

Climatography of the United States

No. 20

1971-2000

Station: SAC CITY, IA

COOP ID: 137312

Climate Division: IA 4

NWS Call Sign:

Elevation: 1,200 Feet Lat: 42° 25N

Lon: 94° 59W

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	25.5	7.0	16.3	63	1981	25	27.6	1990	-29	1974	12	3.1	1979	1512	0	.0	.0	.5	20.4	30.8	10.4
Feb	32.1	12.2	22.2	67	2000	29	33.3	1987	-28+	1979	9	7.6	1979	1199	0	.0	.0	3.2	13.7	27.4	6.2
Mar	44.3	23.4	33.9	88	1986	30	41.6	2000	-19	1962	1	23.9	1975	966	0	.0	.0	11.1	5.7	24.5	1.2
Apr	58.9	34.4	46.7	96	1980	23	52.4	1977	4	1975	3	40.5	1983	551	1	.0	.2	23.2	.5	10.3	.0
May	71.5	46.5	59.0	101	1967	25	65.7	1988	24	1967	2	52.7	1997	232	45	.0	.6	30.6	.0	1.0	.0
Jun	80.8	56.6	68.7	102+	1985	9	73.6	1971	32	1969	3	63.5	1982	35	145	.2	4.2	30.0	.0	.0	.0
Jul	84.4	61.7	73.1	109+	1955	30	77.0	1974	44	1971	30	66.8	1992	7	256	.2	7.7	31.0	.0	.0	.0
Aug	81.9	59.3	70.6	107	1955	27	77.8	1983	39+	1986	28	64.6	1992	28	202	.2	4.6	31.0	.0	.0	.0
Sep	74.3	49.4	61.9	101	1955	15	67.7	1978	27	1974	22	55.8	1993	143	47	@	1.5	29.8	.0	1.0	.0
Oct	62.0	37.5	49.8	95	1953	2	55.3	1973	9	1993	31	44.8	1988	474	1	.0	.1	27.0	.1	9.6	.0
Nov	43.3	24.7	34.0	78+	1949	7	42.9	1999	-11+	1991	7	24.7	1991	931	0	.0	.0	10.2	5.8	24.2	.8
Dec	29.5	12.5	21.0	67	1998	2	29.1	1998	-27	1990	24	5.4	1983	1364	0	.0	.0	1.6	16.7	30.3	5.9
Ann	57.4	35.4	46.4	109+	Jul 1955	30	77.8	Aug 1983	-29	Jan 1974	12	3.1	Jan 1979	7442	697	.6	18.9	229.2	62.9	159.1	24.5

+ 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/normal/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

098-A

**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: SAC CITY, IA

COOP ID: 137312

Climate Division: IA 4

NWS Call Sign:

Elevation: 1,200 Feet Lat: 42°25N

Lon: 94°59W

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	.85	.76	.98	1952	19	2.53	1975	.00	1981	5.6	2.5	.4	.0	.05	.14	.27	.40	.53	.67	.84	1.05	1.33	1.80	2.25
Feb	.83	.73	1.34	1954	20	3.02	1971	.03	1987	5.1	2.6	.4	@	.13	.20	.32	.43	.55	.68	.83	1.02	1.27	1.67	2.05
Mar	2.42	2.13	2.25	1991	23	7.78	1979	.09	1994	8.2	5.4	1.8	.5	.25	.43	.76	1.10	1.46	1.87	2.35	2.95	3.77	5.13	6.46
Apr	3.39	2.63	2.63	1986	5	9.42	1984	.73	1971	10.6	6.6	2.3	.8	.73	1.04	1.54	1.99	2.44	2.93	3.47	4.12	4.98	6.36	7.65
May	4.32	4.37	3.10	1990	19	8.06	1990	1.83	1988	12.0	7.8	3.1	1.1	1.81	2.20	2.75	3.21	3.63	4.06	4.53	5.06	5.73	6.76	7.69
Jun	4.70	4.08	4.45	1967	5	11.99	1983	1.41	1976	10.6	7.6	3.1	1.4	1.65	2.09	2.73	3.28	3.80	4.33	4.91	5.59	6.46	7.80	9.03
Jul	3.91	3.13	4.63	1972	17	9.78	1992	1.31	1985	9.3	6.1	2.5	1.2	1.02	1.39	1.96	2.46	2.95	3.47	4.04	4.72	5.61	7.02	8.33
Aug	3.89	4.12	5.85	1962	30	7.00	1980	.40	1976	8.9	6.1	2.4	1.1	.86	1.22	1.79	2.30	2.82	3.37	3.98	4.72	5.69	7.24	8.70
Sep	3.30	3.03	4.63	1978	13	7.64	1973	.42	1998	8.4	5.5	2.3	.8	.63	.93	1.42	1.86	2.31	2.80	3.35	4.02	4.90	6.32	7.67
Oct	2.45	2.18	2.30	1984	15	6.02	1984	.24	1975	7.8	4.4	1.8	.6	.43	.65	1.01	1.34	1.68	2.06	2.48	2.99	3.68	4.78	5.84
Nov	1.84	1.64	2.59	1991	30	5.23	1991	.00	1976	7.6	4.0	1.1	.3	.18	.39	.70	.97	1.24	1.53	1.87	2.27	2.81	3.68	4.51
Dec	1.11	.98	1.60	1982	28	3.50	1984	.17	1980	6.0	3.0	.6	.1	.24	.35	.51	.66	.80	.96	1.14	1.35	1.63	2.07	2.49
Ann	33.01	33.75	5.85	Aug 1962	30	11.99	Jun 1983	.00+	Jan 1981	100.1	61.6	21.8	7.9	20.60	22.89	25.88	28.20	30.28	32.32	34.45	36.84	39.76	44.06	47.83

+ 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: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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Station: SAC CITY, IA

COOP ID: 137312

Climate Division: IA 4

NWS Call Sign:

Elevation: 1,200 Feet

Lat: 42° 25N

Lon: 94° 59W

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	6.6	5.5	4	3	8.0	1975	10	26.8	1975	19	1975	16	18	1979	4.2	2.3	.8	.2	.0	17.7	11.2	7.0	1.1
Feb	6.2	6.3	4	2	10.0	1997	4	15.5	1993	19	1975	4	17	1975	3.2	2.2	.7	.3	@	13.8	10.1	6.2	2.7
Mar	5.4	5.0	2	1	11.0	1987	29	17.0	1983	23	1979	5	18	1979	2.5	1.7	.7	.2	.1	5.7	3.6	2.0	.5
Apr	1.8	.5	#	#	6.5	1997	12	10.5	1983	8	1997	12	#+	2000	.9	.7	.2	@	.0	.8	.3	.1	.0
May	#	.0	0	0	#	1994	1	#	1994	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	#	1985	30	#	1985	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.0	#	0	3.8	1979	23	3.8	1979	4	1979	23	#+	1997	.2	.2	@	.0	.0	.2	@	.0	.0
Nov	2.9	2.0	#	#	6.0	1978	17	9.5	1991	8	1983	30	2	1991	2.0	1.2	.3	.1	.0	4.2	1.7	.1	.0
Dec	7.1	6.5	3	2	9.0	1994	7	23.0	2000	19	2000	31	11	1985	4.2	2.5	.8	.2	.0	13.1	9.0	6.1	2.2
Ann	30.4	25.8	N/A	N/A	11.0	Mar 1987	29	26.8	Jan 1975	23	Mar 1979	5	18+	Mar 1979	17.2	10.8	3.5	1.0	.1	55.5	35.9	21.5	6.5

+ 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

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	5/22	5/18	5/15	5/12	5/09	5/07	5/04	5/01	4/26
32	5/11	5/07	5/03	5/01	4/28	4/26	4/23	4/20	4/15
28	4/30	4/25	4/21	4/18	4/15	4/13	4/09	4/06	4/01
24	4/17	4/13	4/10	4/08	4/06	4/03	4/01	3/29	3/25
20	4/13	4/07	4/03	3/31	3/28	3/25	3/21	3/17	3/12
16	4/05	3/30	3/26	3/23	3/20	3/16	3/13	3/09	3/03
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	9/12	9/16	9/19	9/21	9/24	9/26	9/28	10/01	10/05
32	9/18	9/23	9/27	10/01	10/04	10/07	10/10	10/14	10/19
28	10/01	10/06	10/10	10/13	10/16	10/19	10/22	10/26	10/31
24	10/10	10/15	10/19	10/22	10/25	10/28	10/31	11/04	11/09
20	10/15	10/22	10/27	11/01	11/05	11/09	11/13	11/18	11/25
16	10/27	11/02	11/07	11/11	11/14	11/18	11/22	11/27	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	155	148	144	140	137	133	129	125	119
32	179	172	166	162	158	154	149	144	137
28	204	197	192	187	183	179	174	169	162
24	221	214	210	206	202	198	194	189	182
20	246	238	232	226	221	216	211	205	196
16	265	256	249	244	239	234	229	222	213

* 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1512	1199	966	551	232	35	7	28	143	474	931	1364	7442
60	1357	1059	811	407	135	8	0	6	61	327	781	1209	6161
57	1264	975	718	326	91	3	0	2	31	248	691	1116	5465
55	1202	919	656	275	67	1	0	0	18	201	632	1054	5025
50	1047	788	512	166	26	0	0	0	3	106	492	900	4040
32	535	360	124	5	0	0	0	0	0	2	119	408	1553

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	46	85	181	445	836	1100	1272	1197	895	552	178	67	6854
55	0	0	0	26	190	411	559	484	223	38	1	0	1932
57	0	0	0	16	152	353	497	423	176	24	0	0	1641
60	0	0	0	7	103	268	404	335	116	9	0	0	1242
65	0	0	0	1	45	145	256	202	47	1	0	0	697
70	0	0	0	0	15	59	129	103	13	0	0	0	319

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	8	75	277	616	884	1045	966	680	346	61	4	0	8	83	360	976	1860	2905	3871	4551	4897	4958	4962
45	0	1	34	173	464	734	890	811	530	219	26	0	0	1	35	208	672	1406	2296	3107	3637	3856	3882	3882
50	0	0	10	96	321	584	735	656	386	123	9	0	0	0	10	106	427	1011	1746	2402	2788	2911	2920	2920
55	0	0	3	45	196	435	580	501	258	58	1	0	0	0	3	48	244	679	1259	1760	2018	2076	2077	2077
60	0	0	0	19	99	293	425	349	151	24	0	0	0	0	0	19	118	411	836	1185	1336	1360	1360	1360
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	8	60	185	379	574	703	637	432	221	49	1	0	8	68	253	632	1206	1909	2546	2978	3199	3248	3249

(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

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
- 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">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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