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: OTTUMWA AP, IA **COOP ID: 136389**

Climate Division: IA 9 **NWS Call Sign: OTM** **Elevation: 842 Feet** **Lat: 41˚06N** **Lon: 92˚27W**

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	30.1	13.8	22.0	71	1989	31	34.3	1989	-23	1982	10	8.5	1979	1336	0	.0	.0	2.0	16.7	29.4	6.5
Feb	36.0	19.8	27.9	72+	1972	29	37.9	1998	-27	1996	3	14.6	1979	1039	0	.0	.0	4.7	11.6	24.3	3.3
Mar	48.6	30.5	39.6	88	1986	29	46.3	1973	-20	1962	1	32.1	1975	789	0	.0	.0	13.3	3.5	18.8	.3
Apr	61.5	41.6	51.6	91	1965	30	58.6	1977	9	1982	6	45.9	1983	411	8	.0	.1	25.2	.2	5.1	.0
May	72.6	53.2	62.9	94	1956	12	70.0	1977	30	1966	10	57.3	1997	148	82	.0	.4	30.9	.0	@	.0
Jun	82.2	62.7	72.5	103	1988	25	78.1	1971	42	2001	1	67.9	1982	10	233	.1	4.3	30.0	.0	.0	.0
Jul	86.2	67.1	76.7	105+	1966	10	81.4	1983	48+	1971	30	71.9	1992	1	362	.6	9.8	31.0	.0	.0	.0
Aug	83.9	64.4	74.2	105	1983	18	82.9	1983	41	1950	20	68.6	1992	13	296	.6	6.9	31.0	.0	.0	.0
Sep	76.0	55.2	65.6	100	1984	1	71.2	1998	27	1984	29	59.9	1993	82	100	@	2.1	30.0	.0	.1	.0
Oct	63.9	43.5	53.7	93+	1953	2	60.4	1971	17	1972	19	47.7	1976	357	7	.0	@	28.3	.0	3.6	.0
Nov	47.7	31.0	39.4	79	1999	8	47.9	1999	-9	1964	30	32.1	1991	769	0	.0	.0	13.3	3.3	17.3	.1
Dec	34.1	19.1	26.6	71	1998	4	34.3	1982	-21	1989	23	11.6	2000	1190	0	.0	.0	3.2	12.6	28.4	3.4
Ann	60.2	41.8	51.1	105+	Aug 1983	18	82.9	Aug 1983	-27	Feb 1996	3	8.5	Jan 1979	6145	1088	1.3	23.6	242.9	47.9	127.0	13.6

+ 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	1.00	.91	1.54	1949	27	3.27	1973	.07	1986
Feb	1.16	1.01	1.24	1978	13	3.77	1997	.35	1991
Mar	2.35	1.96	2.79	1976	4	5.07	1977	.40	1994
Apr	3.28	2.87	2.04	1955	23	6.10	1981	.72	1985
May	4.56	4.31	4.43	1993	2	10.72	1996	.69	1992
Jun	4.51	4.05	3.14	2000	23	11.16	2000	.78	1992
Jul	4.45	4.22	3.78	1989	12	11.18	1992	.62	1983
Aug	4.03	3.77	3.63	1969	20	9.76	1998	.60	1971
Sep	4.07	3.74	5.32	1992	14	10.07	1986	.46	1979
Oct	2.75	2.62	2.26	1998	17	6.63	1998	.24	1975
Nov	2.42	2.14	2.58	1961	2	6.89	1983	.06	1989
Dec	1.32	1.15	1.90	1980	7	3.40	1971	.07	1976
Ann	35.90	35.54	5.32	Sep 1992	14	11.18	Jul 1992	.06	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.4	2.8	.3	.1
Feb	7.6	3.4	.4	.1
Mar	9.6	5.0	1.5	.5
Apr	11.2	6.8	2.2	.6
May	12.1	7.9	2.9	1.3
Jun	10.3	6.9	3.0	1.4
Jul	9.7	6.7	2.9	1.4
Aug	9.5	6.2	2.6	1.2
Sep	8.5	6.2	2.9	1.2
Oct	8.6	4.9	1.9	.7
Nov	8.5	4.8	1.9	.4
Dec	7.8	3.6	.7	.2
Ann	110.8	65.2	23.2	9.1

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	.16	.24	.39	.53	.67	.83	1.00	1.22	1.52	1.99	2.45
Feb	.35	.46	.63	.77	.91	1.05	1.21	1.39	1.63	2.01	2.35
Mar	.43	.64	.99	1.31	1.63	1.98	2.38	2.86	3.51	4.54	5.52
Apr	1.03	1.34	1.80	2.20	2.58	2.98	3.41	3.93	4.59	5.61	6.57
May	1.29	1.72	2.37	2.94	3.50	4.08	4.72	5.48	6.47	8.01	9.45
Jun	1.20	1.63	2.28	2.86	3.42	4.01	4.67	5.44	6.46	8.05	9.54
Jul	.87	1.27	1.92	2.52	3.13	3.78	4.52	5.42	6.60	8.50	10.30
Aug	.98	1.36	1.94	2.47	2.99	3.54	4.15	4.88	5.84	7.35	8.78
Sep	1.22	1.61	2.19	2.69	3.17	3.68	4.23	4.89	5.73	7.05	8.27
Oct	.58	.83	1.24	1.60	1.97	2.37	2.81	3.34	4.05	5.17	6.23
Nov	.35	.55	.90	1.24	1.59	1.97	2.42	2.96	3.69	4.88	6.03
Dec	.18	.29	.48	.66	.85	1.07	1.31	1.62	2.03	2.70	3.35
Ann	24.81	26.94	29.68	31.76	33.62	35.42	37.29	39.35	41.87	45.52	48.69

\+ 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	6.8	5.6	2	1	11.0	1971	3	16.6	1979	16+	1979	31	11	1979	4.8	2.6	.7	.2	@	16.9	10.5	5.9	2.5
Feb	5.9	5.5	2	2	15.0	1978	13	23.4	1978	20+	1979	11	12	1979	4.1	1.9	.6	.2	@	12.7	7.7	4.7	1.3
Mar	3.4	2.0	1	1	7.0	1978	2	17.1	1978	11+	1999	9	4	1978	2.4	1.3	.4	.1	.0	4.5	2.1	1.0	.3
Apr	1.6	.0	#	0	6.6	1973	9	13.3	1997	11	1997	12	1+	1997	.6	.4	.3	.2	.0	.6	.4	.3	.1
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1999	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	2000	.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	.4	.0	#	0	6.0	1980	27	6.0	1980	5	1997	27	#	1997	.1	.1	.1	.1	.0	.1	.1	@	.0
Nov	1.9	.5	#	0	4.0	1975	26	9.8	1974	6+	1975	28	1+	1991	1.3	.7	.2	.0	.0	1.7	.3	.1	.0
Dec	5.4	3.1	1	0	12.0	1977	5	19.4	1977	13+	1977	12	6	1983	3.6	1.8	.6	.3	@	9.7	5.1	2.6	.7
Ann	25.4	16.7	N/A	N/A	15.0	Feb 1978	13	23.4	Feb 1978	20+	Feb 1979	11	12	Feb 1979	16.9	8.8	2.9	1.1	@	46.2	26.2	14.6	4.9

+ 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	5/11	5/07	5/04	5/02	4/29	4/27	4/24	4/22	4/17
32	4/26	4/21	4/18	4/16	4/13	4/11	4/08	4/05	4/01
28	4/18	4/14	4/12	4/10	4/08	4/06	4/04	4/01	3/29
24	4/13	4/09	4/06	4/04	4/01	3/30	3/28	3/25	3/21
20	4/07	4/02	3/29	3/26	3/23	3/20	3/16	3/13	3/07
16	3/28	3/22	3/17	3/13	3/09	3/05	3/01	2/24	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	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/15	10/20
32	10/01	10/06	10/10	10/13	10/16	10/19	10/22	10/25	10/30
28	10/11	10/17	10/21	10/24	10/27	10/31	11/03	11/07	11/13
24	10/24	10/29	11/02	11/05	11/08	11/11	11/15	11/19	11/24
20	10/31	11/06	11/10	11/13	11/16	11/19	11/22	11/26	12/01
16	11/08	11/15	11/19	11/23	11/26	11/30	12/04	12/08	12/14

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	177	171	167	163	159	156	152	147	141
32	204	198	193	189	185	181	177	172	166
28	219	213	209	205	202	198	195	191	185
24	240	233	228	224	220	216	212	207	200
20	263	254	248	242	237	232	227	220	212
16	291	281	274	267	262	256	250	242	232

***** 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	1336	1039	789	411	148	10	1	13	82	357	769	1190	6145
60	1181	899	634	281	74	1	0	2	29	225	620	1035	4981
57	1088	819	548	213	45	0	0	0	13	160	534	942	4362
55	1026	767	490	173	30	0	0	0	6	123	480	882	3977
50	876	637	354	93	9	0	0	0	0	56	347	738	3110
32	394	253	59	1	0	0	0	0	0	0	58	291	1056

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	82	139	293	588	957	1213	1385	1307	1008	673	279	124	8048
55	0	8	11	71	274	523	672	594	324	83	10	2	2572
57	0	4	8	50	226	463	610	532	270	58	5	0	2226
60	0	0	1	28	163	375	517	440	197	30	1	0	1752
65	0	0	0	8	82	233	362	296	100	7	0	0	1088
70	0	0	0	2	31	117	219	173	40	1	0	0	583

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	5	29	123	364	708	973	1137	1064	775	440	118	13	5	34	157	521	1229	2202	3339	4403	5178	5618	5736	5749
45	0	11	67	242	555	823	982	909	625	303	63	7	0	11	78	320	875	1698	2680	3589	4214	4517	4580	4587
50	0	1	34	147	404	673	827	754	478	183	28	1	0	1	35	182	586	1259	2086	2840	3318	3501	3529	3530
55	0	0	11	77	268	524	672	599	339	99	11	0	0	0	11	88	356	880	1552	2151	2490	2589	2600	2600
60	0	0	4	36	153	375	517	444	217	43	2	0	0	0	4	40	193	568	1085	1529	1746	1789	1791	1791
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	21	77	211	431	656	785	723	492	250	65	7	1	22	99	310	741	1397	2182	2905	3397	3647	3712	3719

(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