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: WILLIAMSBURG, IA **COOP ID: 139067**

Climate Division: IA 6 **NWS Call Sign:** **Elevation: 850 Feet** **Lat: 41˚40N** **Lon: 92˚01W**

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	28.2	8.9	18.6	67	1989	31	31.0	1989	-28	1974	12	5.7	1979	1440	0	.0	.0	1.3	18.6	30.0	8.5
Feb	34.5	14.6	24.6	68+	1972	29	37.2	1998	-31	1996	4	11.2	1979	1132	0	.0	.0	4.0	11.9	25.6	4.9
Mar	47.2	26.2	36.7	88	1986	29	43.9	1973	-25	1962	1	28.4	1975	877	0	.0	.0	13.2	3.9	21.4	.5
Apr	60.8	37.2	49.0	92	1980	22	55.7	1977	5	1982	6	43.1	1983	484	4	.0	@	24.6	.3	8.5	.0
May	71.7	48.9	60.3	93+	1967	25	67.1	1977	26	1966	10	54.3	1997	200	55	.0	.5	30.9	.0	.5	.0
Jun	81.1	58.5	69.8	101	1988	21	75.5	1971	37+	1956	2	64.6	1982	23	168	.1	3.9	30.0	.0	.0	.0
Jul	85.2	62.4	73.8	104	1988	31	77.8	1999	45+	1967	4	69.5	1992	5	276	.2	8.3	31.0	.0	.0	.0
Aug	83.1	59.7	71.4	105	1988	15	78.7	1983	40+	1950	20	66.1	1992	26	224	.4	5.6	31.0	.0	.0	.0
Sep	75.7	50.1	62.9	99	1953	1	68.2	1998	27+	1951	28	57.9	1993	121	58	.0	2.0	29.9	.0	.4	.0
Oct	64.0	38.7	51.4	94	1953	2	58.0	1971	10	1952	29	45.5	1976	427	3	.0	.1	28.5	.0	7.4	.0
Nov	46.8	26.5	36.7	80	1999	9	44.8	1999	-8+	1976	30	29.4	1976	850	0	.0	.0	13.1	3.2	20.1	.3
Dec	33.3	15.1	24.2	71	1998	5	31.8	1982	-27	1985	19	10.8	1983	1266	0	.0	.0	2.7	13.4	29.0	4.2
Ann	59.3	37.2	48.3	105	Aug 1988	15	78.7	Aug 1983	-31	Feb 1996	4	5.7	Jan 1979	6851	788	.7	20.4	240.2	51.3	142.9	18.4

\+ 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

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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	1.07	.90	1.68	1960	12	2.87	1973	.00	1981
Feb	1.03	.91	2.19	2001	9	3.29	1997	.05	1995
Mar	2.12	1.81	2.80	1970	3	4.83	1990	.04	1981
Apr	3.50	3.38	3.70	1965	24	6.63	1976	1.02	1985
May	4.71	4.12	5.38	1996	10	13.77	1996	.58	1992
Jun	4.72	4.65	6.15	1982	15	9.46	1990	.61	1988
Jul	4.24	3.26	3.90	1962	14	15.09	1992	.13	1975
Aug	4.76	3.65	4.30	1986	14	10.97	1977	.42	1971
Sep	3.74	3.33	4.25	1961	13	7.34	1992	.44	1976
Oct	2.63	2.61	2.45	1998	18	7.82	1984	.27	1975
Nov	2.60	2.58	3.00	1952	17	6.57	1992	.01	1989
Dec	1.47	1.49	1.90	1971	15	3.95	1971	.09	1989
Ann	36.59	35.03	6.15	Jun 1982	15	15.09	Jul 1992	.00	Jan 1981

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.3	3.4	.4	.1
Feb	4.9	3.2	.4	.1
Mar	7.2	5.3	1.2	.2
Apr	8.8	6.5	2.1	.8
May	10.3	8.2	3.0	1.3
Jun	9.1	7.3	3.1	1.1
Jul	8.6	6.2	2.7	1.2
Aug	8.1	6.3	3.1	1.6
Sep	8.0	6.4	2.4	1.0
Oct	6.8	5.5	1.7	.6
Nov	7.3	5.2	1.7	.7
Dec	6.0	4.1	.9	.2
Ann	90.4	67.6	22.7	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	.22	.37	.55	.69	.83	.97	1.13	1.31	1.55	1.92	2.26
Feb	.13	.21	.36	.50	.65	.82	1.02	1.26	1.58	2.12	2.64
Mar	.28	.45	.76	1.05	1.36	1.70	2.10	2.59	3.25	4.32	5.37
Apr	.96	1.30	1.80	2.24	2.67	3.12	3.62	4.21	4.98	6.19	7.31
May	.99	1.42	2.11	2.74	3.37	4.05	4.81	5.73	6.94	8.87	10.69
Jun	1.40	1.85	2.52	3.10	3.67	4.25	4.90	5.66	6.65	8.19	9.62
Jul	.61	.96	1.57	2.16	2.77	3.44	4.22	5.18	6.46	8.56	10.58
Aug	.93	1.36	2.06	2.70	3.35	4.05	4.84	5.80	7.07	9.10	11.03
Sep	1.05	1.41	1.95	2.41	2.87	3.35	3.88	4.50	5.31	6.59	7.77
Oct	.44	.67	1.06	1.42	1.79	2.19	2.65	3.21	3.96	5.17	6.33
Nov	.22	.40	.74	1.10	1.50	1.95	2.49	3.16	4.09	5.65	7.18
Dec	.22	.34	.55	.75	.97	1.20	1.47	1.79	2.23	2.95	3.64
Ann	22.70	25.25	28.59	31.18	33.51	35.79	38.18	40.85	44.12	48.94	53.17

+ 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	8.6	8.0	4	3	12.0	1971	4	30.2	1979	37	1979	19	24	1979	3.7	3.0	1.2	.3	.1	18.7	13.5	7.5	1.2
Feb	6.2	4.0	4	3	10.0	1978	14	19.0	1978	35	1979	11	30	1979	2.6	2.1	.8	.3	@	12.7	9.1	6.2	1.9
Mar	2.8	2.0	1	#	6.0	1984	20	11.0	1978	20	1979	1	7	1979	1.6	1.4	.4	.1	.0	4.3	2.7	1.6	.1
Apr	1.6	.0	#	0	6.0	1973	9	12.0	1973	12	1973	11	2	1973	.6	.5	.3	.1	.0	.7	.4	.2	.1
May	.1	.0	0	0	1.5	1994	1	1.5	1994	0	0	0	0	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	#	1995	5	#	1995	.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	6.0	1997	27	6.0	1997	6	1997	27	#+	1997	.1	.1	.1	@	.0	.1	.1	@	.0
Nov	2.7	1.3	#	#	8.0	1974	30	12.0	1974	8	1991	24	2	1991	1.0	.7	.4	.1	.0	2.2	1.2	.3	.0
Dec	6.9	5.3	2	1	9.0	1978	3	24.5	2000	14	2000	31	8	2000	3.5	2.8	1.1	.2	.0	13.4	9.5	5.2	1.2
Ann	29.1	20.6	N/A	N/A	12.0	Jan 1971	4	30.2	Jan 1979	37	Jan 1979	19	30	Feb 1979	13.1	10.6	4.3	1.1	.1	52.1	36.5	21.0	4.5

+ 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	5/22	5/17	5/13	5/10	5/07	5/04	5/01	4/28	4/22
32	5/13	5/07	5/03	4/30	4/26	4/23	4/20	4/16	4/10
28	4/24	4/19	4/16	4/14	4/12	4/09	4/07	4/04	3/31
24	4/16	4/13	4/10	4/07	4/05	4/03	4/01	3/29	3/25
20	4/09	4/05	4/02	3/30	3/27	3/25	3/22	3/19	3/14
16	4/03	3/28	3/24	3/20	3/17	3/13	3/10	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	9/14	9/18	9/21	9/24	9/26	9/29	10/01	10/04	10/09
32	9/24	9/28	10/01	10/03	10/06	10/08	10/11	10/14	10/18
28	10/02	10/07	10/11	10/14	10/17	10/20	10/23	10/27	11/01
24	10/14	10/19	10/23	10/26	10/29	10/31	11/03	11/07	11/12
20	10/24	10/29	11/01	11/04	11/07	11/10	11/13	11/16	11/21
16	11/04	11/09	11/13	11/16	11/19	11/22	11/25	11/29	12/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	161	154	149	145	141	137	133	128	121
32	180	174	169	165	162	158	154	149	143
28	206	200	195	191	188	184	180	176	169
24	222	216	212	209	206	202	199	195	190
20	246	238	233	228	224	220	215	210	202
16	270	262	256	251	246	242	237	231	223

***** 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	1440	1132	877	484	200	23	5	26	121	427	850	1266	6851
60	1285	992	722	346	111	4	0	6	48	286	700	1111	5611
57	1192	908	631	272	72	1	0	2	23	213	611	1018	4943
55	1130	856	575	226	51	0	0	0	13	170	552	956	4529
50	976	725	432	132	19	0	0	0	2	86	414	807	3593
32	472	314	91	3	0	0	0	0	0	1	78	337	1296

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	55	106	236	513	878	1135	1295	1221	928	601	218	95	7281
55	0	4	8	47	216	445	582	508	250	56	2	0	2118
57	0	0	1	32	175	386	520	447	201	37	1	0	1800
60	0	0	0	17	121	299	427	359	136	18	0	0	1377
65	0	0	0	4	55	168	276	224	58	3	0	0	788
70	0	0	0	0	19	70	143	120	17	0	0	0	369

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	1	20	110	323	664	931	1082	1012	737	404	101	10	1	21	131	454	1118	2049	3131	4143	4880	5284	5385	5395
45	0	3	57	208	510	781	927	857	587	273	50	4	0	3	60	268	778	1559	2486	3343	3930	4203	4253	4257
50	0	0	30	119	361	631	772	702	441	162	23	1	0	0	30	149	510	1141	1913	2615	3056	3218	3241	3242
55	0	0	9	63	231	482	617	547	304	86	3	0	0	0	9	72	303	785	1402	1949	2253	2339	2342	2342
60	0	0	3	27	125	336	462	394	191	33	0	0	0	0	3	30	155	491	953	1347	1538	1571	1571	1571
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	18	72	207	409	617	739	681	475	250	61	5	0	18	90	297	706	1323	2062	2743	3218	3468	3529	3534

(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