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: LOUISVILLE STANDIFORD AP, KY **COOP ID: 154954**

Climate Division: KY 2 **NWS Call Sign: SDF** **Elevation: 481 Feet** **Lat: 38˚11N** **Lon: 85˚44W**

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	41.0	24.9	33.0	77	1950	25	43.2	1990	-22	1994	19	18.0	1977	992	0	.0	.0	8.1	8.2	23.1	.9
Feb	46.6	28.5	37.6	77+	2000	26	45.1	2000	-19	1951	2	23.2	1978	779	0	.0	.0	12.0	4.5	17.8	.2
Mar	56.8	37.1	46.9	86	1981	31	53.5	1973	-1	1960	6	40.4	1984	569	6	.0	.0	22.0	.6	11.1	.0
Apr	66.8	46.0	56.4	91+	1960	24	62.3	1981	22	1982	7	51.2	1982	280	24	.0	@	28.2	.0	2.1	.0
May	75.4	56.1	65.8	95	1959	4	73.0	1991	31+	1966	10	61.4	1997	84	109	.0	.6	31.0	.0	@	.0
Jun	83.3	65.1	74.2	102	1952	29	78.1	1991	42	1966	1	68.6	1974	6	287	@	6.5	30.0	.0	.0	.0
Jul	87.0	69.8	78.4	106	1999	30	83.2	1999	50+	1972	7	74.7	1971	0	421	.5	12.3	31.0	.0	.0	.0
Aug	85.8	68.2	77.0	101+	1988	17	81.7	1983	46	1986	29	73.2	1992	1	374	.2	10.4	31.0	.0	.0	.0
Sep	79.4	60.9	70.1	104+	1954	6	76.2	1998	33	1949	30	63.6	1974	36	189	.0	3.4	30.0	.0	.0	.0
Oct	68.4	48.5	58.5	92+	1959	5	65.1	1971	23	1952	22	52.5	1976	240	29	.0	.0	30.4	.0	1.0	.0
Nov	55.9	39.3	47.6	84	1958	17	53.9	1985	-1	1950	25	39.4	1976	527	3	.0	.0	20.7	.2	8.7	.0
Dec	45.4	29.9	37.6	76	1982	3	46.0	1984	-15	1989	22	25.4	1989	838	1	.0	.0	11.3	4.2	18.8	.3
Ann	66.0	47.9	56.9	106	Jul 1999	30	83.2	Jul 1999	-22	Jan 1994	19	18.0	Jan 1977	4352	1443	.7	33.2	285.7	17.7	82.6	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/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	3.28	3.32	3.64	2000	3	7.23	1999	.45	1981
Feb	3.25	3.05	3.66	1990	15	9.02	1989	.76	1978
Mar	4.41	4.07	7.22	1997	1	12.58	1997	1.54	1981
Apr	3.91	3.37	4.08	1970	1	8.48	1972	.76	1976
May	4.88	4.43	4.60	1961	7	11.57	1990	1.37	1977
Jun	3.76	3.64	5.12	1960	23	8.11	1997	.49	1984
Jul	4.30	3.68	5.09	1973	21	10.05	1979	.34	1999
Aug	3.41	3.20	3.12	1992	8	8.79	1974	.91	1973
Sep	3.05	2.83	4.30	1979	21	10.49	1979	.96	1978
Oct	2.79	2.39	2.64	1983	22	6.47	1983	.39	1987
Nov	3.81	3.46	3.58	1948	5	7.59	1973	.72	1976
Dec	3.69	3.37	2.77	1978	3	8.86	1990	.65	1976
Ann	44.54	45.30	7.22	Mar 1997	1	12.58	Mar 1997	.34	Jul 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.0	6.1	2.1	.7
Feb	10.5	5.6	2.1	.7
Mar	12.9	8.5	2.9	.8
Apr	11.7	7.8	2.6	.8
May	12.2	8.0	3.6	1.3
Jun	10.4	7.0	2.7	.8
Jul	9.9	6.5	2.7	1.2
Aug	8.3	5.9	2.5	.8
Sep	8.8	5.7	1.9	.7
Oct	7.5	4.7	1.9	.7
Nov	10.6	6.7	3.0	1.0
Dec	11.8	6.7	2.4	1.0
Ann	125.6	79.2	30.4	10.5

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	.87	1.18	1.65	2.07	2.48	2.91	3.39	3.95	4.69	5.85	6.93
Feb	.89	1.20	1.67	2.08	2.48	2.90	3.37	3.92	4.63	5.76	6.81
Mar	1.66	2.07	2.66	3.15	3.62	4.10	4.62	5.22	5.98	7.16	8.24
Apr	1.20	1.58	2.13	2.60	3.06	3.54	4.07	4.68	5.48	6.72	7.87
May	1.63	2.10	2.78	3.35	3.90	4.47	5.09	5.82	6.76	8.20	9.54
Jun	1.02	1.38	1.92	2.40	2.86	3.35	3.89	4.53	5.37	6.68	7.90
Jul	1.01	1.41	2.04	2.60	3.16	3.75	4.42	5.20	6.24	7.88	9.43
Aug	1.14	1.47	1.94	2.34	2.72	3.12	3.55	4.06	4.71	5.72	6.64
Sep	.84	1.13	1.57	1.95	2.33	2.72	3.16	3.68	4.35	5.41	6.39
Oct	.78	1.04	1.45	1.80	2.14	2.50	2.89	3.36	3.97	4.92	5.81
Nov	1.37	1.73	2.25	2.68	3.09	3.52	3.98	4.51	5.20	6.25	7.22
Dec	1.09	1.44	1.96	2.42	2.86	3.32	3.83	4.43	5.21	6.42	7.55
Ann	32.85	35.15	38.07	40.27	42.23	44.11	46.04	48.18	50.75	54.48	57.68

\+ 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)

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	5.2	2.5	1	0	15.5	1994	17	28.4	1978	19	1978	20	7	1978	4.8	1.5	.3	.2	@	5.7	2.0	1.4	.8
Feb	4.5	2.9	1	0	9.2	1998	4	19.3	1998	11	1998	7	5	1978	3.6	1.1	.5	.2	.0	4.5	2.8	1.3	.1
Mar	2.1	.9	#	0	8.3	1987	30	10.0	1975	6	1978	3	1	1978	1.9	.6	.2	.1	.0	.8	.4	.1	.0
Apr	.2	.0	#	0	1.4	1982	8	1.6	1973	2	1987	1	#	1987	.2	.1	.0	.0	.0	.1	.0	.0	.0
May	#	.0	#	0	#	1989	7	#	1989	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	.1	.0	#	0	2.4	1993	30	2.4	1993	1	1993	30	#	1993	.1	.1	.0	.0	.0	@	.0	.0	.0
Nov	.6	.0	#	0	4.8	1977	27	5.4	1971	2+	1977	28	#	1977	.5	.2	@	.0	.0	.2	.0	.0	.0
Dec	2.0	1.1	#	0	4.7	1984	5	9.7	2000	5+	1984	7	1+	2000	2.3	.7	.1	.0	.0	2.3	.6	.1	.0
Ann	14.7	7.4	N/A	N/A	15.5	Jan 1994	17	28.4	Jan 1978	19	Jan 1978	20	7	Jan 1978	13.4	4.3	1.1	.5	@	13.6	5.8	2.9	.9

+ 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	5/02	4/28	4/24	4/21	4/19	4/16	4/13	4/10	4/05
32	4/21	4/16	4/13	4/10	4/08	4/05	4/03	3/30	3/26
28	4/12	4/07	4/03	3/30	3/27	3/24	3/20	3/16	3/10
24	3/29	3/24	3/20	3/17	3/13	3/10	3/07	3/03	2/26
20	3/15	3/09	3/05	3/01	2/25	2/22	2/18	2/14	2/07
16	3/08	3/01	2/23	2/19	2/14	2/10	2/06	1/31	1/24

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	10/06	10/10	10/13	10/16	10/18	10/21	10/23	10/26	10/31
32	10/15	10/20	10/24	10/27	10/30	11/02	11/06	11/10	11/15
28	10/29	11/03	11/07	11/10	11/14	11/17	11/20	11/24	11/29
24	11/03	11/09	11/14	11/18	11/22	11/26	11/30	12/05	12/12
20	11/16	11/23	11/28	12/02	12/06	12/10	12/14	12/19	12/25
16	12/02	12/07	12/11	12/14	12/17	12/20	12/24	12/27	1/02

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	200	194	189	186	182	178	174	170	164
32	227	220	214	209	205	200	196	190	182
28	254	246	240	235	231	227	222	216	208
24	276	268	263	258	253	249	244	238	230
20	303	296	291	287	283	279	274	269	262
16	336	325	318	311	305	299	292	285	274

***** 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	992	779	569	280	84	6	0	1	36	240	527	838	4352
60	838	630	415	154	43	1	0	0	10	137	383	699	3310
57	755	553	332	99	23	0	0	0	4	91	304	613	2774
55	697	501	281	70	14	0	0	0	2	66	255	555	2441
50	555	376	174	22	3	0	0	0	0	25	154	419	1728
32	178	80	9	0	0	0	0	0	0	0	6	95	368

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	160	230	475	733	1051	1271	1442	1397	1141	816	466	242	9424
55	4	8	45	135	345	581	729	684	453	165	43	10	3202
57	2	4	32	104	290	521	667	622	396	128	30	7	2803
60	1	2	19	67	214	431	574	529	313	81	15	3	2249
65	0	0	6	24	109	287	421	374	189	29	3	1	1443
70	0	0	1	5	42	159	267	224	92	7	0	0	797

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	61	111	272	504	812	1038	1204	1158	910	578	266	103	61	172	444	948	1760	2798	4002	5160	6070	6648	6914	7017
45	32	60	172	365	657	888	1049	1003	760	427	168	55	32	92	264	629	1286	2174	3223	4226	4986	5413	5581	5636
50	7	27	99	239	503	738	894	848	610	287	95	27	7	34	133	372	875	1613	2507	3355	3965	4252	4347	4374
55	1	5	48	141	357	588	739	693	462	173	48	9	1	6	54	195	552	1140	1879	2572	3034	3207	3255	3264
60	0	1	22	71	223	439	584	538	323	86	17	1	0	1	23	94	317	756	1340	1878	2201	2287	2304	2305
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	36	64	164	299	518	713	839	808	603	347	146	54	36	100	264	563	1081	1794	2633	3441	4044	4391	4537	4591

(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