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: COLO, IA **COOP ID: 131710**

Climate Division: IA 5 **NWS Call Sign:** **Elevation: 1,000 Feet** **Lat: 42˚01N** **Lon: 93˚19W**

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	26.8	7.6	17.2	59	1981	25	29.0	1990	-28	1977	16	5.4	1979	1481	0	.0	.0	.7	21.2	30.8	9.8
Feb	32.5	13.7	23.1	66	1990	13	34.1	1998	-28	1996	2	10.4	1979	1173	0	.0	.0	2.7	15.1	27.1	6.2
Mar	44.7	25.2	35.0	89	1986	30	42.9	2000	-15	1965	22	25.1	1975	931	0	.0	.0	10.4	6.0	24.0	.9
Apr	58.8	36.4	47.6	96	1980	23	54.0	1977	4	1982	6	41.7	1983	525	2	.0	.1	22.3	.4	9.8	.0
May	71.0	48.5	59.8	97	1967	25	66.6	1977	24	1989	6	53.8	1997	222	59	.0	.4	30.5	.0	.9	.0
Jun	80.6	58.4	69.5	101+	1985	9	75.0	1971	36	1969	3	65.1	1982	27	162	.1	2.8	30.0	.0	.0	.0
Jul	84.2	62.7	73.5	103+	1977	5	78.2	1977	43	1967	4	67.8	1992	7	268	.2	6.1	31.0	.0	.0	.0
Aug	81.7	60.1	70.9	104	1988	18	77.5	1983	40+	1986	28	65.5	1992	25	208	.2	3.8	31.0	.0	.0	.0
Sep	74.5	50.8	62.7	98	2000	12	68.3	1998	26	1984	29	57.1	1993	131	61	.0	1.2	29.9	.0	.8	.0
Oct	62.5	38.6	50.6	93	1997	4	56.8	1971	11+	1972	19	44.0	1976	451	3	.0	.1	27.0	.0	8.8	.0
Nov	45.2	26.0	35.6	80+	1999	9	44.0	1999	-10	1977	26	27.6	1991	883	0	.0	.0	10.5	5.6	23.3	.6
Dec	31.2	13.5	22.4	68	1998	5	29.3	1998	-23+	1989	23	7.9	1983	1323	0	.0	.0	1.7	16.9	30.1	5.9
Ann	57.8	36.8	47.3	104	Aug 1988	18	78.2	Jul 1977	-28+	Feb 1996	2	5.4	Jan 1979	7179	763	.5	14.5	227.7	65.2	155.6	23.4

\+ 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

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1964-2001

(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	.87	.94	1.05	1966	2	2.43	1982	.02	1981
Feb	.93	.82	1.18	1976	21	2.81	1971	.00+	1995
Mar	2.06	1.84	1.75	1990	8	6.26	1990	.10	1994
Apr	3.20	3.22	3.53	1976	18	7.23	1976	.52	1985
May	4.25	3.91	3.48	1966	23	8.99	1974	.92	1992
Jun	5.26	4.93	4.00	1991	4	11.68	1975	1.00	1977
Jul	4.96	4.20	4.85	1990	27	14.00	1993	1.23	1975
Aug	4.51	3.99	4.20	1975	29	12.86	1993	.16	1984
Sep	3.17	2.66	3.30	1986	21	8.42	1986	.63	1998
Oct	2.61	2.45	3.35	1973	11	7.04	1977	.18	1999
Nov	2.05	1.91	2.04	1988	16	5.90	1983	.00	1976
Dec	1.15	1.05	1.30	1982	28	3.48	1982	.23	1976
Ann	35.02	35.18	4.85	Jul 1990	27	14.00	Jul 1993	.00+	Feb 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.7	2.7	.5	.0
Feb	4.3	3.1	.5	@
Mar	6.4	4.5	1.3	.4
Apr	8.6	6.5	2.1	.8
May	10.8	8.2	2.8	.9
Jun	9.8	7.8	3.7	1.6
Jul	9.0	7.3	3.2	1.4
Aug	8.3	6.2	3.1	1.6
Sep	7.4	5.9	2.2	.8
Oct	6.6	5.1	1.7	.6
Nov	6.0	4.1	1.4	.4
Dec	4.6	3.2	.8	.1
Ann	86.5	64.6	23.3	8.6

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	.11	.17	.30	.42	.55	.69	.85	1.06	1.34	1.80	2.25
Feb	.00	.11	.28	.43	.59	.75	.94	1.17	1.48	1.98	2.46
Mar	.25	.41	.70	.99	1.29	1.63	2.03	2.51	3.18	4.26	5.32
Apr	.76	1.06	1.53	1.95	2.36	2.80	3.29	3.88	4.65	5.86	7.01
May	1.21	1.62	2.23	2.76	3.27	3.81	4.41	5.11	6.03	7.46	8.79
Jun	1.36	1.85	2.62	3.29	3.95	4.65	5.43	6.35	7.55	9.45	11.23
Jul	1.21	1.68	2.40	3.04	3.68	4.36	5.11	6.01	7.18	9.04	10.79
Aug	.67	1.04	1.70	2.32	2.97	3.68	4.50	5.51	6.86	9.06	11.18
Sep	.67	.96	1.42	1.85	2.27	2.73	3.24	3.85	4.66	5.96	7.18
Oct	.36	.57	.95	1.31	1.69	2.11	2.59	3.18	3.98	5.29	6.55
Nov	.20	.44	.78	1.08	1.38	1.71	2.08	2.53	3.13	4.10	5.02
Dec	.19	.29	.46	.61	.78	.95	1.16	1.40	1.73	2.27	2.78
Ann	21.46	23.94	27.19	29.72	32.00	34.23	36.56	39.18	42.39	47.12	51.27

\+ 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: 1964-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.0	6.0	3	2
Feb	5.8	5.0	3	2
Mar	3.8	2.5	1	#
Apr	1.8	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.4	.0	#	0
Nov	2.7	2.5	#	#
Dec	7.3	6.0	2	2
Ann	27.8	22.0	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	10.0	1999	2	16.0	1996	17	1999	3	11	1999
Feb	8.0	1972	10	16.0	1997	19	1979	11	13	1979
Mar	9.0	1983	27	11.0	1998	11	1983	27	3	1998
Apr	7.0	1979	2	7.5	1979	6	1979	2	1	1982
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	4.0	1997	27	7.0	1997	5	1997	27	1	1997
Nov	7.0	1972	14	10.0	1971	7	1972	14	2	1991
Dec	10.0	1985	2	23.0	2000	18	2000	29	10	2000
Ann	10.0+	Jan 1999	2	23.0	Dec 2000	19	Feb 1979	11	13	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.8	.9	.4	@
Feb	2.6	2.6	.8	.2	.0
Mar	1.5	1.5	.6	.3	.0
Apr	.8	.8	.2	.1	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.1	.1	.1	.0	.0
Nov	1.0	1.0	.5	.1	.0
Dec	2.7	2.6	.9	.4	@
Ann	11.7	11.4	4.0	1.5	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	17.8	9.4	5.7	.9
Feb	14.5	9.9	5.6	1.2
Mar	4.9	2.2	1.0	.1
Apr	.9	.2	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.2	.1	@	.0
Nov	2.8	1.5	.4	.0
Dec	14.8	7.6	3.7	1.1
Ann	55.9	30.9	16.5	3.3

+ 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

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

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	9/20	9/22	9/25	9/27	9/30	10/03	10/08
32	9/23	9/27	9/30	10/03	10/05	10/08	10/10	10/13	10/18
28	9/29	10/05	10/08	10/12	10/15	10/18	10/21	10/25	10/30
24	10/14	10/20	10/24	10/27	10/30	11/02	11/06	11/10	11/15
20	10/22	10/28	11/02	11/05	11/09	11/12	11/16	11/20	11/26
16	10/30	11/05	11/09	11/13	11/17	11/20	11/24	11/28	12/05

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	154	150	146	143	139	135	131	125
32	177	171	167	164	160	157	153	149	143
28	206	199	194	189	185	181	177	172	165
24	226	219	214	210	206	202	198	193	186
20	248	239	233	228	223	218	212	206	197
16	271	262	255	249	244	238	233	226	216

***** 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	1481	1173	931	525	222	27	7	25	131	451	883	1323	7179
60	1326	1033	776	383	130	6	0	5	57	309	733	1168	5926
57	1233	949	683	305	89	2	0	1	30	234	644	1075	5245
55	1171	893	624	256	66	1	0	0	18	189	587	1013	4818
50	1016	763	482	152	27	0	0	0	3	100	449	861	3853
32	503	339	114	4	0	0	0	0	0	2	100	375	1437

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	45	90	206	471	860	1125	1284	1206	920	576	207	75	7065
55	0	0	3	33	213	435	571	493	248	51	4	0	2051
57	0	0	0	22	174	377	509	432	200	33	1	0	1748
60	0	0	0	10	122	290	416	343	137	15	0	0	1333
65	0	0	0	2	59	162	268	208	61	3	0	0	763
70	0	0	0	0	22	68	141	106	19	0	0	0	356

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	269	616	886	1034	961	682	343	74	6	0	8	83	352	968	1854	2888	3849	4531	4874	4948	4954
45	0	1	41	172	463	736	879	806	534	222	30	2	0	1	42	214	677	1413	2292	3098	3632	3854	3884	3886
50	0	0	12	89	320	586	724	651	392	128	12	0	0	0	12	101	421	1007	1731	2382	2774	2902	2914	2914
55	0	0	4	41	200	437	569	496	261	63	3	0	0	0	4	45	245	682	1251	1747	2008	2071	2074	2074
60	0	0	1	17	108	294	414	341	154	24	0	0	0	0	1	18	126	420	834	1175	1329	1353	1353	1353
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	8	54	165	368	581	701	636	430	213	48	3	0	8	62	227	595	1176	1877	2513	2943	3156	3204	3207

(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