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: BALDWIN, MI **COOP ID: 200446**

Climate Division: MI 5 **NWS Call Sign:** **Elevation: 835 Feet** **Lat: 43˚54N** **Lon: 85˚51W**

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	28.6	10.8	19.7	58	1950	25	27.2	1998	-37	1951	30	10.9	1977	1404	0	.0	.0	.4	19.8	30.4	6.8
Feb	32.4	10.7	21.6	64	1999	12	34.0	1998	-38	1996	3	9.8	1979	1216	0	.0	.0	1.1	14.3	27.3	7.2
Mar	42.7	19.1	30.9	78	1967	31	40.9	2000	-25	1980	1	24.3	1978	1057	0	.0	.0	8.1	5.2	26.9	3.3
Apr	56.0	30.4	43.2	88+	1952	29	49.4	1986	-8	1982	7	36.9	1975	655	1	.0	.0	20.2	.6	17.2	.1
May	69.8	40.8	55.3	92+	1962	18	63.8	1982	16+	1966	10	48.2	1997	338	37	.0	.4	30.1	.0	5.6	.0
Jun	78.0	48.8	63.4	104	1949	27	68.7	1995	26	1972	11	57.8	1972	122	75	.0	1.8	30.0	.0	.5	.0
Jul	82.1	53.2	67.7	101	1988	7	72.1	1999	32	1950	14	62.8	1971	45	128	.1	3.5	31.0	.0	.0	.0
Aug	79.8	52.1	66.0	102	1955	21	73.1	1995	29	1986	28	61.2	1977	85	114	.1	1.6	31.0	.0	.1	.0
Sep	71.4	44.8	58.1	97	1953	1	62.7	1998	21	1989	27	51.9	1975	221	13	.0	.1	29.9	.0	2.7	.0
Oct	59.1	35.3	47.2	87	1971	1	53.4	1971	11	1972	20	42.2	1976	552	0	.0	.0	25.0	.0	13.4	.0
Nov	44.8	27.0	35.9	76	1950	1	42.2	1999	-18	1950	25	28.1	1976	873	0	.0	.0	9.3	2.7	22.4	.1
Dec	33.2	17.3	25.3	64+	1982	3	33.3	1982	-24	1983	19	14.7	1976	1232	0	.0	.0	1.5	13.6	29.1	2.9
Ann	56.5	32.5	44.5	104	Jun 1949	27	73.1	Aug 1995	-38	Feb 1996	3	9.8	Feb 1979	7800	368	.2	7.4	217.6	56.2	175.6	20.4

\+ 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	2.33	2.29	1.61	1974	27	4.34	1982	.99	1981
Feb	1.63	1.51	1.67	1994	20	3.34	1997	.10	1987
Mar	2.25	2.16	2.74	1976	5	6.14	1976	.51	1981
Apr	2.92	2.66	2.18	1979	26	5.55	1993	.84	1997
May	2.97	2.45	2.16	1989	31	6.47	2000	.53	1992
Jun	3.43	2.72	3.52	1990	14	9.27	1990	1.16	1991
Jul	2.76	2.91	3.75	1969	28	6.25	1994	.47	1998
Aug	4.01	3.69	4.21	1985	6	12.80	1975	1.16	1991
Sep	3.90	3.43	2.50	1961	14	11.38	1986	.30	1979
Oct	3.17	3.13	3.84	1991	25	10.22	1991	.44	1971
Nov	3.08	2.76	2.81	1960	30	7.49	1988	.73	1986
Dec	2.29	2.17	1.48	1982	3	5.50	1971	.33	1994
Ann	34.74	34.58	4.21	Aug 1985	6	12.80	Aug 1975	.10	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	15.5	6.5	1.2	.2
Feb	11.0	4.6	.6	.1
Mar	10.3	5.8	1.2	.2
Apr	10.7	7.0	1.7	.5
May	9.9	6.4	2.0	.6
Jun	9.5	6.4	2.1	.9
Jul	8.9	5.7	1.6	.6
Aug	9.6	6.4	2.4	1.0
Sep	10.3	7.2	2.5	.9
Oct	11.0	6.6	1.9	.4
Nov	12.8	7.8	1.6	.6
Dec	14.4	6.6	.9	.2
Ann	133.9	77.0	19.7	6.2

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	.97	1.18	1.48	1.73	1.96	2.19	2.44	2.73	3.10	3.66	4.17
Feb	.39	.54	.78	.99	1.20	1.43	1.68	1.97	2.36	2.98	3.56
Mar	.65	.86	1.18	1.46	1.73	2.02	2.33	2.70	3.19	3.94	4.64
Apr	1.16	1.43	1.81	2.13	2.43	2.73	3.06	3.44	3.92	4.66	5.33
May	.90	1.18	1.60	1.97	2.32	2.68	3.08	3.56	4.17	5.12	6.00
Jun	.99	1.31	1.81	2.23	2.65	3.08	3.56	4.12	4.85	5.99	7.06
Jul	.73	.99	1.39	1.74	2.09	2.45	2.85	3.33	3.95	4.92	5.83
Aug	1.11	1.49	2.06	2.57	3.06	3.58	4.16	4.83	5.71	7.10	8.39
Sep	.79	1.15	1.72	2.24	2.77	3.34	3.98	4.75	5.76	7.39	8.93
Oct	.97	1.27	1.72	2.10	2.48	2.87	3.30	3.80	4.45	5.46	6.40
Nov	.91	1.20	1.64	2.02	2.39	2.77	3.20	3.69	4.34	5.34	6.28
Dec	.62	.84	1.17	1.46	1.74	2.04	2.37	2.76	3.27	4.07	4.82
Ann	25.51	27.32	29.62	31.36	32.90	34.39	35.92	37.60	39.64	42.58	45.12

\+ 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

Complete documentation available from:
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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	23.1	19.5	10	8
Feb	16.5	16.7	10	7
Mar	8.5	6.8	4	3
Apr	2.2	.5	#	#
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	9.1	7.1	1	1
Dec	19.0	17.5	4	4
Ann	78.6	68.1	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	11.3	1978	27	48.8	1979	35	1982	24	27	1979
Feb	8.5	1981	11	33.6	1981	31	1982	14	26	1979
Mar	9.5	1989	18	28.5	1989	23	1982	10	14	1982
Apr	7.0	1982	4	12.5	1985	9	1982	7	1	1985
May	.1	1984	1	.1+	1994	#+	1984	1	#+	1984
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	1.5	1992	21	3.0	1992	1	1992	20	#+	1997
Nov	13.1	1981	20	30.0	1995	13	2000	21	5	1995
Dec	7.0	1991	3	38.0	1972	19	1983	29	10+	1983
Ann	13.1	Nov 1981	20	48.8	Jan 1979	35	Jan 1982	24	27	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	11.9	8.4	2.8	1.1	.1
Feb	8.8	6.3	2.1	.7	.0
Mar	5.2	3.8	1.0	.4	.0
Apr	1.3	.9	.2	.1	.0
May	.1	.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	.2	.1	.0	.0	.0
Nov	4.0	3.3	1.2	.3	@
Dec	10.7	7.9	2.2	.7	.0
Ann	42.2	30.7	9.5	3.3	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	27.6	24.7	21.7	11.9
Feb	25.1	23.6	20.2	12.1
Mar	15.3	10.8	8.6	3.8
Apr	1.7	.7	.3	.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	6.1	3.4	2.2	.5
Dec	21.2	17.3	12.6	3.8
Ann	97.1	80.5	65.6	32.1

+ 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	7/03	6/25	6/20	6/15	6/11	6/06	6/02	5/27	5/20
32	6/14	6/07	6/03	5/30	5/27	5/23	5/19	5/15	5/08
28	5/30	5/23	5/17	5/13	5/09	5/05	4/30	4/25	4/18
24	5/14	5/08	5/05	5/02	4/29	4/26	4/23	4/19	4/14
20	5/05	4/29	4/25	4/22	4/19	4/15	4/12	4/08	4/02
16	4/23	4/18	4/15	4/12	4/09	4/07	4/04	4/01	3/27

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	8/17	8/24	8/28	9/02	9/05	9/09	9/13	9/18	9/25
32	9/05	9/10	9/14	9/17	9/20	9/23	9/26	9/29	10/04
28	9/21	9/26	9/29	10/02	10/05	10/08	10/11	10/15	10/20
24	10/10	10/15	10/18	10/22	10/24	10/27	10/30	11/03	11/08
20	10/18	10/23	10/27	10/30	11/03	11/06	11/09	11/13	11/18
16	10/28	11/03	11/08	11/12	11/16	11/19	11/23	11/28	12/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	121	109	100	93	86	79	71	63	50
32	135	128	123	119	115	112	108	103	96
28	171	164	158	153	148	144	139	133	125
24	201	193	188	183	178	173	168	163	155
20	220	212	206	202	197	193	188	182	175
16	246	237	231	225	220	214	209	202	193

***** 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	1404	1216	1057	655	338	122	45	85	221	552	873	1232	7800
60	1249	1076	902	509	228	54	10	29	109	404	723	1077	6370
57	1156	992	809	423	173	29	3	13	62	320	633	984	5597
55	1094	936	747	368	141	19	0	8	39	268	573	922	5115
50	939	796	595	245	75	5	0	0	9	158	428	767	4017
32	403	339	165	15	0	0	0	0	0	4	65	281	1272

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	22	47	131	350	723	943	1106	1052	782	475	183	72	5886
55	0	0	0	14	150	272	393	347	131	25	0	0	1332
57	0	0	0	8	120	222	333	291	94	15	0	0	1083
60	0	0	0	4	82	157	248	213	51	6	0	0	761
65	0	0	0	1	37	75	128	114	13	0	0	0	368
70	0	0	0	0	15	24	49	46	2	0	0	0	136

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	2	44	184	507	739	891	825	545	251	61	4	0	2	46	230	737	1476	2367	3192	3737	3988	4049	4053
45	0	0	21	107	361	589	736	670	397	147	23	1	0	0	21	128	489	1078	1814	2484	2881	3028	3051	3052
50	0	0	6	56	237	441	581	515	263	71	10	0	0	0	6	62	299	740	1321	1836	2099	2170	2180	2180
55	0	0	0	26	138	295	426	362	152	30	0	0	0	0	0	26	164	459	885	1247	1399	1429	1429	1429
60	0	0	0	10	72	179	275	219	74	5	0	0	0	0	0	10	82	261	536	755	829	834	834	834
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	37	137	331	478	582	537	351	168	36	2	0	0	37	174	505	983	1565	2102	2453	2621	2657	2659

(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