

Climatology of the United States No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: CLEVELAND FILTER PLANT, TN

1971-2000

COOP ID: 401808

Climate Division: TN 1

NWS Call Sign:

Elevation: 800 Feet

Lat: 35° 13N

Lon: 84° 48W

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	48.2	27.7	38.0	74+	1960	13	48.8	1974	-16	1985	21	26.1	1977	840	0	.0	.0	14.3	2.5	21.1	.3
Feb	53.6	30.4	42.0	78+	1977	26	48.9	1990	-2	1996	5	34.1	1978	644	0	.0	.0	17.8	1.0	17.1	@
Mar	62.1	37.4	49.8	86	1982	20	54.8+	1997	0	1993	15	44.0	1971	475	2	.0	.0	26.8	.1	10.3	@
Apr	71.0	44.2	57.6	91	1986	27	63.1	1999	20	1992	3	52.5	1983	236	14	.0	@	29.7	.0	3.4	.0
May	78.0	53.2	65.6	95	1962	19	71.0+	1991	30+	1963	2	61.8	1976	89	109	.0	.2	31.0	.0	@	.0
Jun	85.1	61.9	73.5	98+	1958	14	76.6	1986	37	1966	1	69.0	1974	3	258	@	5.5	30.0	.0	.0	.0
Jul	88.5	66.4	77.5	105	1980	17	81.1	1980	49	1967	15	74.5+	1984	0	386	.4	14.0	31.0	.0	.0	.0
Aug	87.6	65.2	76.4	104	1983	21	80.5	1980	47+	1964	13	72.5	1992	0	354	.3	10.8	31.0	.0	.0	.0
Sep	81.5	58.6	70.1	99	1957	2	74.1	1998	30	1967	30	66.5	1976	23	175	.0	3.4	30.0	.0	.0	.0
Oct	71.6	45.5	58.6	89+	1959	5	66.4	1984	21+	1961	27	53.3	1988	232	33	.0	.0	30.9	.0	2.6	.0
Nov	60.6	36.6	48.6	85	1961	2	57.6	1985	9	1976	30	41.0	1976	494	2	.0	.0	24.9	.0	11.8	.0
Dec	51.4	30.5	41.0	76+	1982	3	48.2	1984	-4+	1962	13	32.6	1989	746	0	.0	.0	17.8	1.0	18.8	.1
Ann	69.9	46.5	58.2	105	Jul 1980	17	81.1	Jul 1980	-16	Jan 1985	21	26.1	Jan 1977	3782	1333	.7	33.9	315.2	4.6	85.1	.4

+ 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: 1955-2001

(3) Derived from 1971-2000 serially complete daily data

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Station: CLEVELAND FILTER PLANT, TN

COOP ID: 401808

Climate Division: TN 1

NWS Call Sign:

Elevation: 800 Feet Lat: 35°13N

Lon: 84°48W

Precipitation (inches)

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	5.37	5.37	3.35	1982	3	9.11	1996	1.38	1986	13.0	8.5	4.1	1.4	2.09	2.59	3.30	3.88	4.44	5.01	5.62	6.33	7.23	8.62	9.88
Feb	4.60	4.67	3.29	1966	13	9.43	1990	.65	1978	10.8	7.6	3.4	1.5	1.44	1.88	2.53	3.08	3.62	4.17	4.78	5.50	6.42	7.86	9.19
Mar	6.19	5.49	6.76	1994	27	14.62	1973	1.75	1986	13.6	9.4	4.1	1.6	1.91	2.50	3.38	4.13	4.86	5.61	6.44	7.42	8.68	10.64	12.45
Apr	4.42	4.26	4.30	1983	5	9.51	1998	1.21	1986	10.6	7.1	3.3	1.1	1.45	1.87	2.48	3.01	3.51	4.03	4.61	5.27	6.13	7.46	8.69
May	4.94	4.61	3.25	1987	21	10.35	1984	1.31	1982	11.5	7.6	3.5	1.5	1.78	2.25	2.92	3.48	4.02	4.57	5.17	5.86	6.75	8.12	9.38
Jun	4.51	4.04	4.76	1996	9	9.90	1989	1.25	1986	11.4	7.7	2.9	1.1	1.58	2.01	2.62	3.14	3.64	4.15	4.71	5.36	6.19	7.47	8.65
Jul	4.29	3.39	5.10	1990	21	12.81	1994	.76	1997	10.9	7.0	2.8	1.1	.82	1.20	1.83	2.41	3.00	3.64	4.36	5.23	6.38	8.23	10.00
Aug	3.43	3.40	3.01	1964	16	6.45	1977	.86	1997	9.6	6.0	2.5	1.0	1.30	1.62	2.07	2.45	2.82	3.19	3.59	4.05	4.64	5.55	6.38
Sep	4.46	4.07	5.85	1977	7	12.72	1977	.87	1985	9.2	6.3	3.2	1.3	1.12	1.54	2.19	2.76	3.33	3.93	4.60	5.39	6.43	8.07	9.61
Oct	3.39	3.34	3.28	1964	4	8.40	1986	.00	2000	8.0	5.2	2.4	1.1	.49	.93	1.51	1.98	2.45	2.95	3.51	4.17	5.03	6.40	7.70
Nov	4.85	4.44	3.50	1979	10	8.26	1986	2.26+	1997	10.9	7.4	3.7	1.5	2.10	2.54	3.15	3.64	4.11	4.58	5.08	5.66	6.39	7.50	8.51
Dec	4.97	4.78	3.95	1991	1	9.62	1973	1.01	1980	11.9	8.4	3.6	1.3	1.53	2.00	2.70	3.30	3.89	4.50	5.16	5.95	6.96	8.54	10.01
Ann	55.42	57.51	6.76	Mar 1994	27	14.62	Mar 1973	.00	Oct 2000	131.4	88.2	39.5	15.5	39.14	42.28	46.31	49.37	52.09	54.72	57.44	60.45	64.10	69.39	73.98

+ 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: 1955-2001

(3) Derived from 1971-2000 serially complete daily data

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1971-2000

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Station: CLEVELAND FILTER PLANT, TN

COOP ID: 401808

Climate Division: TN 1

NWS Call Sign:

Elevation: 800 Feet

Lat: 35°13N

Lon: 84°48W

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	.9	.0	#	0	5.0	1973	7	7.5	1977	6	1987	22	1	1987	.4	.3	.1	@	.0	.5	.2	.1	.0
Feb	.5	#	#	0	2.5	1980	8	5.0	1980	7	1979	18	1	1979	.2	.2	.0	.0	.0	.1	.0	.0	.0
Mar	.2	.0	#	0	2.5	1971	25	2.5	1971	1	1987	11	#+	1998	.1	.1	.0	.0	.0	.1	.0	.0	.0
Apr	.2	.0	0	0	3.0	1971	7	3.0+	1987	0	0	0	0	0	.1	.1	.1	.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	#	1995	14	#+	1995	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.1	.0	#	0	1.0	1997	29	2.0	1997	1	1997	30	#+	1997	.2	.1	.0	.0	.0	@	.0	.0	.0
Ann	1.9	#	N/A	N/A	5.0	Jan 1973	7	7.5	Jan 1977	7	Feb 1979	18	1+	Jan 1987	1.0	.8	.2	@	.0	.7	.2	.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

Complete documentation available from:

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No. 20 1971-2000

Station: CLEVELAND FILTER PLANT, TN

COOP ID: 401808

Climate Division: TN 1

NWS Call Sign:

Elevation: 800 Feet

Lat: 35° 13N

Lon: 84° 48W

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	5/14	5/08	5/04	5/01	4/28	4/24	4/21	4/17	4/11
32	4/27	4/23	4/20	4/17	4/14	4/12	4/09	4/06	4/01
28	4/17	4/11	4/07	4/03	3/31	3/28	3/24	3/20	3/14
24	4/03	3/28	3/23	3/19	3/15	3/12	3/07	3/03	2/24
20	3/19	3/13	3/08	3/04	2/28	2/24	2/20	2/15	2/09
16	3/07	2/27	2/22	2/17	2/12	2/08	2/03	1/28	1/21
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	10/01	10/05	10/07	10/09	10/11	10/13	10/16	10/18	10/22
32	10/10	10/14	10/17	10/20	10/22	10/25	10/28	10/31	11/04
28	10/19	10/24	10/28	11/01	11/04	11/07	11/10	11/14	11/20
24	11/01	11/07	11/11	11/14	11/18	11/21	11/24	11/28	12/04
20	11/17	11/23	11/28	12/02	12/06	12/09	12/13	12/18	12/24
16	11/24	12/03	12/09	12/14	12/19	12/23	12/29	1/04	1/12
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	185	178	174	170	166	162	158	154	147
32	207	201	197	194	190	187	184	180	174
28	238	231	226	221	217	213	208	203	196
24	273	264	257	252	247	241	236	229	221
20	301	294	289	284	280	275	271	266	258
16	343	330	321	314	307	301	294	286	275

* 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

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

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of the United States
No. 20
1971-2000**

Station: CLEVELAND FILTER PLANT, TN

COOP ID: 401808

Climate Division: TN 1 NWS Call Sign: Elevation: 800 Feet Lat: 35°13N Lon: 84°48W

Degree Days to Selected Base Temperatures (°F)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	840	644	475	236	89	3	0	0	23	232	494	746	3782
60	692	504	331	125	34	0	0	0	5	131	354	591	2767
57	604	422	253	76	16	0	0	0	1	86	276	505	2239
55	547	370	206	51	9	0	0	0	0	62	229	446	1920
50	412	246	113	14	1	0	0	0	0	23	133	310	1252
32	88	16	1	0	0	0	0	0	0	0	2	33	140

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	272	297	552	768	1042	1245	1409	1377	1142	823	501	310	9738
55	17	7	44	128	338	555	696	664	452	172	38	11	3122
57	13	2	28	94	283	495	634	602	393	134	25	7	2710
60	7	0	14	52	208	405	541	509	306	86	13	0	2141
65	0	0	2	14	109	258	386	354	175	33	2	0	1333
70	0	0	0	2	43	127	234	206	76	8	0	0	696

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	99	157	337	537	805	1017	1169	1138	912	585	289	139	99	256	593	1130	1935	2952	4121	5259	6171	6756	7045	7184
45	47	83	213	394	650	867	1014	983	762	434	179	71	47	130	343	737	1387	2254	3268	4251	5013	5447	5626	5697
50	21	38	121	263	495	717	859	828	612	289	97	34	21	59	180	443	938	1655	2514	3342	3954	4243	4340	4374
55	3	12	51	152	347	567	704	673	464	166	43	9	3	15	66	218	565	1132	1836	2509	2973	3139	3182	3191
60	0	0	18	71	208	417	549	518	320	78	11	0	0	0	18	89	297	714	1263	1781	2101	2179	2190	2190
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	60	111	217	351	523	692	805	785	608	377	188	89	60	171	388	739	1262	1954	2759	3544	4152	4529	4717	4806

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

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| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
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References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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