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: WILLIAMSBURG 2 N, VA **COOP ID: 449151**

Climate Division: VA 1 **NWS Call Sign:** **Elevation: 70 Feet** **Lat: 37˚18N** **Lon: 76˚42W**

Temperature (˚F)

Month	Mean (1)			Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
	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	48.9	28.1	38.5	80	1952	1	47.7	1974	-7	1985	21	27.4	1977	822	0	.0	.0	14.5	2.2	21.4	.1
Feb	52.4	29.9	41.2	83	1997	27	49.9	1976	1	1996	5	30.8	1978	668	0	.0	.0	16.1	1.1	18.2	.0
Mar	61.0	36.6	48.8	90	1998	30	53.9	2000	12	1996	9	43.0	1984	502	0	.0	@	26.4	.1	11.7	.0
Apr	71.1	44.4	57.8	96	1960	26	63.3	1994	22	1982	7	53.1	1975	234	16	.0	.5	29.7	.0	3.0	.0
May	78.2	54.1	66.2	98+	1996	20	71.6	1991	31	1966	11	62.1	1992	60	95	.0	1.6	31.0	.0	@	.0
Jun	85.2	62.3	73.8	104	1952	26	77.2	1981	37	1967	2	69.7	1992	4	266	.1	7.6	30.0	.0	.0	.0
Jul	89.0	67.2	78.1	103+	1983	21	81.3	1993	51+	1979	6	75.7+	1984	0	406	.4	14.6	31.0	.0	.0	.0
Aug	87.1	65.9	76.5	104	1983	22	79.6	1977	44	1952	25	72.7	1992	0	357	.3	10.2	31.0	.0	.0	.0
Sep	81.6	60.0	70.8	103+	1954	7	74.6	1980	38	1983	23	68.5	1984	10	184	@	3.0	30.0	.0	.0	.0
Oct	71.5	48.0	59.8	96	1954	4	66.1	1971	21	1952	22	53.0	1987	203	38	.0	.2	30.9	.0	1.1	.0
Nov	62.4	39.3	50.9	85+	1993	15	56.9	1985	15	1955	29	43.7	1976	426	2	.0	.0	26.8	.0	8.4	.0
Dec	53.0	31.9	42.5	82	1998	6	50.8	1971	0	1983	26	31.8	1989	700	0	.0	.0	18.5	.8	17.4	@
Ann	70.1	47.3	58.7	104+	Aug 1983	22	81.3	Jul 1993	-7	Jan 1985	21	27.4	Jan 1977	3629	1364	.8	37.7	315.9	4.2	81.2	.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/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

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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	4.19	4.17	2.52	1962	6	8.16	1987	.62	1981
Feb	3.45	3.26	3.19	1998	4	8.12	1998	1.01	1978
Mar	4.64	4.19	2.54	1994	2	9.29	1994	1.26	1986
Apr	3.24	3.32	2.11+	1987	16	6.05	1983	.77	1976
May	4.51	4.42	3.14	1982	25	7.77	1982	.87	1991
Jun	3.38	3.03	4.24	1963	3	7.94	1989	.64	1990
Jul	5.34	5.08	3.80	1960	30	9.28	1975	.62	1987
Aug	4.99	4.25	11.33	1989	18	13.81	1989	1.41	1995
Sep	4.96	3.00	14.28	1999	16	21.35	1999	.73	1986
Oct	3.61	3.43	3.88	1973	2	9.99	1971	.03	2000
Nov	3.39	2.98	3.50	1979	11	7.96	1979	.89	1981
Dec	3.34	3.35	2.95	1958	29	6.64	1998	.63	1988
Ann	49.04	47.33	14.28	Sep 1999	16	21.35	Sep 1999	.03	Oct 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.1	7.8	2.9	.9
Feb	9.7	6.2	2.5	.8
Mar	11.0	7.7	3.4	1.2
Apr	9.5	5.9	2.3	.7
May	11.0	7.7	3.4	1.2
Jun	9.4	5.9	2.2	1.0
Jul	11.7	8.3	3.4	1.5
Aug	10.2	6.9	3.2	1.5
Sep	8.5	5.5	2.5	1.5
Oct	7.6	4.9	2.2	1.1
Nov	9.3	5.9	2.4	.7
Dec	10.6	6.7	2.4	.8
Ann	119.6	79.4	32.8	12.9

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	1.54	1.94	2.50	2.98	3.43	3.89	4.39	4.97	5.71	6.85	7.90
Feb	1.34	1.66	2.12	2.50	2.85	3.22	3.61	4.07	4.64	5.53	6.34
Mar	1.76	2.19	2.81	3.32	3.81	4.31	4.85	5.48	6.27	7.50	8.62
Apr	1.18	1.48	1.92	2.29	2.64	2.99	3.38	3.84	4.41	5.30	6.12
May	1.51	1.93	2.56	3.09	3.60	4.13	4.71	5.38	6.25	7.59	8.83
Jun	.86	1.18	1.67	2.10	2.53	2.98	3.49	4.08	4.86	6.09	7.24
Jul	1.47	1.98	2.75	3.42	4.08	4.76	5.53	6.43	7.60	9.44	11.16
Aug	1.10	1.56	2.29	2.95	3.61	4.32	5.11	6.06	7.31	9.30	11.18
Sep	.64	1.04	1.74	2.43	3.16	3.97	4.90	6.05	7.61	10.17	12.65
Oct	.50	.79	1.31	1.81	2.34	2.91	3.58	4.40	5.51	7.32	9.07
Nov	.91	1.23	1.72	2.15	2.57	3.02	3.50	4.08	4.84	6.03	7.13
Dec	1.04	1.36	1.83	2.23	2.63	3.03	3.48	4.00	4.68	5.74	6.71
Ann	33.46	36.43	40.25	43.17	45.78	48.31	50.93	53.84	57.38	62.53	67.01

\+ 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)

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	3.1	.0	#	#	13.5	1980	5	15.5	1980	14	1980	5	2	1996	.7	.6	.3	.2	@	1.9	1.0	.4	.1
Feb	1.9	.0	#	#	10.5	1989	18	10.5	1989	11	1989	18	3	1979	.8	.5	.3	.3	@	1.2	.6	.2	@
Mar	1.1	.0	#	0	11.3	1980	2	13.3	1980	12	1980	2	1	1980	.3	.2	.1	.1	@	.2	.1	.1	@
Apr	#	.0	#	0	#	1986	23	#+	1986	#	1983	18	#	1983	.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	.3	.0	0	0	7.5	1987	11	7.5	1987	0	0	0	0	0	@	@	@	@	.0	.0	.0	.0	.0
Dec	.4	.0	#	0	3.0	1989	8	3.0	1989	4	1989	14	1	1989	.2	.2	@	.0	.0	.1	.0	.0	.0
Ann	6.8	.0	N/A	N/A	13.5	Jan 1980	5	15.5	Jan 1980	14	Jan 1980	5	3	Feb 1979	2.0	1.5	.7	.6	@	3.4	1.7	.7	.1

+ 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	5/07	5/02	4/29	4/26	4/23	4/20	4/17	4/14	4/09
32	4/25	4/20	4/16	4/13	4/10	4/08	4/05	4/01	3/27
28	4/14	4/08	4/04	3/31	3/28	3/25	3/21	3/17	3/11
24	3/30	3/23	3/19	3/14	3/11	3/07	3/02	2/26	2/19
20	3/16	3/10	3/06	3/02	2/26	2/23	2/19	2/14	2/08
16	3/10	2/28	2/21	2/15	2/09	2/03	1/28	1/20	1/08

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	10/07	10/12	10/15	10/18	10/21	10/24	10/27	10/30	11/04
32	10/14	10/19	10/23	10/26	10/29	11/01	11/04	11/07	11/12
28	10/31	11/05	11/08	11/11	11/13	11/16	11/19	11/22	11/27
24	11/10	11/17	11/21	11/26	11/29	12/03	12/07	12/12	12/18
20	11/21	11/29	12/05	12/10	12/14	12/19	12/24	12/29	1/06
16	12/07	12/15	12/21	12/26	12/31	1/05	1/10	1/16	1/26

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	189	184	180	176	171	166	158
32	222	215	209	205	200	196	192	186	179
28	249	242	238	233	230	226	221	217	210
24	289	280	274	268	263	258	253	246	237
20	322	311	303	296	290	284	277	269	258
16	>365	350	334	326	319	313	306	299	289

***** 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)

Base — Heating Degree Days (1)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	822	668	502	234	60	4	0	0	10	203	426	700	3629
60	668	528	355	125	15	0	0	0	1	108	288	553	2641
57	584	452	273	77	5	0	0	0	0	68	213	466	2138
55	526	400	224	53	2	0	0	0	0	47	170	411	1833
50	389	279	124	15	0	0	0	0	0	15	85	286	1193
32	71	32	2	0	0	0	0	0	0	0	0	34	139

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	272	288	524	772	1058	1252	1429	1380	1164	859	566	357	9921
55	14	12	32	135	347	562	716	667	474	193	45	21	3218
57	10	8	20	99	288	502	654	605	414	152	28	15	2795
60	2	0	9	57	205	412	561	512	325	99	13	8	2203
65	0	0	0	16	95	266	406	357	184	38	2	0	1364
70	0	0	0	2	29	137	251	207	70	10	0	0	706

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	109	142	306	540	823	1022	1190	1146	934	621	347	169	109	251	557	1097	1920	2942	4132	5278	6212	6833	7180	7349
45	54	80	185	395	668	872	1035	991	784	466	226	93	54	134	319	714	1382	2254	3289	4280	5064	5530	5756	5849
50	26	36	105	260	513	722	880	836	634	320	132	46	26	62	167	427	940	1662	2542	3378	4012	4332	4464	4510
55	4	16	52	153	360	572	725	681	484	190	66	19	4	20	72	225	585	1157	1882	2563	3047	3237	3303	3322
60	0	2	23	78	220	422	570	526	338	98	23	4	0	2	25	103	323	745	1315	1841	2179	2277	2300	2304
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	69	99	199	346	526	690	823	785	625	388	214	103	69	168	367	713	1239	1929	2752	3537	4162	4550	4764	4867

(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

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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