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: GAYLORD, MI **COOP ID: 203096**

Climate Division: MI 4 **NWS Call Sign:** **Elevation: 1,350 Feet** **Lat: 45˚02N** **Lon: 84˚40W**

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	25.2	9.6	17.4	53+	1973	26	25.8	1990	-32	1982	10	7.2	1994	1477	0	.0	.0	.1	24.1	30.8	7.0
Feb	29.0	10.2	19.6	58	1984	23	29.9	1998	-37	1979	17	10.9	1994	1272	0	.0	.0	.9	18.3	27.4	6.6
Mar	39.4	18.3	28.9	76	2000	8	38.1	2000	-27	1984	12	22.0	1984	1120	0	.0	.0	5.9	8.1	28.0	2.8
Apr	53.4	29.5	41.5	88+	1980	22	47.0	1977	-4+	1982	7	35.3	1975	707	0	.0	.0	18.2	.8	19.3	.1
May	67.8	41.0	54.4	92	1977	20	61.7	1977	18	1955	9	46.0	1997	357	28	.0	.2	29.4	.0	5.9	.0
Jun	76.1	50.1	63.1	95+	1956	13	67.7	1995	22	1958	6	57.4	1982	118	61	.0	1.4	30.0	.0	.6	.0
Jul	80.0	55.0	67.5	97+	1955	30	72.2	1983	33	1983	6	61.9	1992	41	120	.0	2.1	31.0	.0	.0	.0
Aug	77.3	53.9	65.6	99	1955	21	69.7	1980	26	1982	29	61.9	1982	74	92	.0	.7	31.0	.0	.2	.0
Sep	68.3	46.7	57.5	96+	1952	12	60.7	1998	22+	1957	28	52.7	1993	232	7	.0	.1	29.6	.0	1.9	.0
Oct	56.4	36.8	46.6	85	1971	1	55.0	1971	10	1969	23	41.8	1988	571	0	.0	.0	22.9	.2	10.6	.0
Nov	41.3	26.8	34.1	75	1978	5	40.5	1999	-7	1951	27	27.1	1995	929	0	.0	.0	6.6	6.2	22.9	.1
Dec	29.8	16.2	23.0	65	1951	3	31.7	1982	-27	1983	20	12.3	1989	1302	0	.0	.0	.8	19.2	29.7	2.9
Ann	53.7	32.8	43.3	99	Aug 1955	21	72.2	Jul 1983	-37	Feb 1979	17	7.2	Jan 1994	8200	308	.0	4.5	206.4	76.9	177.3	19.5

\+ 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: 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	3.05	3.00	1.19	1950	26	6.25	1988	1.16	1981
Feb	2.10	1.91	1.23	1971	20	4.08	1985	.53	1998
Mar	2.53	2.23	2.60	1998	31	6.20	1998	.61	1993
Apr	2.46	2.33	1.85	1979	26	4.58	1995	.76	1989
May	2.83	2.67	3.18	1963	8	9.11	1983	.58	1977
Jun	2.72	2.81	3.02	1994	29	6.26	1999	.13	1991
Jul	3.22	3.08	3.04	1969	28	6.27	1975	.59	1989
Aug	3.83	3.53	5.00	1995	17	8.50	1995	.85	1980
Sep	3.85	3.67	3.70	1961	14	10.18	1986	.21	1979
Oct	3.45	3.00	2.82	1969	13	7.69	1983	.32	2000
Nov	3.35	3.08	1.92	1982	12	6.55	1988	1.10	1999
Dec	3.20	3.16	1.48	1971	15	5.38	1985	.83	1997
Ann	36.59	35.92	5.00	Aug 1995	17	10.18	Sep 1986	.13	Jun 1991

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	18.3	10.1	.9	.1
Feb	12.8	6.9	.7	@
Mar	11.9	6.8	1.0	.2
Apr	10.4	6.8	1.3	.3
May	9.9	6.9	2.0	.4
Jun	9.7	6.2	1.9	.4
Jul	9.0	6.1	2.4	.7
Aug	10.8	7.3	2.8	.7
Sep	12.5	8.7	2.3	.6
Oct	12.6	8.5	1.9	.3
Nov	14.8	9.7	1.4	.3
Dec	17.2	10.4	1.1	.1
Ann	149.9	94.4	19.7	4.1

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	1.45	1.71	2.08	2.37	2.64	2.91	3.20	3.53	3.94	4.56	5.12
Feb	.75	.95	1.23	1.47	1.70	1.94	2.20	2.49	2.88	3.47	4.01
Mar	.70	.94	1.30	1.62	1.93	2.26	2.62	3.05	3.60	4.48	5.29
Apr	.91	1.14	1.47	1.74	2.01	2.28	2.57	2.91	3.35	4.01	4.63
May	.81	1.07	1.48	1.83	2.18	2.54	2.94	3.41	4.02	4.98	5.87
Jun	.63	.88	1.28	1.63	1.99	2.37	2.79	3.30	3.96	5.02	6.01
Jul	.89	1.20	1.66	2.07	2.46	2.88	3.34	3.88	4.59	5.70	6.73
Aug	1.25	1.61	2.15	2.60	3.04	3.49	3.99	4.57	5.32	6.47	7.54
Sep	1.04	1.40	1.96	2.45	2.93	3.43	3.99	4.65	5.51	6.86	8.12
Oct	1.14	1.47	1.95	2.36	2.75	3.15	3.60	4.11	4.78	5.81	6.76
Nov	1.42	1.72	2.15	2.50	2.82	3.15	3.51	3.92	4.43	5.22	5.93
Dec	1.44	1.72	2.12	2.43	2.73	3.03	3.35	3.72	4.18	4.88	5.51
Ann	29.07	30.59	32.50	33.93	35.18	36.38	37.60	38.94	40.55	42.85	44.81

\+ 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	39.0	38.3	18	17	13.0	1990	25	64.0	1971	45+	1971	31	35	1971	16.9	14.2	4.9	1.9	.1	30.7	30.4	29.0	26.0
Feb	24.3	24.0	20	19	12.0	1974	22	47.0	1988	47	1971	3	40	1971	11.4	9.2	2.9	1.0	.1	28.0	27.8	27.6	25.0
Mar	18.8	17.5	13	13	12.5	1998	9	42.0	1975	39+	1971	9	28	1971	8.4	6.6	2.5	1.0	@	25.2	24.1	22.6	18.0
Apr	6.8	6.0	1	3	12.0	1973	10	15.0+	1996	22	1975	1	9	1975	2.9	2.3	.9	.3	.1	5.4	4.8	3.8	2.0
May	1.0	.0	#	0	5.6	1979	6	5.6	1979	3	1974	6	#	2000	.4	.4	.2	@	.0	.1	@	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1984	.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	#	1993	29	#+	1993	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	2.5	1.0	#	0	7.0	1989	20	10.0	1988	7	1992	20	1	1992	1.5	1.0	.4	@	.0	.8	.2	.1	.0
Nov	23.3	20.0	2	1	15.0	1971	7	63.0	1995	18	1995	28	10	1995	8.6	7.6	3.1	1.2	.2	11.7	7.9	5.1	2.1
Dec	33.2	31.5	10	7	15.0	1987	15	60.5	1985	35	1985	29	24	1985	13.9	11.5	4.5	1.9	.2	26.4	24.3	21.8	13.1
Ann	148.9	138.3	N/A	N/A	15.0+	Dec 1987	15	64.0	Jan 1971	47	Feb 1971	3	40	Feb 1971	64.0	52.8	19.4	7.3	.7	128.3	119.5	110.0	86.2

+ 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	7/04	6/26	6/20	6/16	6/11	6/07	6/02	5/27	5/20
32	6/12	6/07	6/03	5/30	5/27	5/23	5/20	5/16	5/10
28	5/27	5/22	5/18	5/15	5/12	5/09	5/06	5/02	4/27
24	5/12	5/07	5/04	5/01	4/28	4/25	4/22	4/19	4/14
20	4/25	4/21	4/19	4/16	4/14	4/12	4/10	4/07	4/03
16	4/22	4/18	4/15	4/12	4/09	4/07	4/04	4/01	3/28

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	8/20	8/26	8/31	9/04	9/08	9/11	9/15	9/20	9/26
32	9/01	9/07	9/12	9/16	9/19	9/23	9/27	10/01	10/07
28	9/16	9/23	9/27	10/01	10/05	10/08	10/12	10/17	10/23
24	10/02	10/08	10/13	10/17	10/21	10/24	10/28	11/02	11/09
20	10/21	10/26	10/30	11/02	11/05	11/08	11/11	11/15	11/20
16	10/31	11/05	11/09	11/12	11/15	11/18	11/21	11/25	11/30

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	110	102	94	88	81	74	66	55
32	143	133	126	120	115	109	103	96	87
28	173	163	156	150	145	139	133	126	117
24	203	193	186	180	175	169	164	157	147
20	227	219	213	209	204	199	194	189	181
16	241	233	228	223	219	214	210	204	197

***** 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	1477	1272	1120	707	357	118	41	74	232	571	929	1302	8200
60	1322	1132	965	559	241	49	8	20	114	421	779	1147	6757
57	1229	1048	872	473	183	25	1	8	65	336	689	1054	5983
55	1167	992	810	417	149	15	0	3	41	284	629	992	5499
50	1012	852	656	288	81	3	0	0	9	171	481	837	4390
32	466	375	196	25	1	0	0	0	0	5	82	330	1480

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	13	27	99	309	695	933	1102	1041	765	457	143	50	5634
55	0	0	0	10	130	258	389	331	117	23	0	0	1258
57	0	0	0	6	102	208	328	274	80	13	0	0	1011
60	0	0	0	3	67	142	242	194	40	5	0	0	693
65	0	0	0	0	28	61	120	92	7	0	0	0	308
70	0	0	0	0	10	16	42	30	1	0	0	0	99

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	32	145	469	706	867	804	538	246	47	2	0	0	32	177	646	1352	2219	3023	3561	3807	3854	3856
45	0	0	14	84	325	557	712	649	390	142	18	0	0	0	14	98	423	980	1692	2341	2731	2873	2891	2891
50	0	0	3	45	209	408	557	494	259	75	6	0	0	0	3	48	257	665	1222	1716	1975	2050	2056	2056
55	0	0	0	19	123	276	402	344	147	32	0	0	0	0	0	19	142	418	820	1164	1311	1343	1343	1343
60	0	0	0	9	59	154	254	202	71	7	0	0	0	0	0	9	68	222	476	678	749	756	756	756
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	23	109	306	451	564	512	320	138	23	0	0	0	23	132	438	889	1453	1965	2285	2423	2446	2446

(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