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: BOONVILLE, MO **COOP ID: 230817**

Climate Division: MO 3 **NWS Call Sign:** **Elevation: 670 Feet** **Lat: 38˚58N** **Lon: 92˚45W**

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	36.0	18.1	27.1	77	1950	25	37.5	1990	-18+	1982	11	14.0	1977	1177	0	.0	.0	5.0	11.0	28.1	3.1
Feb	42.5	23.2	32.9	78	1996	27	41.9	1976	-12+	1996	4	19.4	1978	900	0	.0	.0	9.2	7.0	22.3	2.0
Mar	54.1	33.1	43.6	86	1986	30	48.4	2000	-9	1960	5	36.4	1978	663	0	.0	.0	19.1	1.7	14.9	.1
Apr	65.5	43.7	54.6	91	1965	23	61.9	1981	20+	1975	4	47.7	1983	322	10	.0	.2	26.8	.1	2.9	.0
May	75.1	53.9	64.5	95+	2001	17	72.0	1998	33+	1976	4	59.7	1990	123	107	.0	.9	30.9	.0	.0	.0
Jun	84.0	63.4	73.7	103	1988	25	77.3	1971	43	1993	5	68.3	1982	8	270	.3	7.5	30.0	.0	.0	.0
Jul	89.4	68.0	78.7	110+	1980	31	86.6	1980	50+	1972	7	74.2	1971	0	424	1.6	16.8	31.0	.0	.0	.0
Aug	87.8	65.3	76.6	107+	1980	2	82.9	1983	45	1986	28	70.6	1992	8	367	1.2	14.0	31.0	.0	.0	.0
Sep	79.9	56.5	68.2	104	2000	1	75.2	1998	32+	1989	25	61.4	1974	59	155	.2	5.3	30.0	.0	.1	.0
Oct	68.5	44.9	56.7	94	1963	11	63.1	1971	23+	1972	20	50.3	1976	279	20	.0	.2	29.6	.0	2.7	.0
Nov	53.3	33.9	43.6	87	1950	1	53.7	1999	0+	1991	9	35.9	1976	643	0	.0	.0	17.6	1.4	13.6	.1
Dec	40.6	23.1	31.9	74	1998	6	38.0	1994	-22+	1989	23	17.0	1983	1028	0	.0	.0	7.6	7.3	26.0	1.3
Ann	64.7	43.9	54.3	110+	Jul 1980	31	86.6	Jul 1980	-22+	Dec 1989	23	14.0	Jan 1977	5210	1353	3.3	44.9	267.8	28.5	110.6	6.6

\+ 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	1.64	1.41	2.54	1985	1	4.07	1973	.00	1986
Feb	1.84	1.52	3.46	1997	21	6.66	1985	.09	1991
Mar	3.13	2.76	2.30	1998	31	8.50	1973	.63	1995
Apr	4.14	3.33	4.10	1983	2	14.32	1984	.72	2000
May	5.14	4.54	4.88	1990	16	14.94	1995	.70	1998
Jun	4.84	3.37	6.00	1993	7	14.63	1981	.74	1991
Jul	3.74	3.25	4.26	1958	3	7.88	1993	1.21	1980
Aug	4.25	4.12	5.50	1982	27	11.80	1982	.61	1976
Sep	4.26	3.49	4.25	1961	14	13.24	1986	.64	1990
Oct	3.42	2.68	4.54	1986	3	10.36	1984	.80	1988
Nov	3.81	2.59	4.24	1985	19	16.88	1983	.06	1989
Dec	2.51	1.96	3.90	1982	2	10.78	1982	.20	1976
Ann	42.72	38.73	6.00	Jun 1993	7	16.88	Nov 1983	.00	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.3	3.8	.9	.3
Feb	7.5	4.0	1.0	.3
Mar	9.6	6.2	1.9	.7
Apr	10.7	6.9	2.7	1.0
May	12.1	7.9	3.3	1.3
Jun	9.8	6.1	2.8	1.6
Jul	8.8	6.0	2.7	1.0
Aug	8.2	5.5	2.9	1.4
Sep	8.4	5.8	2.6	1.4
Oct	8.4	5.4	2.3	.8
Nov	8.9	5.9	2.4	1.1
Dec	8.1	4.3	1.4	.6
Ann	107.8	67.8	26.9	11.5

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	.10	.27	.52	.77	1.02	1.30	1.62	2.02	2.56	3.44	4.30
Feb	.28	.44	.71	.96	1.23	1.51	1.85	2.25	2.80	3.68	4.53
Mar	.76	1.06	1.52	1.92	2.32	2.75	3.23	3.79	4.53	5.71	6.81
Apr	.79	1.16	1.76	2.32	2.89	3.51	4.20	5.04	6.16	7.95	9.65
May	1.13	1.60	2.36	3.04	3.72	4.45	5.26	6.24	7.53	9.59	11.53
Jun	.98	1.43	2.14	2.78	3.44	4.14	4.93	5.89	7.15	9.17	11.08
Jul	1.10	1.46	1.99	2.45	2.90	3.37	3.89	4.49	5.28	6.51	7.65
Aug	.75	1.12	1.74	2.32	2.91	3.56	4.29	5.18	6.36	8.27	10.10
Sep	.77	1.14	1.77	2.35	2.94	3.58	4.31	5.19	6.37	8.26	10.07
Oct	.74	1.06	1.56	2.01	2.47	2.95	3.50	4.15	5.01	6.38	7.68
Nov	.32	.58	1.08	1.61	2.19	2.85	3.64	4.64	6.01	8.31	10.57
Dec	.34	.54	.90	1.25	1.62	2.02	2.49	3.07	3.85	5.13	6.36
Ann	23.65	26.99	31.46	34.99	38.20	41.38	44.73	48.52	53.20	60.18	66.36

\+ 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	7.2	4.8	1	#	9.0	1979	14	28.8	1979	14	1974	12	5	1974	3.5	2.8	.8	.4	.0	8.9	4.2	2.8	.6
Feb	5.5	4.9	1	#	13.0	1975	24	19.0	1993	14	1975	24	4	1979	2.7	2.0	.8	.2	@	5.5	2.1	.7	.2
Mar	3.1	2.0	#	#	7.5	1978	25	17.5	1978	7	1990	24	1	1998	1.2	1.1	.4	.1	.0	1.1	.5	.1	.0
Apr	.3	.0	#	0	3.0	1973	9	3.5	1973	3	1973	9	#+	1973	.1	.1	.1	.0	.0	.1	@	.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	#	1993	31	#+	1993	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.5	.0	#	0	7.0	1972	19	10.0	1972	7	1974	30	1	1975	.6	.6	.2	.1	.0	.5	.3	.2	.0
Dec	4.0	2.0	#	#	12.0	1987	15	18.3	1973	12	1987	15	2+	2000	2.0	1.6	.5	.1	.1	3.7	1.8	.3	.1
Ann	21.6	13.7	N/A	N/A	13.0	Feb 1975	24	28.8	Jan 1979	14+	Feb 1975	24	5	Jan 1974	10.1	8.2	2.8	.9	.1	19.8	8.9	4.1	.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	4/29	4/24	4/21	4/18	4/16	4/13	4/10	4/07	4/02
32	4/17	4/13	4/11	4/09	4/07	4/05	4/03	3/31	3/28
28	4/14	4/09	4/06	4/03	3/31	3/29	3/26	3/22	3/18
24	4/04	3/29	3/25	3/21	3/17	3/14	3/10	3/05	2/27
20	3/29	3/21	3/16	3/11	3/06	3/02	2/25	2/20	2/12
16	3/17	3/10	3/05	2/28	2/24	2/20	2/16	2/11	2/04

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	9/26	10/01	10/05	10/08	10/11	10/14	10/17	10/21	10/26
32	10/03	10/10	10/14	10/18	10/22	10/26	10/30	11/03	11/09
28	10/18	10/24	10/28	11/01	11/04	11/08	11/11	11/16	11/22
24	10/31	11/06	11/10	11/13	11/17	11/20	11/23	11/27	12/03
20	11/09	11/15	11/19	11/23	11/26	11/29	12/03	12/07	12/12
16	11/17	11/23	11/28	12/02	12/06	12/10	12/14	12/18	12/25

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	199	192	186	182	177	173	168	163	155
32	218	211	206	201	197	193	189	184	177
28	240	232	226	222	217	213	208	203	195
24	269	260	254	249	244	238	233	227	218
20	293	283	276	270	264	258	252	244	234
16	315	304	297	290	284	277	271	263	252

***** 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	1177	900	663	322	123	8	0	8	59	279	643	1028	5210
60	1022	765	512	198	58	1	0	1	20	164	501	873	4115
57	929	686	426	137	32	0	0	0	8	110	418	784	3530
55	867	634	370	102	21	0	0	0	4	82	366	725	3171
50	722	507	245	41	6	0	0	0	0	33	250	582	2386
32	269	168	24	0	0	0	0	0	0	0	28	186	675

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	116	192	383	678	1007	1251	1447	1382	1086	764	375	181	8862
55	1	13	16	91	315	561	734	669	400	133	23	8	2964
57	0	10	10	65	265	501	672	607	345	99	15	4	2593
60	0	4	3	36	197	413	579	515	266	60	8	0	2081
65	0	0	0	10	107	270	424	367	155	20	0	0	1353
70	0	0	0	2	47	147	276	233	77	4	0	0	786

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	18	75	209	455	767	1020	1207	1143	854	527	197	49	18	93	302	757	1524	2544	3751	4894	5748	6275	6472	6521
45	5	32	126	322	612	870	1052	988	704	382	116	21	5	37	163	485	1097	1967	3019	4007	4711	5093	5209	5230
50	2	15	67	209	459	720	897	833	555	250	60	6	2	17	84	293	752	1472	2369	3202	3757	4007	4067	4073
55	0	3	32	121	316	570	742	678	413	147	28	0	0	3	35	156	472	1042	1784	2462	2875	3022	3050	3050
60	0	0	10	61	187	421	587	523	286	74	8	0	0	0	10	71	258	679	1266	1789	2075	2149	2157	2157
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	18	54	135	270	476	694	820	771	554	321	117	33	18	72	207	477	953	1647	2467	3238	3792	4113	4230	4263

(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