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: BROOKFIELD, MO **COOP ID: 230980**

Climate Division: MO 1 **NWS Call Sign:** **Elevation: 767 Feet** **Lat: 39˚46N** **Lon: 93˚04W**

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	32.5	13.9	23.2	74+	1957	21	35.7	1990	-21	1982	10	9.3	1979	1296	0	.0	.0	4.0	12.3	28.1	4.3
Feb	39.9	19.1	29.5	79	1972	29	39.1	1998	-18	1979	9	15.7	1978	994	0	.0	.0	8.5	7.3	22.5	2.2
Mar	52.3	29.6	41.0	86	1986	29	46.4	1991	-15	1960	5	32.3	1984	746	0	.0	.0	18.9	1.4	15.6	.2
Apr	63.0	39.6	51.3	92+	1952	30	58.7	1981	13	1975	3	43.9	1983	417	5	.0	.2	27.1	.0	4.4	.0
May	72.9	51.2	62.1	98	1956	21	68.1	1987	29+	1976	3	56.6	1994	167	76	.0	.2	30.9	.0	.1	.0
Jun	81.8	60.6	71.2	106+	1954	25	75.2	1988	41	1988	10	66.8	1982	13	199	.3	5.5	30.0	.0	.0	.0
Jul	86.8	65.5	76.2	116	1954	14	83.2	1980	46	1971	31	71.3	1971	0	344	1.0	13.3	31.0	.0	.0	.0
Aug	85.2	63.5	74.4	108+	1984	29	81.3	1983	43+	1986	28	69.4	1992	10	299	.6	11.0	31.0	.0	.0	.0
Sep	77.2	54.3	65.8	103	1953	1	72.0	1998	30	1984	30	58.9	1974	82	103	.0	3.4	30.0	.0	.2	.0
Oct	66.6	43.0	54.8	95	1963	10	59.6	1971	16	1993	31	48.2	1976	321	6	.0	.2	29.7	@	3.2	.0
Nov	50.0	30.1	40.1	82	1950	1	49.6	1999	-7	1964	30	32.0	1976	748	0	.0	.0	16.7	1.6	14.8	.1
Dec	37.4	19.5	28.5	72	1949	12	34.8	1994	-24	1989	23	13.4	1983	1134	0	.0	.0	5.6	8.0	26.0	2.2
Ann	62.1	40.8	51.5	116	Jul 1954	14	83.2	Jul 1980	-24	Dec 1989	23	9.3	Jan 1979	5928	1032	1.9	33.8	263.4	30.6	114.9	9.0

\+ 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

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	1.50	1.58	2.82	1965	2	3.71	1973	.00	1986
Feb	1.48	1.39	2.43	1997	21	4.47	1997	.27	1996
Mar	2.74	2.71	2.02	1985	4	7.16	1973	.58	1994
Apr	3.61	3.39	4.14	1973	21	8.81	1973	.58	1980
May	4.78	4.26	3.69	1973	27	11.86	1995	1.19	1980
Jun	4.11	3.59	4.62	1981	25	11.54	1981	.30	1988
Jul	4.74	3.52	7.57	1958	15	15.31	1981	.54	1975
Aug	4.08	3.48	5.81	1978	2	8.77	1978	.76	1973
Sep	4.38	3.52	4.48	1965	16	11.47	1973	.87	1979
Oct	3.34	3.09	5.90	1957	23	8.45	1998	.53	1988
Nov	2.96	2.87	3.27	1984	1	7.92	1992	.14	1989
Dec	2.01	1.80	3.23	1982	2	6.93	1982	.04	1996
Ann	39.73	38.88	7.57	Jul 1958	15	15.31	Jul 1981	.00	Jan 1986

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.1	3.7	.8	.3
Feb	6.7	3.8	.7	.2
Mar	9.2	6.4	1.9	.5
Apr	10.4	7.2	2.1	.8
May	11.5	8.1	3.1	1.3
Jun	10.1	6.8	2.8	1.2
Jul	8.9	6.2	3.4	1.6
Aug	8.7	5.7	2.8	1.3
Sep	8.5	6.3	2.7	1.2
Oct	8.0	5.2	2.3	.9
Nov	8.2	5.4	2.2	.7
Dec	7.4	4.4	1.3	.4
Ann	104.7	69.2	26.1	10.4

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	.25	.48	.70	.93	1.19	1.48	1.85	2.34	3.15	3.93
Feb	.34	.48	.70	.89	1.09	1.29	1.52	1.80	2.16	2.74	3.28
Mar	.83	1.09	1.48	1.81	2.14	2.48	2.85	3.29	3.85	4.74	5.56
Apr	.76	1.09	1.62	2.10	2.59	3.10	3.69	4.39	5.31	6.79	8.19
May	1.39	1.85	2.53	3.12	3.70	4.30	4.97	5.75	6.76	8.34	9.82
Jun	.80	1.17	1.78	2.33	2.89	3.49	4.18	5.00	6.09	7.84	9.50
Jul	.77	1.17	1.86	2.51	3.19	3.92	4.76	5.78	7.15	9.37	11.49
Aug	.91	1.29	1.89	2.43	2.97	3.54	4.18	4.95	5.97	7.58	9.10
Sep	1.20	1.61	2.24	2.79	3.34	3.90	4.53	5.28	6.24	7.76	9.18
Oct	.63	.93	1.42	1.87	2.33	2.83	3.39	4.06	4.96	6.40	7.77
Nov	.48	.73	1.16	1.57	1.99	2.45	2.98	3.62	4.47	5.86	7.19
Dec	.26	.42	.71	.99	1.28	1.61	1.99	2.45	3.08	4.11	5.11
Ann	26.72	29.18	32.37	34.80	36.98	39.10	41.30	43.74	46.71	51.05	54.83

\+ 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:
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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	5.9	6.0	2	1
Feb	3.7	1.2	2	1
Mar	2.1	.3	#	#
Apr	.3	.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	.1	.0	#	0
Nov	1.5	.6	#	#
Dec	3.5	1.5	1	#
Ann	17.1	9.6	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	7.8	1982	4	18.5	1997	18	1977	12	11	1977
Feb	12.0	1978	13	26.0	1978	25	1978	22	15	1978
Mar	7.1	1990	24	12.0	1978	11	1994	1	3	1980
Apr	2.0	1980	15	3.0	1997	2+	1997	11	#+	1997
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	2.0	1997	27	2.0	1997	2	1997	27	#+	1997
Nov	5.0	1991	7	8.0	1991	8	1974	30	1	1991
Dec	5.0	1978	31	14.4	2000	14	1987	15	3+	2000
Ann	12.0	Feb 1978	13	26.0	Feb 1978	25	Feb 1978	22	15	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.6	1.6	.8	.2	.0
Feb	2.0	1.0	.3	.1	.1
Mar	1.0	.6	.2	.1	.0
Apr	.2	.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	1.0	.4	.2	@	.0
Dec	2.0	1.3	.3	@	.0
Ann	8.8	5.0	1.8	.4	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.1	4.9	2.4	.1
Feb	1.9	.4	.0	.0
Mar	1.3	.7	.3	.0
Apr	.2	.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	.9	.4	.1	.0
Dec	3.6	1.5	.4	.0
Ann	16.0	7.9	3.2	.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	5/12	5/08	5/04	5/02	4/29	4/26	4/24	4/20	4/16
32	4/29	4/24	4/21	4/18	4/15	4/13	4/10	4/07	4/02
28	4/16	4/12	4/09	4/07	4/05	4/03	3/31	3/29	3/25
24	4/09	4/05	4/02	3/30	3/28	3/25	3/22	3/19	3/15
20	4/01	3/26	3/22	3/18	3/15	3/12	3/08	3/04	2/26
16	3/26	3/18	3/12	3/06	3/02	2/25	2/19	2/13	2/05

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	177	171	167	163	160	156	152	148	142
32	201	195	190	185	181	177	173	168	161
28	222	216	212	208	205	202	198	194	188
24	249	242	237	232	228	224	220	215	208
20	272	264	258	253	249	244	239	234	226
16	305	293	285	277	271	264	256	248	236

***** 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	1296	994	746	417	167	13	0	10	82	321	748	1134	5928
60	1141	854	592	282	88	2	0	1	28	191	600	979	4758
57	1048	776	507	211	55	1	0	0	12	128	515	886	4139
55	987	724	449	169	38	0	0	0	6	94	461	825	3753
50	843	594	315	86	13	0	0	0	0	38	331	680	2900
32	370	225	44	0	0	0	0	0	0	0	53	240	932

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	97	154	321	578	932	1176	1367	1312	1011	707	295	129	8079
55	1	10	13	57	257	486	654	599	327	88	12	1	2505
57	0	6	8	39	212	427	592	537	273	60	7	0	2161
60	0	0	1	20	152	338	499	445	200	30	2	0	1687
65	0	0	0	5	76	199	344	299	103	6	0	0	1032
70	0	0	0	1	29	88	201	173	42	0	0	0	534

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	15	61	205	445	754	1003	1180	1126	838	529	178	34	15	76	281	726	1480	2483	3663	4789	5627	6156	6334	6368
45	1	26	123	315	599	853	1025	971	689	380	99	14	1	27	150	465	1064	1917	2942	3913	4602	4982	5081	5095
50	0	10	65	198	446	703	870	816	541	251	53	5	0	10	75	273	719	1422	2292	3108	3649	3900	3953	3958
55	0	1	34	112	302	553	715	661	396	146	20	0	0	1	35	147	449	1002	1717	2378	2774	2920	2940	2940
60	0	0	9	56	177	405	560	506	267	68	3	0	0	0	9	65	242	647	1207	1713	1980	2048	2051	2051
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	9	42	131	273	474	680	807	767	549	322	103	16	9	51	182	455	929	1609	2416	3183	3732	4054	4157	4173

(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