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: SHELBINA, MO **COOP ID: 237720**

Climate Division: MO 2 **NWS Call Sign:** **Elevation: 740 Feet** **Lat: 39˚42N** **Lon: 92˚03W**

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	33.9	14.0	24.0	73	1950	24	37.4	1989	-30+	1979	15	10.1	1977	1273	0	.0	.0	4.1	11.7	28.0	4.2
Feb	40.1	18.7	29.4	80	1972	29	38.1	1976	-24	1982	6	14.5	1978	997	0	.0	.0	8.9	7.2	22.9	2.7
Mar	52.2	29.6	40.9	83	1967	30	46.2	1991	-20	1960	5	31.0	1984	747	0	.0	.0	19.3	1.2	16.7	.2
Apr	63.2	39.6	51.4	94	1987	20	58.0	1981	16+	1975	3	42.9	1983	413	5	.0	.1	27.6	.0	5.8	.0
May	72.8	51.3	62.1	93	1956	12	70.5	1987	28+	1971	3	54.9	1983	179	87	.0	.5	31.0	.0	.4	.0
Jun	82.0	60.7	71.4	104	1988	25	77.3	1987	37	1983	1	65.2	1982	26	216	.2	5.9	30.0	.0	.0	.0
Jul	87.1	65.2	76.2	112	1954	14	82.3	1980	41	1972	6	71.8	1985	1	347	.7	13.7	31.0	.0	.0	.0
Aug	85.4	62.3	73.9	104+	1984	30	79.9	1988	35	1986	29	68.8	1986	12	285	.7	11.3	31.0	.0	.0	.0
Sep	77.5	53.2	65.4	100+	1960	2	70.8+	1998	23	1983	23	59.2	1974	88	99	.0	3.7	30.0	.0	.4	.0
Oct	66.5	41.5	54.0	94	1953	2	60.5	1971	12	1952	29	48.2	1976	349	7	.0	.2	29.9	.0	4.8	.0
Nov	50.7	29.6	40.2	82	1968	1	49.4	1999	-10	1964	30	32.6	1985	746	0	.0	.0	17.6	1.3	16.8	.1
Dec	38.5	19.8	29.2	73	1960	4	35.3	1988	-24	1989	22	11.5	1983	1112	0	.0	.0	6.5	7.5	25.8	2.4
Ann	62.5	40.5	51.5	112	Jul 1954	14	82.3	Jul 1980	-30+	Jan 1979	15	10.1	Jan 1977	5943	1046	1.6	35.4	266.9	28.9	121.6	9.6

\+ 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

Issue Date: February 2004

(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	1.61	1.57	2.65	1982	30	4.28	1995	.00+	1986
Feb	1.64	1.56	1.70+	2001	9	3.99	1990	.47	1987
Mar	2.98	2.77	2.68	1990	15	8.96	1973	1.00	1995
Apr	3.68	3.55	5.07	1973	21	9.39	1973	.66	1971
May	5.16	4.22	6.05	1996	7	14.04	1996	.39	1992
Jun	3.91	3.72	3.90	1966	13	8.59	1981	.22	1992
Jul	3.79	3.43	4.95	1991	10	9.77	1991	.06	1975
Aug	3.79	3.54	5.05	1959	5	8.05	1977	.30	1984
Sep	3.64	2.82	4.92	1961	14	12.96	1993	.82	1981
Oct	2.96	2.50	4.75	1969	13	7.41	1977	.65	1975
Nov	3.26	3.02	1.85	1961	16	9.19	1985	.40	1976
Dec	2.17	2.06	2.05	1992	16	5.49	1982	.21	1995
Ann	38.59	38.80	6.05	May 1996	7	14.04	May 1996	.00+	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.3	3.8	1.0	.3
Feb	6.1	3.4	1.0	.2
Mar	8.9	6.3	2.2	.5
Apr	9.9	6.8	2.7	.9
May	10.2	7.8	3.6	1.4
Jun	9.1	6.5	2.5	1.0
Jul	7.5	5.8	2.3	1.2
Aug	7.6	5.9	2.6	.9
Sep	6.8	5.3	3.0	1.0
Oct	7.2	5.2	1.8	.8
Nov	7.4	6.0	2.6	1.0
Dec	6.9	4.8	1.4	.6
Ann	93.9	67.6	26.7	9.8

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	.17	.45	.71	.98	1.27	1.60	2.00	2.56	3.47	4.35
Feb	.46	.61	.85	1.05	1.26	1.47	1.70	1.98	2.34	2.90	3.43
Mar	.91	1.19	1.61	1.98	2.33	2.70	3.10	3.57	4.19	5.14	6.03
Apr	.80	1.14	1.68	2.17	2.66	3.18	3.77	4.47	5.39	6.86	8.25
May	1.35	1.84	2.59	3.25	3.89	4.57	5.33	6.23	7.39	9.24	10.96
Jun	.69	1.03	1.60	2.14	2.68	3.28	3.95	4.77	5.86	7.62	9.31
Jul	.45	.74	1.28	1.80	2.37	2.99	3.72	4.63	5.86	7.88	9.85
Aug	.97	1.33	1.88	2.36	2.84	3.35	3.91	4.58	5.45	6.83	8.12
Sep	.78	1.12	1.65	2.13	2.62	3.14	3.72	4.42	5.34	6.81	8.20
Oct	.69	.96	1.39	1.78	2.17	2.58	3.04	3.59	4.31	5.45	6.53
Nov	.68	.97	1.45	1.89	2.33	2.80	3.33	3.97	4.81	6.16	7.43
Dec	.44	.64	.96	1.25	1.54	1.85	2.21	2.63	3.20	4.09	4.95
Ann	25.44	27.91	31.11	33.58	35.78	37.93	40.16	42.64	45.67	50.11	53.97

\+ 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

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(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	6.9	4.0	2	1
Feb	4.1	2.3	1	1
Mar	3.2	1.9	#	#
Apr	.5	.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
Nov	1.3	.0	#	#
Dec	3.5	2.5	1	#
Ann	19.5	10.7	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	8.0	1979	14	29.0	1979	16	1979	31	12	1979
Feb	8.5	1993	25	14.7	1975	17	1979	10	10	1979
Mar	7.0	1990	24	15.0	1978	12	1994	1	3	1978
Apr	5.0	1980	14	5.0	1980	5	1980	14	#+	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	#	1997	29	#+	1997	#+	1997	29	#+	1997
Nov	6.5	1975	27	8.5	1975	7	1975	27	1	1991
Dec	9.0	1981	17	14.2	1973	9	1981	19	2	1989
Ann	9.0	Dec 1981	17	29.0	Jan 1979	17	Feb 1979	10	12	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.1	2.4	.8	.4	.0
Feb	2.3	1.7	.6	.2	.0
Mar	1.4	1.1	.4	.2	.0
Apr	.2	.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	.0	.0
Nov	.5	.3	.2	.1	.0
Dec	1.9	1.1	.3	.2	.0
Ann	9.4	6.8	2.4	1.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.6	4.4	2.9	1.4
Feb	6.5	3.0	1.8	.9
Mar	2.0	1.0	.4	@
Apr	.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	.0	.0	.0	.0
Nov	.6	.3	.2	.0
Dec	4.6	1.8	1.2	.0
Ann	22.5	10.6	6.5	2.3

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	173	165	159	154	149	145	140	134	126
32	189	181	175	171	166	162	157	152	144
28	220	212	206	200	195	191	185	179	170
24	251	241	233	227	221	215	209	201	191
20	271	261	253	247	241	235	228	220	210
16	292	283	276	270	265	260	254	247	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.

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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	1273	997	747	413	179	26	1	12	88	349	746	1112	5943
60	1118	857	594	279	99	7	0	1	33	218	597	957	4760
57	1025	776	509	208	63	2	0	0	15	153	514	868	4133
55	963	724	452	166	45	1	0	0	8	117	458	811	3745
50	819	594	320	84	17	0	0	0	1	52	327	667	2881
32	351	219	48	0	0	0	0	0	0	0	51	251	920

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	101	146	325	582	931	1181	1369	1297	1000	682	295	162	8071
55	0	7	15	59	263	492	656	584	318	85	12	9	2500
57	0	3	10	40	219	433	594	522	265	60	8	4	2158
60	0	0	2	21	162	347	501	430	193	32	1	0	1689
65	0	0	0	5	87	216	347	285	99	7	0	0	1046
70	0	0	0	1	38	113	207	161	39	1	0	0	560

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	63	198	433	732	987	1154	1092	812	498	172	38	18	81	279	712	1444	2431	3585	4677	5489	5987	6159	6197
45	5	26	117	305	577	837	999	937	662	354	96	12	5	31	148	453	1030	1867	2866	3803	4465	4819	4915	4927
50	0	8	61	190	424	687	844	782	515	233	46	3	0	8	69	259	683	1370	2214	2996	3511	3744	3790	3793
55	0	1	31	105	285	537	689	627	373	132	16	0	0	1	32	137	422	959	1648	2275	2648	2780	2796	2796
60	0	0	8	51	164	388	534	472	243	62	4	0	0	0	8	59	223	611	1145	1617	1860	1922	1926	1926
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	12	43	134	274	463	664	791	736	534	320	107	25	12	55	189	463	926	1590	2381	3117	3651	3971	4078	4103

(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