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: NORFOLK INTL AP, VA **COOP ID: 446139**

Climate Division: VA 1 **NWS Call Sign: ORF** **Elevation: 30 Feet** **Lat: 36˚54N** **Lon: 76˚12W**

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	47.8	32.3	40.1	78	1970	29	47.9	1974	-3	1985	21	28.5	1977	759	1	.0	.0	13.3	2.4	15.1	@
Feb	50.3	33.6	42.0	82	1997	27	49.3	1990	8	1965	1	32.2	1978	638	2	.0	.0	14.7	1.3	13.3	.0
Mar	57.8	40.1	49.0	88+	1990	14	53.6	1977	18	1980	1	44.6	1984	488	8	.0	.0	23.5	.1	5.1	.0
Apr	67.0	47.8	57.4	97	1960	26	63.5	1994	28+	1982	7	51.8	1975	247	35	.0	.4	29.2	.0	.3	.0
May	74.9	57.6	66.3	100	1991	31	71.6	1991	36+	1966	11	61.2	1992	66	119	@	1.7	31.0	.0	.0	.0
Jun	82.8	66.2	74.5	101	1964	10	78.5	1994	45	1967	2	70.0	1972	4	303	@	6.8	30.0	.0	.0	.0
Jul	86.8	71.4	79.1	103+	1993	29	82.3	1993	54+	1979	7	76.0	1978	0	453	.3	12.9	31.0	.0	.0	.0
Aug	84.7	70.1	77.4	104	1980	1	80.6	1980	49	1982	30	74.6	1992	0	400	.3	9.2	31.0	.0	.0	.0
Sep	79.4	64.8	72.1	99	1983	11	75.6	1980	45	1967	24	69.5	1982	8	235	.0	2.6	30.0	.0	.0	.0
Oct	69.4	52.8	61.1	95	1954	4	66.1	1984	27	1976	29	55.8	1987	152	45	.0	.1	30.8	.0	.1	.0
Nov	60.9	43.7	52.3	86	1974	1	59.5	1985	20	1950	26	45.0	1976	375	10	.0	.0	26.6	.0	2.7	.0
Dec	52.3	36.1	44.2	80+	1991	3	51.6	1971	7	1983	25	34.0	1989	631	1	.0	.0	18.9	.7	11.5	.0
Ann	67.8	51.4	59.6	104	Aug 1980	1	82.3	Jul 1993	-3	Jan 1985	21	28.5	Jan 1977	3368	1612	.6	33.7	310.0	4.5	48.1	@

\+ 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

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	3.93	3.52	3.74	1967	8	9.93	1987	1.05	1981
Feb	3.34	2.96	4.75	1998	4	8.21	1998	.84	1991
Mar	4.08	3.69	3.78	1994	2	10.36	1994	.75	1986
Apr	3.38	3.39	5.86	1991	20	7.25	1984	.43	1985
May	3.74	3.56	3.41	1980	24	10.12	1979	.64	1991
Jun	3.77	3.72	5.76	1963	2	8.31	2000	1.10	1997
Jul	5.17	4.75	4.72	1969	27	14.37	1994	.36	1993
Aug	4.79	4.51	7.41	1964	31	14.32	1992	.74	1975
Sep	4.06	3.35	6.48	1959	28	13.80	1979	.26	1986
Oct	3.47	3.24	6.23	1999	17	10.12	1971	.01	2000
Nov	2.98	2.78	3.31	1952	21	5.71	1985	.97+	1993
Dec	3.03	2.91	2.50	1983	12	6.10	1983	.67	1988
Ann	45.74	45.88	7.41	Aug 1964	31	14.37	Jul 1994	.01	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.4	7.4	2.9	.8
Feb	10.1	6.5	2.1	.6
Mar	10.9	7.5	2.8	1.0
Apr	9.5	5.8	2.3	.9
May	10.5	6.8	2.7	.8
Jun	9.5	6.0	2.4	1.1
Jul	11.0	7.1	3.3	1.7
Aug	9.8	6.6	3.1	1.4
Sep	8.4	5.6	2.4	1.2
Oct	7.5	5.0	2.4	.9
Nov	8.3	5.6	2.3	.5
Dec	10.2	6.2	1.9	.6
Ann	117.1	76.1	30.6	11.5

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	1.61	1.97	2.48	2.90	3.29	3.69	4.12	4.62	5.25	6.21	7.09
Feb	1.21	1.52	1.97	2.35	2.72	3.09	3.49	3.96	4.56	5.48	6.33
Mar	1.35	1.74	2.30	2.79	3.25	3.73	4.25	4.87	5.65	6.88	8.01
Apr	.90	1.22	1.71	2.14	2.56	3.00	3.50	4.08	4.84	6.04	7.16
May	1.43	1.78	2.28	2.69	3.08	3.48	3.92	4.42	5.06	6.04	6.93
Jun	1.05	1.40	1.95	2.42	2.88	3.37	3.90	4.53	5.36	6.65	7.85
Jul	1.11	1.59	2.35	3.03	3.72	4.46	5.29	6.28	7.58	9.67	11.64
Aug	.88	1.31	2.01	2.66	3.32	4.04	4.86	5.84	7.15	9.26	11.27
Sep	.59	.92	1.51	2.07	2.66	3.30	4.05	4.96	6.19	8.19	10.11
Oct	.43	.71	1.20	1.68	2.19	2.76	3.42	4.23	5.34	7.15	8.91
Nov	.90	1.18	1.61	1.97	2.33	2.69	3.10	3.57	4.19	5.15	6.04
Dec	.86	1.15	1.59	1.96	2.33	2.71	3.14	3.64	4.29	5.31	6.25
Ann	32.88	35.38	38.57	40.99	43.14	45.22	47.36	49.73	52.59	56.74	60.33

\+ 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	2.6	.3	#	0	9.0	1973	8	10.1	1994	11	1977	10	1+	2000	1.5	.9	.3	.1	.0	1.9	.6	.3	@
Feb	3.8	1.1	#	0	13.6	1989	18	24.4	1989	14	1980	10	3	1980	1.7	.8	.4	.3	.1	1.8	1.2	.7	.1
Mar	1.3	#	#	0	8.1	1980	1	13.7	1980	14	1980	3	1	1980	.6	.2	.2	.1	.0	.3	.2	.1	.1
Apr	.0	.0	0	0	.5	1989	11	.5	1989	#	1989	11	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1994	.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	0	0	.3	1987	11	.3	1987	#	1987	12	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.4	#	#	0	3.9	1993	23	3.9	1993	1+	1993	23	#	1993	.2	.2	@	.0	.0	.1	.0	.0	.0
Ann	8.1	1.4	N/A	N/A	13.6	Feb 1989	18	24.4	Feb 1989	14+	Mar 1980	3	3	Feb 1980	4.0	2.1	.9	.5	.1	4.1	2.0	1.1	.2

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	4/19	4/15	4/11	4/08	4/06	4/03	3/31	3/27	3/23
32	4/07	4/01	3/28	3/24	3/20	3/17	3/13	3/09	3/03
28	3/22	3/16	3/11	3/07	3/04	2/28	2/24	2/20	2/14
24	3/07	2/28	2/23	2/18	2/14	2/10	2/06	1/31	1/23
20	2/25	2/18	2/12	2/07	2/03	1/29	1/23	1/15	0/00
16	2/11	2/03	1/28	1/21	1/13	0/00	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	10/23	10/29	11/02	11/06	11/10	11/13	11/17	11/21	11/27
32	11/06	11/12	11/16	11/20	11/23	11/27	12/01	12/05	12/11
28	11/16	11/23	11/28	12/02	12/06	12/10	12/15	12/20	12/27
24	12/03	12/10	12/15	12/20	12/24	12/28	1/01	1/07	1/15
20	12/18	12/25	12/30	1/03	1/07	1/11	1/16	1/23	0/00
16	12/28	1/06	1/13	1/21	1/31	0/00	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	243	234	228	223	217	212	207	200	191
32	271	263	257	252	247	243	238	232	223
28	302	294	287	282	277	272	266	260	251
24	347	331	323	317	311	305	299	292	283
20	>365	>365	356	345	337	331	325	318	309
16	>365	>365	>365	>365	>365	>365	362	348	336

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	759	638	488	247	66	4	0	0	8	152	375	631	3368
60	625	505	347	131	15	0	0	0	1	82	251	497	2454
57	537	429	264	81	5	0	0	0	0	48	182	411	1957
55	480	377	212	56	2	0	0	0	0	31	143	356	1657
50	347	257	110	16	0	0	0	0	0	8	68	237	1043
32	53	24	1	0	0	0	0	0	0	0	0	19	97

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	297	312	549	785	1080	1290	1475	1425	1221	924	629	405	10392
55	11	17	54	153	369	600	762	712	531	229	81	24	3543
57	7	11	39	120	311	540	700	650	471	181	59	16	3105
60	3	6	23	79	230	450	607	557	381	120	35	8	2499
65	1	2	8	35	119	303	453	400	235	45	10	1	1612
70	0	0	2	10	50	173	299	249	120	15	2	0	920

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	135	161	327	556	841	1059	1234	1184	990	686	400	211	135	296	623	1179	2020	3079	4313	5497	6487	7173	7573	7784
45	73	92	208	408	686	909	1079	1029	840	532	271	119	73	165	373	781	1467	2376	3455	4484	5324	5856	6127	6246
50	35	47	112	269	531	759	924	874	690	377	163	59	35	82	194	463	994	1753	2677	3551	4241	4618	4781	4840
55	10	20	57	160	377	609	769	719	540	238	85	29	10	30	87	247	624	1233	2002	2721	3261	3499	3584	3613
60	0	6	25	82	238	459	614	564	390	122	36	6	0	6	31	113	351	810	1424	1988	2378	2500	2536	2542
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	72	94	176	315	530	729	874	841	678	406	217	107	72	166	342	657	1187	1916	2790	3631	4309	4715	4932	5039

(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