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: MEMPHIS, MO **COOP ID: 235492**

Climate Division: MO 2 **NWS Call Sign:** **Elevation: 770 Feet** **Lat: 40˚28N** **Lon: 92˚10W**

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	31.5	13.1	22.3	70	1950	25	34.5+	1990	-24	1999	5	7.6	1977	1323	0	.0	.0	2.8	14.1	29.2	5.7
Feb	37.4	17.9	27.7	77	1972	29	38.6	1998	-23	1979	9	13.5	1978	1046	0	.0	.0	6.3	9.0	24.2	3.0
Mar	49.6	29.3	39.5	85	1991	26	45.1	1991	-13	1962	1	32.0	1984	793	0	.0	.0	16.2	2.0	18.3	.2
Apr	61.8	39.6	50.7	91+	1956	28	57.8	1981	13	1975	3	44.1	1983	434	4	.0	.0	26.7	@	5.9	.0
May	72.6	50.4	61.5	95	1956	14	67.3	1987	25	1981	11	57.1	1997	169	61	.0	.4	31.0	.0	.2	.0
Jun	81.9	59.6	70.8	102+	1988	25	75.0	1971	38	1972	11	65.8	1982	17	189	.1	5.0	30.0	.0	.0	.0
Jul	86.7	64.6	75.7	106+	1954	19	80.0	1999	42	1971	31	71.4	1971	0	329	.8	11.9	31.0	.0	.0	.0
Aug	84.8	62.5	73.7	105	1983	17	81.3	1983	40	1986	28	67.7	1992	13	281	.7	8.8	31.0	.0	.0	.0
Sep	76.7	53.4	65.1	102+	1953	2	70.4	1998	29	1967	29	59.1	1974	85	86	.0	2.6	30.0	.0	.5	.0
Oct	65.1	42.3	53.7	98	1953	3	59.9	1971	15+	1972	19	47.1	1976	356	6	.0	.1	29.0	.0	4.6	.0
Nov	49.0	29.6	39.3	88	1950	1	48.6	1999	-13	1964	30	31.1	1976	770	0	.0	.0	15.2	2.1	17.2	.1
Dec	35.6	18.4	27.0	70	1949	12	33.5	1994	-23	1962	26	12.6	1983	1178	0	.0	.0	4.2	10.1	27.8	2.9
Ann	61.1	40.1	50.6	106+	Jul 1954	19	81.3	Aug 1983	-24	Jan 1999	5	7.6	Jan 1977	6184	956	1.6	28.8	253.4	37.3	127.9	11.9

\+ 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	1.24	1.15	2.93	1965	2	3.34	1973	.00+	1991
Feb	1.17	1.05	2.40	2001	9	2.70	1998	.00	1991
Mar	2.11	2.09	1.94	1973	25	5.43	1973	.00	1994
Apr	3.35	3.25	5.36	1976	24	9.81	1973	1.05	1980
May	4.56	4.16	4.30	2001	14	10.15	1996	.48	1988
Jun	3.55	3.26	3.70	1990	14	8.71	1980	.19	1992
Jul	4.70	3.97	5.80	1995	4	14.56	1982	.00	1994
Aug	3.17	2.58	4.20	1970	6	6.67	1977	.64	1999
Sep	3.95	3.30	5.97	1986	20	13.31	1973	.10	1979
Oct	2.42	2.03	2.93	2001	22	7.12	1998	.10	1995
Nov	2.41	2.01	2.50	1983	10	7.88	1983	.00+	1995
Dec	1.75	1.61	3.23	1971	15	5.20	1971	.00+	1995
Ann	34.38	32.97	5.97	Sep 1986	20	14.56	Jul 1982	.00+	Dec 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.9	3.1	.6	.3
Feb	4.2	2.6	.6	.1
Mar	7.2	5.1	1.5	.3
Apr	8.3	5.9	2.0	.7
May	9.7	7.2	3.3	1.4
Jun	8.3	5.8	2.0	1.0
Jul	6.4	5.1	2.9	1.5
Aug	7.1	5.3	2.2	.9
Sep	6.2	5.1	2.4	1.1
Oct	6.1	4.6	1.7	.7
Nov	6.3	4.8	2.0	.5
Dec	6.0	4.0	1.0	.3
Ann	81.7	58.6	22.2	8.8

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	.00	.00	.23	.43	.64	.89	1.18	1.54	2.04	2.87	3.69
Feb	.15	.29	.49	.66	.82	1.00	1.20	1.44	1.75	2.26	2.73
Mar	.27	.54	.89	1.19	1.50	1.81	2.17	2.60	3.17	4.07	4.92
Apr	1.03	1.35	1.82	2.23	2.63	3.03	3.48	4.01	4.70	5.76	6.75
May	1.15	1.58	2.25	2.83	3.41	4.02	4.70	5.51	6.56	8.23	9.79
Jun	.57	.88	1.39	1.88	2.39	2.94	3.56	4.33	5.36	7.02	8.61
Jul	.67	1.28	2.08	2.74	3.40	4.09	4.87	5.79	7.00	8.91	10.72
Aug	1.01	1.31	1.75	2.13	2.50	2.88	3.30	3.79	4.42	5.40	6.31
Sep	.55	.87	1.44	1.99	2.56	3.19	3.92	4.82	6.03	8.01	9.91
Oct	.40	.61	.96	1.29	1.64	2.01	2.44	2.95	3.65	4.77	5.84
Nov	.00	.44	.92	1.30	1.68	2.07	2.50	3.00	3.69	4.77	5.80
Dec	.00	.24	.58	.86	1.14	1.44	1.79	2.19	2.74	3.63	4.48
Ann	20.88	23.33	26.56	29.07	31.34	33.56	35.89	38.50	41.70	46.43	50.58

\+ 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	7.1	5.5	2	1
Feb	4.7	4.0	2	#
Mar	2.3	.0	#	#
Apr	.7	.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	1.6	.0	#	0
Dec	2.4	.5	1	#
Ann	18.9	10.0	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	12.0	1971	3	19.3	1997	23	1979	15	14	1979
Feb	10.0	1994	23	17.5	1978	17	1979	12	13	1979
Mar	6.0	1971	10	9.5	1978	13	1978	3	4	1978
Apr	6.0	1973	10	9.0	1973	18	1997	11	2	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	1.6	1997	27	1.6	1997	2	1997	27	#	1997
Nov	8.0	1974	30	10.0	1974	9	1974	30	#+	1998
Dec	6.4	1997	5	9.3	1983	10	1974	1	3+	2000
Ann	12.0	Jan 1971	3	19.3	Jan 1997	23	Jan 1979	15	14	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.1	2.6	.9	.2	.1
Feb	1.8	1.6	.5	.2	@
Mar	.8	.7	.3	@	.0
Apr	.3	.2	.1	@	.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	.5	.5	.2	.1	.0
Dec	1.4	1.2	.3	.1	.0
Ann	7.9	6.8	2.3	.6	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	12.2	8.7	5.4	.6
Feb	8.4	5.0	2.9	.9
Mar	1.7	1.1	.3	.0
Apr	.4	.2	.1	.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	.0
Nov	.9	.2	.1	.0
Dec	4.5	2.7	1.4	.1
Ann	28.2	17.9	10.2	1.6

+ 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	5/17	5/12	5/08	5/05	5/03	4/30	4/27	4/24	4/19
32	5/06	5/01	4/27	4/24	4/21	4/18	4/15	4/11	4/06
28	4/25	4/20	4/17	4/13	4/11	4/08	4/05	4/01	3/27
24	4/14	4/10	4/07	4/04	4/02	3/30	3/28	3/25	3/20
20	4/10	4/04	3/30	3/27	3/23	3/20	3/16	3/12	3/06
16	4/01	3/25	3/21	3/16	3/13	3/09	3/05	2/28	2/21

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	169	162	158	154	150	146	142	138	131
32	196	187	181	176	171	166	161	155	146
28	217	210	205	201	196	192	188	183	175
24	236	229	224	220	216	212	207	202	195
20	261	252	246	241	236	231	225	219	210
16	283	273	266	261	255	250	244	237	228

***** 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	1323	1046	793	434	169	17	0	13	85	356	770	1178	6184
60	1168	906	638	296	86	3	0	2	29	223	621	1023	4995
57	1075	822	548	223	52	1	0	0	12	157	534	930	4354
55	1013	773	491	179	35	0	0	0	6	120	478	868	3963
50	869	643	352	93	11	0	0	0	0	54	345	723	3090
32	389	255	55	0	0	0	0	0	0	0	54	270	1023

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	89	133	286	560	915	1163	1352	1290	991	673	273	115	7840
55	0	7	9	50	237	473	639	577	307	80	8	0	2387
57	0	0	4	33	192	413	577	515	253	55	4	0	2046
60	0	0	0	16	134	325	484	424	180	28	1	0	1592
65	0	0	0	4	61	189	329	281	86	6	0	0	956
70	0	0	0	0	21	84	185	159	31	0	0	0	480

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	8	36	153	389	700	955	1134	1063	787	464	137	20	8	44	197	586	1286	2241	3375	4438	5225	5689	5826	5846
45	0	15	84	259	545	805	979	908	638	320	72	5	0	15	99	358	903	1708	2687	3595	4233	4553	4625	4630
50	0	3	42	161	393	655	824	753	490	202	32	1	0	3	45	206	599	1254	2078	2831	3321	3523	3555	3556
55	0	0	19	83	255	505	669	598	347	112	10	0	0	0	19	102	357	862	1531	2129	2476	2588	2598	2598
60	0	0	6	39	140	358	514	443	221	50	3	0	0	0	6	45	185	543	1057	1500	1721	1771	1774	1774
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	5	30	102	239	437	642	773	718	504	282	82	11	5	35	137	376	813	1455	2228	2946	3450	3732	3814	3825

(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