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: GRAYSON 3 SW, KY **COOP ID: 153391**

Climate Division: KY 4 **NWS Call Sign:** **Elevation: 700 Feet** **Lat: 38˚18N** **Lon: 82˚58W**

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	41.7	19.6	30.7	78	1999	23	40.3	1974	-31	1994	20	16.7	1977	1066	0	.0	.0	8.1	7.5	26.7	2.3
Feb	46.4	21.5	34.0	78+	2000	27	41.2	1976	-22+	1996	6	20.3	1978	870	0	.0	.0	11.5	4.6	23.5	1.9
Mar	56.5	28.6	42.6	86	1998	31	50.3	1973	-10	1980	3	35.5	1996	696	0	.0	.0	21.3	.9	21.2	.2
Apr	67.2	36.3	51.8	91+	1986	28	56.8	1981	15	1969	1	47.7	1997	399	2	.0	.1	27.7	.0	11.4	.0
May	75.9	46.1	61.0	95	1954	31	69.1	1991	26+	1986	5	55.4	1997	183	60	.0	.6	31.0	.0	1.7	.0
Jun	83.3	55.9	69.6	102	1988	26	72.6	1984	35	1984	1	64.2	1972	22	160	.1	4.5	30.0	.0	.0	.0
Jul	87.1	61.0	74.1	105	1954	14	77.6	1999	40	1988	2	70.8	1996	0	282	.3	9.5	31.0	.0	.0	.0
Aug	86.0	59.7	72.9	102	1953	30	77.5	1995	35+	1986	30	68.7	1992	9	252	.1	8.0	31.0	.0	.0	.0
Sep	79.9	51.6	65.8	103+	1953	3	70.4	1998	30+	1983	25	62.5	1974	69	92	.0	2.5	30.0	.0	.3	.0
Oct	69.4	38.7	54.1	91	1951	4	62.0	1971	14	1952	21	47.3	1987	357	17	.0	.0	30.4	.0	9.6	.0
Nov	57.4	30.6	44.0	84	1950	1	51.6	1985	2	1976	30	36.7	1976	631	0	.0	.0	20.5	.2	18.1	.0
Dec	46.5	23.7	35.1	80+	1982	4	43.9	1971	-18	1989	24	22.9	1989	926	0	.0	.0	12.1	3.8	24.3	.5
Ann	66.4	39.4	53.0	105	Jul 1954	14	77.6	Jul 1999	-31	Jan 1994	20	16.7	Jan 1977	5228	865	.5	25.2	284.6	17.0	136.8	4.9

\+ 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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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	3.11	2.53	1.74	1998	8	6.18	1974	.54	1981
Feb	3.05	2.73	2.25	2000	19	8.78	1989	.55	1977
Mar	3.83	3.24	4.30	1997	2	10.49	1997	.98	1983
Apr	3.43	3.36	2.32	1972	22	7.36	1972	.99	1976
May	4.50	4.18	2.44	1982	30	9.11	1996	1.12	1999
Jun	4.15	4.26	2.93	1993	5	7.81	1974	.39	1988
Jul	4.87	4.57	4.02	1988	20	8.73	1978	2.45	1974
Aug	3.53	3.45	3.20	1999	25	6.81	1979	.38	1998
Sep	2.63	2.52	3.21	1954	20	5.87	1975	.41	1985
Oct	2.94	2.48	2.60	1985	21	6.45	1983	.49	1987
Nov	3.14	2.80	2.99	1988	20	7.44	1986	.51	1981
Dec	3.61	3.05	3.53	1978	9	9.59	1990	1.40	1989
Ann	42.79	42.52	4.30	Mar 1997	2	10.49	Mar 1997	.38	Aug 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.7	7.2	1.9	.6
Feb	9.7	6.3	1.9	.6
Mar	11.7	8.4	2.4	.6
Apr	10.8	7.7	2.3	.4
May	11.6	8.7	3.1	1.2
Jun	10.7	7.8	3.1	1.1
Jul	9.9	7.9	3.4	1.2
Aug	8.4	6.1	2.2	.9
Sep	7.7	5.0	1.7	.6
Oct	8.2	5.5	2.0	.7
Nov	9.5	6.8	1.8	.5
Dec	10.5	6.8	2.1	.8
Ann	119.4	84.2	27.9	9.2

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	.90	1.19	1.64	2.02	2.40	2.79	3.23	3.74	4.40	5.44	6.40
Feb	.93	1.22	1.65	2.02	2.39	2.76	3.17	3.66	4.29	5.27	6.17
Mar	1.15	1.52	2.06	2.53	2.99	3.46	3.98	4.60	5.39	6.63	7.78
Apr	1.19	1.51	1.98	2.38	2.76	3.15	3.58	4.08	4.71	5.70	6.61
May	1.49	1.92	2.55	3.08	3.59	4.11	4.69	5.36	6.23	7.57	8.81
Jun	1.27	1.66	2.25	2.76	3.25	3.76	4.32	4.98	5.83	7.15	8.38
Jul	2.34	2.76	3.33	3.80	4.22	4.65	5.11	5.63	6.28	7.26	8.15
Aug	1.15	1.49	1.98	2.40	2.80	3.22	3.68	4.21	4.89	5.96	6.94
Sep	.55	.79	1.17	1.53	1.88	2.26	2.69	3.20	3.88	4.97	5.99
Oct	.72	1.00	1.43	1.81	2.19	2.58	3.03	3.56	4.25	5.35	6.38
Nov	.97	1.27	1.71	2.09	2.46	2.84	3.26	3.76	4.39	5.39	6.31
Dec	1.20	1.55	2.05	2.47	2.88	3.30	3.77	4.30	5.00	6.07	7.06
Ann	33.25	35.16	37.57	39.38	40.97	42.49	44.05	45.77	47.82	50.78	53.31

\+ 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

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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	5.7	3.0	1	#
Feb	5.7	3.5	1	#
Mar	2.9	1.1	#	#
Apr	#	.0	0	0
May	#	.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
Nov	.5	.0	#	0
Dec	1.1	.0	#	#
Ann	15.9	7.6	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	9.0	1994	18	22.5	1978	16	1978	21	8	1977
Feb	9.0	1998	6	21.0+	1998	16	1998	6	4	1979
Mar	11.0	1993	14	14.0	1993	14	1993	14	2	1978
Apr	#	2000	99	#+	2000	8	1987	5	1	1987
May	#	1989	7	#	1989	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	#	1972	19	#	1972	#	1972	19	#	1972
Nov	3.0	1971	25	4.0	1971	1	1977	28	#+	2000
Dec	5.0	1981	17	7.0	1981	5	1993	29	1	1993
Ann	11.0	Mar 1993	14	22.5	Jan 1978	16+	Feb 1998	6	8	Jan 1977

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.7	2.2	.6	.3	.0
Feb	2.0	1.6	.6	.2	.0
Mar	1.2	1.0	.3	.1	@
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	.4	.2	.1	.0	.0
Dec	1.2	.9	@	@	.0
Ann	7.5	5.9	1.6	.6	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	4.7	2.5	1.5	.4
Feb	4.7	3.5	1.2	.1
Mar	1.3	.7	.3	.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	.2	.0	.0	.0
Dec	.9	.2	.1	.0
Ann	11.8	6.9	3.1	.5

+ 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	5/28	5/24	5/20	5/17	5/14	5/11	5/08	5/04	4/30
32	5/17	5/12	5/08	5/05	5/02	4/29	4/26	4/23	4/18
28	5/04	4/29	4/25	4/22	4/19	4/16	4/13	4/10	4/05
24	4/21	4/16	4/13	4/10	4/08	4/05	4/03	3/30	3/26
20	4/12	4/06	4/02	3/30	3/26	3/23	3/19	3/15	3/09
16	3/26	3/20	3/17	3/13	3/10	3/07	3/04	2/28	2/23

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	9/14	9/19	9/22	9/25	9/28	10/01	10/04	10/07	10/11
32	9/28	10/01	10/04	10/06	10/08	10/10	10/12	10/14	10/18
28	10/05	10/10	10/15	10/18	10/21	10/24	10/28	11/01	11/07
24	10/15	10/21	10/25	10/29	11/01	11/04	11/08	11/12	11/18
20	10/23	10/30	11/04	11/08	11/12	11/16	11/20	11/25	12/02
16	11/02	11/10	11/16	11/22	11/27	12/01	12/07	12/13	12/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	154	148	144	140	136	133	129	124	118
32	177	170	166	161	158	154	150	145	138
28	211	201	195	189	184	179	173	167	158
24	230	222	216	211	207	202	197	191	183
20	257	248	241	235	230	225	219	212	203
16	290	280	273	266	260	255	248	241	231

***** 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	1066	870	696	399	183	22	0	9	69	357	631	926	5228
60	911	730	541	257	97	4	0	0	23	234	483	771	4051
57	818	646	455	183	60	1	0	0	10	173	397	681	3424
55	757	592	397	139	41	1	0	0	5	138	343	625	3038
50	615	463	266	58	13	0	0	0	1	70	219	481	2186
32	200	114	23	0	0	0	0	0	0	0	10	117	464

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	157	168	350	593	900	1128	1305	1266	1013	684	369	214	8147
55	2	2	12	42	227	439	592	553	328	109	12	9	2327
57	0	0	7	26	184	380	530	491	273	82	6	3	1982
60	0	0	0	10	129	293	437	398	196	50	2	0	1515
65	0	0	0	2	60	160	282	252	92	17	0	0	865
70	0	0	0	0	21	63	142	129	30	4	0	0	389

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	42	66	172	375	662	894	1063	1021	778	440	185	73	42	108	280	655	1317	2211	3274	4295	5073	5513	5698	5771
45	19	28	97	250	508	744	908	866	628	300	107	33	19	47	144	394	902	1646	2554	3420	4048	4348	4455	4488
50	3	9	45	148	360	594	753	711	479	181	53	15	3	12	57	205	565	1159	1912	2623	3102	3283	3336	3351
55	0	0	21	78	229	445	598	556	336	95	17	3	0	0	21	99	328	773	1371	1927	2263	2358	2375	2378
60	0	0	4	33	125	306	443	403	210	43	4	0	0	0	4	37	162	468	911	1314	1524	1567	1571	1571
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	39	61	148	276	437	591	714	684	510	312	146	57	39	100	248	524	961	1552	2266	2950	3460	3772	3918	3975

(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.
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