1945	23	8.09	1978	.57	1990
May	4.52	4.43	5.12	1976	22	10.22	1996	1.36	2000
Jun	4.46	4.29	4.91	1896	5	10.13	1998	.71	1972
Jul	4.24	4.03	4.42	1909	6	9.52	1998	1.09	1974
Aug	3.51	3.21	5.83	1999	7	7.51	1974	.30	1983
Sep	3.55	3.22	5.20	1973	26	9.63	1992	.10	1980
Oct	2.55	2.54	2.61	1968	17	5.49	1984	.00	1975
Nov	1.76	1.55	2.34	1909	13	4.98	1983	.00	1989
Dec	1.04	.94	2.10	1959	27	4.76	1984	.07	1979
Ann	32.62	32.94	5.83	Aug 1999	7	10.22	May 1996	.00+	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.6	2.5	.5	.0
Feb	5.0	2.5	.3	@
Mar	7.6	5.1	1.4	.5
Apr	9.6	7.1	2.0	.6
May	11.4	8.4	3.3	1.0
Jun	9.3	7.1	3.2	1.5
Jul	8.9	6.7	2.9	1.2
Aug	8.5	5.9	2.2	.9
Sep	7.5	5.7	2.1	1.0
Oct	6.1	4.7	1.6	.7
Nov	6.2	3.9	1.1	.4
Dec	5.6	2.8	.4	.1
Ann	90.3	62.4	21.0	7.9

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	.07	.16	.29	.41	.53	.67	.83	1.02	1.27	1.69	2.08
Feb	.16	.23	.35	.46	.57	.68	.82	.98	1.19	1.54	1.86
Mar	.27	.44	.76	1.07	1.40	1.77	2.20	2.73	3.45	4.64	5.79
Apr	.81	1.10	1.56	1.96	2.36	2.77	3.23	3.78	4.50	5.63	6.68
May	1.53	1.96	2.58	3.11	3.62	4.15	4.72	5.39	6.25	7.58	8.81
Jun	.95	1.36	2.01	2.61	3.20	3.84	4.55	5.41	6.55	8.36	10.07
Jul	1.15	1.55	2.17	2.70	3.22	3.77	4.38	5.10	6.04	7.51	8.89
Aug	.67	.98	1.49	1.97	2.45	2.97	3.56	4.27	5.22	6.73	8.18
Sep	.49	.79	1.29	1.79	2.30	2.87	3.53	4.33	5.42	7.20	8.91
Oct	.18	.44	.85	1.23	1.62	2.04	2.54	3.14	3.96	5.29	6.58
Nov	.13	.32	.60	.86	1.13	1.42	1.76	2.17	2.72	3.62	4.49
Dec	.16	.25	.40	.54	.69	.85	1.04	1.27	1.58	2.07	2.55
Ann	22.06	24.06	26.65	28.62	30.39	32.11	33.89	35.86	38.27	41.78	44.83

\+ 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: 1893-2001
(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	6.4	3	2
Feb	7.2	5.8	3	2
Mar	5.4	4.5	1	1
Apr	1.7	.3	#	#
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.6	.0	#	0
Nov	3.9	3.2	#	#
Dec	6.7	6.3	2	1
Ann	33.4	26.5	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	12.0	1975	10	21.0	1975	17	1984	1	11	1975
Feb	15.0	1971	22	23.2	1978	20	1975	17	16	1975
Mar	10.0	1987	28	16.0	1987	14	1987	29	4	1998
Apr	6.0	1992	21	6.5	1983	9	1997	12	1	1997
May	.0	0	0	.0	0	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	4.5	1980	27	5.0	1980	4+	1997	26	#+	1997
Nov	7.0	1972	13	11.2	1991	8	1991	8	4	1991
Dec	9.0	1984	14	13.2	1984	16	1983	31	10	1983
Ann	15.0	Feb 1971	22	23.2	Feb 1978	20	Feb 1975	17	16	Feb 1975

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	2.5	.9	.3	.1
Feb	3.5	2.3	.7	.3	.1
Mar	2.2	1.6	.7	.4	@
Apr	.9	.7	.3	.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	1.9	1.5	.5	.1	.0
Dec	4.2	2.6	.8	.3	.0
Ann	16.8	11.5	4.0	1.5	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	15.8	12.3	8.4	3.1
Feb	12.8	9.7	6.4	2.0
Mar	5.3	3.5	2.7	.4
Apr	.7	.4	.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	.2	.1	.0	.0
Nov	3.0	1.5	.6	.0
Dec	11.4	5.2	1.7	.0
Ann	49.2	32.7	20.0	5.5

+ 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	5/20	5/15	5/11	5/08	5/05	5/02	4/29	4/26	4/21
32	5/11	5/06	5/03	4/30	4/27	4/24	4/22	4/18	4/14
28	4/28	4/23	4/19	4/17	4/14	4/11	4/08	4/05	3/31
24	4/15	4/11	4/08	4/05	4/03	3/31	3/29	3/26	3/21
20	4/12	4/07	4/03	3/30	3/27	3/24	3/21	3/17	3/12
16	3/31	3/26	3/22	3/19	3/16	3/13	3/10	3/06	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	9/14	9/17	9/20	9/22	9/24	9/26	9/29	10/01	10/05
32	9/21	9/26	9/29	10/03	10/05	10/08	10/11	10/15	10/20
28	9/26	10/01	10/05	10/08	10/11	10/15	10/18	10/22	10/27
24	10/12	10/18	10/22	10/26	10/29	11/01	11/05	11/09	11/15
20	10/17	10/23	10/27	10/31	11/04	11/07	11/11	11/16	11/22
16	10/26	11/01	11/06	11/10	11/14	11/17	11/21	11/26	12/03

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	129	123
32	180	173	168	164	161	157	153	148	141
28	196	191	187	183	180	177	173	169	164
24	233	224	218	213	208	204	199	193	184
20	248	238	232	226	221	215	210	203	194
16	267	258	252	247	242	237	232	226	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	1405	1101	861	462	179	20	4	19	103	409	853	1279	6695
60	1250	961	706	327	95	4	0	4	39	268	703	1124	5481
57	1157	877	614	254	59	1	0	1	18	195	615	1031	4822
55	1095	826	555	211	41	0	0	0	10	153	558	969	4418
50	943	695	413	121	14	0	0	0	1	74	421	820	3502
32	448	293	76	2	0	0	0	0	0	1	89	347	1256

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	65	117	238	537	905	1171	1343	1265	967	618	227	91	7544
55	0	5	4	56	234	481	630	552	287	57	5	0	2311
57	0	0	1	39	190	422	568	490	235	37	2	0	1984
60	0	0	0	21	132	335	475	401	166	17	0	0	1547
65	0	0	0	6	61	202	324	261	80	3	0	0	937
70	0	0	0	1	21	98	186	148	29	0	0	0	483

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	23	120	352	694	958	1115	1041	753	413	95	8	0	23	143	495	1189	2147	3262	4303	5056	5469	5564	5572
45	0	5	64	235	539	808	960	886	604	277	45	1	0	5	69	304	843	1651	2611	3497	4101	4378	4423	4424
50	0	1	33	142	387	658	805	731	458	167	17	0	0	1	34	176	563	1221	2026	2757	3215	3382	3399	3399
55	0	0	8	75	250	508	650	576	322	85	3	0	0	0	8	83	333	841	1491	2067	2389	2474	2477	2477
60	0	0	3	35	144	362	495	423	205	33	0	0	0	0	3	38	182	544	1039	1462	1667	1700	1700	1700
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	3	26	90	231	430	630	755	701	486	267	70	8	3	29	119	350	780	1410	2165	2866	3352	3619	3689	3697

(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