

# Climatography of the United States

No. 20

1971-2000

Station: SHENANDOAH, IA

COOP ID: 137613

Climate Division: IA 7

NWS Call Sign:

Elevation: 975 Feet Lat: 40°46N Lon: 95°23W

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	31.3	11.3	21.3	68	1951	18	33.4	1989	-26	1974	12	4.9	1979	1355	0	.0	.0	2.7	14.0	30.0	6.4
Feb	38.0	17.4	27.7	78+	1972	29	37.1	1998	-24	1979	1	11.3	1979	1045	0	.0	.0	7.0	9.8	25.2	3.2
Mar	50.2	28.3	39.3	90	1968	30	45.1	1986	-22	1960	5	31.2	1975	798	0	.0	.0	17.2	2.6	18.7	.4
Apr	62.8	39.7	51.3	94+	1989	23	57.8	1981	8	1975	3	45.7	1997	418	6	.0	.4	26.5	.1	7.3	.0
May	73.7	51.3	62.5	99+	1967	24	68.5	1988	26+	1961	2	56.9	1997	154	77	.0	1.0	30.9	.0	.4	.0
Jun	83.3	61.0	72.2	105+	1980	27	76.3	1971	39	1979	1	67.5	1982	9	223	.2	7.9	30.0	.0	.0	.0
Jul	86.9	65.4	76.2	107+	1954	13	81.0	1974	41	1971	30	72.1	1992	1	347	1.3	12.4	31.0	.0	.0	.0
Aug	84.9	62.9	73.9	106	1964	2	80.0	1983	38	1950	20	68.8	1992	14	290	.5	10.1	31.0	.0	.0	.0
Sep	78.0	53.6	65.8	103	2000	3	72.9	1998	23	1984	29	59.6	1993	83	107	.1	4.0	29.9	.0	.4	.0
Oct	66.1	40.8	53.5	97	1963	5	58.3	1971	15+	1972	19	47.8	1988	364	7	.0	.2	29.0	.0	5.9	.0
Nov	48.5	28.4	38.5	83	1999	14	47.6	1999	-8	1964	30	30.5	1991	797	0	.0	.0	15.4	2.7	19.0	.1
Dec	35.1	16.9	26.0	71	1964	23	31.8+	1998	-26	1983	22	8.0	1983	1209	0	.0	.0	4.7	10.3	28.7	3.3
Ann	61.6	39.8	50.7	107+	Jul 1954	13	81.0	Jul 1974	-26+	Dec 1983	22	4.9	Jan 1979	6247	1057	2.1	36.0	255.3	39.5	135.6	13.4

+ 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](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

Issue Date: February 2004

(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

# 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: SHENANDOAH, IA**

**COOP ID: 137613**

**Climate Division: IA 7**

**NWS Call Sign:**

**Elevation: 975 Feet Lat: 40°46N**

**Lon: 95°23W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.79	.58	1.22+	1949	3	2.23	1996	.00	1986	4.7	2.4	.3	@	.04	.11	.24	.35	.47	.61	.77	.97	1.24	1.69	2.12
Feb	.93	.84	1.52	1973	1	2.48	1998	.03	1977	5.0	2.7	.4	.1	.10	.17	.30	.43	.57	.72	.91	1.13	1.45	1.96	2.46
Mar	2.32	2.10	2.18	1979	18	7.04	1973	.20	1988	8.0	5.0	1.6	.5	.26	.44	.76	1.08	1.43	1.82	2.27	2.84	3.61	4.88	6.11
Apr	3.26	2.78	2.87	1978	9	8.97	1999	.68	1971	9.6	6.8	2.1	.7	.85	1.15	1.63	2.04	2.45	2.88	3.36	3.93	4.68	5.85	6.94
May	4.53	4.05	4.55	1950	9	9.61	1996	1.18	1989	11.4	7.8	3.3	1.2	1.39	1.82	2.46	3.01	3.55	4.10	4.71	5.43	6.35	7.79	9.13
Jun	4.55	3.47	3.84	1997	30	11.60	1984	.92	1988	10.1	6.6	2.8	1.5	1.28	1.71	2.37	2.94	3.49	4.08	4.72	5.48	6.47	8.02	9.46
Jul	4.59	3.66	4.15	1958	2	15.53	1993	.50	1974	9.2	6.1	3.1	1.5	.89	1.31	1.98	2.60	3.23	3.90	4.67	5.59	6.81	8.76	10.62
Aug	3.76	2.28	4.79	1977	9	16.09	1977	.54	1984	8.9	6.2	2.3	1.1	.54	.85	1.39	1.91	2.46	3.06	3.75	4.60	5.74	7.60	9.39
Sep	3.43	2.75	5.89	1989	8	11.39	1989	.67	1980	7.5	5.2	2.2	1.0	.64	.95	1.45	1.92	2.39	2.90	3.48	4.18	5.11	6.60	8.03
Oct	2.49	2.51	4.70	1954	5	5.69	1994	.04	1975	7.1	4.5	1.4	.7	.42	.64	1.00	1.34	1.69	2.07	2.51	3.04	3.74	4.88	5.97
Nov	2.15	2.08	2.50	1988	16	4.49	1983	.02	1989	6.5	4.2	1.2	.6	.18	.32	.61	.91	1.23	1.61	2.05	2.61	3.38	4.68	5.95
Dec	1.14	.75	1.57	1980	8	3.65	1982	.08	1978	5.5	2.8	.6	.2	.12	.20	.36	.52	.69	.88	1.11	1.39	1.78	2.42	3.05
Ann	33.94	33.82	5.89	Sep 1989	8	16.09	Aug 1977	.00	Jan 1986	93.5	60.3	21.3	9.1	21.90	24.14	27.06	29.31	31.33	33.30	35.35	37.64	40.44	44.53	48.12

+ 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:  
[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

# 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](http://www.ncdc.noaa.gov)

Station: SHENANDOAH, IA

COOP ID: 137613

Climate Division: IA 7

NWS Call Sign:

Elevation: 975 Feet

Lat: 40°46N

Lon: 95°23W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	6.9	6.0	2	1	12.0	1971	3	17.3	1979	12	1974	13	7	1971	3.1	2.5	.9	.2	@	15.1	9.1	4.8	.6
Feb	5.9	4.6	2	1	10.0	1999	23	15.0	1999	11	1978	21	6	1978	2.5	2.0	.7	.4	@	11.1	6.7	3.3	.4
Mar	3.1	2.5	#	#	8.0	1998	8	9.5	1990	12+	1998	9	3	1998	1.6	1.4	.4	.1	.0	3.0	1.5	.6	.1
Apr	1.2	.0	#	0	10.0	1992	21	10.0+	1997	10	1992	21	1	1997	.4	.4	.1	.1	@	.4	.2	.2	@
May	.0	.0	0	0	.0	0	0	.0	0	0	0	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	0	0	0	0	0	0	.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	3.0	1997	26	3.2	1996	4	1997	27	#+	1997	.1	.1	@	.0	.0	.2	.1	.0	.0
Nov	1.7	.0	#	#	6.0	1991	23	10.0	1991	6	1991	23	1	1995	.9	.8	.2	.1	.0	1.6	1.0	.2	.0
Dec	4.7	3.0	1	#	8.0	1972	12	12.6	1997	8+	2000	25	5	2000	2.5	1.8	.5	.1	.0	8.2	3.8	1.6	.0
Ann	23.7	16.1	N/A	N/A	12.0	Jan 1971	3	17.3	Jan 1979	12+	Mar 1998	9	7	Jan 1971	11.1	9.0	2.8	1.0	@	39.6	22.4	10.7	1.1

+ 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

Complete documentation available from:

[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

# Climatography of the United States

## No. 20 1971-2000

**Station:** SHENANDOAH, IA

**COOP ID:** 137613

**Climate Division:** IA 7

**NWS Call Sign:**

**Elevation:** 975 Feet

**Lat:** 40° 46N

**Lon:** 95° 23W

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	5/15	5/10	5/07	5/04	5/01	4/28	4/25	4/21	4/16
32	5/07	5/02	4/29	4/26	4/24	4/21	4/18	4/15	4/10
28	4/28	4/22	4/19	4/15	4/12	4/09	4/06	4/02	3/28
24	4/15	4/10	4/07	4/04	4/02	3/30	3/27	3/24	3/19
20	4/06	3/31	3/28	3/25	3/22	3/19	3/15	3/12	3/06
16	4/01	3/25	3/19	3/15	3/11	3/07	3/02	2/25	2/18
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	9/19	9/22	9/25	9/27	9/30	10/03	10/06	10/10
32	9/22	9/27	10/01	10/05	10/08	10/11	10/15	10/19	10/24
28	9/30	10/06	10/10	10/14	10/17	10/20	10/24	10/28	11/03
24	10/12	10/18	10/23	10/27	10/30	11/03	11/07	11/12	11/18
20	10/22	10/29	11/02	11/06	11/10	11/14	11/18	11/23	11/29
16	11/03	11/09	11/14	11/18	11/21	11/25	11/29	12/03	12/09
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	163	157	153	149	145	141	136	128
32	189	181	176	171	167	162	158	152	145
28	211	203	197	192	187	182	177	171	163
24	232	225	220	215	211	207	203	198	190
20	256	248	243	238	233	228	223	218	210
16	286	275	267	261	255	249	242	234	224

\* 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

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

**Climatography  
of the United States  
No. 20  
1971-2000**

**Station: SHENANDOAH, IA**

**COOP ID: 137613**

**Climate Division: IA 7**

**NWS Call Sign:**

**Elevation: 975 Feet    Lat: 40° 46N    Lon: 95° 23W**

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	1355	1045	798	418	154	9	1	14	83	364	797	1209	6247
60	1200	905	643	284	78	1	0	2	30	232	647	1054	5076
57	1107	828	558	214	47	0	0	0	13	165	560	961	4453
55	1045	775	499	172	32	0	0	0	7	127	504	899	4060
50	895	645	362	89	10	0	0	0	1	59	370	755	3186
32	413	266	63	0	0	0	0	0	0	0	65	299	1106

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	81	145	288	578	946	1204	1369	1299	1014	666	258	113	7961
55	0	10	11	60	265	514	656	586	331	80	7	0	2520
57	0	7	7	41	218	454	594	524	277	56	3	0	2181
60	0	0	0	22	156	365	501	433	204	30	0	0	1711
65	0	0	0	6	77	223	347	290	107	7	0	0	1057
70	0	0	0	1	29	106	204	169	44	1	0	0	554

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	3	39	161	390	723	990	1143	1079	800	466	126	14	3	42	203	593	1316	2306	3449	4528	5328	5794	5920	5934
45	0	14	90	269	568	840	988	924	652	329	64	4	0	14	104	373	941	1781	2769	3693	4345	4674	4738	4742
50	0	2	44	166	416	690	833	769	505	213	24	0	0	2	46	212	628	1318	2151	2920	3425	3638	3662	3662
55	0	1	17	92	278	540	678	614	366	118	5	0	0	1	18	110	388	928	1606	2220	2586	2704	2709	2709
60	0	0	4	45	163	391	523	459	241	50	2	0	0	0	4	49	212	603	1126	1585	1826	1876	1878	1878
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	5	38	112	246	454	662	778	727	522	298	82	13	5	43	155	401	855	1517	2295	3022	3544	3842	3924	3937

(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:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

## 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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)