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: MARION 2 NW, NC **COOP ID: 315340**

Climate Division: NC 1 **NWS Call Sign:** **Elevation: 1,466 Feet** **Lat: 35˚40N** **Lon: 82˚02W**

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	47.7	25.5	36.6	79	1957	29	47.6	1974	-11	1985	21	25.6	1977	881	0	.0	.0	15.7	1.1	21.2	.1
Feb	52.2	28.2	40.2	79+	1977	26	46.8	1976	-7	1958	18	33.0	1978	694	0	.0	.0	18.4	.6	17.9	.0
Mar	60.9	35.6	48.3	86	1998	31	53.2	1997	7	1993	15	43.3	1996	520	0	.0	.0	28.1	.1	9.9	.0
Apr	69.3	44.0	56.7	93+	2001	11	62.1	1981	15	2000	10	52.2	1984	257	7	.0	.2	29.6	.0	3.1	.0
May	76.9	52.9	64.9	95	1962	18	68.9	1982	30	1985	4	59.1	1997	82	78	.0	.7	30.9	.0	.2	.0
Jun	83.1	61.1	72.1	102	1954	27	77.5	1981	33	2000	8	67.6	1974	10	222	.0	4.6	30.0	.0	.0	.0
Jul	86.7	65.5	76.1	106	1952	28	80.7	1993	45	2000	28	72.5	1979	0	344	.1	10.7	31.0	.0	.0	.0
Aug	84.7	64.3	74.5	101+	1988	18	78.3	1988	37	2000	23	69.9	1997	1	295	.1	5.9	31.0	.0	.0	.0
Sep	78.7	58.3	68.5	101	1954	6	71.8	1973	23	2000	28	65.3	1984	26	130	.0	1.3	30.0	.0	.2	.0
Oct	69.4	45.5	57.5	96+	1954	5	63.8	1984	18	1999	26	52.3	1988	252	17	.0	.0	30.9	.0	2.1	.0
Nov	59.9	36.1	48.0	84	1958	18	55.5	1985	6	1950	25	41.6	1976	511	0	.0	.0	26.8	.0	11.0	.0
Dec	50.5	28.0	39.3	80	1998	8	48.0	1984	0	1983	25	30.1	2000	799	0	.0	.0	18.4	.5	19.5	.1
Ann	68.3	45.4	56.9	106	Jul 1952	28	80.7	Jul 1993	-11	Jan 1985	21	25.6	Jan 1977	4033	1093	.2	23.4	320.8	2.3	85.1	.2

\+ 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: 1949-2001

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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	4.18	4.21	3.48	1998	8	10.19	1998	.19	2000
Feb	4.36	4.58	4.06	1966	13	9.84	1998	.62	1978
Mar	5.59	5.00	4.50	1979	4	11.65	1979	1.29	1995
Apr	4.43	4.71	3.50	1957	5	9.48	1983	.28	1986
May	5.34	5.38	4.36	1973	28	12.12	1972	1.84	1994
Jun	4.68	3.96	4.56	1969	15	10.00	1989	.62	1993
Jul	4.25	4.05	5.80	1989	4	10.73	1989	.51	1977
Aug	4.33	3.89	6.35	1974	3	10.92	1974	.40	1997
Sep	4.44	3.62	3.60	1959	30	12.80	1989	.50	1985
Oct	4.13	4.11	4.95	1968	19	11.87	1971	.00	2000
Nov	4.35	4.54	5.00	1977	6	10.15	1992	1.21	1981
Dec	3.93	3.53	5.50	1958	28	11.44	1983	.37	1995
Ann	54.01	52.75	6.35	Aug 1974	3	12.80	Sep 1989	.00	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.6	7.4	3.3	1.5
Feb	8.1	6.3	3.0	1.4
Mar	10.8	7.9	3.6	1.9
Apr	8.5	6.3	2.8	1.3
May	11.1	7.8	3.6	1.4
Jun	10.8	7.1	3.0	1.4
Jul	12.4	8.5	2.9	.9
Aug	11.7	7.8	2.9	1.0
Sep	9.5	7.1	2.9	1.4
Oct	7.2	5.3	2.5	1.6
Nov	8.7	6.3	2.6	1.4
Dec	8.6	6.2	2.6	1.1
Ann	117.0	84.0	35.7	16.3

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	.99	1.38	1.99	2.54	3.08	3.65	4.30	5.06	6.07	7.66	9.16
Feb	1.11	1.52	2.16	2.71	3.27	3.85	4.49	5.26	6.27	7.85	9.33
Mar	1.58	2.11	2.91	3.61	4.29	5.01	5.80	6.73	7.94	9.84	11.60
Apr	.75	1.14	1.78	2.39	3.01	3.69	4.46	5.40	6.66	8.69	10.63
May	1.98	2.48	3.20	3.80	4.37	4.95	5.59	6.32	7.26	8.70	10.03
Jun	1.07	1.51	2.19	2.81	3.42	4.07	4.81	5.68	6.83	8.65	10.38
Jul	1.14	1.54	2.15	2.69	3.22	3.78	4.39	5.12	6.08	7.57	8.97
Aug	1.11	1.52	2.14	2.70	3.25	3.83	4.47	5.24	6.23	7.81	9.28
Sep	.64	1.00	1.64	2.26	2.90	3.61	4.42	5.42	6.76	8.95	11.07
Oct	.32	.77	1.43	2.04	2.67	3.35	4.14	5.10	6.39	8.49	10.51
Nov	1.35	1.76	2.37	2.90	3.41	3.94	4.52	5.20	6.09	7.46	8.73
Dec	.71	1.06	1.63	2.17	2.71	3.30	3.98	4.79	5.87	7.61	9.27
Ann	35.79	39.22	43.66	47.07	50.13	53.10	56.18	59.61	63.80	69.92	75.26

\+ 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: 1949-2001
(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	2.5	.0	#	0
Feb	2.8	2.0	#	0
Mar	1.4	.0	#	0
Apr	.3	.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	.2	.0	0	0
Dec	.7	.0	#	0
Ann	7.9	2.0	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	11.0	1987	22	14.5	1977	8	1977	9	8	1977
Feb	10.0	1979	18	11.2	1979	5	1983	6	2	1987
Mar	8.0	1981	22	13.0	1981	4	1972	25	#+	1998
Apr	4.5	1987	3	4.5	1987	0	0	0	0	0
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	0	0	0	0	0
Nov	4.5	1974	30	4.5	1974	0	0	0	0	0
Dec	12.0	1971	3	12.0	1971	#+	2000	14	#+	2000
Ann	12.0	Dec 1971	3	14.5	Jan 1977	8	Jan 1977	9	8	Jan 1977

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.9	.8	.4	.1	@
Feb	.7	.6	.3	.1	@
Mar	.4	.4	.2	.1	.0
Apr	.1	.1	.1	.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	@	@	.0	.0
Dec	.3	.1	.1	.1	@
Ann	2.5	2.0	1.1	.4	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.2	.0	.0	.0
Feb	.1	.1	.0	.0
Mar	.2	.1	.0	.0
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	.0
Dec	.0	.0	.0	.0
Ann	.5	.2	.0	.0

+ 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	5/16	5/10	5/05	5/01	4/27	4/24	4/20	4/15	4/08
32	5/02	4/25	4/20	4/16	4/12	4/08	4/04	3/30	3/23
28	4/19	4/12	4/06	4/02	3/29	3/24	3/20	3/15	3/07
24	4/05	3/28	3/22	3/17	3/12	3/08	3/03	2/25	2/17
20	3/17	3/10	3/06	3/02	2/26	2/22	2/18	2/13	2/06
16	3/13	3/02	2/23	2/16	2/10	2/04	1/28	1/19	1/07

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	9/26	10/02	10/07	10/10	10/14	10/17	10/21	10/25	10/31
32	10/03	10/11	10/16	10/20	10/24	10/29	11/02	11/07	11/14
28	10/14	10/22	10/27	11/01	11/06	11/10	11/15	11/21	11/29
24	10/27	11/04	11/09	11/14	11/19	11/23	11/28	12/03	12/11
20	11/14	11/22	11/27	12/01	12/06	12/10	12/14	12/20	12/27
16	11/23	12/03	12/10	12/16	12/22	12/28	1/03	1/11	1/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	195	186	179	174	169	163	158	151	142
32	225	215	207	201	195	189	183	175	165
28	259	246	237	229	221	214	206	197	184
24	287	274	265	258	251	243	236	227	214
20	315	303	295	289	282	276	269	261	250
16	>365	344	330	320	311	302	294	283	269

***** 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	881	694	520	257	82	10	0	1	26	252	511	799	4033
60	726	554	373	136	24	1	0	0	4	139	364	644	2965
57	639	470	291	82	9	0	0	0	1	88	282	557	2419
55	581	415	240	55	4	0	0	0	0	62	231	498	2086
50	439	285	137	15	0	0	0	0	0	20	126	357	1379
32	91	18	2	0	0	0	0	0	0	0	1	49	161

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	234	248	505	739	1020	1202	1367	1317	1094	788	481	273	9268
55	10	1	31	105	310	512	654	604	404	137	20	9	2797
57	6	0	19	72	253	452	592	542	345	101	12	6	2400
60	0	0	8	35	176	363	499	449	258	59	4	0	1851
65	0	0	0	7	78	222	344	295	130	17	0	0	1093
70	0	0	0	0	23	108	197	154	43	3	0	0	528

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	96	143	328	536	801	975	1130	1081	861	567	285	129	96	239	567	1103	1904	2879	4009	5090	5951	6518	6803	6932
45	37	66	205	390	646	825	975	926	711	414	171	59	37	103	308	698	1344	2169	3144	4070	4781	5195	5366	5425
50	8	24	110	257	491	675	820	771	561	270	84	27	8	32	142	399	890	1565	2385	3156	3717	3987	4071	4098
55	0	3	45	147	338	525	665	616	412	151	30	3	0	3	48	195	533	1058	1723	2339	2751	2902	2932	2935
60	0	0	7	67	195	376	510	461	274	67	5	0	0	0	7	74	269	645	1155	1616	1890	1957	1962	1962
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	62	104	225	345	517	659	777	745	574	359	184	87	62	166	391	736	1253	1912	2689	3434	4008	4367	4551	4638

(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