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: RALEIGH STATE UNIV, NC **COOP ID: 317079**

Climate Division: NC 4 **NWS Call Sign:** **Elevation: 400 Feet** **Lat: 35˚48N** **Lon: 78˚42W**

Temperature (˚F)

Month	Mean (1)			Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
	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	48.8	30.1	39.5	80	1952	2	48.7	1974	-6	1985	21	27.9	1977	792	0	.0	.0	15.5	2.1	18.5	.1
Feb	53.0	32.3	42.7	83	1977	27	50.2	1990	2	1996	5	33.6	1978	626	0	.0	.0	17.1	1.0	14.9	.0
Mar	61.2	39.8	50.5	91	1945	17	55.0	1997	12+	1980	3	45.6	1996	450	2	.0	.0	26.6	.2	7.4	.0
Apr	70.6	47.8	59.2	94	1976	19	65.1	1985	21	1923	1	55.6	1983	191	17	.0	.3	29.4	.0	.9	.0
May	77.5	56.7	67.1	99	1953	31	71.9	1991	33+	1934	13	63.3	1992	49	114	.0	1.4	31.0	.0	.0	.0
Jun	84.4	65.0	74.7	104+	1954	28	79.2	1981	43	1972	13	70.5	1979	4	295	.0	7.4	30.0	.0	.0	.0
Jul	87.9	69.4	78.7	105+	1952	28	82.6	1986	52	1933	4	75.7	2000	0	422	.4	14.0	31.0	.0	.0	.0
Aug	85.9	68.1	77.0	105	1932	31	80.5	1988	44	1926	17	74.1	1992	0	371	.3	10.6	31.0	.0	.0	.0
Sep	80.0	61.9	71.0	103	1932	1	74.7	1980	41+	1967	30	68.3	1974	11	189	.1	3.5	30.0	.0	.0	.0
Oct	69.8	49.4	59.6	99	1954	7	66.7	1984	28+	1976	28	54.3	1976	207	41	.0	.1	30.7	.0	.5	.0
Nov	61.3	41.6	51.5	87+	1974	3	60.0	1985	13+	1970	25	44.0	1976	412	5	.0	.0	26.5	.0	5.8	.0
Dec	52.1	33.5	42.8	80	1956	8	50.0	1971	4+	1983	26	33.7	1989	689	0	.0	.0	18.5	.9	15.3	.0
Ann	69.4	49.6	59.5	105+	Jul 1952	28	82.6	Jul 1986	-6	Jan 1985	21	27.9	Jan 1977	3431	1456	.8	37.3	317.3	4.2	63.3	.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: 1921-2001

(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	4.46	4.68	3.11	1954	22	8.01	1998	1.29	1981
Feb	3.53	3.31	3.97	1973	2	6.99	1973	.56	1991
Mar	4.46	4.20	3.28	1932	6	7.61	1983	1.06	1985
Apr	2.98	2.83	4.77	1978	26	6.91	1978	.32	1985
May	4.03	3.76	5.58	1957	12	7.94+	1990	1.05	2000
Jun	4.06	3.65	4.17	1943	9	9.52	1992	.67	1993
Jul	4.35	4.03	4.27	1951	19	11.14	1975	.45	1977
Aug	4.30	4.37	4.36	1940	14	13.71	1986	.75	1980
Sep	4.27	3.26	6.04	1999	16	20.75	1999	.23	1990
Oct	3.78	3.82	5.34	1995	5	11.17	1995	.00	2000
Nov	3.06	2.77	4.78	1934	29	7.60	1985	.67	1973
Dec	3.21	3.22	2.70	1931	4	6.78	1983	.64	1988
Ann	46.49	46.49	6.04	Sep 1999	16	20.75	Sep 1999	.00	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.3	8.0	3.2	1.2
Feb	9.4	6.8	2.5	1.0
Mar	10.2	7.6	3.1	1.1
Apr	8.5	5.7	2.0	.7
May	10.2	7.0	2.9	1.1
Jun	9.2	6.5	2.8	1.1
Jul	11.0	7.5	3.2	1.2
Aug	9.2	6.6	2.8	1.3
Sep	8.0	5.3	2.7	1.5
Oct	7.2	4.9	2.5	1.3
Nov	8.0	5.0	2.1	.9
Dec	10.0	6.0	2.6	.7
Ann	112.2	76.9	32.4	13.1

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	1.75	2.16	2.75	3.24	3.70	4.17	4.67	5.26	6.00	7.14	8.19
Feb	1.08	1.41	1.91	2.34	2.76	3.19	3.67	4.23	4.95	6.08	7.13
Mar	1.71	2.12	2.72	3.21	3.68	4.16	4.67	5.27	6.03	7.21	8.28
Apr	.59	.86	1.30	1.70	2.10	2.54	3.03	3.63	4.42	5.68	6.89
May	1.57	1.95	2.48	2.92	3.34	3.76	4.22	4.76	5.43	6.47	7.41
Jun	1.02	1.40	1.99	2.51	3.03	3.57	4.18	4.91	5.85	7.34	8.74
Jul	1.16	1.58	2.21	2.76	3.30	3.87	4.50	5.25	6.23	7.76	9.19
Aug	1.10	1.50	2.13	2.68	3.22	3.80	4.44	5.19	6.18	7.75	9.21
Sep	.32	.59	1.14	1.73	2.38	3.14	4.04	5.19	6.78	9.46	12.11
Oct	.55	1.04	1.68	2.21	2.74	3.29	3.91	4.65	5.62	7.15	8.59
Nov	.81	1.10	1.55	1.93	2.32	2.72	3.16	3.69	4.37	5.45	6.46
Dec	.96	1.26	1.72	2.11	2.50	2.89	3.33	3.85	4.52	5.57	6.54
Ann	35.59	37.76	40.52	42.58	44.40	46.15	47.94	49.91	52.28	55.69	58.61

\+ 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: 1921-2001
(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	1.1	.0	#	0	11.0	2000	25	11.0+	2000	14	2000	26	3	2000	.7	.5	.2	.1	@	1.1	.7	.4	.2
Feb	2.4	.0	#	#	10.5	1979	19	17.5	1979	7	1979	19	1+	2000	.8	.6	.2	.2	@	1.1	.5	.2	.0
Mar	.9	.0	#	0	9.0	1980	3	12.0	1980	8	1980	3	1	1980	.3	.2	.1	@	.0	.3	.1	.1	.0
Apr	.0	.0	#	0	.5	1983	19	.5	1983	#	1983	19	#	1983	@	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	.1	.0	#	0	2.5	2000	20	2.5	2000	#+	2000	19	#+	2000	.1	@	.0	.0	.0	.0	.0	.0	.0
Dec	.4	.0	#	0	5.0	1971	4	5.0	1971	3	1993	23	#+	1998	.2	.2	.1	@	.0	.3	.1	.0	.0
Ann	4.9	.0	N/A	N/A	11.0	Jan 2000	25	17.5	Feb 1979	14	Jan 2000	26	3	Jan 2000	2.1	1.5	.6	.3	@	2.8	1.4	.7	.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	4/26	4/22	4/18	4/15	4/12	4/10	4/07	4/03	3/29
32	4/16	4/11	4/07	4/03	3/31	3/28	3/25	3/21	3/15
28	4/05	3/29	3/24	3/19	3/15	3/11	3/06	3/01	2/22
24	3/24	3/16	3/11	3/06	3/01	2/25	2/20	2/14	2/06
20	3/08	2/28	2/21	2/16	2/11	2/06	1/31	1/25	1/16
16	2/26	2/17	2/10	2/04	1/29	1/23	1/16	1/05	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	10/11	10/17	10/20	10/24	10/27	10/30	11/02	11/06	11/12
32	10/22	10/28	11/01	11/05	11/08	11/11	11/15	11/19	11/25
28	11/02	11/09	11/14	11/18	11/22	11/26	11/30	12/05	12/12
24	11/18	11/24	11/29	12/03	12/07	12/10	12/15	12/19	12/26
20	12/01	12/09	12/15	12/20	12/25	12/29	1/03	1/09	1/17
16	12/13	12/23	12/29	1/04	1/10	1/16	1/24	2/04	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	219	211	206	201	197	192	188	182	175
32	246	238	231	226	221	216	211	204	196
28	281	271	263	257	251	246	239	232	222
24	311	300	293	286	280	273	267	259	248
20	348	333	324	318	312	306	301	294	284
16	>365	>365	>365	354	341	332	325	316	305

***** 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	792	626	450	191	49	4	0	0	11	207	412	689	3431
60	643	486	307	89	11	0	0	0	1	113	277	541	2468
57	555	408	229	48	3	0	0	0	0	73	207	453	1976
55	497	356	184	30	1	0	0	0	0	52	166	396	1682
50	363	237	95	6	0	0	0	0	0	18	85	269	1073
32	59	17	1	0	0	0	0	0	0	0	0	25	102

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	291	315	575	816	1088	1281	1445	1394	1168	857	583	359	10172
55	16	10	46	155	376	591	732	681	478	195	58	17	3355
57	11	7	29	114	316	531	670	619	419	154	39	11	2920
60	6	0	13	65	231	441	577	526	330	102	20	6	2317
65	0	0	2	17	114	295	422	371	189	41	5	0	1456
70	0	0	0	2	41	164	268	221	75	12	0	0	783

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	126	175	360	591	855	1060	1220	1170	952	633	373	179	126	301	661	1252	2107	3167	4387	5557	6509	7142	7515	7694
45	63	98	240	443	700	910	1065	1015	802	479	249	98	63	161	401	844	1544	2454	3519	4534	5336	5815	6064	6162
50	32	51	140	309	545	760	910	860	652	334	150	48	32	83	223	532	1077	1837	2747	3607	4259	4593	4743	4791
55	7	17	71	191	395	610	755	705	503	208	78	23	7	24	95	286	681	1291	2046	2751	3254	3462	3540	3563
60	0	3	32	103	252	462	600	550	355	106	31	5	0	3	35	138	390	852	1452	2002	2357	2463	2494	2499
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	74	112	214	360	551	731	848	819	640	385	212	100	74	186	400	760	1311	2042	2890	3709	4349	4734	4946	5046

(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