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: WAUKEGAN, IL **COOP ID: 119029**

Climate Division: IL 2 **NWS Call Sign:** **Elevation: 700 Feet** **Lat: 42˚21N** **Lon: 87˚53W**

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	28.5	12.0	20.3	64+	1989	31	31.8	1990	-27+	1985	20	7.1	1977	1387	0	.0	.0	.9	19.5	29.5	7.3
Feb	32.9	16.6	24.8	71	2000	26	36.1	1998	-22+	1996	5	13.3	1979	1126	0	.0	.0	2.0	13.2	26.2	3.9
Mar	43.0	26.0	34.5	81+	1986	31	43.3	2000	-12	1962	1	27.7	1984	945	0	.0	.0	7.8	4.9	24.0	.3
Apr	54.6	35.6	45.1	90	1980	23	49.8	1977	8	1982	7	40.1	1975	598	0	.0	@	19.0	.3	10.4	.0
May	66.7	45.8	56.3	93	1987	30	63.8	1977	24	1966	10	51.6	1976	301	30	.0	.3	30.0	.0	.9	.0
Jun	77.1	55.3	66.2	101	1988	26	71.3	1988	34+	1992	22	60.0	1982	79	114	.1	2.2	30.0	.0	.0	.0
Jul	81.7	61.3	71.5	102	1995	14	77.5	1999	45+	2001	2	67.6	1992	11	213	.1	4.0	31.0	.0	.0	.0
Aug	80.1	60.5	70.3	102	1988	1	77.7	1983	40+	1986	31	65.1	1992	37	201	.1	2.7	31.0	.0	.0	.0
Sep	73.1	52.4	62.8	100+	1953	2	67.7	1998	29	1974	23	57.5	1993	118	50	.0	.9	29.9	.0	.3	.0
Oct	61.6	40.9	51.3	90	1963	6	58.7	1971	18+	1981	25	45.4	1988	430	5	.0	.0	27.4	.0	4.9	.0
Nov	47.3	29.9	38.6	79	1950	1	45.3	1999	-5	1950	24	30.8	1995	793	0	.0	.0	11.8	2.4	18.6	.1
Dec	33.9	18.3	26.1	69	2001	6	34.5	1982	-23	1983	24	13.2	1983	1206	0	.0	.0	2.0	13.1	28.3	3.4
Ann	56.7	37.9	47.3	102+	Jul 1995	14	77.7	Aug 1983	-27+	Jan 1985	20	7.1	Jan 1977	7031	613	.3	10.1	222.8	53.4	143.1	15.0

\+ 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: 1923-2001

(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	1.60	1.59	2.37	1938	24	4.45	1974	.00	1987
Feb	1.40	1.15	2.50	1997	21	4.57	1997	.18	1987
Mar	2.15	1.76	2.23	1976	5	5.90	1983	.53	1981
Apr	3.73	3.89	2.50	1983	2	7.11	1993	.63	1997
May	3.44	3.21	1.97	1996	19	7.31	1990	.34	1992
Jun	3.62	3.59	4.00	1972	20	9.86	1993	.98	1995
Jul	3.49	3.31	3.40	1982	22	7.50	1982	.83	1991
Aug	4.22	3.93	3.70	1984	7	10.57	1987	.81	1973
Sep	3.40	2.61	3.10	1986	26	15.11	1986	.02	1979
Oct	2.42	1.80	3.01	2001	14	7.35	1991	.84+	1993
Nov	2.57	2.45	2.36	1928	17	5.67	1992	.31	1999
Dec	2.05	1.81	2.44	1982	3	5.60	1982	.30	1989
Ann	34.09	34.28	4.00	Jun 1972	20	15.11	Sep 1986	.00	Jan 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.9	4.2	.9	.1
Feb	7.7	4.5	.6	.1
Mar	8.8	5.3	1.3	.5
Apr	10.2	6.9	2.6	1.0
May	10.7	6.7	2.4	.8
Jun	9.6	6.5	2.3	.8
Jul	8.9	5.8	2.5	1.1
Aug	9.3	6.3	3.2	1.3
Sep	8.5	5.7	2.5	.9
Oct	8.3	5.0	1.5	.4
Nov	9.5	5.7	1.7	.5
Dec	9.6	4.9	1.2	.3
Ann	110.0	67.5	22.7	7.8

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	.20	.40	.67	.90	1.13	1.37	1.65	1.98	2.41	3.10	3.76
Feb	.27	.40	.61	.79	.98	1.19	1.42	1.70	2.07	2.67	3.23
Mar	.42	.61	.93	1.22	1.51	1.83	2.18	2.62	3.19	4.11	4.98
Apr	1.28	1.64	2.15	2.58	3.00	3.43	3.89	4.44	5.14	6.22	7.21
May	.91	1.23	1.73	2.17	2.60	3.05	3.56	4.15	4.93	6.16	7.30
Jun	.92	1.26	1.79	2.26	2.72	3.20	3.74	4.38	5.22	6.54	7.77
Jul	1.21	1.54	2.02	2.42	2.81	3.21	3.64	4.15	4.80	5.80	6.73
Aug	1.31	1.71	2.30	2.82	3.31	3.83	4.39	5.06	5.92	7.25	8.49
Sep	.37	.63	1.10	1.57	2.08	2.65	3.32	4.15	5.28	7.14	8.97
Oct	.67	.90	1.25	1.55	1.85	2.16	2.50	2.91	3.44	4.27	5.05
Nov	.56	.79	1.17	1.51	1.85	2.22	2.63	3.12	3.76	4.79	5.77
Dec	.37	.56	.86	1.14	1.42	1.73	2.08	2.50	3.06	3.97	4.83
Ann	24.44	26.31	28.71	30.53	32.14	33.70	35.31	37.08	39.23	42.35	45.05

\+ 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: 1923-2001
(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	11.1	10.2	4	3	18.0	1999	3	23.7	1978	32	1979	14	22	1979	4.2	2.7	.8	.3	.1	-9.9	-9.9	-9.9	-9.9
Feb	9.1	8.9	4	2	8.2	1974	7	18.5	1974	29	1978	11	25	1978	3.7	2.1	.8	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	5.9	3.3	1	#	7.0	1972	14	16.5	1972	27	1978	5	9	1978	2.2	1.5	.5	.2	.0	4.3	2.2	1.1	.2
Apr	1.5	.0	#	0	9.0	1975	3	9.5	1975	9	1975	3	1	1975	.5	.3	.2	.1	.0	.6	.3	.1	.0
May	#	.0	0	0	#	1990	11	#+	1990	0	0	0	0	0	.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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	#	0	.5	1992	20	.5	1992	#	2000	8	#	2000	.1	.0	.0	.0	.0	.0	.0	.0	.0
Nov	2.3	1.3	#	0	6.5	1975	27	8.8	1975	8	1977	29	1	1997	1.2	.6	.2	@	.0	.7	.5	.2	.0
Dec	8.4	7.3	2	#	7.0	2000	30	22.8	1973	21+	2000	30	10	2000	3.2	1.9	.6	.3	.0	-9.9	-9.9	-9.9	-9.9
Ann	38.3	31.0	N/A	N/A	18.0	Jan 1999	3	23.7	Jan 1978	32	Jan 1979	14	25	Feb 1978	15.1	9.1	3.1	1.1	.1	-9.9	-9.9	-9.9	-9.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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

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	9/24	9/28	9/30	10/03	10/05	10/07	10/09	10/12	10/16
32	9/28	10/04	10/08	10/12	10/15	10/18	10/22	10/26	11/01
28	10/11	10/17	10/21	10/24	10/27	10/30	11/03	11/07	11/12
24	10/24	10/29	11/02	11/05	11/08	11/11	11/14	11/18	11/23
20	11/01	11/06	11/10	11/14	11/17	11/20	11/24	11/28	12/04
16	11/10	11/15	11/19	11/23	11/26	11/29	12/02	12/06	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	165	158	153	149	145	141	136	131	124
32	195	186	180	175	170	165	160	154	146
28	215	208	203	199	195	191	186	181	174
24	234	228	223	219	215	211	207	203	196
20	261	253	247	241	237	232	227	221	212
16	282	274	267	262	257	252	247	240	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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1387	1126	945	598	301	79	11	37	118	430	793	1206	7031
60	1232	986	790	450	189	30	0	11	44	291	643	1051	5717
57	1139	902	697	364	135	15	0	4	20	218	554	958	5006
55	1077	846	635	309	104	9	0	0	10	176	496	896	4558
50	922	706	489	187	47	2	0	0	1	92	359	750	3555
32	421	275	100	4	0	0	0	0	0	1	50	294	1145

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	58	72	178	396	752	1025	1224	1187	922	599	247	111	6771
55	0	0	0	11	143	344	511	474	242	60	3	0	1788
57	0	0	0	6	112	290	449	416	192	41	1	0	1507
60	0	0	0	2	73	215	357	330	126	20	0	0	1123
65	0	0	0	0	30	114	213	201	50	5	0	0	613
70	0	0	0	0	10	46	100	107	13	0	0	0	276

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	2	10	62	206	512	789	978	937	681	359	96	11	2	12	74	280	792	1581	2559	3496	4177	4536	4632	4643
45	0	1	32	115	363	639	823	782	532	230	45	3	0	1	33	148	511	1150	1973	2755	3287	3517	3562	3565
50	0	0	12	58	230	489	668	627	387	127	18	1	0	0	12	70	300	789	1457	2084	2471	2598	2616	2617
55	0	0	4	32	136	347	513	473	253	60	3	0	0	0	4	36	172	519	1032	1505	1758	1818	1821	1821
60	0	0	0	13	74	219	360	318	145	23	0	0	0	0	0	13	87	306	666	984	1129	1152	1152	1152
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	4	38	118	292	494	655	617	413	200	52	3	0	4	42	160	452	946	1601	2218	2631	2831	2883	2886

(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