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: LICKING 4 N, MO **COOP ID: 234919**

Climate Division: MO 5 **NWS Call Sign:** **Elevation: 1,180 Feet** **Lat: 37˚33N** **Lon: 91˚53W**

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	40.7	19.7	30.2	76	1952	1	39.4	1990	-24+	1985	20	17.2	1977	1079	0	.0	.0	7.5	9.5	27.3	2.9
Feb	47.0	24.5	35.8	83	1962	14	45.6	1976	-19	1979	9	23.7	1978	819	0	.0	.0	11.2	5.6	21.7	1.6
Mar	57.2	33.5	45.4	87	1967	14	51.5	1973	-17	1960	5	38.2	1996	609	0	.0	.0	21.1	1.1	15.6	.2
Apr	68.2	42.7	55.5	90+	1972	13	64.2	1981	16	1987	4	49.9	1997	303	15	.0	@	27.5	.0	5.5	.0
May	76.6	52.2	64.4	96	1953	27	70.5	1977	25	1978	2	59.8	1997	120	100	.0	.4	31.0	.0	.7	.0
Jun	84.3	61.2	72.8	104	1952	30	78.0	1971	36	1972	1	68.9	1985	9	242	.0	4.1	30.0	.0	.0	.0
Jul	90.1	66.0	78.1	114	1954	15	86.3	1980	42+	1972	6	74.0	1996	0	404	1.2	14.0	31.0	.0	.0	.0
Aug	89.2	64.1	76.7	106	1980	1	83.3	1983	38+	1986	29	69.4	1992	8	369	1.0	12.5	31.0	.0	.0	.0
Sep	80.7	56.0	68.4	104	1954	4	74.7	1980	28	1989	24	63.2	1974	63	163	.1	3.2	29.9	.0	.2	.0
Oct	70.2	44.1	57.2	93+	1963	11	64.2	1971	11	1952	29	51.8	1988	265	21	.0	.2	29.8	.0	5.7	.0
Nov	56.0	34.8	45.4	84+	1989	12	52.4	1999	-1	1950	25	38.2	1996	588	0	.0	.0	19.1	.8	14.9	.0
Dec	44.6	24.7	34.7	76	1991	9	42.2	1971	-19	1989	23	19.7	1983	941	0	.0	.0	10.0	5.8	25.1	1.3
Ann	67.1	43.6	55.4	114	Jul 1954	15	86.3	Jul 1980	-24+	Jan 1985	20	17.2	Jan 1977	4804	1314	2.3	34.4	279.1	22.8	116.7	6.0

\+ 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

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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	2.35	2.22	3.17	1982	31	5.97	1982	.04	1986
Feb	2.53	2.07	2.72	1949	15	6.20	1990	.31	1996
Mar	3.94	3.39	2.56	1995	7	8.90	1973	1.23	1986
Apr	4.49	4.14	3.75	1996	22	12.43	1994	.54	2000
May	4.80	4.37	4.05	1950	10	11.56	1974	1.25	1987
Jun	4.44	3.51	3.63	1950	10	10.80	1985	.27	1991
Jul	3.54	2.89	4.34	1979	28	8.62	1998	.60	1999
Aug	3.25	2.65	3.95	1972	23	9.36	1982	.91	1998
Sep	4.17	3.74	5.45	1965	5	12.73	1993	.70	1999
Oct	3.72	3.22	5.55	1986	1	8.68	1986	1.30	1999
Nov	4.44	3.78	4.47	1993	14	11.59	1985	.64	1989
Dec	3.43	2.65	5.00	1982	3	11.65	1982	.61	1976
Ann	45.10	45.91	5.55	Oct 1986	1	12.73	Sep 1993	.04	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.2	4.9	1.2	.5
Feb	7.5	4.9	2.0	.6
Mar	10.5	7.4	2.8	.9
Apr	11.3	7.4	3.0	1.3
May	12.0	7.9	3.2	1.4
Jun	10.2	7.0	3.0	1.5
Jul	7.9	5.5	2.5	.9
Aug	7.7	5.3	2.3	1.0
Sep	8.9	6.1	2.8	1.3
Oct	8.5	5.9	2.5	.9
Nov	9.8	6.9	3.0	1.2
Dec	8.7	5.2	2.4	1.0
Ann	111.2	74.4	30.7	12.5

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	.26	.43	.76	1.09	1.44	1.83	2.30	2.87	3.65	4.95	6.21
Feb	.67	.91	1.27	1.59	1.91	2.24	2.61	3.05	3.62	4.52	5.36
Mar	1.38	1.76	2.29	2.75	3.18	3.63	4.11	4.68	5.40	6.51	7.54
Apr	1.16	1.59	2.24	2.81	3.38	3.98	4.64	5.42	6.45	8.06	9.57
May	1.49	1.95	2.63	3.21	3.77	4.35	4.99	5.75	6.72	8.23	9.63
Jun	.81	1.20	1.85	2.45	3.07	3.73	4.49	5.41	6.63	8.59	10.46
Jul	.75	1.08	1.60	2.07	2.54	3.05	3.62	4.30	5.20	6.64	8.00
Aug	.90	1.21	1.68	2.09	2.49	2.90	3.37	3.91	4.62	5.73	6.77
Sep	.77	1.14	1.75	2.32	2.89	3.52	4.22	5.08	6.22	8.05	9.79
Oct	1.19	1.54	2.07	2.51	2.94	3.38	3.87	4.44	5.18	6.32	7.38
Nov	.94	1.35	2.00	2.59	3.19	3.82	4.54	5.40	6.53	8.34	10.05
Dec	.60	.90	1.40	1.87	2.35	2.87	3.46	4.18	5.13	6.67	8.15
Ann	28.76	31.79	35.74	38.79	41.52	44.20	46.98	50.09	53.90	59.48	64.37

\+ 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	6.5	4.1	1	1
Feb	3.1	1.8	1	#
Mar	2.8	.9	#	#
Apr	.1	.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	.9	.0	#	0
Dec	3.4	.8	#	#
Ann	16.8	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	11.0	1982	31	21.5	1979	11	1982	31	7	1977
Feb	8.2	1980	8	13.7	1980	13	1982	13	6	1982
Mar	10.0	1989	6	12.0	1974	10	1989	6	3	1978
Apr	1.0	1973	9	1.0+	1980	6	1971	5	#+	1988
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	1.0	1993	30	1.0	1993	1	1993	30	#	1993
Nov	5.0	1975	27	8.0	1975	8	1975	27	1	1980
Dec	9.0	1973	20	17.8	2000	9	1973	20	4	2000
Ann	11.0	Jan 1982	31	21.5	Jan 1979	13	Feb 1982	13	7	Jan 1977

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.0	.6	.3	@
Feb	2.4	1.1	.4	.2	.0
Mar	1.1	.7	.3	.2	@
Apr	.1	.1	.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
Nov	.6	.3	.2	@	.0
Dec	1.9	1.0	.3	.1	.0
Ann	9.1	5.2	1.8	.8	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	6.6	3.7	2.2	.5
Feb	5.0	3.4	2.7	.6
Mar	1.7	1.0	.5	@
Apr	@	.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
Nov	.4	.2	.1	.0
Dec	2.9	1.1	.8	.0
Ann	16.6	9.4	6.3	1.1

+ 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	5/24	5/18	5/14	5/11	5/07	5/04	5/01	4/27	4/21
32	5/15	5/09	5/05	5/01	4/28	4/24	4/21	4/16	4/10
28	5/03	4/26	4/22	4/18	4/14	4/11	4/07	4/02	3/27
24	4/14	4/09	4/05	4/02	3/30	3/27	3/24	3/21	3/16
20	4/06	3/31	3/27	3/24	3/21	3/17	3/14	3/10	3/04
16	3/28	3/20	3/15	3/11	3/06	3/02	2/26	2/21	2/13

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	9/17	9/21	9/24	9/27	9/29	10/02	10/04	10/07	10/12
32	9/28	10/01	10/04	10/06	10/08	10/10	10/12	10/14	10/18
28	10/03	10/09	10/14	10/18	10/21	10/25	10/28	11/02	11/08
24	10/20	10/26	10/30	11/03	11/06	11/09	11/13	11/17	11/23
20	10/31	11/06	11/10	11/14	11/18	11/21	11/25	11/29	12/05
16	11/07	11/13	11/17	11/21	11/24	11/28	12/01	12/05	12/11

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	157	152	148	144	140	136	131	124
32	183	176	171	166	162	158	154	149	142
28	218	208	201	195	189	183	177	170	161
24	242	234	229	224	220	216	211	206	199
20	262	255	250	245	241	237	233	227	220
16	287	278	272	267	262	257	252	246	237

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1079	819	609	303	120	9	0	8	63	265	588	941	4804
60	924	679	462	185	54	1	0	1	22	151	448	787	3714
57	831	601	377	129	30	0	0	0	10	99	366	700	3143
55	770	549	323	97	19	0	0	0	5	72	315	642	2792
50	627	422	209	40	5	0	0	0	0	26	206	501	2036
32	205	103	14	0	0	0	0	0	0	0	17	137	476

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	149	208	428	703	1004	1223	1427	1384	1090	779	419	220	9034
55	1	10	25	110	309	533	714	671	406	138	27	12	2956
57	0	6	16	81	258	473	652	609	350	103	18	7	2573
60	0	0	8	48	190	384	559	517	272	63	10	1	2052
65	0	0	0	15	100	242	404	369	163	21	0	0	1314
70	0	0	0	3	41	124	257	235	84	4	0	0	748

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	36	89	230	456	736	954	1150	1108	822	507	210	58	36	125	355	811	1547	2501	3651	4759	5581	6088	6298	6356
45	10	49	140	322	582	804	995	953	673	363	127	29	10	59	199	521	1103	1907	2902	3855	4528	4891	5018	5047
50	1	17	79	209	429	654	840	798	527	239	69	8	1	18	97	306	735	1389	2229	3027	3554	3793	3862	3870
55	0	5	36	121	289	504	685	643	386	140	29	0	0	5	41	162	451	955	1640	2283	2669	2809	2838	2838
60	0	0	12	61	166	359	531	489	258	65	6	0	0	0	12	73	239	598	1129	1618	1876	1941	1947	1947
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	28	71	155	287	470	645	778	744	538	327	133	46	28	99	254	541	1011	1656	2434	3178	3716	4043	4176	4222

(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