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: FREDERICK POLICE BRKS, MD **COOP ID: 183348**

Climate Division: MD 6 **NWS Call Sign:** **Elevation: 380 Feet** **Lat: 39˚25N** **Lon: 77˚26W**

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	41.5	25.1	33.3	74	1950	27	42.0	1990	-10	1984	22	22.2	1977	983	0	.0	.0	5.9	5.7	24.1	.4
Feb	45.9	27.3	36.6	79+	1985	24	44.6	1976	-4	1961	2	25.4	1979	796	0	.0	.0	9.3	3.0	20.3	@
Mar	55.6	34.5	45.1	87+	1990	14	50.5	1977	3	1980	1	38.4	1984	618	0	.0	.0	20.5	.6	13.3	.0
Apr	67.4	43.7	55.6	94	1990	26	60.8	1994	20	1956	1	50.4	1975	290	6	.0	.5	29.1	.0	2.4	.0
May	76.8	53.5	65.2	97	1996	21	71.9	1991	30	1956	17	61.6	1992	85	89	.0	1.5	31.0	.0	.0	.0
Jun	84.8	62.3	73.6	101	1988	23	77.0	1994	41	1976	4	69.5	1972	3	259	.1	6.7	30.0	.0	.0	.0
Jul	88.9	66.9	77.9	106	1997	15	81.6	1988	47	1952	2	73.5	2000	0	400	.9	12.3	31.0	.0	.0	.0
Aug	86.7	65.5	76.1	104+	1983	20	79.6	1988	44+	1952	24	72.9+	1992	0	343	.3	8.9	31.0	.0	.0	.0
Sep	80.0	58.5	69.3	100+	1953	1	74.3	1998	34+	1951	30	65.9	1975	25	152	.0	2.6	30.0	.0	.0	.0
Oct	68.4	46.8	57.6	91	1951	5	63.6	1971	23+	1952	21	52.9+	1988	253	23	.0	.0	30.7	.0	1.2	.0
Nov	56.5	38.0	47.3	83	1950	1	52.1	1985	12	1950	26	41.6+	1995	532	0	.0	.0	22.0	@	8.3	.0
Dec	45.9	29.6	37.8	77+	1984	29	45.8	1984	-8	1983	25	25.8	1989	845	0	.0	.0	9.7	2.8	20.2	.1
Ann	66.5	46.0	56.3	106	Jul 1997	15	81.6	Jul 1988	-10	Jan 1984	22	22.2	Jan 1977	4430	1272	1.3	32.5	280.2	12.1	89.8	.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

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	3.05	2.60	3.75	2001	5	8.06	1996	.41	1981
Feb	2.59	2.29	2.30	1984	14	5.47+	1984	.15	1987
Mar	3.45	3.20	1.85	1974	30	6.95	1994	1.22	1995
Apr	3.32	3.45	1.88	1952	27	7.66	1983	.37	1985
May	4.18	4.22	2.73	1988	19	10.06	1989	.76	1977
Jun	3.91	3.16	2.66	1951	10	12.91	1972	.85+	1988
Jul	3.50	3.16	3.20	1955	8	9.64	1996	.70	1983
Aug	2.93	2.83	2.69	1952	20	5.66	1979	.56	1989
Sep	3.82	3.13	3.35	1979	6	10.23	1975	.85	1986
Oct	3.26	2.62	4.07	1976	9	11.21	1976	.27	2000
Nov	3.27	3.24	2.73	1952	21	6.83	1972	.71	1981
Dec	3.36	2.81	2.48	1973	26	7.85	1973	.78	1980
Ann	40.64	40.24	4.07	Oct 1976	9	12.91	Jun 1972	.15	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.4	6.5	2.3	.8
Feb	7.0	5.1	1.5	.4
Mar	10.4	7.3	2.7	.6
Apr	9.2	6.3	2.3	.6
May	11.5	8.2	2.9	1.0
Jun	10.4	7.1	2.7	.8
Jul	9.4	6.3	2.3	.9
Aug	9.0	6.0	2.1	.7
Sep	8.5	5.9	2.7	1.1
Oct	7.9	5.3	2.2	.9
Nov	8.5	5.7	2.0	.7
Dec	9.0	6.2	2.4	.8
Ann	110.2	75.9	28.1	9.3

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	.82	1.11	1.55	1.94	2.32	2.71	3.16	3.68	4.36	5.42	6.42
Feb	.56	.79	1.17	1.52	1.87	2.24	2.65	3.15	3.81	4.86	5.85
Mar	1.31	1.63	2.09	2.48	2.84	3.21	3.61	4.07	4.66	5.57	6.40
Apr	1.01	1.32	1.79	2.20	2.59	3.00	3.45	3.98	4.66	5.72	6.71
May	1.19	1.58	2.18	2.71	3.22	3.75	4.34	5.03	5.93	7.34	8.65
Jun	.93	1.29	1.87	2.38	2.88	3.42	4.02	4.74	5.68	7.17	8.57
Jul	.91	1.24	1.75	2.20	2.64	3.10	3.62	4.23	5.03	6.29	7.47
Aug	1.15	1.42	1.80	2.12	2.42	2.73	3.06	3.45	3.94	4.68	5.37
Sep	.73	1.08	1.64	2.15	2.68	3.24	3.88	4.66	5.68	7.33	8.89
Oct	.67	.97	1.45	1.88	2.32	2.80	3.33	3.97	4.82	6.17	7.46
Nov	.96	1.27	1.73	2.14	2.53	2.94	3.39	3.92	4.61	5.69	6.69
Dec	.81	1.13	1.62	2.06	2.49	2.95	3.46	4.07	4.86	6.13	7.31
Ann	29.10	31.34	34.21	36.38	38.31	40.17	42.10	44.22	46.80	50.53	53.75

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	7.5	4.1	2	1
Feb	5.5	1.5	1	1
Mar	2.4	.0	#	#
Apr	.0	.0	#	0
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	.0	.0	0	0
Nov	.3	.0	#	0
Dec	1.4	.0	#	#
Ann	17.1	5.6	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	13.0	1996	7	32.0	1996	37	1996	13	16	1996
Feb	23.0	1983	11	30.5	1983	30	1983	14	7	1983
Mar	20.0	1993	14	20.0	1993	20	1993	15	3	1993
Apr	.0	0	0	.0	0	#	1996	9	#	1996
May	.0	0	0	.0	0	#	1997	1	#	1997
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	.0	0	0	.0	0	0	0	0	0	0
Nov	4.0	1989	23	4.0	1989	3	1989	23	#+	1995
Dec	6.0	1992	10	7.0	1981	10	1973	17	2	1973
Ann	23.0	Feb 1983	11	32.0	Jan 1996	37	Jan 1996	13	16	Jan 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.4	2.1	1.1	.5	.1
Feb	1.4	1.3	.6	.3	.1
Mar	.9	.9	.4	.2	@
Apr	.0	.0	.0	.0	.0
May	.0	.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	.0	.0	.0	.0	.0
Nov	.1	.1	@	.0	.0
Dec	.5	.5	.2	.1	.0
Ann	5.3	4.9	2.3	1.1	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	5.2	2.6	1.7	.4
Feb	4.9	3.3	2.2	.4
Mar	1.8	.9	.4	.2
Apr	.0	.0	.0	.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	.0	.0	.0	.0
Nov	.2	@	.0	.0
Dec	.9	.3	@	.0
Ann	13.0	7.1	4.3	1.0

+ 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	5/08	5/02	4/28	4/25	4/22	4/19	4/15	4/11	4/06
32	4/19	4/16	4/13	4/11	4/09	4/07	4/04	4/02	3/29
28	4/15	4/09	4/04	3/31	3/28	3/24	3/20	3/15	3/09
24	4/01	3/27	3/23	3/20	3/16	3/13	3/10	3/06	3/01
20	3/30	3/21	3/15	3/09	3/04	2/27	2/21	2/15	2/04
16	3/17	3/08	3/01	2/23	2/17	2/11	2/05	1/29	1/17

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	10/01	10/07	10/10	10/14	10/17	10/20	10/23	10/27	11/01
32	10/13	10/19	10/23	10/26	10/30	11/02	11/05	11/09	11/15
28	10/29	11/03	11/08	11/11	11/15	11/18	11/21	11/26	12/01
24	11/11	11/17	11/22	11/26	11/29	12/03	12/07	12/11	12/18
20	11/26	12/01	12/05	12/09	12/12	12/15	12/19	12/23	12/29
16	12/06	12/11	12/15	12/18	12/22	12/25	12/28	1/01	1/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	202	194	187	182	177	172	167	161	152
32	223	216	211	207	203	199	195	190	183
28	256	247	241	236	231	226	221	215	207
24	278	271	266	261	257	253	248	243	236
20	317	304	296	289	283	276	270	262	252
16	338	326	319	313	307	302	296	289	280

***** 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.

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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	983	796	618	290	85	3	0	0	25	253	532	845	4430
60	828	656	464	163	29	0	0	0	5	143	387	690	3365
57	735	572	377	103	12	0	0	0	1	94	305	603	2802
55	674	520	320	72	6	0	0	0	0	68	254	545	2459
50	532	390	196	22	0	0	0	0	0	24	147	405	1716
32	138	70	8	0	0	0	0	0	0	0	4	75	295

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	178	197	413	706	1027	1246	1423	1366	1117	793	462	252	9180
55	1	3	13	88	320	556	710	653	428	148	22	10	2952
57	0	0	7	59	264	496	648	591	369	112	13	5	2564
60	0	0	1	29	188	406	555	498	282	68	5	0	2032
65	0	0	0	6	89	259	400	343	152	23	0	0	1272
70	0	0	0	0	30	130	250	197	58	5	0	0	670

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	42	73	208	469	782	1011	1179	1122	876	545	248	75	42	115	323	792	1574	2585	3764	4886	5762	6307	6555	6630
45	21	34	113	326	627	861	1024	967	726	394	145	37	21	55	168	494	1121	1982	3006	3973	4699	5093	5238	5275
50	6	13	60	201	472	711	869	812	576	250	76	12	6	19	79	280	752	1463	2332	3144	3720	3970	4046	4058
55	0	2	27	106	324	561	714	657	428	138	31	3	0	2	29	135	459	1020	1734	2391	2819	2957	2988	2991
60	0	0	8	54	190	411	559	502	287	59	7	0	0	0	8	62	252	663	1222	1724	2011	2070	2077	2077
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	26	45	128	277	491	684	813	777	574	317	131	40	26	71	199	476	967	1651	2464	3241	3815	4132	4263	4303

(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