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: COPPERHILL, TN **COOP ID: 402024**

Climate Division: TN 1 **NWS Call Sign:** **Elevation: 1,450 Feet** **Lat: 35˚00N** **Lon: 84˚23W**

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	49.0	26.4	37.7	74+	1952	2	50.9	1974	-16+	1985	20	26.4	1977	847	0	.0	.0	15.5	3.0	22.2	.5
Feb	53.6	28.3	41.0	78+	1977	27	47.3	1990	-5	1996	5	33.6	1978	673	0	.0	.0	17.8	1.5	19.5	.1
Mar	61.5	34.7	48.1	85	1982	19	53.8	1974	2	1993	15	41.2	1996	525	1	.0	.0	26.0	.2	13.8	.0
Apr	70.6	41.0	55.8	91+	1955	19	61.5	1977	19	1992	3	50.2	1997	285	10	.0	.1	29.1	.0	5.9	.0
May	77.7	50.0	63.9	94	1962	17	69.2	1987	29	1963	2	58.8	1997	113	78	.0	.2	31.0	.0	.4	.0
Jun	84.0	58.4	71.2	100	1964	23	74.1	1986	37	1966	1	67.2	1972	9	195	.0	4.4	30.0	.0	.0	.0
Jul	87.5	63.6	75.6	103	1952	30	79.0	1980	47	1963	11	72.0	1976	0	327	.2	11.6	31.0	.0	.0	.0
Aug	86.6	62.5	74.6	101+	1968	24	78.6	1983	46+	1968	30	71.0	1992	1	297	.2	8.6	31.0	.0	.0	.0
Sep	81.1	55.8	68.5	98	1975	5	73.0	1978	30	1967	30	64.6	1999	35	138	.0	2.2	30.0	.0	.1	.0
Oct	72.0	42.8	57.4	92	1954	6	64.8	1984	19	1952	21	50.8	1988	260	24	.0	@	30.8	.0	5.2	.0
Nov	61.8	35.6	48.7	83	1957	17	56.9	1985	-1+	1950	25	42.1	1976	491	1	.0	.0	25.6	.1	14.2	.0
Dec	52.7	28.9	40.8	76+	1984	28	51.9	1984	-8	1989	23	31.0	1989	750	0	.0	.0	19.1	1.2	20.9	.2
Ann	69.8	44.0	56.9	103	Jul 1952	30	79.0	Jul 1980	-16+	Jan 1985	20	26.4	Jan 1977	3989	1071	.4	27.1	316.9	6.0	102.2	.8

+ 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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Climate Division: TN 1 **NWS Call Sign:** **Elevation: 1,450 Feet** **Lat: 35˚00N** **Lon: 84˚23W**

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	5.78	5.94	4.04	1996	27	10.62	1996	1.49	1981
Feb	5.47	5.68	5.40	1990	16	12.00	1990	.62	1978
Mar	6.43	5.94	5.24	1951	29	15.31	1980	1.86	1985
Apr	4.94	4.60	3.89	1958	28	11.53	1998	1.07	1976
May	5.00	5.06	3.92	1976	15	9.47	1976	1.37	1992
Jun	4.56	4.10	4.57	1961	21	10.98	1989	1.40	1988
Jul	5.40	4.84	5.42	1990	14	11.30	1990	1.43	1986
Aug	4.78	4.42	3.89	1976	27	9.58	1996	2.12	1987
Sep	4.52	4.34	4.25	1997	25	10.13	1977	.49	1984
Oct	3.28	3.15	4.56	1949	31	7.28	1986	.01	2000
Nov	4.99	4.72	3.02	1948	28	8.15	1992	1.98	1971
Dec	5.00	5.33	4.25	1961	12	9.01	1983	1.05	1980
Ann	60.15	60.58	5.42	Jul 1990	14	15.31	Mar 1980	.01	Oct 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.1	9.1	4.1	1.8
Feb	10.2	7.0	3.3	1.6
Mar	12.3	8.9	4.1	2.2
Apr	9.4	6.9	3.0	1.3
May	10.8	7.5	3.1	1.4
Jun	10.8	7.6	2.8	1.1
Jul	12.1	8.7	3.7	1.6
Aug	11.0	7.8	3.1	1.2
Sep	8.9	6.4	2.6	1.2
Oct	7.9	4.8	2.3	1.1
Nov	10.5	7.0	3.3	1.5
Dec	10.9	7.4	3.2	1.3
Ann	127.9	89.1	38.6	17.3

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	2.32	2.85	3.60	4.22	4.81	5.41	6.05	6.79	7.74	9.18	10.50
Feb	1.50	2.02	2.81	3.50	4.17	4.88	5.66	6.59	7.80	9.69	11.46
Mar	2.41	3.01	3.87	4.59	5.27	5.97	6.73	7.60	8.72	10.44	12.02
Apr	1.59	2.06	2.75	3.34	3.91	4.50	5.14	5.90	6.87	8.39	9.79
May	1.87	2.33	3.01	3.57	4.10	4.64	5.23	5.92	6.79	8.14	9.37
Jun	1.60	2.03	2.65	3.18	3.68	4.20	4.77	5.42	6.27	7.57	8.77
Jul	1.54	2.05	2.82	3.50	4.15	4.84	5.59	6.49	7.65	9.47	11.16
Aug	2.01	2.44	3.05	3.55	4.02	4.50	5.01	5.60	6.34	7.48	8.51
Sep	1.13	1.56	2.22	2.80	3.38	3.99	4.66	5.47	6.53	8.20	9.76
Oct	.30	.53	.97	1.43	1.92	2.49	3.16	4.00	5.15	7.07	8.95
Nov	2.16	2.61	3.24	3.75	4.23	4.71	5.23	5.82	6.57	7.71	8.74
Dec	1.74	2.21	2.90	3.47	4.03	4.60	5.22	5.94	6.86	8.30	9.61
Ann	44.85	47.86	51.69	54.58	57.14	59.59	62.12	64.90	68.26	73.10	77.27

\+ 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

Complete documentation available from:
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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	.9	.0	#	0
Feb	1.3	.0	#	0
Mar	.4	.0	#	0
Apr	#	.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
Nov	.1	.0	#	0
Dec	.2	.0	#	0
Ann	2.9	.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	2.0	1971	1	4.0	1977	2+	1994	5	1	1978
Feb	4.0	1983	6	10.5	1979	5	1979	19	1	1980
Mar	4.6	1971	26	4.8	1971	2	1971	26	#+	1998
Apr	#	1973	10	#+	1973	#	1971	7	#	1971
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	#	1989	20	#	1989	0	0	0	0	0
Nov	2.0	1975	23	2.0	1975	1	1975	23	#+	1995
Dec	2.0	1971	4	2.0+	1974	2	1974	2	#+	2000
Ann	4.6	Mar 1971	26	10.5	Feb 1979	5	Feb 1979	19	1+	Feb 1980

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.6	.4	.0	.0	.0
Feb	.6	.5	.1	.0	.0
Mar	.3	.2	@	.0	.0
Apr	.0	.0	.0	.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	.0
Dec	.1	.1	.0	.0	.0
Ann	1.7	1.2	.1	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.9	.0	.0	.0
Feb	.8	.4	.1	.0
Mar	.2	.0	.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
Dec	@	.0	.0	.0
Ann	1.9	.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	5/22	5/17	5/13	5/10	5/06	5/03	4/30	4/26	4/21
32	5/11	5/05	5/01	4/27	4/24	4/20	4/16	4/12	4/06
28	4/24	4/19	4/15	4/12	4/09	4/06	4/02	3/30	3/25
24	4/10	4/04	3/31	3/27	3/23	3/19	3/15	3/11	3/05
20	3/22	3/16	3/12	3/08	3/04	3/01	2/25	2/20	2/14
16	3/12	3/05	2/27	2/23	2/19	2/14	2/10	2/04	1/28

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	9/30	10/02	10/05	10/07	10/09	10/11	10/13	10/17
32	10/02	10/06	10/10	10/12	10/15	10/17	10/20	10/23	10/27
28	10/12	10/18	10/22	10/26	10/29	11/02	11/06	11/10	11/16
24	10/28	11/02	11/06	11/09	11/12	11/15	11/18	11/22	11/27
20	11/09	11/16	11/21	11/25	11/29	12/03	12/07	12/12	12/19
16	11/19	11/27	12/03	12/09	12/14	12/19	12/24	12/30	1/08

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	164	159	156	152	149	145	141	135
32	193	186	181	177	173	169	165	160	153
28	225	218	212	207	203	199	194	189	181
24	256	248	243	238	233	229	224	218	210
20	295	286	279	274	269	264	258	252	243
16	333	321	312	304	297	290	283	274	262

***** 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	847	673	525	285	113	9	0	1	35	260	491	750	3989
60	697	533	379	164	46	1	0	0	8	150	351	601	2930
57	610	450	298	108	23	0	0	0	3	100	273	513	2378
55	552	396	248	78	13	0	0	0	1	73	226	457	2044
50	415	268	145	27	2	0	0	0	0	27	130	325	1339
32	88	16	3	0	0	0	0	0	0	0	3	46	156

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	264	267	502	715	988	1176	1350	1319	1093	787	503	319	9283
55	15	2	34	102	288	486	637	606	404	147	36	17	2774
57	11	0	22	73	236	426	575	544	346	111	23	12	2379
60	5	0	10	38	166	337	482	451	261	68	11	7	1836
65	0	0	1	10	78	195	327	297	138	24	1	0	1071
70	0	0	0	1	26	83	179	154	52	5	0	0	500

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	93	134	283	478	747	948	1112	1081	863	539	280	133	93	227	510	988	1735	2683	3795	4876	5739	6278	6558	6691
45	44	68	174	335	593	798	957	926	713	389	172	70	44	112	286	621	1214	2012	2969	3895	4608	4997	5169	5239
50	18	28	86	214	439	648	802	771	563	254	89	32	18	46	132	346	785	1433	2235	3006	3569	3823	3912	3944
55	1	7	38	112	294	498	647	616	414	139	38	12	1	8	46	158	452	950	1597	2213	2627	2766	2804	2816
60	0	0	7	53	165	351	492	461	274	60	9	0	0	0	7	60	225	576	1068	1529	1803	1863	1872	1872
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	61	107	202	326	489	635	756	737	571	363	196	94	61	168	370	696	1185	1820	2576	3313	3884	4247	4443	4537

(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