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: COLUMBUS JUNCT 2 SSW, IA **COOP ID: 131731**

Climate Division: IA 9 **NWS Call Sign:** **Elevation: 670 Feet** **Lat: 41˚15N** **Lon: 91˚22W**

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	12.5	21.3	68	1989	31	33.3	1990	-25+	1957	14	8.3	1979	1354	0	.0	.0	1.6	16.7	29.2	6.8
Feb	36.4	18.8	27.6	70+	1972	29	37.8	1998	-30	1996	3	14.7	1979	1047	0	.0	.0	4.4	10.5	24.4	3.4
Mar	49.3	29.3	39.3	88	1986	29	45.7	1973	-17	1962	1	31.3	1984	798	0	.0	.0	14.5	2.6	18.8	.2
Apr	63.0	40.0	51.5	91+	1980	22	57.7	1977	8	1982	6	45.7	1983	413	7	.0	.1	26.0	.1	6.5	.0
May	73.9	50.8	62.4	94+	1956	12	69.7	1977	30+	1954	3	56.4	1997	165	82	.0	1.0	30.8	.0	.3	.0
Jun	82.8	60.0	71.4	102	1988	25	76.6	1971	38	1972	11	66.5	1974	17	209	.2	4.4	30.0	.0	.0	.0
Jul	86.5	64.2	75.4	106+	1987	31	80.0	1983	43	1972	5	71.1	1992	4	326	.6	10.4	31.0	.0	.0	.0
Aug	84.2	62.0	73.1	105+	1988	1	80.2	1983	39	1986	28	67.1	1992	16	267	.7	6.5	31.0	.0	.0	.0
Sep	77.1	53.6	65.4	101+	1953	1	70.2	1978	27	1984	29	59.9	1993	84	93	.0	2.3	30.0	.0	.4	.0
Oct	65.3	42.3	53.8	96	1963	6	61.0	1971	10	1952	29	47.8	1988	355	7	.0	.1	28.7	.0	5.2	.0
Nov	48.3	30.2	39.3	79+	1950	1	46.7	1999	-8	1976	29	32.2	1976	772	0	.0	.0	13.8	2.2	18.0	.2
Dec	34.5	18.3	26.4	72	1998	4	34.1	1982	-24	1989	23	12.8	2000	1196	0	.0	.0	2.8	11.5	27.9	3.6
Ann	61.0	40.2	50.6	106+	Jul 1987	31	80.2	Aug 1983	-30	Feb 1996	3	8.3	Jan 1979	6221	991	1.5	24.8	244.6	43.6	130.7	14.2

\+ 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

Issue Date: February 2004

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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	1.17	1.06	2.15	1960	12	3.20	1974	.06	1981
Feb	1.34	1.06	2.35	1997	21	3.62	1997	.21	1977
Mar	2.68	2.28	3.43	1976	4	5.98	1973	.25	1981
Apr	3.59	3.46	3.75	1955	24	7.55	1981	1.20	1985
May	4.49	3.71	3.90	1996	10	14.89	1996	1.34	1992
Jun	4.23	3.89	4.65	1995	2	9.09	1993	1.09	1988
Jul	4.41	3.95	3.36	1993	24	12.89	1993	.56	1975
Aug	4.51	4.09	5.64	1965	30	10.43	1977	.79	1971
Sep	3.76	3.34	5.56	1961	13	11.08	1973	.01	1979
Oct	2.93	2.36	3.25	1959	6	8.63	1984	.21	1975
Nov	2.72	2.70	2.20	1952	17	6.75	1992	.07	1989
Dec	1.86	1.86	2.50	1971	15	4.55	1971	.23	1996
Ann	37.69	36.12	5.64	Aug 1965	30	14.89	May 1996	.01	Sep 1979

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.1	3.4	.5	@
Feb	7.8	3.7	.6	.1
Mar	9.9	5.7	1.7	.5
Apr	11.5	6.9	2.4	.9
May	12.7	7.8	2.9	1.3
Jun	11.0	7.3	3.0	1.2
Jul	10.3	7.3	3.3	1.4
Aug	9.9	6.7	2.8	1.4
Sep	8.8	5.7	2.5	1.1
Oct	9.1	5.7	2.1	.6
Nov	10.1	5.8	2.2	.3
Dec	9.3	4.2	1.3	.3
Ann	119.5	70.2	25.3	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	.22	.32	.50	.66	.82	.99	1.19	1.43	1.74	2.25	2.74
Feb	.28	.41	.60	.78	.96	1.15	1.37	1.63	1.97	2.52	3.03
Mar	.45	.69	1.08	1.45	1.82	2.23	2.70	3.27	4.03	5.26	6.43
Apr	1.28	1.61	2.10	2.51	2.91	3.31	3.75	4.26	4.91	5.91	6.84
May	1.09	1.51	2.17	2.75	3.33	3.94	4.62	5.43	6.49	8.18	9.76
Jun	1.58	1.98	2.54	3.02	3.47	3.93	4.43	5.01	5.75	6.89	7.93
Jul	.81	1.20	1.85	2.45	3.06	3.72	4.47	5.38	6.59	8.53	10.39
Aug	1.06	1.48	2.14	2.73	3.32	3.94	4.64	5.47	6.56	8.29	9.92
Sep	.50	.80	1.34	1.86	2.41	3.02	3.73	4.60	5.77	7.70	9.56
Oct	.47	.72	1.15	1.55	1.97	2.42	2.94	3.58	4.42	5.80	7.12
Nov	.31	.52	.90	1.28	1.69	2.14	2.67	3.33	4.22	5.69	7.12
Dec	.38	.55	.82	1.07	1.32	1.59	1.90	2.26	2.75	3.52	4.26
Ann	26.02	28.26	31.13	33.33	35.28	37.18	39.14	41.31	43.96	47.80	51.14

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	9.6	8.4	4	3
Feb	8.3	7.0	3	3
Mar	5.7	4.2	1	#
Apr	2.5	.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	3.6	1.6	#	#
Dec	9.0	7.7	2	1
Ann	39.1	28.9	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	15.0	1971	3	25.9	1979	27	1979	16	20	1979
Feb	14.0	1975	24	26.9	1975	26	1979	8	21	1979
Mar	8.0	1972	29	24.0	1984	16	1978	6	7	1978
Apr	12.0	1997	11	16.0+	1997	14	1997	12	2	1997
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	1980	27	7.0	1980	4	1980	28	#+	1997
Nov	12.0	1974	30	18.0	1974	12	1974	30	1	1991
Dec	12.0	1987	15	24.0	1983	27	2000	31	12	2000
Ann	15.0	Jan 1971	3	26.9	Feb 1975	27+	Dec 2000	31	21	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.6	3.3	1.1	.4	.1
Feb	4.3	2.4	1.1	.4	.1
Mar	2.9	1.8	.9	.3	.0
Apr	1.0	.7	.3	.2	@
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	.2	.1	.1	.0	.0
Nov	2.1	1.2	.3	.2	@
Dec	5.1	3.5	1.1	.4	.1
Ann	22.2	13.0	4.9	1.9	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.8	14.1	9.2	3.0
Feb	14.3	10.5	8.6	2.9
Mar	5.3	3.0	1.8	.5
Apr	.7	.4	.3	.1
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	.1	.1	.0	.0
Nov	2.1	.7	.4	@
Dec	12.1	8.5	5.2	1.8
Ann	53.4	37.3	25.5	8.3

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	162	157	153	148	144	140	134	127
32	185	179	175	171	167	164	160	155	149
28	211	205	200	196	192	188	184	179	172
24	228	222	218	214	211	207	204	200	194
20	253	245	240	235	231	226	221	216	208
16	276	267	261	255	250	245	240	234	225

***** 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	1354	1047	798	413	165	17	4	16	84	355	772	1196	6221
60	1199	907	643	281	87	3	0	2	29	224	622	1041	5038
57	1106	823	553	212	54	1	0	0	12	159	536	948	4404
55	1044	772	497	172	38	0	0	0	6	122	481	886	4018
50	892	642	358	90	13	0	0	0	0	56	348	743	3142
32	408	250	57	0	0	0	0	0	0	0	56	292	1063

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	77	127	283	585	940	1181	1344	1275	1000	675	275	120	7882
55	0	5	9	66	265	492	631	562	316	85	9	0	2440
57	0	0	3	46	219	432	569	500	262	60	4	0	2095
60	0	0	0	25	159	344	476	409	189	32	1	0	1635
65	0	0	0	7	82	209	326	267	93	7	0	0	991
70	0	0	0	1	33	101	188	150	35	1	0	0	509

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	133	369	700	949	1108	1037	771	445	121	13	5	34	167	536	1236	2185	3293	4330	5101	5546	5667	5680
45	0	11	74	250	546	799	953	882	621	306	67	4	0	11	85	335	881	1680	2633	3515	4136	4442	4509	4513
50	0	1	39	147	397	649	798	727	473	189	29	4	0	1	40	187	584	1233	2031	2758	3231	3420	3449	3453
55	0	0	17	76	260	499	643	572	332	103	8	0	0	0	17	93	353	852	1495	2067	2399	2502	2510	2510
60	0	0	6	33	152	354	488	417	211	45	2	0	0	0	6	39	191	545	1033	1450	1661	1706	1708	1708
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	18	83	226	435	638	754	700	497	272	68	6	0	18	101	327	762	1400	2154	2854	3351	3623	3691	3697

(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.
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