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: GREENCASTLE 5 E, IN **COOP ID: 123513**

Climate Division: IN 4 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 39˚38N** **Lon: 86˚47W**

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	34.0	17.7	25.9	71	1950	26	36.8	1990	-23+	1985	20	11.2	1977	1214	0	.0	.0	3.6	14.1	27.7	3.9
Feb	39.9	22.0	31.0	74	2000	26	40.2	1998	-20	1951	2	18.0	1978	953	0	.0	.0	6.5	8.4	22.6	2.2
Mar	50.9	31.5	41.2	84	1986	31	49.5	1973	-3+	1960	1	29.2	1984	738	0	.0	.0	16.1	2.5	17.8	.1
Apr	62.9	41.7	52.3	90	1977	19	58.4	1977	16	1982	7	48.1+	1997	386	5	.0	@	26.0	.0	5.5	.0
May	73.8	52.2	63.0	94+	1977	20	71.2	1977	28	1966	10	57.3	1997	157	94	.0	.9	30.9	.0	.3	.0
Jun	82.4	61.4	71.9	105	1954	27	75.9	1971	37	1992	22	67.3	1982	13	221	.1	5.0	30.0	.0	.0	.0
Jul	86.0	64.9	75.5	107	1954	15	79.7	1983	43	2001	6	70.6	2000	1	325	.3	9.5	31.0	.0	.0	.0
Aug	84.3	63.2	73.8	102+	1955	29	80.1	1983	40	1965	29	69.1	1992	10	280	.1	6.5	31.0	.0	.0	.0
Sep	78.1	55.8	67.0	106	1954	6	71.4	1978	32+	1951	29	61.9	1993	64	122	.0	2.6	30.0	.0	.1	.0
Oct	65.9	44.3	55.1	93	1953	4	63.4	1971	19	1952	21	48.2+	1988	325	19	.0	.1	29.1	.0	3.2	.0
Nov	51.6	34.2	42.9	85	1950	1	49.6	1990	-6	1950	25	35.0	1976	663	0	.0	.0	16.5	1.2	14.7	.0
Dec	38.9	23.1	31.0	74	1982	3	40.3	1982	-21+	1989	22	17.4	2000	1055	0	.0	.0	5.7	8.4	25.2	1.9
Ann	62.4	42.7	52.6	107	Jul 1954	15	80.1	Aug 1983	-23+	Jan 1985	20	11.2	Jan 1977	5579	1066	.5	24.6	256.4	34.6	117.1	8.1

\+ 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

(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	2.40	2.07	4.56	1950	4	5.41	1999	.22	1986
Feb	2.52	2.17	3.10	1997	27	6.21	1971	.45	1978
Mar	3.62	3.76	2.41	1963	5	6.36	1973	1.10	1994
Apr	3.82	3.74	2.55	1996	29	7.26	1996	.92	1971
May	4.75	4.68	3.95	1968	24	10.81	1981	.90	1988
Jun	4.32	4.43	6.50	1952	22	10.54	1998	.05	1988
Jul	5.14	4.34	4.63	1962	14	11.80	1979	.59	1974
Aug	4.22	3.49	3.76	1993	17	11.22	1979	.83	1999
Sep	3.25	2.70	6.35	1950	1	9.14	1989	.43	1979
Oct	3.12	2.64	4.30	1991	26	9.39	1986	.70	1992
Nov	3.96	3.55	2.80	1972	2	10.77	1985	.56	1999
Dec	3.08	2.80	2.85	1990	30	7.92	1990	.26	1976
Ann	44.20	44.65	6.50	Jun 1952	22	11.80	Jul 1979	.05	Jun 1988

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.5	6.1	1.5	.3
Feb	8.7	5.5	1.7	.4
Mar	11.0	7.2	2.6	.9
Apr	11.3	7.8	2.7	.7
May	10.9	8.4	3.8	1.4
Jun	10.0	7.8	3.3	1.0
Jul	9.4	7.2	3.4	1.7
Aug	8.7	6.2	3.1	1.3
Sep	7.1	5.0	2.4	1.0
Oct	8.2	5.3	1.8	.8
Nov	10.1	6.8	2.7	1.2
Dec	11.3	6.5	2.1	.6
Ann	117.2	79.8	31.1	11.3

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	.48	.70	1.05	1.37	1.70	2.05	2.44	2.91	3.54	4.55	5.50
Feb	.57	.80	1.17	1.50	1.84	2.19	2.58	3.06	3.68	4.66	5.60
Mar	1.35	1.69	2.18	2.58	2.97	3.36	3.79	4.28	4.91	5.89	6.77
Apr	1.40	1.76	2.28	2.71	3.12	3.54	4.00	4.53	5.20	6.25	7.20
May	1.49	1.95	2.62	3.19	3.74	4.32	4.95	5.68	6.64	8.12	9.49
Jun	.83	1.22	1.85	2.44	3.03	3.67	4.39	5.26	6.42	8.27	10.03
Jul	1.26	1.74	2.49	3.16	3.82	4.52	5.30	6.23	7.44	9.36	11.16
Aug	.85	1.24	1.86	2.42	2.99	3.61	4.30	5.13	6.23	8.00	9.67
Sep	.61	.91	1.38	1.82	2.27	2.75	3.30	3.96	4.84	6.25	7.59
Oct	.86	1.15	1.60	2.00	2.38	2.78	3.23	3.75	4.44	5.52	6.52
Nov	.84	1.20	1.78	2.31	2.84	3.41	4.05	4.81	5.83	7.45	8.98
Dec	.66	.94	1.39	1.80	2.22	2.66	3.15	3.75	4.53	5.79	6.97
Ann	33.51	35.63	38.32	40.34	42.13	43.84	45.60	47.54	49.87	53.23	56.11

\+ 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	9.6	6.8	2	1
Feb	5.8	5.6	2	1
Mar	3.6	1.9	#	#
Apr	.5	.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	.2	.0	#	0
Nov	1.5	.4	#	#
Dec	4.8	3.6	1	#
Ann	26.0	18.3	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	10.0	1987	10	26.6	1978	19	1978	28	8	1978
Feb	9.0	1984	28	13.2	1985	15	1982	10	11	1978
Mar	15.4	1996	20	17.1	1996	13	1978	9	5	1978
Apr	3.0	1980	15	3.0	1980	2	1977	6	#+	1999
May	#	1989	7	#	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	2.1	1993	30	3.0	1989	2+	1993	30	#+	1993
Nov	6.0	1997	14	9.4	1997	5	1997	16	1	1997
Dec	10.5	1973	20	14.1	1977	14	1973	21	3+	2000
Ann	15.4	Mar 1996	20	26.6	Jan 1978	19	Jan 1978	28	11	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.4	3.1	.8	.5	@
Feb	4.6	2.6	.6	.3	.0
Mar	2.5	1.1	.4	.1	@
Apr	.5	.2	@	.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	.1	.1	.0	.0	.0
Nov	1.4	.5	.1	@	.0
Dec	4.8	2.0	.5	.3	.1
Ann	20.3	9.6	2.4	1.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	9.6	5.2	3.3	.8
Feb	8.4	5.1	3.6	1.6
Mar	2.3	1.3	.8	.2
Apr	.2	.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	.1	.0	.0	.0
Nov	.7	.2	.1	.0
Dec	5.7	3.0	1.5	.3
Ann	27.0	14.8	9.3	2.9

+ 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	5/14	5/09	5/06	5/04	5/01	4/29	4/26	4/23	4/18
32	5/05	4/29	4/26	4/23	4/20	4/17	4/14	4/10	4/05
28	4/17	4/13	4/11	4/09	4/07	4/05	4/03	4/01	3/28
24	4/13	4/08	4/05	4/02	3/30	3/27	3/24	3/21	3/16
20	4/02	3/28	3/24	3/21	3/18	3/15	3/12	3/09	3/04
16	3/25	3/19	3/15	3/11	3/07	3/04	2/28	2/23	2/17

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	9/29	10/02	10/05	10/07	10/10	10/13	10/16	10/20
32	10/05	10/10	10/14	10/17	10/20	10/23	10/26	10/30	11/05
28	10/14	10/20	10/24	10/27	10/31	11/03	11/06	11/10	11/16
24	10/28	11/01	11/04	11/07	11/09	11/12	11/15	11/18	11/22
20	11/04	11/10	11/14	11/18	11/22	11/25	11/29	12/03	12/09
16	11/15	11/21	11/26	11/30	12/03	12/07	12/11	12/15	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	175	169	165	162	159	155	152	148	142
32	206	198	192	187	183	178	173	167	159
28	224	218	213	209	206	202	198	194	188
24	240	235	231	227	224	220	217	213	207
20	269	261	256	252	248	243	239	234	226
16	296	287	281	275	270	265	260	253	245

***** 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	1214	953	738	386	157	13	1	10	64	325	663	1055	5579
60	1059	813	589	253	83	3	0	1	21	206	515	900	4443
57	966	729	503	185	51	1	0	0	9	147	432	810	3833
55	904	675	446	146	35	0	0	0	5	114	377	753	3455
50	758	544	318	70	12	0	0	0	1	54	253	609	2619
32	295	168	48	0	0	0	0	0	0	0	23	206	740

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	103	139	333	610	960	1197	1347	1293	1047	717	351	174	8271
55	0	2	18	65	282	508	634	580	362	118	14	8	2591
57	0	0	13	45	236	448	572	518	306	89	9	3	2239
60	0	0	6	23	175	360	479	426	229	54	2	0	1754
65	0	0	0	5	94	221	325	280	122	19	0	0	1066
70	0	0	0	1	41	108	184	156	50	5	0	0	545

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	22	49	166	387	719	962	1106	1049	812	479	185	39	22	71	237	624	1343	2305	3411	4460	5272	5751	5936	5975
45	6	21	99	262	566	812	951	894	662	340	108	19	6	27	126	388	954	1766	2717	3611	4273	4613	4721	4740
50	1	7	54	164	416	662	796	739	514	217	61	3	1	8	62	226	642	1304	2100	2839	3353	3570	3631	3634
55	0	0	27	88	276	513	641	584	371	121	25	0	0	0	27	115	391	904	1545	2129	2500	2621	2646	2646
60	0	0	8	44	163	367	486	429	243	59	6	0	0	0	8	52	215	582	1068	1497	1740	1799	1805	1805
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	7	31	104	230	444	647	757	718	525	284	103	21	7	38	142	372	816	1463	2220	2938	3463	3747	3850	3871

(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