

# Climatology of the United States

## No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

**Station: BACK BAY WILDLIFE REFUGE, VA**

**1971-2000**

**COOP ID: 440385**

**Climate Division: VA 1**

**NWS Call Sign:**

**Elevation: 10 Feet**

**Lat: 36°40N**

**Lon: 75°55W**

### 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	50.3	31.9	41.1	75+	1999	29	49.8	1974	-11	1985	21	30.8	1977	741	0	.0	.0	16.4	1.3	14.6	.1
Feb	52.6	33.2	42.9	81	1989	2	52.1	1990	10+	1996	6	32.3	1978	618	0	.0	.0	15.4	.7	12.9	.0
Mar	58.9	38.9	48.9	87	1998	30	53.4	1976	15	1980	3	43.6	1978	500	0	.0	.0	24.9	.1	5.2	.0
Apr	67.7	47.0	57.4	94	1985	23	62.2	1994	25	2000	6	51.8	1975	243	12	.0	.1	29.5	.0	.6	.0
May	74.6	56.1	65.4	98	1996	20	71.0	1991	32	1999	4	61.3	1978	70	81	.0	1.0	31.0	.0	@	.0
Jun	83.1	65.3	74.2	98	1997	25	79.3	1989	47	1988	12	69.1	1972	3	280	.0	6.0	30.0	.0	.0	.0
Jul	87.3	70.2	78.8	103	1957	23	82.5	1993	52	1978	13	74.7	1978	0	426	.1	11.9	31.0	.0	.0	.0
Aug	85.8	69.2	77.5	102	1980	1	79.7	1987	46	1976	31	73.7	1976	0	387	.1	8.0	31.0	.0	.0	.0
Sep	80.9	65.0	73.0	99	1993	3	75.4	1980	44	1982	26	69.8	1982	3	242	.0	2.4	30.0	.0	.0	.0
Oct	71.6	54.0	62.8	93+	1986	5	67.3	1990	30+	1976	29	57.9	1987	134	67	.0	.2	30.9	.0	.1	.0
Nov	63.1	44.1	53.6	87	1959	3	61.8	1985	16	1958	30	44.3	1976	353	11	.0	.0	28.0	.0	2.8	.0
Dec	54.5	36.5	45.5	81	1998	7	51.3	1971	5	1983	27	34.9	1989	606	0	.0	.0	22.0	.3	10.4	.0
Ann	69.2	51.0	60.1	103	Jul 1957	23	82.5	Jul 1993	-11	Jan 1985	21	30.8	Jan 1977	3271	1506	.2	29.6	320.1	2.4	46.6	.1

+ 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: 1953-2001

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

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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	4.25	3.69	3.85	1987	1	11.70	1987	1.37	1981	9.1	7.0	2.8	.9	1.65	2.04	2.60	3.07	3.51	3.96	4.45	5.02	5.73	6.83	7.84
Feb	3.42	3.08	5.96	1998	1	8.89	1998	1.25	1986	6.8	5.2	2.2	.7	1.10	1.43	1.90	2.31	2.71	3.11	3.56	4.08	4.76	5.80	6.77
Mar	4.00	3.72	2.63	1994	2	8.41	1989	.94	1986	8.4	6.6	2.7	1.1	1.58	1.95	2.48	2.91	3.32	3.73	4.18	4.70	5.36	6.37	7.30
Apr	2.81	2.95	2.27	2000	18	6.07	2000	.63	1994	6.8	4.4	1.6	.5	.82	1.09	1.49	1.84	2.18	2.53	2.92	3.38	3.97	4.90	5.76
May	3.95	3.65	3.15	1972	4	9.31	1978	.51	1986	8.8	6.2	2.4	1.0	1.19	1.56	2.13	2.61	3.08	3.57	4.11	4.74	5.56	6.84	8.03
Jun	3.51	3.33	4.40	1963	2	8.00	2000	.48	1984	7.1	5.2	2.2	1.0	1.04	1.38	1.88	2.31	2.73	3.16	3.64	4.21	4.94	6.08	7.14
Jul	4.51	4.12	4.37	1996	19	11.97	1996	.60	1987	8.7	6.6	3.1	1.6	.87	1.28	1.94	2.55	3.17	3.83	4.59	5.50	6.71	8.64	10.49
Aug	5.39	4.73	6.00	1967	11	12.81	1992	.74	1993	7.8	6.1	2.9	1.4	1.22	1.72	2.51	3.22	3.93	4.68	5.53	6.53	7.86	9.97	11.95
Sep	4.49	4.51	11.20	1964	1	11.54	1999	.38	1986	6.4	5.2	2.4	1.4	.87	1.28	1.93	2.54	3.15	3.81	4.56	5.46	6.66	8.58	10.40
Oct	3.56	3.17	7.82	1999	18	9.32	1971	.00	2000	5.8	4.3	2.1	.9	.44	.89	1.49	2.00	2.51	3.05	3.66	4.38	5.34	6.88	8.33
Nov	3.02	2.62	2.97	1977	7	6.22	1977	1.01	1973	6.4	4.6	2.2	.6	1.13	1.42	1.82	2.16	2.48	2.80	3.16	3.57	4.09	4.89	5.63
Dec	3.06	2.91	2.12	1989	9	5.81	1973	.57	1988	8.1	5.4	2.0	.5	1.09	1.38	1.80	2.15	2.48	2.83	3.20	3.64	4.20	5.06	5.85
Ann	45.97	45.40	11.20	Sep 1964	1	12.81	Aug 1992	.00	Oct 2000	90.2	66.8	28.6	11.6	32.70	35.27	38.56	41.06	43.27	45.42	47.63	50.07	53.04	57.34	61.06

+ 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: 1953-2001

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**NWS Call Sign:**

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**Lat: 36°40N**

**Lon: 75°55W**

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	.3	.0	0	0	4.8	1980	31	4.8+	1980	0	0	0	0	0	.1	.1	.1	.0	.0	.0	.0	.0	.0
Feb	1.1	.0	#	0	10.0	1989	18	19.0	1989	#	1984	6	#	1984	.4	.2	.1	.1	.1	.0	.0	.0	.0
Mar	.4	.0	#	0	7.0	1974	25	7.0	1974	7	1974	25	#+	1999	.1	.1	.1	.1	.0	.1	.1	.1	.0
Apr	#	.0	0	0	#	1983	19	#	1983	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	#	.0	#	0	#	1999	30	#+	1999	#	1999	30	#	1999	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	#	.0	#	0	#	1998	30	#	1998	#	1998	30	#	1998	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	1.8	.0	N/A	N/A	10.0	Feb 1989	18	19.0	Feb 1989	7	Mar 1974	25	#+	Nov 1999	.6	.4	.3	.2	.1	.1	.1	.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	4/22	4/17	4/14	4/12	4/10	4/07	4/05	4/02	3/28
32	4/16	4/10	4/06	4/03	3/31	3/28	3/24	3/20	3/15
28	3/28	3/22	3/17	3/13	3/09	3/06	3/02	2/25	2/18
24	3/07	2/28	2/22	2/18	2/13	2/09	2/04	1/30	1/23
20	2/28	2/18	2/11	2/05	1/30	1/24	1/17	1/06	0/00
16	2/15	2/07	2/01	1/26	1/19	1/09	0/00	0/00	0/00
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	10/21	10/27	10/31	11/03	11/07	11/10	11/14	11/18	11/24
32	11/03	11/10	11/14	11/18	11/22	11/26	11/30	12/04	12/11
28	11/17	11/24	11/29	12/04	12/08	12/12	12/17	12/22	12/30
24	11/27	12/06	12/13	12/18	12/23	12/29	1/03	1/10	1/19
20	12/10	12/18	12/24	12/30	1/04	1/09	1/15	1/25	0/00
16	12/25	1/03	1/09	1/16	1/24	2/06	0/00	0/00	0/00
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	234	226	220	215	211	206	201	195	187
32	260	252	246	240	236	231	225	219	211
28	306	295	287	280	273	267	260	252	240
24	346	333	325	318	312	305	299	291	280
20	>365	>365	>365	349	338	330	322	314	303
16	>365	>365	>365	>365	>365	>365	350	338	325

\* 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	741	618	500	243	70	3	0	0	3	134	353	606	3271
60	596	486	349	130	19	0	0	0	0	62	228	459	2329
57	510	408	264	79	7	0	0	0	0	35	166	374	1843
55	455	358	213	53	3	0	0	0	0	22	131	321	1556
50	328	246	110	14	0	0	0	0	0	6	63	206	973
32	51	26	1	0	0	0	0	0	0	0	0	12	90

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	333	332	525	759	1034	1266	1449	1410	1230	956	648	430	10372
55	24	20	23	122	324	576	736	697	540	265	89	25	3441
57	17	14	13	88	265	516	674	635	480	216	64	17	2999
60	11	8	5	49	185	426	581	542	390	150	36	9	2392
65	0	0	0	12	81	280	426	387	242	67	11	0	1506
70	0	0	0	1	23	151	274	232	110	20	2	0	813

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	143	169	317	546	813	1043	1219	1179	1006	718	430	224	143	312	629	1175	1988	3031	4250	5429	6435	7153	7583	7807
45	69	95	191	400	658	893	1064	1024	856	563	293	123	69	164	355	755	1413	2306	3370	4394	5250	5813	6106	6229
50	30	43	105	260	503	743	909	869	706	411	180	57	30	73	178	438	941	1684	2593	3462	4168	4579	4759	4816
55	4	18	47	150	351	593	754	714	556	264	91	22	4	22	69	219	570	1163	1917	2631	3187	3451	3542	3564
60	0	4	19	71	207	443	599	559	406	147	36	5	0	4	23	94	301	744	1343	1902	2308	2455	2491	2496
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	78	96	173	307	502	720	859	838	697	436	237	112	78	174	347	654	1156	1876	2735	3573	4270	4706	4943	5055

(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.  
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> |
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## 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)