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: MADISON SEWAGE PLANT, IN **COOP ID: 125237**

Climate Division: IN 9 **NWS Call Sign:** **Elevation: 460 Feet** **Lat: 38˚44N** **Lon: 85˚24W**

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	38.7	22.6	30.7	75	1950	26	40.0	1990	-17	1994	19	15.5	1977	1064	0	.0	.0	6.8	7.8	24.7	1.2
Feb	44.2	25.5	34.9	76+	2000	25	42.7	1976	-12	1951	2	22.0	1978	844	0	.0	.0	10.9	4.2	20.1	.3
Mar	55.0	34.0	44.5	84+	1981	31	52.3	1973	-2	1980	2	36.7	1984	637	0	.0	.0	21.5	.5	14.3	@
Apr	65.2	42.7	54.0	93	1957	22	59.5	1981	19+	1982	7	49.9	1997	336	4	.0	.1	28.1	.0	3.6	.0
May	74.6	52.7	63.7	97	1953	27	70.2	1991	27	1963	1	58.0	1997	134	92	.0	.4	30.9	.0	.1	.0
Jun	82.6	61.5	72.1	103+	1954	27	75.0	1991	37	1966	1	68.1	1972	9	220	.1	4.5	30.0	.0	.0	.0
Jul	86.5	66.4	76.5	108	1954	15	80.2	1983	48	1972	6	73.3	1984	0	354	.3	10.6	31.0	.0	.0	.0
Aug	85.1	64.7	74.9	104	1988	17	81.0	1983	43	1986	29	70.4	1992	4	311	.2	7.7	31.0	.0	.0	.0
Sep	78.5	57.4	68.0	108	1953	3	73.0	1998	33+	1995	23	63.4	1974	44	133	.0	2.8	30.0	.0	.0	.0
Oct	67.4	45.4	56.4	96	1953	1	63.8	1971	23+	1952	21	49.8	1987	287	21	.0	@	30.5	.0	1.5	.0
Nov	54.6	36.1	45.4	88	1950	1	50.9	1999	0	1950	25	38.1	1976	589	0	.0	.0	20.3	.3	10.8	.0
Dec	43.8	27.3	35.6	77	1982	2	45.0	1982	-18	1989	22	22.8	1989	912	0	.0	.0	10.5	4.6	20.7	.4
Ann	64.7	44.7	54.7	108+	Jul 1954	15	81.0	Aug 1983	-18	Dec 1989	22	15.5	Jan 1977	4860	1135	.6	26.1	281.5	17.4	95.8	1.9

\+ 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

(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

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	3.13	2.67	4.00	2000	3	8.21	1982	.52	1981
Feb	2.96	2.80	2.60	2000	18	7.82	1990	.22	1978
Mar	4.26	3.93	3.10	1997	1	7.80	1997	1.78	1981
Apr	4.28	4.10	2.58	1950	3	8.22	1994	.88	1976
May	4.96	4.72	3.40	1956	28	11.63	1995	1.31	1987
Jun	4.36	4.59	4.00	1960	23	9.00	1997	.34	1988
Jul	4.39	4.48	3.65	1984	4	7.93	1978	.94	1983
Aug	4.10	4.25	4.97	1992	8	7.82	1977	1.00	1973
Sep	2.92	2.75	2.59	1979	14	7.93	1979	.24	1998
Oct	3.20	2.81	3.88	1955	7	12.30	1983	.83	1987
Nov	3.84	3.78	2.70	1993	14	7.39	1985	.94	1976
Dec	3.69	3.73	3.17	1948	15	7.93	1990	.50	1976
Ann	46.09	47.19	4.97	Aug 1992	8	12.30	Oct 1983	.22	Feb 1978

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.5	6.3	1.8	.6
Feb	9.2	5.8	1.7	.8
Mar	11.5	7.9	2.9	1.0
Apr	12.3	8.8	2.9	.9
May	13.1	9.2	3.5	1.4
Jun	10.6	7.7	3.2	1.2
Jul	9.7	6.7	3.2	1.3
Aug	8.4	6.1	2.7	1.4
Sep	7.3	5.2	1.9	.8
Oct	8.2	5.4	2.2	.8
Nov	11.1	7.3	2.9	.9
Dec	11.4	6.5	2.4	.9
Ann	123.3	82.9	31.3	12.0

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	.88	1.18	1.63	2.02	2.40	2.80	3.24	3.77	4.45	5.51	6.50
Feb	.67	.94	1.38	1.77	2.16	2.57	3.03	3.59	4.32	5.48	6.58
Mar	1.69	2.09	2.64	3.10	3.54	3.98	4.46	5.02	5.72	6.80	7.78
Apr	1.59	1.99	2.57	3.05	3.50	3.97	4.48	5.07	5.82	6.98	8.04
May	1.70	2.17	2.85	3.43	3.99	4.56	5.18	5.91	6.84	8.28	9.61
Jun	1.36	1.78	2.39	2.92	3.43	3.96	4.54	5.22	6.10	7.47	8.74
Jul	1.45	1.87	2.48	3.00	3.50	4.01	4.58	5.24	6.09	7.41	8.62
Aug	1.23	1.62	2.21	2.71	3.20	3.70	4.26	4.92	5.77	7.09	8.33
Sep	.55	.81	1.23	1.63	2.03	2.47	2.96	3.56	4.35	5.62	6.83
Oct	.94	1.24	1.70	2.09	2.48	2.88	3.32	3.84	4.51	5.56	6.53
Nov	1.10	1.47	2.02	2.49	2.96	3.44	3.98	4.61	5.43	6.72	7.91
Dec	1.10	1.45	1.98	2.43	2.87	3.33	3.83	4.42	5.19	6.39	7.50
Ann	33.95	36.33	39.37	41.66	43.69	45.64	47.66	49.87	52.55	56.43	59.76

\+ 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)

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	2.1	1	#	8.0	1994	17	25.6	1977	14	1978	21	6	1978	3.4	2.5	.8	.2	.0	5.4	3.3	2.0	.4
Feb	3.3	.7	1	#	8.0	1993	25	16.0	1998	16	1998	6	2	1998	1.8	1.3	.5	.2	.0	5.6	2.2	.8	.2
Mar	3.0	1.0	#	#	7.0	1980	1	11.2	1978	8	1999	14	1+	1999	.7	.6	.3	.2	.0	.9	.4	.2	.0
Apr	.1	.0	#	0	1.0	1982	6	1.0	1982	#+	1997	17	#+	1997	.1	@	.0	.0	.0	.0	.0	.0	.0
May	#	.0	0	0	#	1989	6	#	1989	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	4.0	1993	30	4.0	1993	4	1993	30	#	1993	@	@	@	.0	.0	.1	@	.0	.0
Nov	.1	.0	#	0	2.0	1977	27	2.0	1977	#+	2000	29	#+	2000	.1	@	.0	.0	.0	.0	.0	.0	.0
Dec	2.1	.5	#	#	10.0	1990	27	10.0	1990	10	1990	27	1+	2000	1.5	1.1	.3	.1	@	1.4	.3	.1	.1
Ann	13.6	4.3	N/A	N/A	10.0	Dec 1990	27	25.6	Jan 1977	16	Feb 1998	6	6	Jan 1978	7.6	5.5	1.9	.7	@	13.4	6.2	3.1	.7

+ 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	5/14	5/09	5/05	5/02	4/29	4/26	4/23	4/19	4/14
32	5/02	4/26	4/22	4/19	4/16	4/13	4/09	4/05	3/31
28	4/14	4/09	4/07	4/04	4/02	3/30	3/28	3/25	3/21
24	4/05	3/31	3/28	3/24	3/21	3/18	3/15	3/11	3/06
20	3/29	3/22	3/17	3/13	3/09	3/05	2/28	2/23	2/16
16	3/12	3/06	3/02	2/26	2/23	2/19	2/15	2/11	2/05

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	9/28	10/03	10/06	10/09	10/12	10/15	10/18	10/21	10/26
32	10/13	10/18	10/22	10/25	10/28	10/31	11/03	11/06	11/11
28	10/21	10/27	10/31	11/03	11/07	11/10	11/13	11/17	11/23
24	11/01	11/08	11/13	11/17	11/21	11/25	11/29	12/04	12/11
20	11/14	11/20	11/25	11/29	12/03	12/07	12/11	12/16	12/22
16	11/29	12/04	12/08	12/12	12/15	12/18	12/22	12/26	1/01

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	184	177	173	169	165	162	158	153	147
32	216	209	203	199	194	190	185	180	173
28	239	232	227	222	218	214	209	204	197
24	270	261	254	249	244	239	233	227	218
20	294	285	279	274	269	264	258	252	243
16	319	311	305	300	295	290	285	279	270

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1064	844	637	336	134	9	0	4	44	287	589	912	4860
60	909	704	487	203	63	1	0	0	11	173	442	757	3750
57	817	621	402	137	35	0	0	0	4	118	359	673	3166
55	763	568	347	100	23	0	0	0	2	89	306	614	2812
50	617	439	227	36	6	0	0	0	0	37	189	473	2024
32	210	103	17	0	0	0	0	0	0	0	8	121	459

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	169	183	404	658	981	1201	1377	1330	1079	757	409	232	8780
55	9	4	20	68	291	511	664	617	390	133	16	12	2735
57	1	1	13	45	241	451	602	555	333	101	10	9	2362
60	0	0	6	21	176	362	509	462	250	62	3	0	1851
65	0	0	0	4	92	220	354	311	133	21	0	0	1135
70	0	0	0	0	37	101	207	176	53	5	0	0	579

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	44	81	236	463	767	993	1151	1108	869	550	237	80	44	125	361	824	1591	2584	3735	4843	5712	6262	6499	6579
45	18	38	141	328	612	843	996	953	719	398	140	38	18	56	197	525	1137	1980	2976	3929	4648	5046	5186	5224
50	4	14	75	206	459	693	841	798	569	263	75	17	4	18	93	299	758	1451	2292	3090	3659	3922	3997	4014
55	0	2	37	112	313	543	686	643	423	149	33	4	0	2	39	151	464	1007	1693	2336	2759	2908	2941	2945
60	0	0	9	51	185	394	531	488	286	69	9	0	0	0	9	60	245	639	1170	1658	1944	2013	2022	2022
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	26	57	147	282	485	675	798	764	571	334	135	43	26	83	230	512	997	1672	2470	3234	3805	4139	4274	4317

(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