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: BLOOMINGTON INDIANA UNIV, IN **COOP ID: 120784**

Climate Division: IN 8 **NWS Call Sign:** **Elevation: 830 Feet** **Lat: 39˚10N** **Lon: 86˚31W**

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	36.5	19.3	27.9	78+	1950	25	38.4	1990	-21	1985	21	11.9	1977	1151	0	.0	.0	4.9	11.6	27.2	2.7
Feb	42.0	22.8	32.4	76+	1932	10	40.9	1998	-15	1912	4	18.9	1978	913	0	.0	.0	8.2	7.0	21.9	1.5
Mar	52.4	31.6	42.0	86+	1910	23	49.6	1973	-2+	1943	3	34.0	1984	713	0	.0	.0	17.8	1.9	16.8	.1
Apr	64.0	41.4	52.7	91	1925	24	58.4	1985	17	1923	1	47.3	1983	375	5	.0	.0	26.7	.0	5.0	.0
May	73.9	51.5	62.7	97+	1911	28	69.5	1977	29+	1908	1	57.5	1997	161	90	.0	.4	30.8	.0	@	.0
Jun	82.0	60.6	71.3	103+	1913	28	75.3	1994	36	1910	3	66.7	1982	18	206	@	3.6	30.0	.0	.0	.0
Jul	86.0	64.7	75.4	110+	1936	14	79.5	1999	46	1911	26	72.1	1984	0	321	.2	8.2	31.0	.0	.0	.0
Aug	84.5	62.5	73.5	104+	1930	7	79.5	1995	41	1915	31	68.8	1992	10	274	@	5.9	31.0	.0	.0	.0
Sep	78.1	54.8	66.5	103	1922	6	71.4	1998	31+	1928	26	61.5	1974	60	102	.0	2.1	30.0	.0	.0	.0
Oct	66.8	43.5	55.2	96	1954	4	63.7	1971	17	1925	29	48.3	1987	325	19	.0	.1	29.6	.0	2.7	.0
Nov	53.5	34.9	44.2	84	1950	1	50.0	1999	-2	1958	30	36.4	1976	624	0	.0	.0	18.1	.8	13.1	.0
Dec	41.3	24.3	32.8	74	1982	3	41.6	1982	-20+	1989	22	19.9	1989	998	0	.0	.0	8.1	7.0	23.6	1.3
Ann	63.4	42.7	53.1	110+	Jul 1936	14	79.5+	Jul 1999	-21	Jan 1985	21	11.9	Jan 1977	5348	1017	.2	20.3	266.2	28.3	110.3	5.6

+ 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: 1901-2001

(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	2.66	2.14	3.38	1937	21	6.17	1982	.04	1986
Feb	2.71	2.59	2.61	1908	15	6.06	1999	.32	1978
Mar	3.66	3.29	6.56	1913	25	7.78	1973	1.20	1994
Apr	4.29	3.81	3.65	1996	29	10.20	1996	1.17	1971
May	5.12	4.30	3.30	1908	4	10.66	1996	.89	1988
Jun	4.07	3.73	4.85	1960	23	10.32	1998	.61	1988
Jul	4.32	3.89	5.50	1979	13	11.79	1979	1.45	1974
Aug	3.99	4.02	4.97	1925	13	8.21	1993	.97+	1998
Sep	3.62	2.68	4.00	1993	3	10.20	1993	.47	1978
Oct	3.14	2.76	4.15	2000	5	7.77	1993	.67	1997
Nov	3.95	3.59	3.16	1936	3	8.80	1985	1.42	1976
Dec	3.38	3.21	2.56	1932	31	7.44	1990	.36	1976
Ann	44.91	43.70	6.56	Mar 1913	25	11.79	Jul 1979	.04	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.9	6.3	1.7	.5
Feb	8.3	5.5	2.1	.6
Mar	10.6	7.1	2.6	.7
Apr	12.0	8.3	2.9	1.0
May	10.9	8.3	3.5	1.6
Jun	9.9	7.2	3.2	1.1
Jul	9.2	6.9	2.8	1.3
Aug	8.5	6.4	2.5	1.4
Sep	7.6	5.6	2.3	1.1
Oct	7.6	5.3	2.0	.8
Nov	10.3	7.0	2.8	1.1
Dec	9.7	6.5	2.5	.9
Ann	114.5	80.4	30.9	12.1

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	.41	.64	1.02	1.39	1.77	2.19	2.67	3.25	4.03	5.31	6.53
Feb	.66	.91	1.31	1.66	2.01	2.38	2.79	3.28	3.92	4.94	5.89
Mar	1.30	1.64	2.14	2.56	2.96	3.37	3.82	4.34	5.01	6.04	6.99
Apr	1.51	1.91	2.50	3.00	3.47	3.95	4.48	5.10	5.89	7.11	8.23
May	1.67	2.16	2.87	3.48	4.07	4.67	5.33	6.11	7.11	8.66	10.09
Jun	1.07	1.45	2.04	2.56	3.07	3.61	4.20	4.91	5.83	7.28	8.64
Jul	1.27	1.68	2.29	2.83	3.35	3.89	4.48	5.18	6.09	7.51	8.83
Aug	.92	1.29	1.87	2.40	2.92	3.47	4.09	4.84	5.81	7.36	8.81
Sep	.57	.88	1.40	1.90	2.42	2.98	3.63	4.42	5.47	7.19	8.83
Oct	.93	1.23	1.68	2.06	2.44	2.83	3.26	3.77	4.43	5.46	6.41
Nov	1.46	1.83	2.36	2.81	3.23	3.66	4.13	4.68	5.38	6.45	7.43
Dec	.98	1.31	1.79	2.21	2.61	3.04	3.51	4.06	4.77	5.89	6.93
Ann	31.66	34.22	37.49	39.98	42.20	44.34	46.55	49.00	51.97	56.29	60.02

\+ 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: 1901-2001
(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	4.9	2.4	1	#	9.3	1994	17	20.5	1996	13	1996	8	5	1996	2.7	1.4	.4	.2	.0	4.8	2.4	2.1	.5
Feb	2.6	1.1	#	#	6.3	1993	26	13.7	1993	6	1993	27	6	1974	1.5	.6	.1	.1	.0	1.7	.7	.4	.0
Mar	.7	.0	#	0	5.0	1990	24	5.0	1990	14	1996	21	2	1996	.4	.3	.1	.1	.0	.2	.1	.1	.0
Apr	.1	.0	#	0	.8	1992	2	.8	1992	1	1992	2	#+	1996	.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	.2	.0	#	0	2.5	1989	19	2.5	1989	2	1993	30	#+	1993	.1	.1	.0	.0	.0	.1	.0	.0	.0
Nov	.1	.0	#	0	.5	1997	17	1.0	1997	#+	1997	16	#+	1997	.2	.0	.0	.0	.0	.0	.0	.0	.0
Dec	1.0	.0	#	0	7.0	2000	14	7.0	2000	6	1996	21	2+	2000	1.8	.9	.2	.2	.0	1.6	.4	.3	.0
Ann	9.6	3.5	N/A	N/A	9.3	Jan 1994	17	20.5	Jan 1996	14	Mar 1996	21	6	Feb 1974	6.8	3.3	.8	.6	.0	8.4	3.6	2.9	.5

+ 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	5/10	5/06	5/02	4/29	4/27	4/24	4/21	4/18	4/13
32	4/27	4/22	4/19	4/17	4/14	4/12	4/09	4/06	4/02
28	4/16	4/12	4/09	4/06	4/04	4/02	3/30	3/27	3/23
24	4/09	4/03	3/30	3/27	3/24	3/21	3/17	3/13	3/08
20	3/31	3/26	3/22	3/19	3/16	3/13	3/09	3/05	2/28
16	3/18	3/12	3/07	3/03	2/28	2/24	2/20	2/15	2/09

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	9/29	10/04	10/07	10/10	10/12	10/15	10/18	10/21	10/26
32	10/09	10/14	10/18	10/21	10/24	10/26	10/30	11/02	11/07
28	10/18	10/23	10/27	10/31	11/03	11/06	11/09	11/13	11/19
24	11/01	11/06	11/10	11/14	11/17	11/20	11/24	11/28	12/03
20	11/10	11/16	11/21	11/25	11/28	12/02	12/05	12/10	12/16
16	11/24	11/30	12/04	12/07	12/11	12/14	12/18	12/22	12/28

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	187	180	176	172	168	164	160	156	149
32	210	204	199	195	191	188	184	179	173
28	231	225	220	216	212	208	204	199	193
24	255	249	245	241	237	234	230	226	219
20	280	272	266	261	257	252	247	242	234
16	311	302	296	291	285	280	275	268	260

***** 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	1151	913	713	375	161	18	0	10	60	325	624	998	5348
60	996	773	562	242	84	4	0	0	18	206	477	843	4205
57	903	690	476	174	52	1	0	0	7	148	394	756	3601
55	841	638	419	134	35	0	0	0	3	116	340	699	3225
50	698	508	291	60	12	0	0	0	0	55	221	556	2401
32	259	150	36	0	0	0	0	0	0	0	15	174	634

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	132	161	346	620	952	1179	1343	1287	1032	718	380	199	8349
55	1	5	16	64	274	489	630	574	346	120	16	11	2546
57	0	1	11	43	228	430	568	512	289	91	10	7	2190
60	0	0	4	22	168	343	475	419	210	55	3	0	1699
65	0	0	0	5	90	206	321	274	102	19	0	0	1017
70	0	0	0	1	38	99	177	150	35	5	0	0	505

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	35	62	183	408	727	966	1127	1069	817	498	210	60	35	97	280	688	1415	2381	3508	4577	5394	5892	6102	6162
45	9	29	107	280	573	816	972	914	667	352	126	26	9	38	145	425	998	1814	2786	3700	4367	4719	4845	4871
50	3	8	62	174	424	666	817	759	518	228	68	10	3	11	73	247	671	1337	2154	2913	3431	3659	3727	3737
55	0	1	30	95	284	516	662	604	372	127	31	2	0	1	31	126	410	926	1588	2192	2564	2691	2722	2724
60	0	0	10	46	166	369	507	449	243	58	8	0	0	0	10	56	222	591	1098	1547	1790	1848	1856	1856
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	18	41	114	242	454	653	778	734	526	298	116	35	18	59	173	415	869	1522	2300	3034	3560	3858	3974	4009

(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