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: CHARLESTON, IL **COOP ID: 111436**

Climate Division: IL 7 **NWS Call Sign:** **Elevation: 680 Feet** **Lat: 39˚28N** **Lon: 88˚11W**

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	35.2	18.6	26.9	71	1909	23	38.7	1990	-27	1994	19	12.6	1977	1182	0	.0	.0	3.9	12.8	26.6	3.4
Feb	41.0	23.5	32.3	75	1930	24	41.7	1998	-23	1905	13	19.0	1978	918	0	.0	.0	7.1	7.6	21.3	1.9
Mar	52.7	32.8	42.8	89	1929	24	49.5	1973	-14	1960	6	34.2	1984	690	0	.0	.0	18.0	1.6	15.4	.1
Apr	65.0	42.5	53.8	92	1930	11	59.0	1977	17	1982	7	48.6	1982	345	7	.0	.0	27.6	@	4.5	.0
May	75.5	52.3	63.9	101	1934	31	70.2	1977	26	1925	25	58.8	1997	134	100	.0	.4	30.9	.0	.2	.0
Jun	84.5	61.0	72.8	108	1934	28	76.6	1984	35	1945	4	67.4	1982	8	241	@	5.1	30.0	.0	.0	.0
Jul	87.8	65.0	76.4	110+	1936	15	80.7	1980	45+	1947	23	72.8	1971	0	354	.2	8.4	31.0	.0	.0	.0
Aug	85.6	63.3	74.5	107	1918	5	79.8	1983	39	1915	31	69.4	1992	7	300	.1	5.9	31.0	.0	.0	.0
Sep	79.3	55.9	67.6	104+	1954	6	73.1	1998	26	1942	28	61.1	1974	57	135	.0	2.0	30.0	.0	.1	.0
Oct	67.6	44.9	56.3	96	1912	21	62.4	1971	11	1925	29	50.1	1976	294	22	.0	.0	29.8	.0	3.2	.0
Nov	52.5	34.4	43.5	84+	1950	1	49.7	1999	-2	1929	30	35.7	1976	646	0	.0	.0	16.8	.8	12.8	.0
Dec	39.9	23.7	31.8	73	1948	15	40.2	1982	-20+	1989	22	19.1	2000	1029	0	.0	.0	5.6	7.1	23.8	1.5
Ann	63.9	43.2	53.6	110+	Jul 1936	15	80.7	Jul 1980	-27	Jan 1994	19	12.6	Jan 1977	5310	1159	.3	21.8	261.7	29.9	107.9	6.9

\+ 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: 1901-2001

(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	2.20	2.09	2.65	1949	18	5.49	1975	.00	1986
Feb	2.40	2.00	2.70	1997	27	5.46	1990	.62	1987
Mar	3.35	3.19	4.16	1922	14	7.43	1973	1.09	1972
Apr	3.98	3.91	3.42	1996	29	8.62	1994	.22	1971
May	4.23	3.95	4.29	1935	2	10.45	1974	.81	1992
Jun	3.94	3.60	6.50	1957	28	10.42	2000	.70	1992
Jul	4.65	3.48	5.18	1973	21	10.10	1987	1.26	1999
Aug	3.46	2.90	4.49	1951	29	10.41	1981	.52	1984
Sep	3.17	2.70	6.00	1926	9	8.60	1989	.12	1979
Oct	3.25	2.78	3.61	1982	7	8.39	1983	.80	1987
Nov	3.87	3.62	2.75	1958	17	11.57	1985	.60	1976
Dec	3.23	2.53	2.87	1990	30	8.33	1990	.37	1976
Ann	41.73	41.39	6.50	Jun 1957	28	11.57	Nov 1985	.00	Jan 1986

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.4	5.4	1.3	.4
Feb	8.7	5.4	1.4	.5
Mar	10.6	7.3	2.5	.5
Apr	11.5	8.4	2.8	.8
May	10.2	7.4	2.8	1.1
Jun	9.0	6.6	2.7	1.0
Jul	8.9	6.5	3.3	1.4
Aug	7.8	5.5	2.3	1.1
Sep	7.0	4.9	2.4	.9
Oct	7.7	5.2	2.0	.9
Nov	10.2	6.8	2.7	1.1
Dec	10.1	6.6	2.2	.8
Ann	111.1	76.0	28.4	10.5

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	.36	.65	1.03	1.33	1.63	1.95	2.29	2.71	3.24	4.09	4.89
Feb	.55	.78	1.13	1.44	1.76	2.09	2.47	2.91	3.50	4.43	5.31
Mar	1.10	1.42	1.89	2.29	2.67	3.06	3.49	4.00	4.65	5.66	6.59
Apr	.83	1.20	1.78	2.31	2.85	3.42	4.06	4.83	5.85	7.48	9.03
May	1.29	1.70	2.30	2.81	3.31	3.83	4.40	5.07	5.93	7.28	8.53
Jun	.92	1.29	1.86	2.38	2.89	3.44	4.05	4.78	5.74	7.26	8.69
Jul	1.10	1.54	2.22	2.83	3.43	4.07	4.78	5.64	6.75	8.53	10.19
Aug	.61	.91	1.42	1.89	2.38	2.90	3.50	4.22	5.19	6.74	8.23
Sep	.42	.68	1.13	1.57	2.04	2.55	3.14	3.87	4.85	6.46	8.02
Oct	.98	1.29	1.75	2.15	2.54	2.94	3.38	3.90	4.58	5.63	6.60
Nov	.84	1.20	1.77	2.28	2.80	3.35	3.96	4.70	5.68	7.23	8.70
Dec	.70	.99	1.47	1.90	2.33	2.79	3.30	3.92	4.74	6.04	7.27
Ann	30.11	32.37	35.27	37.46	39.40	41.28	43.22	45.35	47.94	51.69	54.93

\+ 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: 1901-2001
(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	6.6	5.3	2	1
Feb	4.4	4.0	2	1
Mar	3.2	1.9	#	#
Apr	.2	.0	#	0
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	#	.0	#	0
Nov	1.5	.2	#	0
Dec	2.8	1.5	1	1
Ann	18.7	12.9	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	12.0	1982	30	22.9	1977	24	1996	7	10	1996
Feb	7.0	1974	24	14.0	1993	21	1982	9	10	1979
Mar	6.5	1978	8	16.0	1978	18	1978	9	5	1978
Apr	2.0	1994	7	2.0	1994	2	1994	7	#+	2000
May	#	1989	6	#	1989	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	#	1993	31	#+	1993	#+	1997	24	#+	1997
Nov	7.5	1980	27	10.6	1975	8	1980	27	1	1980
Dec	8.3	1975	26	10.5	1975	18	1973	21	4	1973
Ann	12.0	Jan 1982	30	22.9	Jan 1977	24	Jan 1996	7	10+	Jan 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.5	2.9	.9	.4	.1
Feb	2.7	1.4	.4	.1	.0
Mar	1.4	.9	.4	.2	.0
Apr	.2	.1	.0	.0	.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	.0	.0	.0	.0	.0
Nov	.8	.5	.2	.1	.0
Dec	2.7	1.5	.4	.2	.0
Ann	12.3	7.3	2.3	1.0	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.6	5.0	3.2	.2
Feb	5.9	2.5	1.2	.0
Mar	1.2	.3	.1	.0
Apr	.1	.0	.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	.0	.0	.0	.0
Nov	.9	.3	.1	.0
Dec	3.9	1.7	.3	.0
Ann	20.6	9.8	4.9	.2

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

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	10/05	10/08	10/11	10/14	10/18
32	10/01	10/06	10/10	10/13	10/16	10/19	10/23	10/27	11/01
28	10/13	10/18	10/22	10/26	10/29	11/01	11/05	11/09	11/15
24	10/28	11/03	11/07	11/10	11/14	11/17	11/20	11/24	11/30
20	11/02	11/08	11/13	11/17	11/20	11/24	11/28	12/02	12/08
16	11/15	11/21	11/25	11/29	12/02	12/06	12/09	12/14	12/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	178	171	165	161	157	153	148	143	136
32	201	194	189	185	181	176	172	167	160
28	228	220	215	211	207	203	198	193	186
24	253	245	240	236	231	227	223	217	210
20	266	259	253	249	245	240	236	230	223
16	296	288	282	277	273	268	263	257	249

***** 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	1182	918	690	345	134	8	0	7	57	294	646	1029	5310
60	1027	778	540	217	65	1	0	0	18	179	499	874	4198
57	934	698	454	153	38	0	0	0	7	123	416	785	3608
55	872	646	398	117	25	0	0	0	4	93	361	728	3244
50	730	517	272	50	7	0	0	0	0	40	239	584	2439
32	284	164	32	0	0	0	0	0	0	0	20	191	691

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	125	170	365	652	989	1223	1377	1316	1068	751	363	185	8584
55	1	8	18	79	300	533	664	603	381	131	15	10	2743
57	0	4	12	55	251	473	602	541	325	99	9	5	2376
60	0	0	5	29	186	384	509	448	246	61	2	0	1870
65	0	0	0	7	100	241	354	300	135	22	0	0	1159
70	0	0	0	1	43	120	207	170	59	5	0	0	605

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	26	61	192	434	749	992	1133	1074	837	513	192	46	26	87	279	713	1462	2454	3587	4661	5498	6011	6203	6249
45	8	31	112	303	596	842	978	919	687	370	114	24	8	39	151	454	1050	1892	2870	3789	4476	4846	4960	4984
50	2	10	61	186	444	692	823	764	537	242	57	6	2	12	73	259	703	1395	2218	2982	3519	3761	3818	3824
55	0	2	31	100	302	542	668	609	392	143	25	1	0	2	33	133	435	977	1645	2254	2646	2789	2814	2815
60	0	0	8	53	176	392	513	454	263	69	7	0	0	0	8	61	237	629	1142	1596	1859	1928	1935	1935
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	8	36	113	258	475	674	786	739	545	307	102	23	8	44	157	415	890	1564	2350	3089	3634	3941	4043	4066

(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