

# Climatology of the United States

No. 20

1971-2000

Station: WEST LIBERTY, KY

COOP ID: 158551

Climate Division: KY 4

NWS Call Sign:

Elevation: 830 Feet

Lat: 37° 55N

Lon: 83° 16W

## 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	42.5	19.2	30.9	80	1999	23	40.6	1974	-30+	1994	20	17.5	1977	1058	0	.0	.0	9.2	6.7	27.2	2.3
Feb	47.9	21.0	34.5	81	2000	27	43.1	1990	-22	1996	5	22.1	1978	855	0	.0	.0	12.8	3.6	24.4	1.4
Mar	57.8	28.9	43.4	86+	1998	30	50.8	1973	-11	1993	15	37.4	1993	671	0	.0	.0	22.2	.7	20.8	.1
Apr	68.1	36.5	52.3	93	1986	28	56.4	1981	13	1997	2	45.8	1997	384	3	.0	.2	28.0	.0	10.4	.0
May	76.3	46.4	61.4	95	1950	6	68.0	1991	24	1997	22	54.1	1997	180	66	.0	1.0	30.9	.0	2.1	.0
Jun	83.4	56.1	69.8	107	1994	20	72.5	1996	33	1998	8	64.6	1972	21	163	.1	5.2	30.0	.0	.0	.0
Jul	87.2	60.9	74.1	103+	1999	31	78.0	1999	43	2000	20	71.0	1976	0	280	.3	10.5	31.0	.0	.0	.0
Aug	86.0	59.4	72.7	103	1953	31	77.3	1980	38+	1986	30	67.9	1992	9	247	.2	8.4	31.0	.0	.0	.0
Sep	80.0	51.3	65.7	103	1953	4	70.2	1977	26	2000	27	61.7	1994	73	93	.0	2.6	30.0	.0	.4	.0
Oct	69.7	37.8	53.8	92	1953	1	62.6	1971	10	1997	23	47.7	1988	364	15	.0	.0	30.4	.0	10.3	.0
Nov	57.9	30.0	44.0	84+	1999	2	51.8	1985	5+	1964	23	36.1	1976	632	0	.0	.0	21.5	.2	18.9	.0
Dec	47.3	23.5	35.4	81	1982	4	44.4	1971	-15+	1989	23	23.5	1989	919	0	.0	.0	13.4	3.3	24.5	.5
Ann	67.0	39.3	53.2	107	Jun 1994	20	78.0	Jul 1999	-30+	Jan 1994	20	17.5	Jan 1977	5166	867	.6	27.9	290.4	14.5	139.0	4.3

+ 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](http://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: 1948-2001

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

056-A

# 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: WEST LIBERTY, KY

COOP ID: 158551

Climate Division: KY 4

NWS Call Sign:

Elevation: 830 Feet

Lat: 37°55N

Lon: 83°16W

#### 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	3.48	3.30	2.31	1950	31	6.84	1978	.49	1981	10.6	7.6	2.5	.6	.99	1.32	1.82	2.26	2.68	3.12	3.61	4.19	4.93	6.10	7.19	
Feb	3.09	2.79	3.26	1962	27	9.84	1989	.72	1977	9.4	6.5	2.0	.6	.96	1.26	1.69	2.07	2.43	2.80	3.21	3.70	4.32	5.29	6.19	
Mar	4.01	3.47	2.47	1963	12	11.11	1997	1.26	1986	11.8	8.3	2.8	.9	1.18	1.56	2.13	2.62	3.10	3.61	4.16	4.81	5.65	6.97	8.20	
Apr	3.61	3.45	2.65	1972	22	8.34	1972	.69	1986	10.3	8.0	2.5	.5	1.01	1.36	1.87	2.33	2.77	3.23	3.74	4.34	5.13	6.36	7.50	
May	4.84	4.75	2.03	1967	15	7.70	1983	1.53	1999	11.2	9.0	3.7	1.2	2.13	2.57	3.17	3.66	4.12	4.58	5.07	5.64	6.36	7.45	8.43	
Jun	4.00	3.87	3.10	1950	19	7.23	1998	1.27	1980	9.8	7.7	2.8	.8	1.61	1.98	2.50	2.93	3.33	3.74	4.19	4.70	5.35	6.34	7.25	
Jul	5.07	4.93	4.86	1971	18	13.02	1971	1.86	1984	10.1	8.1	3.6	1.6	2.00	2.47	3.13	3.68	4.21	4.74	5.31	5.97	6.81	8.10	9.27	
Aug	3.49	3.22	4.25	1969	20	7.77	1974	1.13	1998	8.1	6.1	2.3	.9	1.12	1.45	1.94	2.36	2.77	3.18	3.64	4.17	4.86	5.93	6.92	
Sep	3.10	2.60	5.90	1950	20	6.45	1989	.41	1978	7.4	5.8	2.1	.7	.59	.87	1.32	1.74	2.17	2.62	3.14	3.77	4.60	5.94	7.21	
Oct	2.82	2.61	2.55	1989	17	5.83	1989	.62	1987	7.7	5.4	2.1	.6	.82	1.09	1.50	1.85	2.18	2.54	2.93	3.39	3.99	4.92	5.79	
Nov	3.31	2.99	3.41	1973	28	6.95	1985	.82	1976	9.3	6.9	2.1	.7	1.07	1.39	1.85	2.25	2.63	3.02	3.45	3.96	4.61	5.62	6.56	
Dec	4.02	3.24	2.60	2000	17	12.87	1990	1.33	1999	10.2	7.7	2.4	.8	1.12	1.50	2.08	2.59	3.08	3.60	4.17	4.84	5.72	7.10	8.38	
Ann	44.84	42.81	5.90	Sep 1950	20	13.02	Jul 1971	.41	Sep 1978	115.9	87.1	30.9	9.9	32.74	35.10	38.12	40.41	42.43	44.38	46.38	48.60	51.28	55.15	58.49	

+ 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:  
[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

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**Station: WEST LIBERTY, KY**

**COOP ID: 158551**

**Climate Division: KY 4**

**NWS Call Sign:**

**Elevation: 830 Feet**

**Lat: 37°55N**

**Lon: 83°16W**

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	1.4	.2	1	#	2.0	1976	8	7.0	1976	16	1978	23	6	1978	.6	.5	.0	.0	.0	1.2	.2	.0	.0
Feb	2.7	.5	1	#	16.0	1985	13	16.0	1985	18	1985	14	6	1985	.9	.8	.3	.3	.1	.2	.0	.0	.0
Mar	1.3	.0	#	#	7.0	1980	2	7.0+	1980	7	1980	2	1	1980	.4	.3	.1	@	.0	.5	.2	.1	.0
Apr	#	.0	#	0	#	1990	12	#+	1990	12	1987	5	1	1987	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	#	.0	0	0	#	1989	8	#	1989	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	#	1989	20	#+	1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.2	.0	#	0	2.0	1976	29	2.0+	1995	2	1976	29	#+	1989	.1	.1	.0	.0	.0	.1	.0	.0	.0
Dec	.3	#	#	0	3.0	1989	8	3.2	1973	5	1989	28	2	1989	.5	.4	.1	.0	.0	1.0	.1	.0	.0
Ann	5.9	.7	N/A	N/A	16.0	Feb 1985	13	16.0	Feb 1985	18	Feb 1985	14	6+	Feb 1985	2.5	2.1	.5	.3	.1	3.0	.5	.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	6/02	5/27	5/23	5/19	5/16	5/13	5/09	5/05	4/29
32	5/22	5/16	5/12	5/08	5/05	5/02	4/28	4/24	4/18
28	5/10	5/03	4/29	4/25	4/21	4/18	4/14	4/10	4/03
24	4/27	4/22	4/18	4/14	4/11	4/08	4/04	3/31	3/25
20	4/14	4/08	4/03	3/30	3/26	3/22	3/18	3/14	3/07
16	3/27	3/21	3/17	3/14	3/11	3/07	3/04	2/28	2/22
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	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/10	10/15
32	9/25	9/29	10/02	10/05	10/07	10/09	10/12	10/15	10/19
28	10/03	10/09	10/13	10/17	10/20	10/23	10/27	10/31	11/06
24	10/13	10/19	10/23	10/26	10/29	11/01	11/05	11/09	11/14
20	10/24	10/30	11/04	11/07	11/11	11/15	11/19	11/23	11/29
16	11/06	11/13	11/18	11/22	11/26	11/30	12/04	12/09	12/16
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	164	154	148	142	136	131	125	118	109
32	177	169	163	159	154	150	145	140	132
28	212	201	194	187	181	175	168	161	150
24	227	218	211	206	201	195	190	183	174
20	254	246	239	234	229	224	219	213	204
16	289	279	272	265	260	254	247	240	230

\* 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:  
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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	1058	855	671	384	180	21	0	9	73	364	632	919	5166
60	903	715	518	246	96	4	0	0	25	239	484	764	3994
57	810	631	432	174	59	1	0	0	11	176	398	671	3363
55	756	577	375	133	41	1	0	0	6	140	344	616	2989
50	609	448	247	56	13	0	0	0	1	71	220	471	2136
32	198	104	19	0	0	0	0	0	0	0	10	105	436

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	163	173	371	608	910	1132	1303	1261	1010	674	368	209	8182
55	7	2	14	51	237	443	590	548	326	101	12	7	2338
57	0	0	9	32	194	384	528	486	271	75	6	0	1985
60	0	0	2	15	138	296	435	393	196	44	2	0	1521
65	0	0	0	3	66	163	280	247	93	15	0	0	867
70	0	0	0	0	24	64	140	125	32	3	0	0	388

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	41	70	195	392	669	897	1065	1020	777	436	196	77	41	111	306	698	1367	2264	3329	4349	5126	5562	5758	5835
45	19	29	111	263	514	747	910	865	627	296	109	33	19	48	159	422	936	1683	2593	3458	4085	4381	4490	4523
50	2	11	54	161	367	597	755	710	479	174	54	12	2	13	67	228	595	1192	1947	2657	3136	3310	3364	3376
55	0	0	27	85	234	447	600	555	334	90	21	1	0	0	27	112	346	793	1393	1948	2282	2372	2393	2394
60	0	0	7	37	126	305	445	401	206	36	7	0	0	0	7	44	170	475	920	1321	1527	1563	1570	1570
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	41	74	165	288	443	592	709	681	516	323	156	63	41	115	280	568	1011	1603	2312	2993	3509	3832	3988	4051

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

- 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/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)