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: BERGLAND DAM, MI **COOP ID: 200718**

Climate Division: MI 1 **NWS Call Sign:** **Elevation: 1,300 Feet** **Lat: 46˚35N** **Lon: 89˚33W**

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	20.0	-.2	9.9	53	1981	26	20.0	1990	-38+	1950	30	-.8	1977	1710	0	.0	.0	@	26.9	31.0	15.9
Feb	25.6	1.4	13.5	59	1961	22	29.2	1998	-40+	1979	17	3.8	1979	1442	0	.0	.0	.6	20.0	28.1	13.5
Mar	35.8	10.8	23.3	70	2000	9	32.5	1973	-37	1962	1	15.1	1996	1292	0	.0	.0	4.2	11.6	29.8	8.2
Apr	49.6	25.3	37.5	89+	1952	28	43.4	1986	-11+	1954	4	30.1	1996	827	0	.0	.0	13.8	2.2	25.2	1.0
May	64.7	37.8	51.3	93+	1962	16	57.5	1977	15	1996	2	44.3	1997	442	15	.0	.2	27.0	.1	11.3	.0
Jun	73.1	48.1	60.6	98	1971	28	65.7	1995	27+	1949	8	55.2	1982	166	34	.0	.4	29.8	.0	1.0	.0
Jul	77.5	52.6	65.1	97+	1975	31	69.8	1983	32+	1968	10	58.7	1992	79	81	.0	1.5	31.0	.0	@	.0
Aug	75.7	50.3	63.0	99	1949	7	68.0	1983	30	1950	26	57.4	1977	120	57	.0	.7	31.0	.0	.2	.0
Sep	65.7	42.3	54.0	98	1976	8	59.1	1998	21	1991	28	47.9	1974	335	5	.0	.1	28.5	.0	4.1	.0
Oct	53.9	32.4	43.2	86+	1953	2	50.0	1971	11	1952	17	37.9	1987	677	0	.0	.0	19.2	.5	17.5	.0
Nov	37.0	20.9	29.0	73+	1999	9	36.3	1999	-15	1951	6	20.8	1995	1082	0	.0	.0	4.3	10.6	27.3	1.4
Dec	24.7	7.5	16.1	59	1982	3	24.1	1997	-30+	1983	19	5.7	1989	1517	0	.0	.0	.2	23.5	30.9	9.5
Ann	50.3	27.4	38.9	99	Aug 1949	7	69.8	Jul 1983	-40+	Feb 1979	17	-.8	Jan 1977	9689	192	.0	2.9	189.6	95.4	206.4	49.5

\+ 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: 1888-2001

(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	2.84	2.68	1.36	1996	19	5.45	1997	1.15	1984
Feb	1.62	1.48	2.52	1965	19	4.03	1971	.31	1998
Mar	2.52	2.40	2.21	1998	30	5.03	1998	1.01	1974
Apr	2.31	2.12	3.05	1954	26	5.66	1982	.62	1988
May	3.40	3.21	3.43	1964	24	6.53	1973	.88	1986
Jun	3.92	4.01	4.52	1983	22	6.31	1983	1.46	1978
Jul	3.92	3.88	2.64	1967	22	7.36	1992	.67	1975
Aug	4.01	3.70	3.98	1972	16	8.57	1988	.67	1976
Sep	3.73	3.66	5.58	1955	17	6.22	1985	1.23	1989
Oct	3.55	3.31	2.06	1985	5	7.07	1995	1.50	1972
Nov	3.57	3.51	2.14	1975	10	7.38	1991	1.01+	1984
Dec	2.99	2.83	1.75	1985	2	7.17	1996	1.11	1994
Ann	38.38	37.41	5.58	Sep 1955	17	8.57	Aug 1988	.31	Feb 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	20.3	9.2	.9	.1
Feb	13.3	5.4	.5	.0
Mar	14.9	6.8	1.0	.2
Apr	11.8	6.4	1.2	.2
May	11.4	7.5	2.3	.8
Jun	13.2	8.5	2.4	.7
Jul	10.8	7.7	2.7	.8
Aug	11.4	7.1	2.8	.9
Sep	13.8	8.8	2.4	.5
Oct	14.5	9.0	2.1	.6
Nov	17.0	9.7	1.5	.5
Dec	19.2	9.3	.9	.1
Ann	171.6	95.4	20.7	5.4

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	1.41	1.65	1.98	2.24	2.48	2.72	2.97	3.26	3.63	4.17	4.66
Feb	.47	.62	.85	1.05	1.25	1.45	1.68	1.94	2.29	2.82	3.32
Mar	.91	1.15	1.49	1.78	2.05	2.33	2.63	2.99	3.44	4.13	4.77
Apr	.78	1.00	1.32	1.59	1.85	2.12	2.41	2.75	3.18	3.86	4.48
May	1.38	1.69	2.13	2.50	2.84	3.19	3.56	4.00	4.55	5.39	6.16
Jun	1.83	2.17	2.64	3.02	3.38	3.73	4.11	4.55	5.09	5.92	6.66
Jul	1.22	1.59	2.15	2.62	3.08	3.56	4.08	4.70	5.49	6.73	7.87
Aug	1.19	1.57	2.14	2.64	3.12	3.62	4.17	4.81	5.65	6.96	8.18
Sep	1.51	1.85	2.34	2.74	3.11	3.50	3.91	4.39	4.99	5.92	6.76
Oct	1.58	1.89	2.33	2.69	3.03	3.36	3.72	4.14	4.66	5.45	6.17
Nov	1.24	1.57	2.06	2.48	2.87	3.28	3.72	4.24	4.91	5.93	6.88
Dec	1.24	1.51	1.90	2.21	2.51	2.81	3.13	3.51	3.98	4.70	5.36
Ann	30.25	31.88	33.95	35.49	36.85	38.15	39.47	40.93	42.67	45.18	47.32

\+ 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: 1888-2001
(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	42.1	40.3	23	24	18.4	1997	5	74.9+	1982	49	1997	7	42	1997	18.7	13.9	4.9	2.1	.4	30.7	30.7	30.7	30.3
Feb	25.0	24.2	27	28	14.6	1995	4	52.3	1971	49	1971	6	41	1971	12.1	7.9	2.3	1.0	.3	27.6	27.6	27.6	27.4
Mar	25.5	24.7	22	22	18.0	1979	24	59.0	1976	52	1976	13	37+	1976	10.7	7.7	2.5	1.2	.4	29.9	29.5	28.9	26.7
Apr	9.6	9.5	7	5	13.0	1974	4	26.0	1974	44	1971	4	20	1996	4.4	3.2	1.2	.4	.1	12.4	10.7	9.1	6.2
May	1.5	.0	#	0	11.6	1984	1	11.8	1984	16	1996	1	3	1996	.3	.3	.2	.1	@	.4	.2	.2	@
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	.2	.0	#	0	3.1	1995	22	3.1	1995	3	1995	22	#+	1995	.1	.1	@	.0	.0	.1	@	.0	.0
Oct	3.7	1.0	#	#	7.5	1982	20	16.5	1988	10+	1993	31	2	1988	2.0	1.6	.3	.1	.0	2.1	.9	.4	.1
Nov	30.6	26.5	5	4	22.1	1991	24	66.3	1991	41	1991	30	13	1988	10.6	8.7	3.5	1.8	.3	17.0	13.2	9.8	4.9
Dec	43.8	38.8	14	13	19.4	1996	19	88.2	1996	42	1996	24	29	1991	17.2	12.5	4.6	2.0	.2	28.9	28.6	27.1	21.9
Ann	182.0	165.0	N/A	N/A	22.1	Nov 1991	24	88.2	Dec 1996	52	Mar 1976	13	42	Jan 1997	76.1	55.9	19.5	8.7	1.7	149.1	141.4	133.8	117.5

+ 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	7/07	6/30	6/25	6/20	6/16	6/12	6/07	6/02	5/26
32	6/20	6/15	6/11	6/08	6/04	6/01	5/29	5/25	5/19
28	6/03	5/28	5/24	5/20	5/17	5/14	5/10	5/06	4/30
24	5/16	5/12	5/09	5/06	5/04	5/02	4/29	4/26	4/22
20	5/01	4/27	4/24	4/21	4/18	4/15	4/13	4/09	4/05
16	4/24	4/20	4/17	4/15	4/13	4/11	4/08	4/05	4/02

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	8/12	8/19	8/24	8/28	8/31	9/04	9/08	9/13	9/20
32	9/04	9/09	9/13	9/16	9/19	9/22	9/25	9/29	10/04
28	9/14	9/19	9/22	9/25	9/28	10/01	10/04	10/07	10/12
24	9/29	10/04	10/08	10/11	10/14	10/17	10/20	10/23	10/28
20	10/15	10/20	10/24	10/27	10/30	11/02	11/05	11/08	11/13
16	10/26	10/30	11/02	11/05	11/07	11/09	11/12	11/15	11/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	106	96	88	82	76	70	63	56	45
32	125	119	114	110	106	102	98	93	86
28	157	149	143	138	133	129	124	118	109
24	179	173	169	165	162	159	155	151	145
20	214	207	202	198	194	190	186	181	174
16	227	220	215	211	208	204	200	195	188

***** 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	1710	1442	1292	827	442	166	79	120	335	677	1082	1517	9689
60	1555	1302	1137	678	312	79	21	46	204	523	932	1362	8151
57	1462	1218	1044	590	244	44	8	21	140	433	842	1269	7315
55	1400	1162	982	532	205	28	4	11	104	374	782	1207	6791
50	1245	1022	827	394	122	7	0	1	41	243	632	1052	5586
32	697	542	318	61	5	0	0	0	0	12	179	517	2331

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	10	24	49	225	600	858	1025	960	660	359	88	23	4881
55	0	0	0	5	87	196	316	258	74	8	0	0	944
57	0	0	0	3	65	152	258	206	50	4	0	0	738
60	0	0	0	1	39	97	178	138	24	1	0	0	478
65	0	0	0	0	15	34	81	57	5	0	0	0	192
70	0	0	0	0	4	8	22	15	0	0	0	0	49

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	0	0	10	86	372	609	771	714	434	160	22	0	0	0	10	96	468	1077	1848	2562	2996	3156	3178	3178
45	0	0	1	46	248	461	616	559	297	83	8	0	0	0	1	47	295	756	1372	1931	2228	2311	2319	2319
50	0	0	0	18	153	325	462	405	180	39	1	0	0	0	0	18	171	496	958	1363	1543	1582	1583	1583
55	0	0	0	9	87	198	314	262	96	11	0	0	0	0	0	9	96	294	608	870	966	977	977	977
60	0	0	0	0	41	106	181	141	41	1	0	0	0	0	0	0	41	147	328	469	510	511	511	511
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	13	79	257	383	488	449	262	110	13	0	0	0	13	92	349	732	1220	1669	1931	2041	2054	2054

(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