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: HARTWELL, GA **COOP ID: 094133**

Climate Division: GA 3 **NWS Call Sign:** **Elevation: 690 Feet** **Lat: 34˚21N** **Lon: 82˚56W**

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	31.7	41.5	80	1975	30	52.7	1974	-5+	1985	21	30.9	1977	729	0	.0	.0	19.4	.6	14.5	.1
Feb	56.1	33.9	45.0	82+	1972	29	52.8	1990	4	1958	17	36.6	1978	561	0	.0	.0	20.9	.2	11.0	.0
Mar	64.6	41.3	53.0	91	1974	10	58.6	1997	10+	1960	5	45.8	1971	383	9	.0	@	29.0	.1	4.3	.0
Apr	72.7	48.6	60.7	94+	1986	27	64.9+	1981	25	1950	7	56.4	1997	161	31	.0	.4	29.8	.0	.3	.0
May	79.5	57.8	68.7	100+	1953	31	72.4	1987	34+	1963	16	63.6	1997	37	151	.0	1.6	31.0	.0	.0	.0
Jun	85.9	65.5	75.7	106+	1954	27	79.8	1981	45+	1972	1	71.0	1997	1	323	.1	10.0	30.0	.0	.0	.0
Jul	89.4	69.6	79.5	109	1952	29	85.0	1986	52	1947	8	75.6	1984	0	449	1.3	18.3	31.0	.0	.0	.0
Aug	87.9	68.8	78.4	108	1983	22	82.4	1983	53	1930	23	74.8	1994	0	413	.3	13.5	31.0	.0	.0	.0
Sep	81.9	62.8	72.4	104+	1954	6	76.9	1972	39	1967	30	69.3	1984	10	230	@	4.2	30.0	.0	.0	.0
Oct	72.2	50.7	61.5	100	1954	5	66.9	1984	26	1954	31	56.4	1988	156	45	.0	.2	31.0	.0	.4	.0
Nov	63.6	41.4	52.5	86+	1964	17	62.0	1985	7	1950	25	44.1	1976	384	10	.0	.0	28.8	.0	4.8	.0
Dec	54.5	34.2	44.4	82+	1970	2	51.6	1984	3	1983	25	35.3	1989	640	0	.0	.0	23.0	.2	11.6	.0
Ann	71.6	50.5	61.1	109	Jul 1952	29	85.0	Jul 1986	-5+	Jan 1985	21	30.9	Jan 1977	3062	1661	1.7	48.2	334.9	1.1	46.9	.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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1930-2001

(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	5.30	4.88	4.39	1943	18	10.80	1993	.80	1981
Feb	4.54	4.56	3.40	1966	13	9.49	1998	.51	1978
Mar	5.90	5.35	5.00	1990	15	13.67	1973	1.44	1985
Apr	3.54	2.91	3.63	1979	13	11.37	1998	.56	1976
May	4.40	3.92	2.50	1973	24	12.05	1973	.29	2000
Jun	4.11	3.21	5.61	1967	4	11.47	1994	.81	1993
Jul	4.00	3.54	6.00	1964	19	11.51	1982	.11	1993
Aug	4.08	3.25	7.20	1994	17	11.83	1994	.78	1997
Sep	3.89	3.02	6.35	1956	26	13.11	1989	1.10	1985
Oct	3.77	3.42	4.85	1932	16	8.32	1977	.00+	2000
Nov	3.90	3.68	5.10	1957	18	8.75	1992	1.35	1984
Dec	4.53	4.12	4.53	1992	17	11.61	1983	.55	1980
Ann	51.96	52.55	7.20	Aug 1994	17	13.67	Mar 1973	.00+	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.8	7.6	3.9	2.1
Feb	8.3	6.7	3.5	1.6
Mar	9.2	7.7	4.0	2.1
Apr	6.6	5.5	2.6	1.2
May	8.1	6.5	3.2	1.6
Jun	8.8	6.8	2.5	1.3
Jul	8.7	6.7	2.5	1.3
Aug	8.2	6.0	2.4	1.2
Sep	7.1	5.3	2.5	1.3
Oct	5.9	4.8	2.3	1.3
Nov	7.4	5.6	3.0	1.4
Dec	9.0	7.1	3.1	1.5
Ann	97.1	76.3	35.5	17.9

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	1.79	2.29	3.02	3.65	4.24	4.86	5.53	6.31	7.32	8.88	10.32
Feb	1.10	1.52	2.18	2.78	3.36	3.98	4.68	5.50	6.59	8.30	9.91
Mar	1.26	1.81	2.67	3.46	4.25	5.09	6.03	7.17	8.67	11.06	13.32
Apr	.66	.98	1.50	1.98	2.47	2.99	3.59	4.31	5.26	6.80	8.26
May	.88	1.28	1.93	2.52	3.12	3.76	4.48	5.35	6.50	8.35	10.10
Jun	.74	1.11	1.71	2.27	2.84	3.45	4.16	5.01	6.14	7.96	9.70
Jul	.49	.80	1.37	1.93	2.52	3.17	3.94	4.88	6.17	8.27	10.32
Aug	.69	1.05	1.64	2.20	2.78	3.40	4.11	4.98	6.13	8.00	9.79
Sep	.89	1.25	1.82	2.33	2.84	3.38	3.99	4.71	5.67	7.18	8.61
Oct	.00	.57	1.31	1.91	2.51	3.15	3.87	4.71	5.85	7.69	9.45
Nov	1.41	1.78	2.30	2.75	3.17	3.61	4.08	4.63	5.33	6.41	7.40
Dec	1.06	1.48	2.15	2.74	3.33	3.95	4.65	5.49	6.58	8.32	9.96
Ann	36.53	39.50	43.32	46.22	48.79	51.29	53.87	56.72	60.18	65.21	69.57

\+ 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: 1930-2001
(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	5.5	1988	7	5.5	1988	7+	1988	8	1+	1988	.4	.3	.2	.1	.0	.8	.4	.1	.0
Feb	.2	.0	#	0	1.5	1978	21	1.8	1978	7	1989	23	1	1980	.2	.1	.0	.0	.0	@	.0	.0	.0
Mar	.4	.0	#	0	7.0	1971	25	7.0	1971	8	1971	25	#+	1983	.1	.1	.1	.1	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	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	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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.0	.0	#	0	.0	0	0	.0	0	6	1971	3	#	1971	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	1.7	.0	N/A	N/A	7.0	Mar 1971	25	7.0	Mar 1971	8	Mar 1971	25	1+	Jan 1988	.7	.5	.3	.2	.0	.8	.4	.1	.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	4/27	4/20	4/15	4/10	4/06	4/02	3/29	3/24	3/17
32	4/09	4/03	3/30	3/27	3/24	3/21	3/17	3/13	3/08
28	3/25	3/19	3/14	3/10	3/06	3/02	2/26	2/22	2/15
24	3/15	3/07	3/02	2/25	2/20	2/16	2/11	2/06	1/29
20	3/07	2/26	2/19	2/14	2/08	2/03	1/28	1/21	1/11
16	2/23	2/14	2/07	2/01	1/25	1/17	1/02	0/00	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	10/09	10/16	10/22	10/26	10/30	11/03	11/08	11/13	11/20
32	10/27	11/02	11/06	11/10	11/13	11/17	11/20	11/25	12/01
28	11/02	11/09	11/14	11/18	11/22	11/26	11/30	12/05	12/12
24	11/25	12/02	12/07	12/11	12/15	12/19	12/23	12/29	1/04
20	12/02	12/11	12/17	12/23	12/28	1/02	1/07	1/14	1/25
16	12/11	12/21	12/28	1/04	1/11	1/19	2/04	0/00	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	231	223	216	211	206	201	196	190	181
32	258	250	244	239	234	229	224	217	209
28	285	277	270	265	260	255	250	244	235
24	330	318	310	303	297	290	284	275	264
20	>365	343	329	321	315	309	304	297	288
16	>365	>365	>365	>365	>365	341	327	317	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	729	561	383	161	37	1	0	0	10	156	384	640	3062
60	585	423	250	73	8	0	0	0	1	73	256	493	2162
57	499	346	184	39	2	0	0	0	0	41	191	407	1709
55	444	296	146	23	1	0	0	0	0	25	154	353	1442
50	319	185	72	5	0	0	0	0	0	6	80	234	901
32	48	8	0	0	0	0	0	0	0	0	0	18	74

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	342	371	649	860	1137	1311	1472	1436	1210	912	616	402	10718
55	25	15	82	193	425	621	759	723	520	224	80	24	3691
57	18	9	58	149	364	561	697	661	460	178	57	16	3228
60	11	3	31	93	277	471	604	568	371	117	31	9	2586
65	0	0	9	31	151	323	449	413	230	45	10	0	1661
70	0	0	0	6	64	186	300	260	114	12	1	0	943

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	163	234	456	656	916	1092	1247	1202	982	691	408	223	163	397	853	1509	2425	3517	4764	5966	6948	7639	8047	8270
45	78	135	316	506	761	942	1092	1047	832	536	270	118	78	213	529	1035	1796	2738	3830	4877	5709	6245	6515	6633
50	32	62	193	361	606	792	937	892	682	382	160	54	32	94	287	648	1254	2046	2983	3875	4557	4939	5099	5153
55	8	23	100	225	451	642	782	737	532	239	78	24	8	31	131	356	807	1449	2231	2968	3500	3739	3817	3841
60	0	1	38	119	300	492	627	582	384	127	26	0	0	1	39	158	458	950	1577	2159	2543	2670	2696	2696
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	90	143	275	409	605	751	860	839	666	425	240	123	90	233	508	917	1522	2273	3133	3972	4638	5063	5303	5426

(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