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: BANNER ELK, NC **COOP ID: 310506**

Climate Division: NC 3 **NWS Call Sign:** **Elevation: 3,748 Feet** **Lat: 36˚10N** **Lon: 81˚53W**

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	40.5	18.9	29.7	69+	1999	28	42.5	1974	-31	1985	21	17.1	1977	1095	0	.0	.0	8.6	5.9	25.6	1.7
Feb	43.4	21.4	32.4	74	1989	15	40.3	1990	-13+	1996	5	22.7	1978	912	0	.0	.0	10.0	4.2	22.8	.7
Mar	51.0	28.2	39.6	81	1985	30	44.7	1997	-9	1993	15	32.9	1971	787	0	.0	.0	19.8	1.4	18.9	.2
Apr	58.8	36.2	47.5	86	1986	27	53.3	1994	11+	1993	5	42.8	1983	524	0	.0	.0	25.7	.2	10.0	.0
May	66.9	45.4	56.2	84+	1996	20	61.4	1991	23+	1966	10	52.9	1973	284	9	.0	.0	30.5	.0	1.9	.0
Jun	73.1	52.5	62.8	87	1952	28	65.7+	1994	27	1972	11	58.2	1972	98	33	.0	.0	30.0	.0	.1	.0
Jul	76.8	56.5	66.7	90	1988	8	70.8	1993	36	1961	10	63.8	1976	35	85	.0	@	31.0	.0	.0	.0
Aug	75.6	55.2	65.4	92	1988	18	68.8	1995	34	1986	29	62.8	1976	44	57	.0	.1	31.0	.0	.0	.0
Sep	70.5	49.7	60.1	89	1954	6	63.1	1978	27+	1983	24	56.9	1976	156	9	.0	@	29.9	.0	.7	.0
Oct	62.0	38.1	50.1	82	1954	5	57.0	1984	8	1952	21	44.2	1988	464	1	.0	.0	28.9	.0	7.9	.0
Nov	52.9	29.7	41.3	76	1994	4	50.3	1985	-4	1970	25	33.3	1976	711	0	.0	.0	20.8	.7	16.9	.0
Dec	44.5	22.6	33.6	74	1951	31	41.8	1984	-20	1983	25	24.2	1989	975	0	.0	.0	12.1	3.9	23.6	.7
Ann	59.7	37.9	48.8	92	Aug 1988	18	70.8	Jul 1993	-31	Jan 1985	21	17.1	Jan 1977	6085	194	.0	.1	278.3	16.3	128.4	3.3

\+ 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	4.22	3.73	6.30	1995	15	12.68	1995	.78	1981
Feb	3.81	3.75	3.80	1984	14	7.29	1984	1.22	1978
Mar	4.88	4.28	4.55	1979	24	9.74	1983	1.75+	1998
Apr	4.16	3.98	4.06	1957	5	8.93	1987	.89	1995
May	4.73	4.80	2.80	1973	28	8.13	1981	1.45	2000
Jun	4.60	4.45	4.26	1972	21	10.14	1974	1.19	1988
Jul	4.36	4.19	4.10	1989	5	8.36	1989	1.42	1978
Aug	4.32	4.06	4.10	1994	17	9.32	1996	.48	1999
Sep	4.07	3.56	5.80	1959	30	11.63	1979	.42	1984
Oct	3.57	2.76	7.40	1995	5	10.32	1990	.03	2000
Nov	3.73	3.43	3.65	1985	1	10.26	1985	1.47	1998
Dec	3.17	3.13	2.58	1993	5	5.90	1973	.68	2000
Ann	49.62	51.53	7.40	Oct 1995	5	12.68	Jan 1995	.03	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.4	8.6	2.7	.8
Feb	11.1	8.0	2.9	.7
Mar	12.5	9.3	3.0	1.3
Apr	10.6	8.0	2.7	1.0
May	12.1	9.7	3.3	.8
Jun	11.6	8.6	3.1	.9
Jul	12.0	8.6	3.0	1.0
Aug	11.5	8.0	3.0	1.2
Sep	9.4	7.1	2.6	1.1
Oct	8.3	6.2	2.1	.9
Nov	9.5	6.7	2.4	.9
Dec	10.3	7.2	1.8	.4
Ann	131.3	96.0	32.6	11.0

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	1.39	1.79	2.38	2.88	3.36	3.85	4.40	5.03	5.84	7.11	8.27
Feb	1.33	1.69	2.21	2.65	3.07	3.51	3.98	4.53	5.23	6.32	7.33
Mar	1.57	2.04	2.72	3.30	3.87	4.45	5.08	5.83	6.79	8.28	9.66
Apr	1.44	1.84	2.41	2.89	3.35	3.83	4.34	4.95	5.72	6.92	8.02
May	2.15	2.57	3.14	3.61	4.05	4.49	4.96	5.50	6.17	7.20	8.12
Jun	1.28	1.72	2.38	2.96	3.52	4.11	4.76	5.53	6.53	8.10	9.56
Jul	1.51	1.92	2.52	3.03	3.51	4.01	4.55	5.19	6.00	7.25	8.40
Aug	1.10	1.51	2.14	2.70	3.24	3.82	4.46	5.23	6.22	7.79	9.27
Sep	1.10	1.48	2.07	2.58	3.09	3.62	4.21	4.91	5.82	7.24	8.57
Oct	.39	.66	1.16	1.66	2.19	2.79	3.49	4.36	5.54	7.50	9.40
Nov	1.26	1.62	2.13	2.57	2.99	3.42	3.89	4.44	5.15	6.25	7.25
Dec	.83	1.13	1.59	1.99	2.39	2.81	3.27	3.82	4.54	5.67	6.73
Ann	34.55	37.44	41.16	43.99	46.51	48.95	51.47	54.27	57.67	62.61	66.89

\+ 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	11.2	8.9	2	1
Feb	13.3	12.8	2	1
Mar	7.3	3.5	1	#
Apr	3.1	1.5	#	0
May	.2	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.4	.0	#	0
Nov	2.5	.5	#	#
Dec	5.1	3.5	1	#
Ann	43.1	30.7	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	12.0	1977	10	46.0	1977	19	1977	29	10	1977
Feb	9.0	1971	14	33.0	1979	18	1977	1	11	1983
Mar	14.0	1981	23	25.1	1971	30	1993	15	12	1993
Apr	10.0	1987	4	20.0	1987	20	1987	6	2	1987
May	2.5	1989	8	3.5	1989	1	1971	3	#	1971
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	4.0	1977	17	4.0	1977	4	1977	17	#+	2000
Nov	5.5	1985	5	8.0+	1975	6	1995	15	#+	2000
Dec	10.0	1973	9	18.0	1973	18	1974	4	5	1974
Ann	14.0	Mar 1981	23	46.0	Jan 1977	30	Mar 1993	15	12	Mar 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.1	3.2	1.3	.7	.1
Feb	4.6	3.6	1.5	1.0	.0
Mar	2.3	1.8	.8	.3	.1
Apr	1.0	1.0	.2	.1	@
May	.1	.1	.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	.2	.2	.1	.0	.0
Nov	1.4	1.0	.3	@	.0
Dec	2.1	1.6	.6	.3	.1
Ann	15.8	12.5	4.8	2.4	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	5.7	4.4	3.5	.9
Feb	9.1	5.1	4.3	1.8
Mar	2.8	1.4	.7	.2
Apr	.6	.2	@	.0
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.1	@	.0	.0
Nov	1.0	.3	@	.0
Dec	2.6	1.3	.8	.4
Ann	21.9	12.7	9.3	3.3

+ 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	6/15	6/08	6/03	5/29	5/25	5/20	5/16	5/10	5/03
32	6/01	5/24	5/19	5/15	5/11	5/06	5/02	4/27	4/20
28	5/20	5/13	5/08	5/04	4/29	4/25	4/21	4/16	4/08
24	4/26	4/21	4/18	4/15	4/13	4/10	4/07	4/04	3/31
20	4/16	4/10	4/06	4/03	3/30	3/27	3/23	3/19	3/13
16	4/08	3/31	3/25	3/21	3/16	3/11	3/06	3/01	2/21

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	9/09	9/15	9/18	9/22	9/25	9/28	10/01	10/05	10/11
32	9/17	9/22	9/26	9/29	10/02	10/05	10/08	10/12	10/17
28	10/02	10/06	10/08	10/11	10/13	10/15	10/17	10/20	10/24
24	10/09	10/16	10/21	10/25	10/28	11/01	11/05	11/10	11/17
20	10/19	10/26	11/01	11/05	11/10	11/14	11/19	11/24	12/02
16	10/30	11/06	11/11	11/15	11/20	11/24	11/28	12/03	12/11

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	151	141	134	128	123	117	111	104	94
32	170	161	154	149	144	138	133	126	117
28	190	182	176	170	166	161	156	150	141
24	221	213	207	202	198	193	188	183	175
20	252	242	235	229	224	218	213	206	196
16	280	269	261	254	248	242	235	227	216

***** 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	1095	912	787	524	284	98	35	44	156	464	711	975	6085
60	940	772	632	376	160	28	4	4	57	320	561	820	4674
57	847	688	541	293	103	9	0	0	26	241	473	727	3948
55	785	632	482	239	73	4	0	0	14	195	416	665	3505
50	642	492	340	129	24	0	0	0	2	103	283	521	2536
32	215	103	33	1	0	0	0	0	0	1	20	124	497

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	143	115	269	467	748	925	1074	1036	843	561	299	172	6652
55	0	0	4	15	108	239	361	323	167	42	6	0	1265
57	0	0	1	8	77	184	299	261	119	26	2	0	977
60	0	0	0	2	40	113	210	172	60	12	0	0	609
65	0	0	0	0	9	33	85	57	9	1	0	0	194
70	0	0	0	0	0	4	17	7	0	0	0	0	28

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	36	53	144	299	530	709	848	815	629	362	162	67	36	89	233	532	1062	1771	2619	3434	4063	4425	4587	4654
45	5	20	71	185	377	559	693	660	480	223	78	29	5	25	96	281	658	1217	1910	2570	3050	3273	3351	3380
50	0	2	30	96	237	410	538	505	335	115	31	7	0	2	32	128	365	775	1313	1818	2153	2268	2299	2306
55	0	0	3	39	121	262	383	350	200	46	3	0	0	0	3	42	163	425	808	1158	1358	1404	1407	1407
60	0	0	0	5	41	132	231	195	89	8	0	0	0	0	0	5	46	178	409	604	693	701	701	701
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	28	38	99	191	309	433	541	508	374	220	104	43	28	66	165	356	665	1098	1639	2147	2521	2741	2845	2888

(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