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

COOP ID: 119002

Lon: 90°09W

Station: WATERLOO, IL

Climate Division: IL 8 NWS Call Sign:

Temperature (°F) Degree Days (1) Mean (1) Mean Number of Days (3) **Extremes** Base Temp 65 Max Max Max Max Min Min Highest Lowest Daily Daily Highest Lowest Month(1) Month(1) Cooling >= >= >= <= <= <= Month Mean Year Day Year Year Day Year Heating Max Min Daily(2) Daily(2) Mean Mean 100 90 50 32 32 0 37.6 20.3 29.0 75+ 1986 22 40.9 1990 -16+ 1985 20 15.1 1977 1118 0 .0 .0 6.1 10.7 26.0 1.9 Jan .7 44.0 25.1 34.6 83 1962 13 42.3 1976 -12+1996 4 21.8 1978 853 0 .0 .0 9.6 6.4 19.9 Feb Mar 54.8 35.1 45.0 88 1985 29 51.1 1973 0 1980 2 36.5 1984 621 0 .0 .0 20.2 1.1 13.5 .1 27 62.7 21 1983 Apr 66.0 44.6 55.3 93 +1989 1981 1996 10 49.1 306 15 .0. .2 27.5 .0 2.8 0. May 75.6 54.7 65.2 95 1978 27 71.6 1987 30 1976 3 60.3 1976 110 114 .0 1.0 30.9 .0 .1 .0 74.1 103+ 77.9 42 8.0 Jun 84.4 63.8 1988 26 1971 1972 69.4 1974 279 .2 30.0 .0 .0 .0 6 Jul 88.5 68.1 78.3 12 82.9 1980 47 1972 75.4 1996 412 .9 14.4 31.0 .0 106 1966 6 0 .0 .0 1992 3 86.9 66.2 76.6 107 1962 21 82.0 1983 45 1964 13 71.0 361 .7 11.5 31.0 .0 .0 .0 Aug 41 Sep 79.9 58.6 69.3 102 1971 14 74.2 1998 34+ 1984 30 62.7 1974 168 .1 4.4 30.0 .0 .0 .0 65.1 22 25 51.5 1976 250 27 Oct 68.6 47.0 57.8 94 1963 11 1971 1981 .0 .2 30.0 .0 2.1 .0 54.3 36.2 45.3 89 1987 3 53.5 1999 3 1964 30 36.7 1976 595 .0 .0 18.3 .7 11.6 .0 Nov 1 Dec 42.0 25.1 33.6 75 1970 3 40.8 1971 -18+1989 23 19.8 1983 976 0 .0 .0 8.7 6.2 22.9 .8

Dec

1989

23

15.1

Jan

1977

4879

1377

45.4

55.3

65.2

Ann

107

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

21

82.9

Jul

1980

-18+

Issue Date: February 2004 084-A

Aug

1962

(1) From the 1971-2000 Monthly Normals

39.7

1.9

Elevation: 650 Feet Lat: 38°20N

(2) Derived from station's available digital record: 1948-2000

273.3

25.1

98.9

3.5

(3) Derived from 1971-2000 serially complete daily data

⁺ Also occurred on an earlier date(s)

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

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Climate Division: IL 8 NWS Call Sign: Elevation: 650 Feet Lat: 38°20N Lon: 90°09W

										Pı	recipi	tation	(incl	nes)										
	Mea	Precipitation Totals Means/ Medians(1) Extremes										ays (3)	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										
	Medi	ans(1)				Extremes	•			Daily Precipitation				These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	2.32	1.80	3.29	1982	31	6.61	1999	.15	1986	7.2	4.6	1.2	.5	.32	.51	.84	1.16	1.50	1.87	2.30	2.83	3.55	4.71	5.83
Feb	2.40	2.06	3.00	1988	1	5.28	1985	.56	1991	6.8	4.4	1.5	.6	.58	.80	1.15	1.46	1.77	2.10	2.47	2.91	3.48	4.39	5.24
Mar	3.73	3.46	3.18	1977	28	7.60	1973	1.28	1971	9.8	7.1	2.6	.7	1.40	1.74	2.24	2.66	3.06	3.46	3.90	4.41	5.06	6.06	6.97
Apr	4.16	3.61	6.79	1996	29	12.81	1996	.82	1977	10.4	7.4	2.5	1.1	.93	1.31	1.92	2.47	3.02	3.60	4.26	5.05	6.08	7.73	9.29
May	4.04	3.49	3.70	1961	8	13.25	1995	.75	1992	10.7	7.3	2.9	1.0	1.07	1.46	2.04	2.56	3.06	3.59	4.18	4.88	5.79	7.22	8.56
Jun	4.01	2.99	4.66	2000	17	10.08	2000	.22	1991	9.5	6.6	2.8	1.0	.88	1.25	1.84	2.37	2.90	3.47	4.11	4.87	5.87	7.48	8.99
Jul	4.25	3.65	5.32	1979	28	8.38	1993	.63	1974	8.1	5.9	2.7	1.3	1.22	1.62	2.23	2.76	3.28	3.82	4.41	5.11	6.02	7.45	8.77
Aug	3.13	3.04	3.40	1975	26	6.40	1998	1.03	1976	7.5	5.3	2.0	.9	1.39	1.67	2.05	2.37	2.67	2.96	3.28	3.65	4.11	4.81	5.45
Sep	3.41	2.72	5.08	1986	18	10.81	1993	.01	1979	7.3	5.0	2.0	.9	.24	.45	.89	1.35	1.88	2.48	3.21	4.14	5.43	7.60	9.76
Oct	3.05	2.46	3.80	1951	23	8.56	1986	.65	1999	8.4	5.3	2.2	.8	.74	1.03	1.47	1.87	2.26	2.67	3.14	3.69	4.41	5.55	6.63
Nov	4.21	3.77	5.96	1972	2	13.59	1985	.51	1976	8.8	6.3	2.4	1.0	.73	1.10	1.71	2.29	2.88	3.52	4.25	5.13	6.31	8.22	10.04
Dec	3.40	2.67	3.80	1971	10	9.34	1987	.83	1976	8.5	5.6	2.2	.9	.84	1.16	1.65	2.09	2.53	2.99	3.50	4.11	4.90	6.16	7.34
Ann	42.11	42.73	6.79	Apr 1996	29	13.59	Nov 1985	.01	Sep 1979	103.0	70.8	27.0	10.7	29.10	31.59	34.79	37.24	39.42	41.53	43.71	46.13	49.08	53.36	57.08

⁺ Also occurred on an earlier date(s)

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

[#] 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: 1948-2000

⁽³⁾ Derived from 1971-2000 serially complete daily data

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COOP ID: 119002

Station: WATERLOO, IL

Climate Division: IL 8 NWS Call Sign: Elevation: 650 Feet Lat: 38°20N Lon: 90°09W

										Snov	v (incl	hes)												
						Sno	ow To	tals							Mean Number of Days (1)									
	Means/Medians (1)					Extremes (2)											Snow Fall >= Thresholds						n ds	
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	4.4	2.7	1	#	15.0	1982	31	18.9	1982	15	1982	31	8	1977	2.5	1.4	.4	.1	@	4.1	1.2	.6	.1	
Feb	1.9	1.0	1	#	11.0	1993	26	11.5	1982	18	1982	9	6	1982	1.7	.8	.3	.1	@	2.4	1.0	.4	.1	
Mar	2.1	1.0	#	#	7.0	1989	5	8.0	1974	12	1984	1	2	1984	1.1	.7	.2	.1	.0	1.2	.6	.2	.0	
Apr	.8	.0	#	0	7.5	1971	6	9.0	1971	10	1971	6	1	1971	.2	.2	.1	@	.0	.3	.2	.1	@	
May	.0	.0	0	0	.0	0	0	.0	0	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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	
Nov	1.4	.0	#	0	9.0	1980	27	12.0	1980	9	1980	28	1	1980	.6	.4	.2	.1	.0	.8	.3	.2	.0	
Dec	3.0	1.0	#	#	12.0	1973	20	17.9	1973	13	1973	21	3	1989	1.3	.9	.3	.1	@	2.6	1.1	.4	.2	
Ann	13.6	5.7	N/A	N/A	15.0	Jan 1982	31	18.9	Jan 1982	18	Feb 1982	9	8	Jan 1977	7.4	4.4	1.5	.5	@	11.4	4.4	1.9	.4	

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

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

[@] 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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Climate Division: IL 8 NWS Call Sign:

Elevation: 650 Feet

Lat: 38°20N Lon: 90°09W

				Freez	e Data										
			Spri	ng Freeze D	ates (Month	/Day)									
Temp (F)		P	robability of	later date i	n spring (thr	u Jul 31) tha	n indicated(*)							
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	5/06	5/01	4/28	4/25	4/22	4/19	4/16	4/13	4/08						
32	4/23	4/19	4/15	4/13	4/10	4/08	4/05	4/02	3/28						
28	4/15	4/10	4/07	4/04	4/01	3/30	3/27	3/24	3/19						
24	4/05	3/31	3/27	3/24	3/22	3/19	3/16	3/12	3/08						
20	3/25	3/18	3/13	3/08	3/04	2/28	2/24	2/19	2/12						
16	3/16	3/08	3/03	2/27	2/22	2/18	2/14	2/09	2/01						
<u>.</u>		•	Fal	ll Freeze Da	tes (Month/I	Day)									
Tomp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)														
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	9/27	10/02	10/06	10/09	10/13	10/16	10/19	10/23	10/29						
32	10/07	10/12	10/16	10/19	10/22	10/25	10/28	11/01	11/06						
28	10/21	10/27	10/31	11/04	11/07	11/11	11/14	11/18	11/24						
24	10/31	11/06	11/11	11/14	11/18	11/21	11/25	11/29	12/05						
20	11/07	11/13	11/17	11/21	11/25	11/28	12/02	12/06	12/12						
16	11/17	11/24	11/29	12/03	12/07	12/11	12/16	12/21	12/28						
		-		Freeze F	ree Period										
To (E)			Probability	of longer th	an indicated	freeze free p	eriod (Days)								
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	195	187	182	177	173	169	164	159	151						
32	216	209	203	199	194	190	186	180	173						
28	242	234	228	223	219	214	210	204	196						
24	264	256	250	245	240	235	230	224	216						
20	292	283	276	270	264	259	253	246	236						
16	319	308	300	294	287	281	274	266	256						

^{*} 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.

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	Degree Days to Selected Base Temperatures (°F)														
Base						Heatin	g Degree l	Days (1)							
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann		
65	1118	853	621	306	110	6	0	3	41	250	595	976	4879		
60	963	713	476	188	49	1	0	0	11	142	454	821	3818		
57	870	634	392	131	27	0	0	0	4	94	373	733	3258		
55	808	582	339	99	17	0	0	0	2	69	322	676	2914		
50	665	455	224	41	4	0	0	0	0	26	213	533	2161		
32	233	124	20	0	0	0	0	0	0	0	18	156	551		

Base						Coolin	g Degree l	Days (1)					
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	138	195	421	698	1027	1263	1435	1381	1117	801	414	203	9093
55	1	10	27	107	331	573	722	668	428	156	28	10	3061
57	0	6	18	79	279	513	660	606	371	120	19	5	2676
60	0	0	10	46	208	424	567	513	288	75	10	0	2141
65	0	0	0	15	114	279	412	361	168	27	1	0	1377
70	0	0	0	3	50	152	260	221	81	6	0	0	773

	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	39	92	243	480	794	1031	1190	1137	878	560	232	65	39	131	374	854	1648	2679	3869	5006	5884	6444	6676	6741
45	13	53	149	346	639	881	1035	982	728	412	143	32	13	66	215	561	1200	2081	3116	4098	4826	5238	5381	5413
50	3	20	83	228	485	731	880	827	581	278	82	9	3	23	106	334	819	1550	2430	3257	3838	4116	4198	4207
55	0	8	45	133	337	581	725	672	433	170	41	3	0	8	53	186	523	1104	1829	2501	2934	3104	3145	3148
60	0	1	18	69	207	431	570	517	298	87	15	0	0	1	19	88	295	726	1296	1813	2111	2198	2213	2213
Base				Gro	wing De	gree Unit	s for Co	rn (Mont	hly)						Gr	owing D	egree Un	its for C	orn (Acc	umulate	d Month	ly)		
50/86	27	60	148	284	502	702	824	774	573	334	132	36	27	87	235	519	1021	1723	2547	3321	3894	4228	4360	4396

(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

- c. Snow Tables
 - 1. Snow Climatology
 - 2. Cooperative Summary of the Day
- d. Freeze Data Table

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

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