

# Climatology of the United States

No. 20

1971-2000

Station: OSAGE, IA

COOP ID: 136305

Climate Division: IA 2

NWS Call Sign:

Elevation: 1,170 Feet Lat: 43° 17N

Lon: 92° 49W

## 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	21.3	3.3	12.3	57	1981	25	25.9	1990	-32	1967	18	.1	1979	1634	0	.0	.0	.3	22.8	30.7	11.1
Feb	28.0	10.0	19.0	63	1981	17	30.5	1998	-32	1996	2	7.5	1979	1288	0	.0	.0	1.1	15.0	27.0	6.2
Mar	40.9	22.7	31.8	84	1986	29	41.1	2000	-27	1962	1	22.8	1975	1029	0	.0	.0	8.4	6.4	23.9	1.4
Apr	56.3	35.4	45.9	92	1980	22	53.4	1977	6	1982	6	39.5	1975	575	2	.0	.1	22.2	.4	9.4	.0
May	69.1	47.4	58.3	95	1967	18	66.0	1977	22	1967	3	51.9	1997	253	43	.0	.3	30.7	.0	.6	.0
Jun	78.5	56.8	67.7	101+	1985	8	72.9	1988	39+	1951	5	62.3	1982	45	124	.1	2.7	30.0	.0	.0	.0
Jul	82.1	61.0	71.6	102	1988	31	75.7	1974	43+	1967	3	65.1	1992	16	219	.1	4.8	31.0	.0	.0	.0
Aug	80.0	58.7	69.4	102	1955	21	75.5	1983	37+	1950	20	64.3	1992	35	169	.1	2.3	31.0	.0	.0	.0
Sep	72.3	48.7	60.5	99	1955	9	66.9	1998	22	1949	29	54.2	1993	171	36	.0	.8	29.8	.0	.4	.0
Oct	60.4	37.4	48.9	93+	1963	5	54.9	1973	12	1952	29	44.0	1976	500	1	.0	.1	26.6	.2	7.0	.0
Nov	41.3	23.1	32.2	77	1999	9	41.0	1999	-15	1977	26	23.4	1996	984	0	.0	.0	8.1	6.5	22.7	.6
Dec	26.4	9.9	18.2	68	2001	6	26.3	1998	-30	1950	27	4.6	1983	1453	0	.0	.0	.5	19.4	30.3	6.6
Ann	54.7	34.5	44.7	102+	Jul 1988	31	75.7	Jul 1974	-32+	Feb 1996	2	.1	Jan 1979	7983	594	.3	11.1	219.7	70.7	152.0	25.9

+ 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](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

087-A

# Climatology 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: OSAGE, IA**

**COOP ID: 136305**

**Climate Division: IA 2**

**NWS Call Sign:**

**Elevation: 1,170 Feet Lat: 43°17N**

**Lon: 92°49W**

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	1.06	.98	1.19	1982	22	3.27	1982	.00	2000	6.7	2.9	.5	.1	.09	.21	.38	.54	.70	.87	1.07	1.31	1.63	2.16	2.66
Feb	.76	.58	1.30	1971	19	3.27	1971	.00+	1999	4.8	2.2	.4	@	.00	.00	.14	.28	.42	.57	.75	.96	1.25	1.72	2.18
Mar	1.98	1.94	2.07	1959	6	4.50	1976	.00	1999	7.7	4.6	1.4	.3	.19	.42	.74	1.03	1.33	1.65	2.01	2.45	3.03	3.97	4.88
Apr	3.47	3.57	3.05	1975	28	6.90	1999	.40	1997	9.4	6.6	2.3	.8	.90	1.23	1.73	2.17	2.61	3.07	3.58	4.19	4.98	6.23	7.40
May	4.12	3.96	2.93	1957	29	8.35	1974	1.36	1985	10.9	8.1	2.9	.9	1.78	2.15	2.67	3.09	3.49	3.89	4.32	4.81	5.43	6.37	7.23
Jun	4.80	4.57	4.09	1971	20	10.76	2000	1.59	1976	10.0	7.4	3.4	1.4	1.34	1.80	2.49	3.09	3.68	4.29	4.97	5.77	6.82	8.45	9.98
Jul	4.27	3.93	5.75	1999	18	14.17	1999	.70	1996	8.8	6.0	2.5	1.3	.89	1.28	1.90	2.47	3.05	3.66	4.36	5.19	6.29	8.05	9.71
Aug	4.71	3.83	6.37	1980	10	17.45	1980	.76	1971	9.8	6.8	2.8	1.6	.90	1.32	2.02	2.65	3.30	3.99	4.78	5.73	7.00	9.03	10.95
Sep	3.60	2.78	5.17	1983	20	10.35	1985	.24	1975	8.2	6.1	2.2	.8	.53	.83	1.35	1.85	2.37	2.94	3.59	4.39	5.47	7.22	8.91
Oct	2.39	2.36	2.67	1970	9	4.91	1984	.39	1987	6.8	4.5	1.9	.5	.54	.76	1.11	1.42	1.74	2.08	2.45	2.90	3.50	4.44	5.33
Nov	2.08	2.27	2.58	1991	1	5.19	1975	.00	1997	6.9	4.4	1.3	.4	.11	.31	.63	.93	1.26	1.62	2.04	2.57	3.28	4.45	5.59
Dec	1.19	.97	1.78	1982	28	3.70	1982	.00+	1998	6.4	3.0	.8	.1	.00	.22	.46	.65	.83	1.03	1.24	1.49	1.83	2.36	2.87
Ann	34.43	34.73	6.37	Aug 1980	10	17.45	Aug 1980	.00+	Jan 2000	96.4	62.6	22.4	8.2	23.56	25.63	28.30	30.34	32.16	33.92	35.75	37.77	40.24	43.83	46.95

+ 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:  
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**Climate Division: IA 2**

**NWS Call Sign:**

**Elevation: 1,170 Feet**

**Lat: 43° 17N**

**Lon: 92° 49W**

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	9.9	8.3	6	6	10.0	1971	4	24.3	1982	26	1979	31	16	1979	5.4	3.7	1.1	.5	@	21.8	19.0	15.8	7.1
Feb	5.3	5.0	7	5	9.0	1993	21	14.0	1983	27	1979	4	21	1979	3.4	2.0	.6	.3	.0	20.0	17.0	13.1	5.2
Mar	5.8	5.0	2	1	8.0	1987	29	17.0	1975	16	1978	6	8	1975	2.6	1.6	.7	.3	.0	6.5	4.3	3.0	.8
Apr	2.4	1.0	#	#	7.0	1973	10	12.5	1973	11	1973	10	1	1985	1.1	.9	.3	@	.0	1.2	.7	.3	@
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	2.0	1972	18	2.0	1972	2	1972	18	#+	1981	.2	.1	.0	.0	.0	.1	.0	.0	.0
Nov	4.1	2.5	1	#	6.0	1985	9	16.8	1985	10	1985	10	3	1985	2.1	1.4	.6	.1	.0	4.3	2.5	1.3	@
Dec	8.2	8.5	3	2	12.0	1987	28	17.8	1987	16	1985	5	13	1985	4.5	3.0	.9	.4	@	18.6	14.4	9.2	1.5
Ann	35.9	30.3	N/A	N/A	12.0	Dec 1987	28	24.3	Jan 1982	27	Feb 1979	4	21	Feb 1979	19.3	12.7	4.2	1.6	@	72.5	57.9	42.7	14.6

+ 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:

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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	5/10	5/07	5/05	5/02	4/29	4/26	4/22
32	5/11	5/06	5/03	4/30	4/27	4/24	4/21	4/18	4/13
28	4/27	4/22	4/18	4/15	4/12	4/09	4/06	4/03	3/29
24	4/15	4/11	4/09	4/06	4/04	4/02	3/31	3/28	3/25
20	4/12	4/07	4/04	4/01	3/29	3/26	3/23	3/19	3/14
16	4/08	4/02	3/29	3/25	3/22	3/18	3/15	3/11	3/05
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	9/19	9/22	9/24	9/26	9/28	10/01	10/03	10/07
32	9/22	9/27	9/30	10/03	10/05	10/08	10/10	10/14	10/18
28	10/02	10/07	10/11	10/15	10/18	10/21	10/24	10/28	11/03
24	10/17	10/22	10/25	10/28	10/30	11/02	11/04	11/08	11/12
20	10/24	10/29	11/02	11/05	11/07	11/10	11/13	11/17	11/21
16	10/31	11/05	11/09	11/12	11/15	11/18	11/22	11/25	12/01
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	163	156	152	148	144	140	136	131	125
32	177	171	167	164	160	157	154	150	144
28	210	202	197	192	188	184	179	174	167
24	224	218	215	211	208	205	202	198	193
20	245	238	232	227	223	219	214	208	201
16	265	255	249	243	238	232	227	220	211

\* 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:

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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	1634	1288	1029	575	253	45	16	35	171	500	984	1453	7983
60	1479	1148	874	432	154	11	2	9	81	351	834	1298	6673
57	1386	1064	781	351	107	4	0	2	45	269	744	1205	5958
55	1324	1008	720	301	81	2	0	1	28	220	684	1143	5512
50	1169	868	575	191	35	0	0	0	6	118	540	988	4490
32	638	413	163	9	0	0	0	0	0	2	143	473	1841

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	27	49	157	426	813	1069	1226	1157	855	525	149	43	6496
55	0	0	1	27	181	381	513	444	193	30	0	0	1770
57	0	0	0	18	145	323	451	384	150	17	0	0	1488
60	0	0	0	8	98	240	360	297	96	6	0	0	1105
65	0	0	0	2	43	124	219	169	36	1	0	0	594
70	0	0	0	0	15	46	111	79	9	0	0	0	260

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	2	68	261	620	879	1021	950	669	339	56	2	0	2	70	331	951	1830	2851	3801	4470	4809	4865	4867
45	0	0	27	159	467	729	866	795	520	216	25	1	0	0	27	186	653	1382	2248	3043	3563	3779	3804	3805
50	0	0	11	83	320	579	711	640	376	121	4	0	0	0	11	94	414	993	1704	2344	2720	2841	2845	2845
55	0	0	3	43	195	431	556	485	245	53	1	0	0	0	3	46	241	672	1228	1713	1958	2011	2012	2012
60	0	0	0	15	105	287	401	332	140	19	0	0	0	0	0	15	120	407	808	1140	1280	1299	1299	1299
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	38	158	371	574	693	632	407	195	31	1	0	1	39	197	568	1142	1835	2467	2874	3069	3100	3101

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