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: DETROIT METRO AP, MI **COOP ID: 202103**

Climate Division: MI10 **NWS Call Sign: DTW** **Elevation: 637 Feet** **Lat: 42˚14N** **Lon: 83˚20W**

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	31.1	17.8	24.5	62+	1965	8	33.6	1990	-21	1984	21	13.5	1977	1270	0	.0	.0	1.6	16.7	28.5	3.1
Feb	34.4	20.0	27.2	70	1999	11	36.7	1998	-15	1985	3	16.9	1978	1074	0	.0	.0	2.4	12.9	24.7	2.0
Mar	45.2	28.5	36.9	81+	1986	30	44.0	2000	-4	1978	2	29.8	1984	886	0	.0	.0	10.2	4.1	21.7	.1
Apr	57.8	38.4	48.1	89	1977	12	53.2	1977	10	1982	7	41.7	1975	527	6	.0	.0	22.6	.2	8.7	.0
May	70.2	49.4	59.8	93	1988	31	66.5	1991	25	1966	10	52.0	1997	219	42	.0	.5	30.5	.0	.5	.0
Jun	79.0	58.9	69.0	104	1988	25	72.4	1991	36+	1966	1	64.2	1985	41	145	@	2.8	30.0	.0	.0	.0
Jul	83.4	63.6	73.5	102+	1977	15	77.1	1988	41	1965	1	68.8	1992	5	254	.2	5.0	31.0	.0	.0	.0
Aug	81.4	62.2	71.8	100	1988	17	77.2	1995	38	1982	29	66.7	1992	12	208	@	2.9	31.0	.0	.0	.0
Sep	73.7	54.1	63.9	98	1976	8	68.2	1978	29	1974	23	59.8	1975	121	75	.0	.8	30.0	.0	.1	.0
Oct	61.2	42.5	51.9	91	1963	6	59.2	1971	17	1974	21	46.0	1988	426	6	.0	.0	27.6	.0	4.0	.0
Nov	47.8	33.5	40.7	77	1968	1	47.5	1975	9+	1964	30	34.2	1976	742	0	.0	.0	12.8	1.4	15.8	.0
Dec	35.9	23.4	29.6	69	1998	6	38.2	1982	-10	1983	25	18.0	1989	1099	0	.0	.0	3.0	10.3	25.8	1.2
Ann	58.4	41.0	49.7	104	Jun 1988	25	77.2	Aug 1995	-21	Jan 1984	21	13.5	Jan 1977	6422	736	.2	12.0	232.7	45.6	129.8	6.4

+ 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: 1958-2001

(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	1.91	1.72	1.59	1993	4	3.92	1993	.57	1981
Feb	1.88	1.46	2.28	1990	22	5.02	1990	.45	1978
Mar	2.52	2.24	1.69	1985	28	4.48	1973	.82	1981
Apr	3.05	2.95	3.58	2000	20	5.13	1999	.92	1971
May	3.05	2.83	2.56	1968	26	6.20	1991	.87	1988
Jun	3.55	3.28	2.24	1964	7	7.04	1987	.97	1988
Jul	3.16	2.94	4.34	1998	7	5.91	1992	.59	1974
Aug	3.10	3.00	3.21	1964	11	7.83	1975	.43	1996
Sep	3.27	2.99	3.71	2000	11	7.52	1986	.62	1995
Oct	2.23	2.01	2.11	1959	6	4.14+	1991	.81	1974
Nov	2.66	2.57	1.59+	1982	1	5.68	1982	.79	1976
Dec	2.51	2.39	2.67	1965	24	4.60	1987	.78	1993
Ann	32.89	32.65	4.34	Jul 1998	7	7.83	Aug 1975	.43	Aug 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.4	5.4	.9	.1
Feb	11.3	4.8	.9	.2
Mar	12.7	6.7	1.4	.2
Apr	12.6	7.4	1.9	.4
May	11.6	6.3	2.0	.6
Jun	10.1	6.4	2.5	.9
Jul	9.6	6.1	1.8	.8
Aug	9.5	5.8	2.1	.7
Sep	9.9	6.1	2.2	.6
Oct	9.8	5.2	1.4	.3
Nov	12.3	6.6	1.7	.3
Dec	13.9	6.6	1.2	.2
Ann	136.7	73.4	20.0	5.3

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	.65	.83	1.10	1.32	1.53	1.75	2.00	2.28	2.64	3.20	3.71
Feb	.42	.59	.87	1.12	1.37	1.63	1.93	2.28	2.75	3.50	4.20
Mar	1.01	1.24	1.57	1.84	2.10	2.36	2.64	2.97	3.38	4.01	4.59
Apr	1.35	1.62	2.00	2.31	2.60	2.89	3.20	3.55	4.00	4.69	5.30
May	1.17	1.45	1.86	2.20	2.52	2.84	3.19	3.60	4.12	4.92	5.65
Jun	1.24	1.57	2.06	2.47	2.86	3.27	3.71	4.22	4.88	5.89	6.83
Jul	1.00	1.30	1.75	2.13	2.49	2.87	3.29	3.77	4.40	5.38	6.28
Aug	.82	1.12	1.57	1.96	2.35	2.75	3.21	3.74	4.44	5.54	6.57
Sep	.98	1.29	1.75	2.15	2.54	2.95	3.40	3.93	4.61	5.67	6.66
Oct	.85	1.05	1.35	1.60	1.84	2.08	2.34	2.64	3.02	3.61	4.15
Nov	.89	1.14	1.51	1.82	2.12	2.43	2.77	3.17	3.68	4.48	5.21
Dec	.95	1.19	1.52	1.80	2.07	2.34	2.63	2.97	3.40	4.07	4.67
Ann	25.23	26.76	28.69	30.15	31.43	32.66	33.92	35.30	36.97	39.36	41.41

+ 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: 1958-2001
(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	11.3	9.2	2	2	11.1	1992	14	29.6	1978	24+	1999	15	11	1999	10.0	3.6	.8	.4	.1	17.7	11.0	5.6	1.0
Feb	9.2	8.7	2	2	8.1	1981	10	21.3	1986	18+	1982	7	10	1982	7.9	2.9	.8	.4	.0	13.2	8.2	4.3	.8
Mar	6.8	6.8	1	1	8.4	1973	17	15.7	1993	9+	1999	9	3	1978	5.5	2.1	.5	.4	.0	5.5	2.9	1.8	.0
Apr	1.7	1.1	#	0	5.0	1982	5	9.0	1982	6+	1982	7	1	1982	2.1	.5	.1	@	.0	.6	.2	.1	.0
May	#	.0	#	0	#	1994	1	#+	1994	0	0	0	#	2000	.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	.3	.0	#	0	2.7	1989	19	2.9	1980	1	1980	28	#	1980	.3	.1	.0	.0	.0	@	.0	.0	.0
Nov	2.9	2.2	#	0	5.6	1977	27	7.7	1974	5+	1977	28	#	1997	3.5	.9	.2	@	.0	1.6	.5	.1	.0
Dec	11.1	9.7	1	1	18.4	1974	1	34.9	1974	19	1974	2	7	1974	9.0	3.5	1.1	.4	@	9.7	5.6	3.4	.7
Ann	43.3	37.7	N/A	N/A	18.4	Dec 1974	1	34.9	Dec 1974	24+	Jan 1999	15	11	Jan 1999	38.3	13.6	3.5	1.6	.1	48.3	28.4	15.3	2.5

+ 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	5/28	5/22	5/17	5/13	5/10	5/06	5/02	4/28	4/21
32	5/10	5/05	5/02	4/28	4/26	4/23	4/19	4/16	4/11
28	4/28	4/23	4/20	4/17	4/15	4/12	4/09	4/06	4/02
24	4/17	4/12	4/08	4/05	4/02	3/30	3/26	3/23	3/17
20	4/10	4/04	3/31	3/28	3/25	3/22	3/18	3/14	3/09
16	3/28	3/24	3/20	3/18	3/15	3/12	3/09	3/06	3/01

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	169	161	156	151	147	142	138	132	125
32	198	190	184	179	174	169	164	158	150
28	222	213	207	202	196	191	186	180	171
24	250	240	233	227	222	216	210	203	194
20	266	257	251	245	240	234	229	222	213
16	286	278	272	267	262	258	253	247	239

***** 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	1270	1074	886	527	219	41	5	12	121	426	742	1099	6422
60	1101	918	718	362	124	8	0	1	31	276	580	941	5060
57	1008	834	625	281	82	3	0	0	13	206	491	848	4391
55	946	778	564	231	60	2	0	0	7	165	433	786	3972
50	791	638	420	126	23	0	0	0	1	85	297	638	3019
32	299	211	69	1	0	0	0	0	0	0	23	202	805

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	41	60	204	474	845	1090	1267	1215	943	604	269	79	7091
55	0	0	7	37	181	402	554	502	269	59	8	1	2020
57	0	0	5	26	143	345	492	440	220	40	4	0	1715
60	0	0	2	16	95	262	399	348	155	21	1	0	1299
65	0	0	0	6	42	145	254	208	75	6	0	0	736
70	0	0	0	1	13	62	122	89	26	1	0	0	314

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	7	13	83	267	608	856	1027	975	714	372	118	24	7	20	103	370	978	1834	2861	3836	4550	4922	5040	5064
45	0	2	44	161	455	706	872	820	564	236	57	6	0	2	46	207	662	1368	2240	3060	3624	3860	3917	3923
50	0	0	19	84	309	556	717	665	414	131	24	3	0	0	19	103	412	968	1685	2350	2764	2895	2919	2922
55	0	0	6	42	188	408	562	511	277	63	7	0	0	0	6	48	236	644	1206	1717	1994	2057	2064	2064
60	0	0	0	14	100	271	407	357	162	22	0	0	0	0	0	14	114	385	792	1149	1311	1333	1333	1333
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	5	51	155	360	556	699	658	440	202	57	7	0	5	56	211	571	1127	1826	2484	2924	3126	3183	3190

(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