

# Climatology of the United States No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

Station: HENNEPIN POWER PLANT, IL

1971-2000

COOP ID: 114013

Climate Division: IL 1

NWS Call Sign:

Elevation: 460 Feet

Lat: 41° 18N

Lon: 89° 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	30.3	13.2	21.8	66	1967	24	33.9	1990	-30	1999	5	8.1	1977	1340	0	.0	.0	1.6	16.2	30.1	7.4
Feb	36.0	18.5	27.3	72+	2000	26	38.6	1998	-21+	1996	4	14.4	1979	1058	0	.0	.0	4.2	10.9	26.0	4.2
Mar	48.3	29.5	38.9	86	1986	30	46.0	1973	-8	1978	5	31.2	1984	808	0	.0	.0	13.2	3.1	21.5	.3
Apr	61.6	39.2	50.4	93	1986	26	56.2	1986	9	1982	7	45.8	1975	442	4	.0	.1	24.9	.2	8.8	.0
May	73.4	49.8	61.6	95+	1977	20	68.7	1977	24	1966	10	56.5	1997	180	75	.0	1.6	30.8	.0	1.1	.0
Jun	82.7	59.4	71.1	104	1988	26	74.9	1971	34	1972	11	67.3	1974	14	196	.1	5.5	30.0	.0	.0	.0
Jul	86.2	63.7	75.0	104+	1991	23	80.1	1983	43+	1972	5	69.8	1992	4	312	.4	9.4	31.0	.0	.0	.0
Aug	84.0	61.8	72.9	104	1988	2	79.4	1995	40+	1986	28	66.7	1992	18	262	.4	6.2	31.0	.0	.0	.0
Sep	77.4	53.2	65.3	99	2000	2	70.9	1978	28	1974	23	60.1	1993	83	91	.0	2.6	30.0	.0	.6	.0
Oct	65.1	41.3	53.2	92	1963	6	59.9	1971	15	1988	30	47.3	1987	374	8	.0	.0	28.6	.0	8.2	.0
Nov	49.0	30.8	39.9	82	2000	2	45.5	1975	-4	1977	26	32.5	1976	753	0	.0	.0	13.8	1.7	20.0	.1
Dec	35.6	19.4	27.5	70+	2001	6	37.2	1982	-25	1983	25	13.7	1983	1163	0	.0	.0	3.5	10.4	28.6	3.9
Ann	60.8	40.0	50.4	104+	Jul 1991	23	80.1	Jul 1983	-30	Jan 1999	5	8.1	Jan 1977	6237	948	.9	25.4	242.6	42.5	144.9	15.9

+ 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](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1962-2001

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

036-A

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**Climate Division: IL 1**

**NWS Call Sign:**

**Elevation: 460 Feet**

**Lat: 41°18N**

**Lon: 89°19W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels 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	1.14	.92	1.92	2001	30	4.05	1974	.00+	1996	6.5	3.3	.8	.2	.00	.00	.34	.54	.73	.94	1.17	1.46	1.82	2.41	2.99
Feb	1.15	1.05	1.44	1989	15	2.82	1975	.00+	1991	5.2	3.5	1.0	.2	.00	.15	.37	.56	.74	.94	1.17	1.44	1.80	2.40	2.97
Mar	2.15	1.76	1.82	1973	7	5.12	1976	.02	1997	7.1	4.6	1.3	.5	.28	.45	.76	1.05	1.37	1.72	2.12	2.62	3.30	4.40	5.47
Apr	3.24	3.24	2.27	1981	14	6.34	1981	.76	1985	8.8	5.9	2.1	.8	1.17	1.48	1.92	2.29	2.64	3.00	3.39	3.85	4.43	5.33	6.15
May	3.62	3.41	3.27	1974	17	9.57	1974	.95	1988	9.6	6.7	2.5	.9	.96	1.30	1.82	2.28	2.74	3.21	3.74	4.37	5.18	6.47	7.67
Jun	4.20	4.01	2.67	1975	14	8.64	1990	1.01	1988	9.3	7.0	3.0	1.1	1.36	1.76	2.35	2.85	3.33	3.83	4.38	5.02	5.84	7.12	8.30
Jul	3.78	3.26	3.42	1982	13	10.90	1982	.08	1991	8.5	6.2	2.3	1.0	.62	.95	1.50	2.02	2.56	3.14	3.80	4.61	5.69	7.45	9.12
Aug	4.32	3.49	5.32	1979	18	11.90	1979	.25	1971	8.6	5.8	2.9	1.2	.62	.98	1.60	2.20	2.83	3.51	4.31	5.28	6.59	8.73	10.79
Sep	3.62	3.23	3.20	1989	6	10.15	1989	.01	1979	8.0	5.6	2.6	1.1	.45	.74	1.25	1.75	2.28	2.88	3.57	4.42	5.57	7.47	9.31
Oct	2.71	2.08	6.07	1995	20	9.92	1995	.23	1987	7.2	4.9	2.0	.7	.46	.69	1.09	1.46	1.84	2.26	2.73	3.31	4.08	5.32	6.51
Nov	2.48	2.12	2.81	1966	9	6.79	1994	.16	1999	6.6	4.8	1.8	.5	.42	.64	1.00	1.34	1.69	2.07	2.50	3.03	3.73	4.86	5.94
Dec	2.04	2.02	3.02	1982	3	5.21	1973	.28	1976	6.8	4.3	1.3	.5	.43	.62	.92	1.19	1.46	1.76	2.08	2.48	3.00	3.83	4.61
Ann	34.45	33.51	6.07	Oct 1995	20	11.90	Aug 1979	.00+	Jan 1996	92.2	62.6	23.6	8.7	24.90	26.76	29.14	30.94	32.53	34.08	35.67	37.42	39.55	42.62	45.28

+ 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: 1962-2001

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

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**COOP ID: 114013**

**Climate Division: IL 1**

**NWS Call Sign:**

**Elevation: 460 Feet**

**Lat: 41°18N**

**Lon: 89°19W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	2.1	.4	3	1	9.0	1979	13	9.0	1979	30	1979	31	20	1979	1.4	.8	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
Feb	2.6	.5	2	#	5.5	1988	11	14.0	1980	30	1979	2	25	1979	1.2	.8	.3	.1	.0	2.3	1.1	.4	.1
Mar	.5	.0	#	#	2.0	1977	20	3.5	1977	9	1998	13	2	1998	.3	.2	.0	.0	.0	.2	.0	.0	.0
Apr	.1	.0	#	0	1.0	2000	8	1.0	2000	#+	1980	15	#+	1980	.1	@	.0	.0	.0	.0	.0	.0	.0
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	.1	.0	0	0	1.2	1972	18	1.2	1972	0	0	0	0	0	.1	.1	.0	.0	.0	.0	.0	.0	.0
Nov	1.2	.0	#	0	7.5	1975	27	7.5	1975	8	1975	27	1	1977	.5	.3	.1	.1	.0	.5	.4	.2	.0
Dec	3.2	3.5	1	#	11.0	1987	16	11.0	1987	8	1978	11	4	1978	1.2	.8	.4	.2	.1	5.1	2.8	.9	.0
Ann	9.8	4.4	N/A	N/A	11.0	Dec 1987	16	14.0	Feb 1980	30+	Feb 1979	2	25	Feb 1979	4.8	3.0	1.0	.5	.1	-9.9	-9.9	-9.9	-9.9

+ 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

Complete documentation available from:

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**Lat: 41° 18N**

**Lon: 89° 19W**

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	5/29	5/24	5/20	5/17	5/14	5/11	5/07	5/04	4/28
32	5/16	5/11	5/07	5/04	5/01	4/29	4/25	4/22	4/17
28	5/01	4/26	4/22	4/19	4/17	4/14	4/11	4/07	4/02
24	4/19	4/15	4/11	4/08	4/05	4/03	3/31	3/27	3/22
20	4/14	4/08	4/04	3/31	3/28	3/24	3/21	3/17	3/11
16	4/02	3/27	3/23	3/19	3/15	3/11	3/07	3/03	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	9/14	9/19	9/22	9/25	9/28	10/01	10/04	10/07	10/12
32	9/20	9/25	9/28	10/02	10/05	10/07	10/11	10/14	10/19
28	10/03	10/08	10/11	10/14	10/17	10/20	10/23	10/26	10/31
24	10/12	10/18	10/22	10/26	10/29	11/01	11/05	11/09	11/14
20	10/28	11/01	11/05	11/07	11/10	11/13	11/16	11/19	11/24
16	11/02	11/08	11/12	11/16	11/19	11/23	11/26	11/30	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	158	150	145	141	137	133	128	123	116
32	179	171	165	160	155	151	146	140	132
28	204	197	191	187	183	179	174	169	162
24	230	222	216	211	206	201	196	190	181
20	249	241	236	231	227	222	218	212	205
16	270	262	257	253	249	244	240	235	228

\* 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

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

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**Elevation: 460 Feet**

**Lat: 41°18N**

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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	1340	1058	808	442	180	14	4	18	83	374	753	1163	6237
60	1185	918	653	304	99	3	0	4	29	242	603	1008	5048
57	1092	834	563	230	63	1	0	0	12	176	514	915	4400
55	1030	778	506	186	45	0	0	0	6	138	457	857	4003
50	877	648	366	97	16	0	0	0	1	66	323	712	3106
32	390	245	59	0	0	0	0	0	0	0	40	276	1010

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	73	111	273	552	918	1171	1331	1267	998	658	278	136	7766
55	0	0	8	48	250	481	618	554	314	82	4	4	2363
57	0	0	3	32	206	422	556	492	261	58	2	0	2032
60	0	0	0	16	149	334	463	403	187	32	0	0	1584
65	0	0	0	4	75	196	312	262	91	8	0	0	948
70	0	0	0	0	29	87	175	148	33	1	0	0	473

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	4	21	114	329	660	914	1056	1001	742	399	113	18	4	25	139	468	1128	2042	3098	4099	4841	5240	5353	5371
45	0	6	61	212	507	764	901	846	592	266	57	6	0	6	67	279	786	1550	2451	3297	3889	4155	4212	4218
50	0	0	31	123	359	614	746	691	446	161	21	1	0	0	31	154	513	1127	1873	2564	3010	3171	3192	3193
55	0	0	11	63	232	465	591	536	307	85	7	0	0	0	11	74	306	771	1362	1898	2205	2290	2297	2297
60	0	0	4	29	129	323	436	384	191	37	0	0	0	0	4	33	162	485	921	1305	1496	1533	1533	1533
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	3	15	79	208	411	599	704	670	476	258	72	10	3	18	97	305	716	1315	2019	2689	3165	3423	3495	3505

(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](http://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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
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## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)