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: WASHINGTON DULLES INTL, VA **COOP ID: 448903**

Climate Division: VA 4 **NWS Call Sign: IAD** **Elevation: 290 Feet** **Lat: 38˚56N** **Lon: 77˚29W**

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	41.4	21.9	31.7	75	1975	29	40.8	1990	-18	1984	22	20.1	1977	1025	0	.0	.0	6.6	6.4	25.6	1.1
Feb	45.5	24.1	34.8	79+	2000	25	42.2	1990	-14	1979	18	22.4	1979	847	0	.0	.0	9.9	3.8	21.6	.4
Mar	55.0	31.8	43.4	89+	1998	30	48.1+	1990	-1	1993	15	37.5	1984	670	4	.0	.0	19.9	.6	16.7	@
Apr	65.9	40.2	53.1	92+	1990	27	60.1	1994	17	1969	1	48.4	1975	362	11	.0	.3	28.5	.0	5.6	.0
May	74.6	49.9	62.3	97	1969	29	69.3	1991	28	1970	7	57.4	1976	139	60	.0	1.0	31.0	.0	.3	.0
Jun	82.8	59.0	70.9	100	1964	27	76.1	1994	36	1977	8	66.4	1974	21	203	.0	5.0	30.0	.0	.0	.0
Jul	87.4	64.0	75.7	104	1988	16	79.7	1993	41	1988	1	71.6	1976	1	345	.4	12.0	31.0	.0	.0	.0
Aug	85.9	62.8	74.4	104	1983	20	78.4	1988	38	1982	29	70.4	1992	4	302	.3	8.7	31.0	.0	.0	.0
Sep	78.9	55.6	67.3	99+	1983	11	72.7	1998	30	1974	24	63.0	1984	60	132	.0	2.9	30.0	.0	.1	.0
Oct	67.7	42.3	55.0	90+	1986	1	61.8	1984	15	1969	24	49.2	1988	323	15	.0	@	30.4	.0	4.9	.0
Nov	56.5	33.8	45.2	84+	1982	1	52.6	1985	9	1989	24	37.9	1976	589	3	.0	.0	21.7	.1	14.7	.0
Dec	45.9	26.0	36.0	79	1998	6	43.3	1984	-4	1989	25	23.1	1989	884	0	.0	.0	10.6	3.1	23.0	.1
Ann	65.6	42.6	54.2	104+	Jul 1988	16	79.7	Jul 1993	-18	Jan 1984	22	20.1	Jan 1977	4925	1075	.7	29.9	280.6	14.0	112.5	1.6

\+ 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: 1962-2001

(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	3.05	2.66	1.64	1998	28	6.61	1979	.40	1981
Feb	2.77	2.56	2.17	1998	4	5.83	1998	.25	1978
Mar	3.55	3.46	2.21	1991	23	7.65	1993	.99	1981
Apr	3.22	2.76	2.43	1993	16	7.35	1973	.33	1985
May	4.22	3.92	3.13	1988	18	10.26	1988	1.19	1986
Jun	4.07	3.32	10.67	1972	21	18.19	1972	.52	1988
Jul	3.57	2.87	3.50	1994	27	7.23	1992	.94	1983
Aug	3.78	4.04	4.68	1984	11	10.71	1984	.44	1998
Sep	3.82	3.15	5.52	1966	14	11.26	1975	.78	1978
Oct	3.37	2.71	4.06	1979	1	9.19	1971	.06	2000
Nov	3.31	3.08	2.59	1993	27	7.09	1972	.24	1981
Dec	3.07	2.44	2.92	1977	18	6.06	1972	.68	1980
Ann	41.80	40.49	10.67	Jun 1972	21	18.19	Jun 1972	.06	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.8	6.2	2.1	.6
Feb	9.2	5.4	1.8	.8
Mar	10.6	7.1	2.4	.9
Apr	10.1	6.6	2.0	.7
May	12.3	7.9	3.0	.8
Jun	10.8	6.7	2.6	.9
Jul	10.8	6.7	2.3	.9
Aug	9.7	6.3	2.3	1.0
Sep	9.1	5.7	2.7	1.0
Oct	7.8	5.0	2.3	.9
Nov	9.1	5.6	2.3	.8
Dec	9.8	6.0	2.2	.5
Ann	120.1	75.2	28.0	9.8

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	.92	1.21	1.65	2.02	2.38	2.76	3.17	3.66	4.29	5.27	6.18
Feb	.64	.89	1.30	1.66	2.02	2.41	2.84	3.35	4.03	5.11	6.12
Mar	1.25	1.59	2.07	2.48	2.87	3.27	3.70	4.21	4.86	5.86	6.78
Apr	.98	1.29	1.74	2.14	2.52	2.91	3.35	3.86	4.52	5.56	6.51
May	1.58	1.97	2.54	3.01	3.46	3.92	4.41	4.99	5.72	6.85	7.88
Jun	.85	1.22	1.82	2.37	2.91	3.50	4.16	4.95	6.00	7.67	9.26
Jul	1.10	1.44	1.94	2.38	2.80	3.23	3.71	4.27	5.00	6.13	7.18
Aug	.80	1.15	1.70	2.21	2.71	3.25	3.86	4.59	5.56	7.10	8.55
Sep	.81	1.17	1.73	2.23	2.74	3.29	3.90	4.64	5.61	7.16	8.62
Oct	.44	.71	1.18	1.65	2.15	2.70	3.33	4.11	5.17	6.91	8.59
Nov	.72	1.03	1.52	1.95	2.40	2.86	3.39	4.02	4.85	6.18	7.43
Dec	.72	1.01	1.46	1.86	2.26	2.68	3.16	3.72	4.46	5.64	6.74
Ann	30.38	32.61	35.45	37.60	39.51	41.35	43.25	45.34	47.87	51.54	54.70

\+ 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: 1962-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	8.1	6.5	1	0
Feb	6.2	3.0	1	0
Mar	3.4	1.2	#	0
Apr	.4	.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	#	0
Sep	.0	.0	0	0
Oct	.1	.0	0	0
Nov	.8	.0	#	0
Dec	2.2	.6	#	0
Ann	21.2	11.3	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	19.8	1996	7	30.9	1996	24+	1996	9	7	1996
Feb	22.5	1983	11	27.6	1979	22+	1983	12	6	1979
Mar	13.9	1993	13	15.5	1993	13	1993	14	1+	1999
Apr	2.7	1990	6	4.0	1990	1+	1990	7	#	1990
May	.0	0	0	.0	0	0	0	0	#	2000
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	#	1997
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	1.3	1979	10	1.3	1979	#	1979	10	0	0
Nov	5.3	1987	11	5.5	1987	4+	1987	12	#	1995
Dec	10.6	1982	12	11.9	1982	10	1982	12	3	1989
Ann	22.5	Feb 1983	11	30.9	Jan 1996	24+	Jan 1996	9	7	Jan 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	2.0	1.1	.4	.1
Feb	2.7	1.3	.7	.4	.1
Mar	1.8	1.1	.4	.1	@
Apr	.4	.2	.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	.1	.0	.0	.0	.0
Nov	.6	.2	.1	@	.0
Dec	1.4	.6	.2	.1	@
Ann	10.8	5.4	2.5	1.0	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	7.8	4.5	2.1	.8
Feb	5.1	2.8	1.5	.4
Mar	1.8	.8	.3	.1
Apr	.1	.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	.3	.1	.0	.0
Dec	1.7	1.2	.4	@
Ann	16.8	9.4	4.3	1.3

+ 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	5/21	5/16	5/13	5/10	5/07	5/05	5/02	4/28	4/24
32	5/09	5/04	4/29	4/26	4/23	4/19	4/16	4/12	4/06
28	4/20	4/16	4/13	4/10	4/07	4/05	4/02	3/30	3/26
24	4/12	4/07	4/04	4/01	3/30	3/27	3/24	3/21	3/16
20	4/06	3/31	3/26	3/22	3/18	3/14	3/10	3/05	2/26
16	3/19	3/12	3/07	3/02	2/26	2/22	2/18	2/13	2/06

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	9/22	9/26	9/29	10/02	10/05	10/07	10/10	10/13	10/17
32	9/29	10/04	10/07	10/10	10/13	10/16	10/18	10/22	10/26
28	10/11	10/16	10/20	10/23	10/26	10/29	11/01	11/05	11/10
24	10/24	10/29	11/01	11/04	11/07	11/10	11/13	11/17	11/22
20	11/04	11/11	11/16	11/20	11/24	11/28	12/02	12/07	12/14
16	11/18	11/25	12/01	12/06	12/10	12/15	12/19	12/25	1/02

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	163	158	154	150	145	141	136	129
32	194	187	181	177	172	168	163	158	150
28	219	213	208	204	201	197	193	189	182
24	242	235	230	226	222	218	214	209	202
20	278	269	262	256	251	245	239	232	223
16	317	306	299	292	286	280	273	265	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

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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	1025	847	670	362	139	21	1	4	60	323	589	884	4925
60	880	705	516	223	63	2	0	0	11	200	448	745	3793
57	787	621	424	153	33	0	0	0	4	141	364	653	3180
55	725	565	367	113	19	0	0	0	2	108	310	596	2805
50	581	435	232	42	4	0	0	0	0	48	191	453	1986
32	165	89	11	0	0	0	0	0	0	0	7	96	368

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	122	161	375	639	947	1174	1362	1319	1060	717	405	193	8474
55	2	3	22	80	251	484	649	606	375	103	26	6	2607
57	1	1	16	59	201	425	587	545	319	76	18	4	2252
60	1	1	10	33	138	338	494	452	241	45	9	2	1764
65	0	0	4	11	60	203	345	302	132	15	3	0	1075
70	0	0	1	2	19	98	196	162	57	3	0	0	538

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	42	66	185	414	707	943	1125	1077	829	479	212	72	42	108	293	707	1414	2357	3482	4559	5388	5867	6079	6151
45	18	28	107	275	552	793	970	922	679	333	122	38	18	46	153	428	980	1773	2743	3665	4344	4677	4799	4837
50	7	12	52	162	398	643	815	767	532	202	66	14	7	19	71	233	631	1274	2089	2856	3388	3590	3656	3670
55	0	1	24	89	257	493	660	612	384	108	25	4	0	1	25	114	371	864	1524	2136	2520	2628	2653	2657
60	0	0	7	35	144	345	505	458	250	52	8	0	0	0	7	42	186	531	1036	1494	1744	1796	1804	1804
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	28	48	129	261	443	633	761	738	540	308	136	48	28	76	205	466	909	1542	2303	3041	3581	3889	4025	4073

(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