

# Climatography of the United States

No. 20

1971-2000

Station: WARRENTON 3 SE, VA

COOP ID: 448888

Climate Division: VA 4

NWS Call Sign:

Elevation: 500 Feet

Lat: 38°41N

Lon: 77°46W

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	42.1	23.5	32.8	75+	1993	1	40.9	1990	-11	1972	16	23.0	1977	1000	0	.0	.0	7.8	5.4	26.1	.6
Feb	45.7	25.6	35.7	80	1985	25	42.4	1990	-7	1996	5	23.9	1979	822	0	.0	.0	10.1	3.6	22.0	.2
Mar	54.6	33.0	43.8	90	1990	14	49.5	2000	6	1960	11	38.3	1984	658	0	.0	@	20.3	.6	15.6	.0
Apr	65.0	42.3	53.7	94	1976	19	58.4	1985	15	1977	9	49.2	1975	342	1	.0	.5	28.3	.0	3.7	.0
May	72.7	52.2	62.5	95	1969	30	69.3	1991	30+	1986	4	56.7	1994	137	57	.0	.7	30.9	.0	.1	.0
Jun	80.1	61.2	70.7	99	1988	22	73.4	1973	39	1972	11	63.5	1972	18	187	.0	4.1	30.0	.0	.0	.0
Jul	84.2	65.8	75.0	103	1977	7	79.4	1993	48	1988	1	71.5	2000	0	310	.3	9.5	31.0	.0	.0	.0
Aug	83.3	64.1	73.7	104	1988	18	77.8	1988	44+	1986	30	70.0	1992	4	275	.1	7.6	31.0	.0	.0	.0
Sep	77.5	57.4	67.5	102	1953	1	72.4	1998	27	1993	30	64.1	1975	38	111	.1	3.1	30.0	.0	.1	.0
Oct	66.8	45.0	55.9	94+	1998	1	61.6	1971	16	1993	24	50.4	1976	298	15	.0	.1	30.7	.0	2.6	.0
Nov	56.0	36.7	46.4	86	1974	2	52.9	1994	8	1955	29	40.3	1976	558	0	.0	.0	22.3	@	11.5	.0
Dec	45.9	28.1	37.0	79+	1998	8	43.6	1998	-2	1983	26	25.5	1989	869	0	.0	.0	11.5	2.8	22.6	.1
Ann	64.5	44.6	54.6	104	Aug 1988	18	79.4	Jul 1993	-11	Jan 1972	16	23.0	Jan 1977	4744	956	.5	25.6	283.9	12.4	104.3	.9

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1951-2001

(3) Derived from 1971-2000 serially complete daily data

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**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: WARRENTON 3 SE, VA**

**COOP ID: 448888**

**Climate Division: VA 4**

**NWS Call Sign:**

**Elevation: 500 Feet Lat: 38°41N**

**Lon: 77°46W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	3.36	3.07	3.21	1978	9	7.97	1978	.26	1981	10.0	6.7	2.4	.8	.87	1.19	1.67	2.10	2.53	2.97	3.47	4.05	4.82	6.03	7.16
Feb	2.80	2.27	2.35	1965	8	6.36	1998	.25	1978	8.5	5.4	1.8	.7	.54	.79	1.20	1.58	1.97	2.38	2.85	3.41	4.16	5.37	6.51
Mar	3.59	3.08	2.95	1984	29	8.50	1993	1.02	1981	10.3	6.9	2.6	.9	1.24	1.58	2.07	2.49	2.89	3.30	3.74	4.27	4.94	5.97	6.93
Apr	3.34	3.00	2.71	1964	29	9.75	1983	.66	1985	10.6	6.5	2.3	.7	1.13	1.44	1.90	2.29	2.67	3.06	3.48	3.97	4.61	5.59	6.49
May	4.28	4.19	3.80	1989	6	11.01	1989	1.52	1994	12.1	7.9	3.0	1.1	1.64	2.04	2.61	3.08	3.53	3.99	4.48	5.05	5.78	6.90	7.93
Jun	4.02	3.76	8.85	1972	22	13.57	1972	.64	1984	10.3	6.8	2.5	.9	.77	1.13	1.72	2.26	2.81	3.41	4.08	4.89	5.97	7.71	9.36
Jul	4.06	3.85	6.92	1956	21	7.92	1994	.77	1974	11.1	7.2	2.7	1.1	1.25	1.64	2.21	2.71	3.18	3.68	4.22	4.86	5.68	6.96	8.15
Aug	3.67	3.22	4.44	1955	13	10.17	1994	.85	1998	10.1	6.2	2.3	.9	.86	1.20	1.74	2.22	2.70	3.20	3.77	4.45	5.34	6.74	8.07
Sep	4.06	3.37	3.20	1979	6	9.50	1975	1.34	1986	9.4	6.1	2.7	1.3	1.03	1.41	2.00	2.52	3.04	3.58	4.19	4.91	5.85	7.33	8.72
Oct	3.43	2.45	4.06	1976	9	12.15	1976	.03	2000	8.2	5.1	2.4	1.2	.44	.71	1.20	1.68	2.19	2.74	3.39	4.20	5.28	7.06	8.78
Nov	3.47	3.26	4.38	1993	28	7.20	1985	.42	2000	8.8	5.8	2.4	.9	.73	1.05	1.56	2.02	2.49	2.99	3.55	4.22	5.11	6.53	7.87
Dec	3.28	2.59	3.09	1974	2	6.79	1983	.73	1980	9.7	6.0	2.2	1.0	.79	1.09	1.57	2.00	2.43	2.87	3.38	3.97	4.76	6.00	7.16
Ann	43.36	43.54	8.85	Jun 1972	22	13.57	Jun 1972	.03	Oct 2000	119.1	76.6	29.3	11.5	32.61	34.73	37.43	39.46	41.26	42.98	44.75	46.70	49.05	52.44	55.35

+ 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: 1951-2001

(3) Derived from 1971-2000 serially complete daily data

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**Climate Division: VA 4**

**NWS Call Sign:**

**Elevation: 500 Feet**

**Lat: 38°41N**

**Lon: 77°46W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	6.3	4.8	1	#	10.5	1971	1	24.1	1987	26	1996	11	10	1996	2.9	1.8	.8	.2	.1	7.9	4.3	1.5	.5
Feb	5.1	1.5	1	#	10.0	1983	12	24.5	1983	20	1983	13	6	1983	2.1	1.3	.6	.3	.1	7.1	2.8	1.3	.5
Mar	3.0	.0	#	#	13.0	1993	14	21.0	1993	13	1993	15	2	1993	1.1	.9	.3	.1	@	2.2	.8	.3	@
Apr	.3	.0	#	0	2.5	1990	7	2.5+	1990	3	1990	7	#+	1990	.2	.2	.0	.0	.0	.2	@	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	.1	.0	#	0	1.5	1979	10	1.5	1979	2	1979	10	#	1979	@	@	.0	.0	.0	@	.0	.0	.0
Nov	.9	.0	#	0	7.5	1987	12	8.0	1987	8	1987	12	1	1987	.4	.2	.1	@	.0	.5	.2	.1	.0
Dec	2.3	.2	#	#	6.0	1973	17	13.7	1989	9+	1989	13	4	1989	1.1	.7	.4	.1	.0	2.6	1.7	.8	.0
Ann	18.0	6.5	N/A	N/A	13.0	Mar 1993	14	24.5	Feb 1983	26	Jan 1996	11	10	Jan 1996	7.8	5.1	2.2	.7	.2	20.5	9.8	4.0	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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**Lon: 77° 46W**

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	5/17	5/11	5/07	5/03	4/30	4/27	4/23	4/19	4/13
32	4/28	4/23	4/19	4/16	4/13	4/10	4/07	4/04	3/30
28	4/16	4/11	4/08	4/06	4/03	3/31	3/29	3/26	3/21
24	4/03	3/29	3/26	3/23	3/20	3/17	3/14	3/10	3/06
20	4/03	3/27	3/22	3/18	3/14	3/10	3/05	2/28	2/21
16	3/21	3/14	3/09	3/04	2/28	2/24	2/19	2/14	2/07
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	9/27	10/03	10/06	10/10	10/13	10/16	10/19	10/22	10/28
32	10/07	10/13	10/18	10/22	10/25	10/29	11/02	11/06	11/12
28	10/20	10/26	10/30	11/03	11/06	11/09	11/13	11/17	11/23
24	11/02	11/09	11/14	11/18	11/21	11/25	11/29	12/04	12/11
20	11/08	11/17	11/23	11/28	12/03	12/08	12/13	12/19	12/27
16	11/26	12/03	12/08	12/12	12/16	12/19	12/24	12/28	1/04
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	189	181	175	169	165	160	155	149	141
32	216	208	203	198	194	190	185	180	173
28	238	231	225	221	216	212	207	202	194
24	270	262	256	251	246	241	236	230	222
20	298	286	278	270	263	257	249	241	229
16	325	313	304	297	290	283	276	267	255

\* 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:

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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	1000	822	658	342	137	18	0	4	38	298	558	869	4744
60	845	682	503	204	58	3	0	0	8	178	413	714	3608
57	752	598	417	134	29	1	0	0	3	122	331	625	3012
55	690	543	360	96	17	0	0	0	1	91	279	568	2645
50	545	413	232	32	3	0	0	0	0	37	169	426	1857
32	140	77	14	0	0	0	0	0	0	0	5	84	320

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	164	179	380	649	943	1159	1333	1293	1063	740	437	238	8578
55	0	1	12	55	247	469	620	580	374	119	21	9	2507
57	0	0	7	34	197	410	558	518	316	87	13	4	2144
60	0	0	1	13	133	322	465	425	231	50	5	0	1645
65	0	0	0	1	57	187	310	275	111	15	0	0	956
70	0	0	0	0	17	84	169	142	35	2	0	0	449

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	43	70	198	429	707	933	1097	1058	824	498	237	75	43	113	311	740	1447	2380	3477	4535	5359	5857	6094	6169
45	19	31	113	291	552	783	942	903	674	348	138	37	19	50	163	454	1006	1789	2731	3634	4308	4656	4794	4831
50	6	12	57	176	399	633	787	748	526	219	73	14	6	18	75	251	650	1283	2070	2818	3344	3563	3636	3650
55	0	1	26	91	262	483	632	593	377	114	32	5	0	1	27	118	380	863	1495	2088	2465	2579	2611	2616
60	0	0	9	42	144	335	477	439	242	50	9	0	0	0	9	51	195	530	1007	1446	1688	1738	1747	1747
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	32	51	132	259	437	617	753	719	532	311	145	50	32	83	215	474	911	1528	2281	3000	3532	3843	3988	4038

(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](http://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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)