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: NATIONAL ARBORETUM DC, MD **COOP ID: 186350**

Climate Division: MD 4 **NWS Call Sign:** **Elevation: 50 Feet** **Lat: 38˚54N** **Lon: 76˚59W**

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	43.0	24.0	33.5	80	1950	26	42.2	1998	-10	1982	17	23.5	1977	977	0	.0	.0	7.9	5.2	25.2	.4
Feb	46.4	26.0	36.2	82	2000	26	43.8	1976	-1	1961	2	24.1	1979	807	0	.0	.0	10.4	3.3	20.8	@
Mar	55.3	33.4	44.4	90	1998	31	50.1	2000	9	1962	2	38.4	1984	641	0	.0	@	21.2	.4	13.4	.0
Apr	66.0	42.2	54.1	94+	1957	28	59.5	1994	18	1982	8	49.7	1975	332	4	.0	.4	28.8	.0	2.4	.0
May	75.8	52.4	64.1	98+	1991	31	71.5	1991	25	1966	5	60.2	1997	108	80	.0	1.6	31.0	.0	.0	.0
Jun	84.4	61.8	73.1	101+	1988	23	77.2	1994	42	1984	1	68.9	1972	6	249	.2	6.8	30.0	.0	.0	.0
Jul	88.9	66.9	77.9	104+	1954	31	83.1	1999	47	1988	1	74.8	2000	0	399	.8	13.3	31.0	.0	.0	.0
Aug	87.4	64.8	76.1	104+	1997	18	79.6	1999	42+	1982	29	72.4	1992	1	345	.3	10.8	31.0	.0	.0	.0
Sep	80.4	56.9	68.7	102	1953	1	75.1	1998	34+	1989	28	64.3	1988	35	144	@	3.6	30.0	.0	.0	.0
Oct	69.0	44.1	56.6	94+	1951	5	63.0	1971	20	1966	31	49.9	1988	283	22	.0	.1	30.6	.0	2.4	.0
Nov	58.0	35.7	46.9	87	1950	1	52.0	1999	10	1987	22	41.2	1996	544	0	.0	.0	23.7	@	11.0	.0
Dec	47.7	28.2	38.0	81	1998	8	44.0	1971	0	1983	25	26.3	1989	837	0	.0	.0	13.4	2.4	21.3	@
Ann	66.9	44.7	55.8	104+	Aug 1997	18	83.1	Jul 1999	-10	Jan 1982	17	23.5	Jan 1977	4571	1243	1.3	36.6	289.0	11.3	96.5	.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

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: NATIONAL ARBORETUM DC, MD **COOP ID: 186350**

Climate Division: MD 4 **NWS Call Sign:** **Elevation: 50 Feet** **Lat: 38˚54N** **Lon: 76˚59W**

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	3.57	3.21	2.43	1976	1	7.58	1978	.49	1981
Feb	2.84	2.64	1.91	1972	19	6.49	1972	.12	1987
Mar	3.92	3.66	2.61	1984	29	8.45	1994	1.36	1986
Apr	3.26	3.10	2.88	1970	14	7.45	1983	.05	1985
May	4.29	4.40	3.59	1997	26	8.49	1989	.90	1986
Jun	3.63	3.02	6.28	1972	22	12.77	1972	.51	1988
Jul	4.21	4.12	4.60	1975	14	11.03	1975	.59	1999
Aug	3.90	3.60	5.88	1955	13	7.63	1971	.32	1989
Sep	4.08	2.71	6.18	1979	6	13.72	1975	.45	1977
Oct	3.43	3.08	5.30	1955	14	8.16	1976	.00	2000
Nov	3.32	3.12	2.91	1996	9	6.88	1972	.51	1981
Dec	3.25	2.49	2.84	1974	2	6.61	1983	.73	1980
Ann	43.70	41.30	6.28	Jun 1972	22	13.72	Sep 1975	.00	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.9	7.0	2.6	.8
Feb	8.3	6.0	2.2	.5
Mar	9.8	6.8	2.9	1.0
Apr	10.4	6.7	2.4	.6
May	12.0	7.7	3.1	.9
Jun	10.7	6.6	2.4	.9
Jul	11.0	7.0	2.6	1.2
Aug	9.1	6.2	2.6	1.0
Sep	9.0	5.7	2.5	1.2
Oct	8.1	5.2	2.5	1.0
Nov	9.0	5.6	2.4	.8
Dec	9.1	5.6	2.2	.8
Ann	116.4	76.1	30.4	10.7

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	1.18	1.52	2.01	2.43	2.84	3.26	3.72	4.26	4.94	6.02	7.00
Feb	.43	.67	1.09	1.48	1.88	2.33	2.84	3.47	4.31	5.67	6.98
Mar	1.36	1.73	2.27	2.72	3.16	3.60	4.09	4.65	5.38	6.50	7.53
Apr	.80	1.11	1.59	2.01	2.43	2.87	3.36	3.95	4.71	5.93	7.07
May	1.40	1.81	2.41	2.92	3.41	3.92	4.48	5.13	5.96	7.27	8.47
Jun	.96	1.30	1.83	2.29	2.74	3.22	3.75	4.37	5.19	6.48	7.68
Jul	1.23	1.63	2.23	2.75	3.26	3.79	4.37	5.06	5.95	7.34	8.63
Aug	1.17	1.54	2.10	2.57	3.04	3.52	4.06	4.68	5.49	6.76	7.93
Sep	.63	.98	1.57	2.14	2.72	3.36	4.09	4.98	6.18	8.13	10.00
Oct	.72	1.21	1.78	2.24	2.68	3.13	3.62	4.19	4.94	6.09	7.16
Nov	.78	1.09	1.58	2.01	2.44	2.90	3.41	4.02	4.82	6.08	7.27
Dec	.81	1.12	1.59	2.01	2.43	2.86	3.35	3.93	4.69	5.89	7.01
Ann	32.91	35.05	37.76	39.79	41.59	43.32	45.10	47.06	49.42	52.81	55.73

\+ 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: NATIONAL ARBORETUM DC, MD **COOP ID: 186350**

Climate Division: MD 4 **NWS Call Sign:** **Elevation: 50 Feet** **Lat: 38°54N** **Lon: 76°59W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	4.8	3.5	1	#
Feb	5.4	.9	1	#
Mar	1.0	.0	#	0
Apr	.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
Nov	.5	.0	#	0
Dec	.7	.0	#	0
Ann	12.4	4.4	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	8.1	1996	8	23.1	1996	19	1996	10	8	1971
Feb	11.0	1979	19	30.5	1979	24	1979	20	7	1979
Mar	7.1	1999	10	8.0	1978	7	1999	10	1	1993
Apr	1.0	1972	8	1.0	1972	#+	2000	9	#+	2000
May	.0	0	0	.0	0	0	0	0	0	0
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	#	1979	11	#+	1979	#	1979	10	#	1979
Nov	9.5	1987	12	13.0	1987	1	1976	12	#+	1996
Dec	6.5	1982	12	7.0	1982	7	1982	12	1	1989
Ann	11.0	Feb 1979	19	30.5	Feb 1979	24	Feb 1979	20	8	Jan 1971

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.3	1.7	.9	.3	.0
Feb	1.7	1.2	.6	.3	@
Mar	.5	.4	.2	@	.0
Apr	@	@	.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	.1	@	.0
Dec	.4	.3	.1	@	.0
Ann	5.0	3.7	1.9	.6	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	4.7	3.0	1.9	.4
Feb	3.3	2.0	1.1	.3
Mar	.5	.2	@	.0
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	.0	.0	.0	.0
Dec	.5	.3	.1	.0
Ann	9.0	5.5	3.1	.7

+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: NATIONAL ARBORETUM DC, MD **COOP ID: 186350**

Climate Division: MD 4 **NWS Call Sign:** **Elevation: 50 Feet** **Lat: 38˚54N** **Lon: 76˚59W**

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	5/07	5/03	4/30	4/27	4/24	4/22	4/19	4/16	4/11
32	4/20	4/16	4/13	4/11	4/09	4/06	4/04	4/01	3/28
28	4/11	4/06	4/03	3/31	3/28	3/26	3/23	3/20	3/15
24	3/28	3/24	3/21	3/18	3/16	3/14	3/11	3/08	3/04
20	3/23	3/16	3/11	3/06	3/02	2/26	2/22	2/17	2/10
16	3/11	3/04	2/26	2/22	2/18	2/13	2/09	2/03	1/27

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	9/30	10/05	10/09	10/12	10/15	10/17	10/20	10/24	10/29
32	10/12	10/17	10/21	10/23	10/26	10/29	11/01	11/04	11/09
28	10/19	10/25	10/30	11/02	11/06	11/10	11/14	11/18	11/25
24	11/05	11/12	11/17	11/21	11/25	11/29	12/03	12/08	12/15
20	11/23	11/29	12/04	12/08	12/11	12/15	12/19	12/23	12/30
16	11/27	12/07	12/13	12/19	12/25	12/30	1/05	1/12	1/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	192	185	180	176	173	169	165	160	154
32	221	214	209	204	200	196	191	186	179
28	246	238	232	227	222	217	212	206	198
24	277	269	263	258	253	249	244	238	230
20	308	299	293	288	283	278	273	267	259
16	343	332	323	316	309	303	295	287	275

***** 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: NATIONAL ARBORETUM DC, MD **COOP ID: 186350**

Climate Division: MD 4 **NWS Call Sign:** **Elevation: 50 Feet** **Lat: 38˚54N** **Lon: 76˚59W**

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	977	807	641	332	108	6	0	1	35	283	544	837	4571
60	822	667	486	201	43	0	0	0	8	170	398	682	3477
57	729	583	397	136	21	0	0	0	3	116	316	593	2894
55	668	528	340	100	12	0	0	0	1	87	263	536	2535
50	526	399	211	37	2	0	0	0	0	36	153	395	1759
32	134	72	8	0	0	0	0	0	0	0	3	66	283

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	180	189	391	662	995	1233	1422	1367	1099	762	449	252	9001
55	1	1	10	72	293	543	709	654	410	136	20	9	2858
57	0	0	4	48	241	483	647	592	352	103	12	4	2486
60	0	0	0	23	170	393	554	499	267	63	4	0	1973
65	0	0	0	4	80	249	399	345	144	22	0	0	1243
70	0	0	0	0	27	125	248	203	57	5	0	0	665

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	51	82	210	452	759	999	1176	1125	874	535	251	88	51	133	343	795	1554	2553	3729	4854	5728	6263	6514	6602
45	24	40	120	312	604	849	1021	970	724	385	146	45	24	64	184	496	1100	1949	2970	3940	4664	5049	5195	5240
50	7	15	59	189	451	699	866	815	575	245	75	19	7	22	81	270	721	1420	2286	3101	3676	3921	3996	4015
55	0	3	30	100	304	549	711	660	426	137	32	3	0	3	33	133	437	986	1697	2357	2783	2920	2952	2955
60	0	0	8	43	179	399	556	505	284	61	11	0	0	0	8	51	230	629	1185	1690	1974	2035	2046	2046
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	33	56	133	267	472	675	807	770	570	329	152	56	33	89	222	489	961	1636	2443	3213	3783	4112	4264	4320

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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