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: WARSAW, IN **COOP ID: 129240**

Climate Division: IN 2 **NWS Call Sign:** **Elevation: 810 Feet** **Lat: 41˚14N** **Lon: 85˚52W**

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	30.7	14.9	22.8	69	1950	26	33.8	1990	-25+	1972	16	5.4	1977	1309	0	.0	.0	1.7	16.9	28.8	4.8
Feb	35.3	18.1	26.7	73	1999	11	37.5	1998	-21+	1963	26	11.2	1978	1073	0	.0	.0	3.3	11.5	24.5	3.1
Mar	46.9	28.1	37.5	82+	1981	31	44.9	1973	-9	1980	2	27.8	1978	854	0	.0	.0	12.1	3.1	20.9	.1
Apr	58.6	37.8	48.2	88	1951	30	54.8	1985	8	1982	7	43.3	1975	507	2	.0	.0	23.9	.2	8.5	.0
May	70.5	48.7	59.6	93+	1953	31	67.5	1977	24	1966	10	52.7	1997	231	63	.0	.3	30.7	.0	.6	.0
Jun	78.9	57.8	68.4	102	1988	25	72.6	1971	32	1956	2	63.6	1972	39	139	@	2.2	30.0	.0	.0	.0
Jul	82.2	62.1	72.2	103	1976	14	76.9	1999	40	1963	10	68.7	1996	10	232	.1	4.5	31.0	.0	.0	.0
Aug	79.6	60.3	70.0	98+	1953	30	76.9	1995	36	1964	14	65.9	1976	30	183	.0	1.9	31.0	.0	.0	.0
Sep	73.4	52.6	63.0	102	1953	3	67.6	1998	28+	1951	29	58.8	1975	104	43	.0	.7	30.0	.0	.2	.0
Oct	61.5	41.5	51.5	90	1953	4	59.0	1971	19+	1962	27	45.2	1988	424	6	.0	.0	28.2	.0	4.8	.0
Nov	47.9	31.8	39.9	85	1950	1	45.2	1975	-4	1950	24	30.1	1976	754	0	.0	.0	14.2	1.6	16.4	.0
Dec	35.3	21.2	28.3	69+	1982	2	37.6	1982	-20+	1983	25	15.9	1989	1139	0	.0	.0	3.6	10.8	26.9	2.1
Ann	58.4	39.6	49.0	103	Jul 1976	14	76.9+	Jul 1999	-25+	Jan 1972	16	5.4	Jan 1977	6474	668	.1	9.6	239.7	44.1	131.6	10.1

\+ 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

Issue Date: February 2004

(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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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	1.85	1.25	1.80	1965	23	6.75	1998	.12	1986
Feb	1.45	1.23	1.86	1949	15	3.41	1985	.02	1987
Mar	2.08	1.87	3.12	1954	25	4.79	1998	.25	1981
Apr	3.36	2.87	4.75	1956	29	8.82	1981	1.17	1971
May	3.83	3.41	2.93	1987	18	9.03	1996	.69	1994
Jun	4.51	3.96	4.87	1994	26	9.25	1981	.38	1988
Jul	3.67	3.18	4.36	1951	9	8.15	1996	.61	1975
Aug	4.05	3.44	3.53	2001	22	8.75	1980	.73	1984
Sep	3.22	3.16	5.67	1958	16	6.56	1972	.00	1979
Oct	3.04	2.42	5.00	1954	10	6.86	1991	1.11	1989
Nov	2.97	3.07	3.87	1966	9	5.84	1982	.47	1999
Dec	2.62	2.60	4.10	1965	25	6.43	1990	.32	1976
Ann	36.65	35.94	5.67	Sep 1958	16	9.25	Jun 1981	.00	Sep 1979

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.9	5.0	1.0	.3
Feb	7.5	4.4	.7	.2
Mar	9.2	5.5	1.2	.3
Apr	11.2	7.6	2.2	.6
May	11.1	7.3	3.0	.8
Jun	10.5	7.5	3.0	1.0
Jul	9.1	6.5	2.3	.9
Aug	9.3	6.6	2.7	.9
Sep	8.4	6.1	2.4	.8
Oct	9.6	6.0	1.9	.7
Nov	10.3	6.3	1.9	.6
Dec	11.4	6.6	1.6	.2
Ann	116.5	75.4	23.9	7.3

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
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.20	.33	.59	.85	1.13	1.44	1.80	2.26	2.88	3.91	4.91
Feb	.19	.30	.51	.71	.92	1.16	1.43	1.77	2.22	2.97	3.69
Mar	.45	.64	.95	1.22	1.50	1.80	2.13	2.53	3.05	3.89	4.68
Apr	1.23	1.54	2.00	2.38	2.74	3.11	3.52	3.98	4.58	5.51	6.35
May	1.06	1.43	1.98	2.46	2.93	3.42	3.96	4.61	5.44	6.76	7.98
Jun	1.19	1.62	2.27	2.85	3.41	4.01	4.67	5.45	6.47	8.07	9.57
Jul	.86	1.20	1.73	2.21	2.69	3.20	3.77	4.44	5.33	6.74	8.07
Aug	1.19	1.58	2.16	2.66	3.14	3.65	4.21	4.87	5.72	7.05	8.29
Sep	.82	1.28	1.81	2.22	2.61	3.00	3.42	3.91	4.54	5.50	6.39
Oct	.94	1.23	1.66	2.03	2.38	2.75	3.16	3.64	4.25	5.21	6.10
Nov	.85	1.13	1.55	1.92	2.28	2.66	3.08	3.57	4.21	5.21	6.14
Dec	.79	1.04	1.41	1.73	2.04	2.37	2.72	3.14	3.68	4.53	5.31
Ann	25.56	27.69	30.43	32.51	34.37	36.17	38.03	40.08	42.59	46.22	49.37

\+ 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	4.7	-99.9	2	1
Feb	.4	.3	#	#
Mar	.6	.0	#	0
Apr	.3	.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
Nov	.1	#	#	0
Dec	2.2	-99.9	1	#
Ann	8.3	-9.9	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	18.6	1984	2	18.6	1984	11	1999	8	5	1981
Feb	1.8	1994	8	1.8	1994	6	2000	2	1+	2000
Mar	4.0	1993	10	4.4	1991	4	1999	8	#+	1999
Apr	4.3	1994	6	4.3	1994	4	1994	6	#	1994
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	#	1993	31	#+	1993	0	0	0	0	0
Nov	.8	1991	24	.8	1991	2	1996	28	#+	2000
Dec	3.5	1989	19	11.1	1989	10	2000	18	5	2000
Ann	18.6	Jan 1984	2	18.6	Jan 1984	11	Jan 1999	8	5+	Dec 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.9	1.9	.9	.1	.0
Feb	1.6	.6	.0	.0	.0
Mar	.5	.3	.2	.0	.0
Apr	.1	.1	.1	.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	.1	.0	.0	.0	.0
Dec	2.5	1.3	.4	.0	.0
Ann	7.7	4.2	1.6	.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	.1	.1	.0	.0
Apr	@	@	.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	.0	.0	.0	.0
Dec	2.8	1.9	.7	.0
Ann	-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

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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	5/30	5/23	5/17	5/13	5/09	5/05	4/30	4/25	4/18
32	5/10	5/05	5/01	4/28	4/26	4/23	4/20	4/16	4/11
28	5/01	4/25	4/22	4/18	4/16	4/13	4/09	4/06	4/01
24	4/20	4/16	4/12	4/10	4/07	4/04	4/02	3/29	3/25
20	4/10	4/04	3/31	3/27	3/24	3/21	3/17	3/13	3/07
16	4/01	3/25	3/20	3/16	3/12	3/08	3/04	2/27	2/20

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	9/19	9/24	9/27	9/29	10/02	10/04	10/07	10/10	10/14
32	9/24	9/30	10/04	10/07	10/10	10/13	10/16	10/20	10/26
28	10/09	10/15	10/19	10/22	10/25	10/28	11/01	11/05	11/10
24	10/24	10/29	11/02	11/05	11/08	11/10	11/13	11/17	11/22
20	10/30	11/06	11/11	11/16	11/20	11/24	11/28	12/04	12/11
16	11/12	11/19	11/24	11/28	12/02	12/05	12/10	12/14	12/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	169	161	155	150	145	140	135	129	121
32	186	180	175	171	167	163	159	154	147
28	218	209	202	197	192	187	181	175	166
24	233	227	222	218	214	210	206	201	194
20	270	260	253	246	240	234	228	221	210
16	292	283	276	270	264	258	252	245	236

***** 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	1309	1073	854	507	231	39	10	30	104	424	754	1139	6474
60	1154	933	699	363	139	10	0	7	35	287	604	984	5215
57	1061	849	606	283	96	4	0	0	14	216	516	891	4536
55	999	793	550	233	72	2	0	0	7	175	459	829	4119
50	853	662	407	129	31	0	0	0	1	94	325	686	3188
32	371	254	73	1	0	0	0	0	0	1	38	249	987

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	86	105	242	486	856	1090	1245	1177	930	606	273	133	7229
55	0	0	7	28	215	402	532	464	247	67	5	0	1967
57	0	0	0	18	176	344	470	402	194	46	2	0	1652
60	0	0	0	8	127	260	377	316	124	24	0	0	1236
65	0	0	0	2	63	139	232	183	43	6	0	0	668
70	0	0	0	0	25	55	114	90	8	0	0	0	292

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	9	18	110	298	633	880	1024	963	722	402	136	26	9	27	137	435	1068	1948	2972	3935	4657	5059	5195	5221
45	1	6	59	186	479	730	869	808	572	265	72	8	1	7	66	252	731	1461	2330	3138	3710	3975	4047	4055
50	0	0	28	103	335	580	714	653	422	151	33	4	0	0	28	131	466	1046	1760	2413	2835	2986	3019	3023
55	0	0	11	55	208	432	559	499	285	78	13	0	0	0	11	66	274	706	1265	1764	2049	2127	2140	2140
60	0	0	1	21	112	289	404	347	173	31	2	0	0	0	1	22	134	423	827	1174	1347	1378	1380	1380
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	14	70	175	385	579	695	651	454	231	73	11	0	14	84	259	644	1223	1918	2569	3023	3254	3327	3338

(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