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: CULLOWHEE, NC **COOP ID: 312200**

Climate Division: NC 1 **NWS Call Sign:** **Elevation: 2,192 Feet** **Lat: 35˚20N** **Lon: 83˚11W**

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	47.4	24.9	36.2	76	1952	1	47.8	1974	-19	1985	21	24.0	1977	894	0	.0	.0	15.5	1.4	21.4	.5
Feb	52.0	27.4	39.7	78	1996	23	46.3	1990	-14	1958	18	32.5	1978	708	0	.0	.0	18.8	.7	18.1	@
Mar	60.2	33.7	47.0	86+	1985	30	52.3	1997	-1	1993	15	41.3	1996	560	0	.0	.0	27.5	.1	13.4	.1
Apr	68.3	41.0	54.7	89	1986	27	58.6	1991	17	1960	11	50.1	1983	313	2	.0	.0	29.3	.0	6.4	.0
May	75.5	50.7	63.1	92	1996	19	68.0	1991	26	1971	4	59.5	1973	118	59	.0	.2	31.0	.0	.7	.0
Jun	81.2	58.0	69.6	97	1952	27	72.0	1994	33+	1966	2	65.4	1972	11	149	.0	1.2	30.0	.0	.0	.0
Jul	84.3	62.5	73.4	99	1952	28	77.3	1993	44+	1953	14	69.8	1984	0	261	.0	4.9	31.0	.0	.0	.0
Aug	82.8	61.5	72.2	98	1983	23	75.0	1987	42	1968	30	69.6	1981	1	224	.0	2.6	31.0	.0	.0	.0
Sep	77.7	55.9	66.8	96+	1954	6	70.3	1998	28	1963	24	63.4	1984	41	95	.0	.5	30.0	.0	@	.0
Oct	69.0	43.0	56.0	98	1981	29	62.2	1985	14	1952	30	50.4	1988	291	12	.0	@	30.9	.0	4.8	.0
Nov	59.1	34.3	46.7	81	1961	5	56.4	1985	4	1950	26	40.2	1976	548	0	.0	.0	26.1	@	14.3	.0
Dec	50.3	27.5	38.9	80	1951	31	45.7	1971	-8	1962	13	31.5	1989	809	0	.0	.0	18.7	.9	20.3	.1
Ann	67.3	43.4	55.4	99	Jul 1952	28	77.3	Jul 1993	-19	Jan 1985	21	24.0	Jan 1977	4294	802	.0	9.4	319.8	3.1	99.4	.7

\+ 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	4.92	5.07	3.50	1957	31	9.56	1996	.60	1986
Feb	4.69	4.95	4.30	1990	16	8.67	1990	.68	1978
Mar	5.43	4.82	5.00	1994	27	10.95	1975	1.24	1985
Apr	3.91	3.50	2.91	1974	4	6.98	1994	.35	1976
May	4.86	4.21	4.02	1973	28	11.98	1976	1.22	1987
Jun	4.34	3.98	4.56	1949	16	10.75	1989	.44	1986
Jul	4.27	3.97	2.90	1982	15	10.30	1971	1.15	1993
Aug	3.91	3.46	3.77	1978	7	10.85	1978	.59	1999
Sep	3.57	3.10	3.67	1989	29	9.65	1989	.25	1984
Oct	3.20	2.87	3.79	1995	4	8.47	1995	.04	2000
Nov	4.28	4.00	3.20	1948	28	8.13	1979	1.46	1990
Dec	4.33	4.36	3.00	1961	12	8.29	1983	1.15	1980
Ann	51.71	51.93	5.00	Mar 1994	27	11.98	May 1976	.04	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.8	8.8	3.7	1.4
Feb	10.4	7.9	3.4	1.1
Mar	12.3	8.8	4.1	1.3
Apr	10.2	7.1	2.9	.9
May	12.0	8.9	3.3	1.0
Jun	12.5	8.8	3.1	.8
Jul	12.7	8.5	2.8	1.1
Aug	11.9	7.4	2.7	.9
Sep	9.4	6.8	2.2	.8
Oct	7.1	5.2	2.1	1.0
Nov	10.0	6.6	3.4	1.4
Dec	11.2	8.0	3.0	1.3
Ann	131.5	92.8	36.7	13.0

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	1.63	2.10	2.78	3.36	3.92	4.50	5.13	5.87	6.82	8.29	9.65
Feb	1.57	2.02	2.67	3.22	3.75	4.30	4.90	5.59	6.49	7.88	9.16
Mar	1.96	2.47	3.21	3.83	4.42	5.02	5.68	6.45	7.42	8.93	10.31
Apr	1.09	1.46	2.02	2.51	2.99	3.49	4.05	4.70	5.56	6.90	8.14
May	1.84	2.30	2.95	3.49	4.00	4.52	5.09	5.75	6.58	7.87	9.05
Jun	1.13	1.54	2.17	2.73	3.27	3.85	4.49	5.24	6.23	7.78	9.24
Jul	1.20	1.61	2.22	2.76	3.28	3.82	4.43	5.14	6.07	7.52	8.87
Aug	.84	1.20	1.77	2.29	2.81	3.37	4.00	4.75	5.74	7.32	8.81
Sep	.75	1.07	1.60	2.07	2.56	3.07	3.65	4.34	5.26	6.73	8.12
Oct	.37	.62	1.07	1.51	1.99	2.52	3.14	3.91	4.96	6.69	8.37
Nov	1.95	2.33	2.85	3.28	3.67	4.07	4.49	4.98	5.59	6.51	7.35
Dec	1.46	1.87	2.47	2.98	3.47	3.97	4.52	5.16	5.98	7.26	8.43
Ann	38.12	40.80	44.20	46.77	49.04	51.23	53.48	55.97	58.97	63.31	67.04

+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	3.2	1.0	#	0
Feb	2.2	.0	#	0
Mar	1.8	.0	#	0
Apr	#	.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
Nov	.2	.0	#	0
Dec	1.3	.0	#	0
Ann	8.7	1.0	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	9.5	1988	7	12.5	1988	12	1988	8	2	1996
Feb	11.5	1979	18	16.0	1979	12	1979	18	1	1979
Mar	17.0	1993	13	19.0	1993	19	1993	14	2	1993
Apr	#	1986	17	#+	1986	11	1987	3	#	1987
May	.0	0	0	.0	0	0	0	0	0	0
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	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	.0	0	0	.0	0	#	1993	31	#	1993
Nov	3.8	1975	23	4.8	1975	1	1975	14	#	1975
Dec	13.0	1971	3	13.0	1971	13	1971	3	1	1993
Ann	17.0	Mar 1993	13	19.0	Mar 1993	19	Mar 1993	14	2+	Jan 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.2	1.1	.6	.1	.0
Feb	.6	.6	.3	.1	@
Mar	.5	.4	.2	.1	@
Apr	.0	.0	.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	.0	.0	.0	.0	.0
Nov	.1	.1	@	.0	.0
Dec	.4	.4	.2	@	@
Ann	2.8	2.6	1.3	.3	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	2.1	1.3	.7	.1
Feb	.7	.3	.2	@
Mar	.4	.2	.1	.1
Apr	.0	.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	@	.0	.0	.0
Dec	.3	.3	.1	@
Ann	3.5	2.1	1.1	.2

+ 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	5/25	5/19	5/15	5/11	5/07	5/04	4/30	4/26	4/20
32	5/17	5/10	5/06	5/02	4/28	4/25	4/21	4/16	4/10
28	5/04	4/28	4/24	4/20	4/16	4/13	4/09	4/04	3/29
24	4/12	4/06	4/02	3/29	3/26	3/23	3/19	3/15	3/09
20	4/01	3/24	3/18	3/12	3/08	3/03	2/25	2/19	2/11
16	3/21	3/13	3/07	3/02	2/25	2/20	2/15	2/09	2/01

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	9/25	9/29	10/01	10/04	10/06	10/08	10/11	10/14	10/17
32	10/01	10/05	10/08	10/11	10/14	10/16	10/19	10/22	10/27
28	10/10	10/16	10/20	10/23	10/26	10/29	11/01	11/05	11/11
24	10/25	10/31	11/04	11/08	11/11	11/14	11/18	11/22	11/28
20	11/07	11/12	11/17	11/20	11/23	11/27	11/30	12/04	12/10
16	11/20	11/29	12/05	12/10	12/15	12/19	12/25	12/31	1/08

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	174	166	160	156	151	146	141	136	128
32	190	183	177	172	168	163	159	153	145
28	215	207	201	197	192	188	183	177	169
24	254	245	239	234	229	224	219	213	205
20	291	280	273	266	260	254	248	240	229
16	326	313	304	297	290	284	277	269	257

***** 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	894	708	560	313	118	11	0	1	41	291	548	809	4294
60	739	568	410	178	45	1	0	0	9	169	403	654	3176
57	653	484	325	112	21	0	0	0	3	113	321	562	2594
55	595	429	272	77	11	0	0	0	1	83	270	506	2244
50	454	299	161	22	1	0	0	0	0	32	161	364	1494
32	102	22	4	0	0	0	0	0	0	0	4	48	180

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	231	238	467	679	964	1128	1284	1246	1044	744	446	262	8733
55	11	1	22	65	262	438	571	533	355	113	22	7	2400
57	7	0	14	40	209	378	509	471	297	81	13	1	2020
60	0	0	6	16	141	289	416	378	213	45	5	0	1509
65	0	0	0	2	59	149	261	224	95	12	0	0	802
70	0	0	0	0	15	47	118	89	25	1	0	0	295

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	90	133	294	477	729	899	1045	1012	822	532	259	123	90	223	517	994	1723	2622	3667	4679	5501	6033	6292	6415
45	39	63	177	333	574	749	890	857	672	378	150	61	39	102	279	612	1186	1935	2825	3682	4354	4732	4882	4943
50	12	20	87	209	420	599	735	702	522	238	74	28	12	32	119	328	748	1347	2082	2784	3306	3544	3618	3646
55	0	3	34	108	273	449	580	547	373	124	30	3	0	3	37	145	418	867	1447	1994	2367	2491	2521	2524
60	0	0	4	42	146	300	425	392	231	51	1	0	0	0	4	46	192	492	917	1309	1540	1591	1592	1592
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	61	102	206	322	471	600	712	686	536	347	180	82	61	163	369	691	1162	1762	2474	3160	3696	4043	4223	4305

(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