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: BOLIVAR 1 NE, MO **COOP ID: 230789**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,034 Feet** **Lat: 37˚37N** **Lon: 93˚23W**

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	40.3	19.7	30.0	77	1950	24	39.6	1990	-18	1985	20	17.4	1977	1084	0	.0	.0	8.5	8.1	28.0	2.4
Feb	46.4	24.7	35.6	86	1921	16	45.2	1976	-19	1979	1	23.6	1978	823	0	.0	.0	12.4	4.9	22.3	1.5
Mar	56.9	34.4	45.7	86+	1995	23	50.5	1973	-7	1943	7	39.4	1996	599	0	.0	.0	22.0	.7	15.1	.2
Apr	67.3	44.1	55.7	91	1987	21	62.6	1981	16+	1987	4	49.1	1983	294	15	.0	.1	28.3	.0	4.6	.0
May	75.5	53.9	64.7	99	1926	29	71.0	1977	28	1989	2	59.5	1983	115	104	.0	.4	31.0	.0	.4	.0
Jun	83.5	63.3	73.4	104	1952	29	76.9	1971	39	1921	5	69.1	1992	8	259	.1	6.3	30.0	.0	.0	.0
Jul	89.2	67.8	78.5	115	1954	14	85.6	1980	44+	1972	6	75.4	1996	0	420	1.1	17.9	31.0	.0	.0	.0
Aug	88.7	65.9	77.3	105+	1988	18	84.5	1980	36	1988	29	70.0	1992	5	385	1.5	15.3	31.0	.0	.0	.0
Sep	80.5	57.1	68.8	106	1947	7	75.5	1980	19	1989	24	61.2	1989	66	181	.2	5.4	30.0	.0	.5	.0
Oct	69.8	44.8	57.3	95+	1963	7	62.4	1971	18+	1989	19	50.5	1987	259	21	.0	.2	30.0	.0	5.2	.0
Nov	55.4	34.8	45.1	87	1922	3	53.4	1999	-1	1989	29	38.1	1976	597	0	.0	.0	20.0	.7	15.8	@
Dec	44.3	24.5	34.4	76	1991	9	42.0	1984	-19	1989	24	19.8	1983	948	0	.0	.0	11.6	4.9	24.9	1.0
Ann	66.5	44.6	55.5	115	Jul 1954	14	85.6	Jul 1980	-19+	Dec 1989	24	17.4	Jan 1977	4798	1385	2.9	45.6	285.8	19.3	116.8	5.1

\+ 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: 1918-2001

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

Issue Date: February 2004

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: BOLIVAR 1 NE, MO **COOP ID: 230789**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,034 Feet** **Lat: 37˚37N** **Lon: 93˚23W**

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	1.94	1.67	2.63	1949	10	4.46	1975	.01	1986
Feb	2.25	2.12	4.54	1985	23	6.88	1985	.20	1996
Mar	3.87	3.15	3.32	1988	29	10.59	1973	1.19	1991
Apr	4.28	3.61	3.51	1961	30	12.04	1994	.98	2000
May	5.00	4.37	5.41	1989	22	12.51	1990	1.98	1980
Jun	4.75	3.71	5.46	1987	23	12.00	1977	.94	1972
Jul	3.86	3.24	5.50+	2000	12	9.65	1992	.22	1980
Aug	3.42	2.91	4.40	1946	14	8.49	1982	.51	2000
Sep	4.57	4.03	4.80	1993	25	18.23	1993	.56	1980
Oct	4.28	3.58	4.83	1919	10	9.73	1998	.83	1999
Nov	4.21	3.84	3.52	1985	14	10.25	1985	.18	1989
Dec	3.02	2.68	3.04	1982	3	7.48	1982	.68+	1996
Ann	45.45+	45.75+	5.50+	Jul 2000	12	18.23	Sep 1993	.01	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.9	4.5	1.3	.3
Feb	6.9	4.2	1.5	.5
Mar	10.1	6.7	3.0	.8
Apr	10.3	6.9	3.0	1.2
May	11.7	7.9	3.4	1.4
Jun	10.3	7.6	3.1	1.3
Jul	7.5	5.2	2.7	1.1
Aug	7.4	5.2	2.4	1.0
Sep	8.6	5.8	2.9	1.5
Oct	8.7	5.7	2.6	1.3
Nov	8.5	6.0	2.7	1.5
Dec	8.4	4.8	2.2	1.1
Ann	106.3	70.5	30.8	13.0

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	.20	.34	.61	.88	1.17	1.50	1.88	2.36	3.02	4.11	5.17
Feb	.44	.65	.98	1.28	1.59	1.92	2.29	2.74	3.34	4.29	5.20
Mar	1.10	1.47	2.02	2.51	2.98	3.47	4.01	4.66	5.49	6.80	8.01
Apr	1.18	1.59	2.21	2.74	3.27	3.82	4.44	5.16	6.10	7.58	8.95
May	1.94	2.41	3.07	3.62	4.14	4.67	5.24	5.90	6.75	8.04	9.22
Jun	1.31	1.76	2.44	3.04	3.63	4.24	4.92	5.72	6.77	8.40	9.93
Jul	.53	.85	1.41	1.94	2.50	3.12	3.84	4.72	5.90	7.84	9.71
Aug	.83	1.15	1.65	2.10	2.54	3.00	3.52	4.14	4.95	6.23	7.43
Sep	.61	.99	1.64	2.27	2.94	3.68	4.53	5.58	7.00	9.32	11.56
Oct	1.08	1.48	2.11	2.66	3.20	3.78	4.42	5.18	6.17	7.74	9.21
Nov	.71	1.07	1.69	2.26	2.86	3.50	4.24	5.14	6.34	8.28	10.13
Dec	.65	.93	1.37	1.77	2.18	2.61	3.09	3.67	4.43	5.65	6.80
Ann	31.17	33.90	37.41	40.10	42.49	44.81	47.22	49.88	53.13	57.86	61.96

+ 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: 1918-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: BOLIVAR 1 NE, MO **COOP ID: 230789**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,034 Feet** **Lat: 37°37N** **Lon: 93°23W**

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	4.9	-99.9	0	0	14.8	1995	19	14.8	1995	15	1995	20	2	1995	-9.9	-9.9	-9.9	-9.9	-9.9	.5	.4	.2	.2
Feb	-99.9	-99.9	#	0	#	1995	14	#+	1995	#	1988	3	#	1988	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Mar	-99.9	-99.9	0	0	#	1983	10	#	1983	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Apr	-99.9	-99.9	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Jun	-99.9	-99.9	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Oct	-99.9	-99.9	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Nov	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Dec	-99.9	-99.9	0	0	#	1990	99	#	1990	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Ann	-9.9	-9.9	N/A	N/A	14.8	Jan 1995	19	14.8	Jan 1995	15	Jan 1995	20	2	Jan 1995	-9.9	-9.9	-9.9	-9.9	-9.9	.5	.4	.2	.2

+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: BOLIVAR 1 NE, MO **COOP ID: 230789**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,034 Feet** **Lat: 37˚37N** **Lon: 93˚23W**

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	5/20	5/14	5/10	5/07	5/03	4/30	4/27	4/23	4/17
32	5/09	5/03	4/29	4/25	4/22	4/19	4/15	4/11	4/05
28	4/20	4/15	4/12	4/09	4/06	4/04	4/01	3/29	3/24
24	4/10	4/06	4/03	3/31	3/28	3/26	3/23	3/20	3/15
20	3/27	3/22	3/18	3/14	3/11	3/08	3/04	2/28	2/23
16	3/25	3/17	3/10	3/05	2/28	2/22	2/17	2/11	2/02

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	178	169	162	157	151	146	140	134	125
32	198	189	182	176	170	165	159	152	142
28	227	218	211	206	201	195	190	183	174
24	248	240	234	228	224	219	213	207	199
20	282	271	263	257	250	244	237	229	218
16	312	300	291	283	275	268	260	251	238

***** 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: BOLIVAR 1 NE, MO **COOP ID: 230789**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,034 Feet** **Lat: 37˚37N** **Lon: 93˚23W**

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	1084	823	599	294	115	8	0	5	66	259	597	948	4798
60	929	688	452	177	51	1	0	0	25	145	452	793	3713
57	836	609	366	121	28	0	0	0	13	92	369	705	3139
55	776	557	313	90	17	0	0	0	8	65	317	647	2790
50	631	432	198	34	4	0	0	0	1	21	203	505	2029
32	203	117	13	0	0	0	0	0	0	0	14	135	482

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	142	218	437	711	1013	1241	1443	1404	1104	785	407	210	9115
55	1	14	23	110	317	551	730	691	422	137	19	9	3024
57	0	10	15	82	265	491	668	629	367	102	12	5	2646
60	0	5	7	47	196	402	575	536	290	62	5	0	2125
65	0	0	0	15	104	259	420	385	181	21	0	0	1385
70	0	0	0	3	43	137	271	246	99	5	0	0	804

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	37	96	245	465	747	981	1175	1133	842	527	213	66	37	133	378	843	1590	2571	3746	4879	5721	6248	6461	6527
45	10	47	151	333	592	831	1020	978	692	384	128	33	10	57	208	541	1133	1964	2984	3962	4654	5038	5166	5199
50	2	19	86	215	443	681	865	823	545	252	69	11	2	21	107	322	765	1446	2311	3134	3679	3931	4000	4011
55	0	5	38	122	299	531	710	668	403	149	31	2	0	5	43	165	464	995	1705	2373	2776	2925	2956	2958
60	0	0	16	59	175	386	555	514	276	69	7	0	0	0	16	75	250	636	1191	1705	1981	2050	2057	2057
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	35	78	166	299	479	658	787	753	554	348	140	56	35	113	279	578	1057	1715	2502	3255	3809	4157	4297	4353

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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