

Climatography of the United States

No. 20

1971-2000

Station: RED OAK, IA

COOP ID: 136940

Climate Division: IA 7

NWS Call Sign:

Elevation: 1,040 Feet Lat: 41° 11N

Lon: 95° 15W

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	30.6	10.8	20.7	69	1989	31	31.9	1989	-27	1974	12	7.0	1979	1375	0	.0	.0	2.6	14.7	29.9	6.8
Feb	37.0	15.7	26.4	78	1972	29	35.8	1998	-28	1996	3	13.0	1979	1082	0	.0	.0	6.5	10.0	25.5	3.7
Mar	49.2	26.4	37.8	91	1986	29	43.4	2000	-21	1960	5	30.5	1975	844	0	.0	@	16.5	2.5	20.4	.5
Apr	62.1	37.9	50.0	94+	1987	29	55.8	1981	2	1975	3	43.6	1983	454	3	.0	.5	26.4	@	8.1	.0
May	73.1	50.5	61.8	99	1967	24	67.3	1977	26	1976	3	56.6	1997	163	64	.0	1.2	31.0	.0	.7	.0
Jun	82.5	59.9	71.2	104+	1956	19	76.4	1971	35+	1950	4	65.5	1982	19	204	.5	7.6	30.0	.0	.0	.0
Jul	86.2	64.8	75.5	109	1974	21	80.5	1980	39	1971	30	70.8	1992	1	326	1.2	12.8	31.0	.0	.0	.0
Aug	84.1	61.4	72.8	106	1988	15	80.9	1983	34	1986	28	67.1	1992	22	262	.9	9.8	31.0	.0	.0	.0
Sep	77.3	52.0	64.7	102	1953	28	70.8	1998	23	1984	29	58.6	1993	100	90	.0	3.9	29.9	.0	.7	.0
Oct	65.2	39.4	52.3	94	1976	1	57.9	1971	13+	1972	19	45.6	1976	401	7	.0	.2	28.8	.1	7.2	.0
Nov	47.6	26.8	37.2	82	1999	14	45.4	1999	-14	1964	30	29.1	1991	835	0	.0	.0	14.8	2.8	20.5	.3
Dec	34.2	15.5	24.9	69	2001	6	30.8+	1982	-26	1989	23	8.3	1983	1245	0	.0	.0	3.9	11.2	29.2	4.0
Ann	60.8	38.4	49.6	109	Jul 1974	21	80.9	Aug 1983	-28	Feb 1996	3	7.0	Jan 1979	6541	956	2.6	36.0	252.4	41.3	142.2	15.3

+ 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

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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: RED OAK, IA

COOP ID: 136940

Climate Division: IA 7

NWS Call Sign:

Elevation: 1,040 Feet Lat: 41°11N

Lon: 95°15W

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	.97	.81	.99	1949	3	2.76	1973	.00	1986	5.6	2.9	.6	.0	.06	.15	.30	.45	.60	.76	.96	1.20	1.52	2.05	2.57
Feb	1.16	1.18	2.33	1976	21	3.29	1976	.20	1977	6.5	3.2	.6	.1	.24	.34	.51	.67	.82	.99	1.18	1.41	1.71	2.19	2.64
Mar	2.33	2.32	2.01	1982	19	5.94	1973	.17	1994	9.0	5.1	1.4	.5	.30	.48	.81	1.14	1.48	1.86	2.30	2.85	3.59	4.80	5.98
Apr	3.71	3.02	3.19+	1955	23	9.38	1999	.79	1971	10.1	6.7	2.5	.9	1.01	1.36	1.90	2.36	2.82	3.30	3.84	4.47	5.29	6.58	7.78
May	4.74	4.20	6.50	1987	26	13.15	1987	1.13	1989	12.1	7.8	3.2	1.1	1.03	1.46	2.16	2.79	3.42	4.09	4.85	5.76	6.95	8.86	10.67
Jun	4.86	4.51	5.95	1967	10	9.25	1994	1.53	1973	10.0	6.9	3.5	1.7	1.69	2.15	2.82	3.38	3.92	4.47	5.07	5.77	6.67	8.06	9.34
Jul	4.65	3.52	4.75	1990	26	11.65	1993	.67	1974	9.9	6.4	3.1	1.5	.97	1.39	2.07	2.69	3.32	3.99	4.75	5.65	6.85	8.77	10.58
Aug	4.05	2.98	7.60	1987	25	16.58	1977	.92	1983	8.7	5.7	2.3	1.0	.65	1.00	1.59	2.14	2.72	3.35	4.06	4.94	6.11	8.02	9.84
Sep	4.11	3.93	5.45	1989	8	9.45	1989	1.03	2000	8.1	5.2	2.5	1.3	1.04	1.42	2.02	2.55	3.07	3.62	4.24	4.97	5.92	7.43	8.84
Oct	2.60	2.60	2.55	1986	11	4.55	1997	.09	1975	7.3	4.7	1.5	.8	.45	.68	1.06	1.42	1.78	2.18	2.63	3.17	3.90	5.07	6.19
Nov	2.17	2.19	2.52	1988	15	4.66	1971	.04	1976	7.3	4.3	1.3	.6	.24	.40	.70	1.00	1.33	1.69	2.11	2.64	3.37	4.56	5.72
Dec	1.21	.92	1.28	1968	18	3.17	1982	.16	1976	7.1	3.3	.6	.1	.24	.35	.52	.69	.85	1.03	1.23	1.47	1.79	2.30	2.79
Ann	36.56	35.06	7.60	Aug 1987	25	16.58	Aug 1977	.00	Jan 1986	101.7	62.2	23.1	9.6	23.77	26.16	29.27	31.65	33.79	35.88	38.05	40.47	43.43	47.76	51.54

+ 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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Station: RED OAK, IA

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Climate Division: IA 7

NWS Call Sign:

Elevation: 1,040 Feet

Lat: 41° 11N

Lon: 95° 15W

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	8.0	6.5	3	2	13.0	1971	3	21.5	1975	18	1984	1	10	1984	3.8	2.5	1.0	.4	.1	11.9	7.4	5.3	2.0
Feb	8.7	7.6	3	2	14.0	1978	13	22.8	1978	18	1978	20	11	1978	3.6	2.3	1.0	.5	.1	10.6	7.9	5.0	1.5
Mar	4.8	3.1	1	#	8.0	1983	26	18.5	1984	16	1978	4	6	1978	2.3	1.6	.6	.2	.0	4.3	2.4	1.5	.6
Apr	1.8	.2	#	0	9.0	1992	21	9.3	1992	7	1973	10	1+	1997	.9	.5	.2	.1	.0	.5	.3	.2	.0
May	.0	.0	#	0	.0	0	0	.0	0	1	1993	1	#	1993	.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	.6	.0	#	0	5.0	1997	26	6.5	1997	5	1997	26	#+	1997	.2	.2	.1	@	.0	.2	.1	@	.0
Nov	2.8	1.4	#	#	8.0	1987	28	10.0	1987	8	1991	23	1	1992	1.5	.9	.4	.3	.0	1.8	1.0	.4	.0
Dec	6.8	5.4	1	1	8.0	1995	6	17.5	1973	12	1973	20	6	2000	3.8	2.1	1.0	.4	.0	9.3	5.3	3.0	.2
Ann	33.5	24.2	N/A	N/A	14.0	Feb 1978	13	22.8	Feb 1978	18+	Jan 1984	1	11	Feb 1978	16.1	10.1	4.3	1.9	.2	38.6	24.4	15.4	4.3

+ 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	5/13	5/10	5/07	5/05	5/02	4/29	4/26	4/21
32	5/12	5/07	5/04	5/01	4/29	4/26	4/23	4/20	4/16
28	5/02	4/27	4/24	4/22	4/19	4/17	4/14	4/11	4/07
24	4/16	4/12	4/09	4/07	4/05	4/02	3/31	3/28	3/24
20	4/11	4/05	4/01	3/29	3/26	3/23	3/19	3/15	3/10
16	4/03	3/28	3/23	3/20	3/16	3/13	3/09	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	9/08	9/13	9/16	9/19	9/22	9/24	9/27	10/01	10/05
32	9/17	9/22	9/25	9/29	10/02	10/05	10/08	10/11	10/17
28	9/26	10/02	10/05	10/09	10/12	10/15	10/18	10/22	10/27
24	10/06	10/12	10/17	10/22	10/26	10/30	11/03	11/08	11/15
20	10/16	10/23	10/28	11/01	11/04	11/08	11/12	11/17	11/24
16	10/23	10/31	11/06	11/10	11/15	11/19	11/24	11/30	12/07
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	148	143	139	135	131	126	119
32	177	169	164	160	155	151	146	141	134
28	194	187	183	179	175	171	167	162	156
24	226	218	213	208	203	199	194	188	180
20	250	241	234	228	223	218	212	205	196
16	273	262	255	249	243	237	231	223	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

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	1375	1082	844	454	163	19	1	22	100	401	835	1245	6541
60	1220	942	689	316	82	3	0	6	39	266	685	1090	5338
57	1127	858	597	242	49	1	0	1	19	197	596	997	4684
55	1065	805	539	197	33	0	0	0	10	157	539	935	4280
50	913	676	397	106	9	0	0	0	2	79	402	784	3368
32	423	274	69	1	0	0	0	0	0	1	74	314	1156

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	71	116	249	540	924	1176	1348	1263	980	630	229	92	7618
55	0	3	6	46	243	486	635	550	300	73	4	0	2346
57	0	0	1	30	197	427	573	490	249	51	2	0	2020
60	0	0	0	15	138	339	480	401	179	27	0	0	1579
65	0	0	0	3	64	204	326	262	90	7	0	0	956
70	0	0	0	0	22	99	185	151	35	1	0	0	493

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	4	28	141	381	710	969	1133	1068	785	442	109	8	4	32	173	554	1264	2233	3366	4434	5219	5661	5770	5778
45	0	12	79	259	555	819	978	913	635	308	51	3	0	12	91	350	905	1724	2702	3615	4250	4558	4609	4612
50	0	1	39	156	405	669	823	758	486	189	20	0	0	1	40	196	601	1270	2093	2851	3337	3526	3546	3546
55	0	0	13	85	267	519	668	603	347	101	4	0	0	0	13	98	365	884	1552	2155	2502	2603	2607	2607
60	0	0	4	39	152	372	513	449	225	45	1	0	0	0	4	43	195	567	1080	1529	1754	1799	1800	1800
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	7	28	107	244	448	647	764	717	509	287	73	8	7	35	142	386	834	1481	2245	2962	3471	3758	3831	3839

(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.

- 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/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