

Climatology of the United States

No. 20

1971-2000

Station: CHARLOTTE DGLAS INTL AP, NC

COOP ID: 311690

Climate Division: NC 5

NWS Call Sign: CLT

Elevation: 728 Feet

Lat: 35° 13N

Lon: 80° 57W

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	51.3	32.1	41.7	78+	1952	2	51.5	1974	-5	1985	21	31.8	1977	739	0	.0	.0	16.1	1.2	16.9	.1
Feb	55.9	34.4	45.2	81+	1989	3	52.3	1990	5	1958	18	38.3	1978	571	1	.0	.0	18.7	.6	13.1	.0
Mar	64.1	41.6	52.8	87	1998	29	58.3	1997	4	1980	3	47.3	1996	401	7	.0	.0	28.3	@	6.2	.0
Apr	72.8	49.1	60.9	93	1960	24	65.6	1981	25	1972	9	56.2	1983	179	40	.0	.2	29.7	.0	.9	.0
May	79.7	58.2	69.0	97	1953	31	74.4	1998	32	1963	2	65.9	1999	36	145	.0	1.4	31.0	.0	.0	.0
Jun	86.6	66.5	76.5	103	1954	27	80.8	1998	45+	2000	7	73.0	1972	1	332	.1	8.5	30.0	.0	.0	.0
Jul	90.1	70.6	80.3	103+	1986	21	85.5	1993	53	1961	10	76.9	2000	0	459	.8	15.3	31.0	.0	.0	.0
Aug	88.4	69.3	78.9	103+	1983	23	82.6	1980	53	1965	30	76.1	1992	0	415	.2	11.1	31.0	.0	.0	.0
Sep	82.3	63.0	72.7	104	1954	6	76.3	1980	39+	1999	23	69.1	2000	16	231	.0	3.6	30.0	.0	.0	.0
Oct	72.6	50.9	61.7	98	1954	6	69.1	1984	24	1962	27	56.2	1987	164	45	.0	.2	30.8	.0	.6	.0
Nov	62.8	41.8	52.3	85	1961	2	60.0	1985	11	1950	26	45.5	1976	400	5	.0	.0	26.7	.0	6.0	.0
Dec	54.0	34.9	44.4	78	1998	6	52.2	1971	2	1962	13	35.2	2000	655	1	.0	.0	19.2	.3	14.2	.0
Ann	71.7	51.0	61.4	104	Sep 1954	6	85.5	Jul 1993	-5	Jan 1985	21	31.8	Jan 1977	3162	1681	1.1	40.3	322.5	2.1	57.9	.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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
		Means/ Medians(1)		Extremes						Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution											
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	4.00	4.11	3.45	1962	6	6.80	1978	.45	1981	11.0	7.6	2.8	.9	1.40	1.78	2.33	2.79	3.23	3.68	4.18	4.76	5.49	6.64	7.69	
Feb	3.55	3.73	2.91	1955	6	7.59	1979	.74	1978	9.3	6.6	2.5	1.0	.97	1.31	1.82	2.27	2.71	3.17	3.68	4.28	5.06	6.29	7.44	
Mar	4.39	4.08	3.04	1952	3	8.76	1980	.58	1985	10.6	7.7	3.0	1.0	1.25	1.66	2.29	2.84	3.38	3.93	4.55	5.28	6.22	7.71	9.08	
Apr	2.95	2.48	3.20	1962	11	6.47	1979	.30	1976	8.6	5.6	2.2	.6	.76	1.04	1.47	1.85	2.22	2.61	3.05	3.57	4.24	5.30	6.30	
May	3.66	3.59	3.67	1975	3	12.48	1975	.99	1987	10.1	6.4	2.6	.9	1.01	1.35	1.88	2.34	2.79	3.27	3.79	4.41	5.21	6.48	7.66	
Jun	3.42	3.34	3.77	1949	13	6.85	1997	.15	1993	10.2	6.2	2.4	.9	.75	1.06	1.56	2.02	2.47	2.96	3.50	4.16	5.02	6.39	7.69	
Jul	3.79	3.64	6.88	1997	23	8.94	1997	.53	1983	11.0	6.8	2.4	.8	.98	1.34	1.89	2.38	2.85	3.36	3.92	4.58	5.45	6.81	8.09	
Aug	3.72	3.36	4.51	1978	3	8.18	1991	.61	1972	9.4	5.8	2.3	1.0	.91	1.26	1.80	2.29	2.76	3.27	3.83	4.51	5.38	6.78	8.08	
Sep	3.83	3.60	3.65	1979	30	9.69	1979	.64	1982	7.9	5.5	2.6	1.1	.59	.91	1.47	2.00	2.55	3.14	3.83	4.68	5.80	7.64	9.40	
Oct	3.66	3.54	4.21	1992	4	14.72	1990	.00	2000	6.6	4.8	2.2	1.3	.27	.65	1.24	1.77	2.34	2.95	3.65	4.52	5.68	7.58	9.41	
Nov	3.36	3.01	3.26	1985	21	8.68	1985	.46	1973	8.6	5.6	2.6	.9	1.12	1.44	1.91	2.30	2.69	3.08	3.51	4.01	4.66	5.66	6.58	
Dec	3.18	3.15	2.46	1972	15	7.49	1983	.83	1980	9.9	6.4	2.1	.8	.94	1.24	1.69	2.09	2.47	2.86	3.30	3.81	4.48	5.52	6.49	
Ann	43.51	42.96	6.88	Jul 1997	23	14.72	Oct 1990	.00	Oct 2000	113.2	75.0	29.7	11.2	31.71	34.02	36.97	39.19	41.17	43.07	45.03	47.19	49.81	53.60	56.86	

+ 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

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Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	1.7	.1	#	0	12.1	1988	7	12.1	1988	12	1988	8	2	1988	1.0	.5	.2	.1	@	1.5	.8	.4	.1
Feb	1.6	.2	#	0	10.0	1979	18	14.9	1979	9	1979	19	1	1979	.8	.4	.2	.1	@	.6	.2	.1	.0
Mar	1.2	.0	#	0	10.3	1983	24	10.3	1983	6	1980	3	#	1998	.5	.3	.2	.1	@	.4	.1	@	.0
Apr	.0	.0	0	0	.1	1982	8	.1	1982	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	2000	.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	0	2.5	2000	19	2.5	2000	#	1971	24	0	0	.1	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.6	#	#	0	7.5	1971	3	7.5	1971	6	1971	4	#	1997	.3	.2	.1	@	.0	.2	@	@	.0
Ann	5.2	.3	N/A	N/A	12.1	Jan 1988	7	14.9	Feb 1979	12	Jan 1988	8	2	Jan 1988	2.7	1.4	.7	.3	@	2.7	1.1	.5	.1

+ 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	4/30	4/23	4/19	4/15	4/11	4/08	4/04	3/30	3/24
32	4/15	4/09	4/05	4/01	3/29	3/25	3/22	3/17	3/11
28	4/04	3/28	3/24	3/20	3/16	3/12	3/08	3/03	2/25
24	3/16	3/09	3/04	2/28	2/24	2/20	2/16	2/11	2/04
20	3/08	2/26	2/19	2/13	2/07	2/02	1/26	1/19	1/07
16	3/02	2/21	2/14	2/08	2/02	1/27	1/20	1/09	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	10/21	10/24	10/28	10/31	11/04	11/08	11/13
32	10/21	10/28	11/01	11/05	11/09	11/13	11/16	11/21	11/27
28	11/03	11/08	11/12	11/16	11/19	11/22	11/26	11/30	12/05
24	11/16	11/24	11/29	12/04	12/08	12/12	12/17	12/22	12/30
20	11/26	12/06	12/14	12/21	12/28	1/03	1/10	1/19	2/01
16	12/11	12/22	12/31	1/07	1/14	1/22	1/31	2/14	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	225	216	209	204	199	194	188	182	173
32	253	243	236	230	225	219	213	206	196
28	271	263	257	252	248	243	238	232	224
24	315	305	298	292	286	280	274	267	257
20	>365	350	333	323	316	309	302	294	283
16	>365	>365	>365	357	340	330	321	312	301

* 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)

Base	Heating Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Below 65	739	571	401	179	36	1	0	0	16	164	400	655	3162
60	573	417	244	64	8	0	0	0	1	77	253	490	2127
57	486	339	175	32	2	0	0	0	0	44	185	404	1667
55	429	288	136	18	0	0	0	0	0	29	146	349	1395
50	299	175	62	3	0	0	0	0	0	8	70	229	846
32	33	5	0	0	0	0	0	0	0	0	0	16	54

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Above 32	303	358	626	847	1122	1310	1471	1426	1197	900	588	371	10519
55	8	16	74	196	411	620	758	713	507	215	62	17	3597
57	5	10	52	154	352	560	696	651	448	169	43	11	3151
60	2	4	28	101	266	470	603	558	361	110	23	5	2531
65	0	1	7	40	145	332	459	415	231	45	5	1	1681
70	0	0	1	7	53	184	295	250	110	10	1	0	911

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	134	194	398	615	882	1077	1233	1187	965	661	365	184	134	328	726	1341	2223	3300	4533	5720	6685	7346	7711	7895
45	67	107	264	468	727	927	1078	1032	815	506	240	100	67	174	438	906	1633	2560	3638	4670	5485	5991	6231	6331
50	29	51	157	326	572	777	923	877	665	356	136	47	29	80	237	563	1135	1912	2835	3712	4377	4733	4869	4916
55	5	18	78	203	418	627	768	722	515	220	68	19	5	23	101	304	722	1349	2117	2839	3354	3574	3642	3661
60	0	2	31	108	274	477	613	567	368	118	26	3	0	2	33	141	415	892	1505	2072	2440	2558	2584	2587
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	75	123	238	381	579	747	858	833	656	404	212	104	75	198	436	817	1396	2143	3001	3834	4490	4894	5106	5210

(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.
Complete 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