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: MANSFIELD, MO **COOP ID: 235227**

Climate Division: MO 4 **NWS Call Sign:** **Elevation: 1,520 Feet** **Lat: 37˚07N** **Lon: 92˚35W**

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	40.7	19.5	30.1	76	1965	7	39.3	1990	-25	1985	20	17.2	1977	1081	0	.0	.0	9.1	7.6	27.3	2.4
Feb	46.8	24.6	35.7	82	1972	29	45.2	1976	-16	1989	4	21.5	1989	820	0	.0	.0	13.8	4.0	21.8	1.3
Mar	56.6	33.1	44.9	85+	1985	28	51.5	1973	-1	1978	4	36.9	1996	624	0	.0	.0	23.6	.9	15.8	@
Apr	66.0	42.2	54.1	92	1989	26	61.3	1981	10+	1989	11	46.5	1983	337	10	.0	.1	28.8	.0	5.4	.0
May	74.5	52.8	63.7	92+	1987	19	68.5	1998	28	1976	3	59.7	1984	116	74	.0	.3	31.0	.0	.4	.0
Jun	82.7	60.9	71.8	100+	1988	26	76.7	1971	35	1988	11	67.1	1982	14	218	.1	4.7	30.0	.0	.0	.0
Jul	88.4	65.7	77.1	106	1978	9	83.7	1980	43	1987	14	69.9	1989	0	373	1.1	15.7	31.0	.0	.0	.0
Aug	87.8	63.6	75.7	104+	1978	13	82.8	1980	35+	1988	29	69.7	1986	10	342	1.1	14.2	31.0	.0	.0	.0
Sep	79.5	55.2	67.4	103	2000	1	74.0	1998	24	1984	30	61.0	1974	77	147	.2	4.0	30.0	.0	.3	.0
Oct	69.3	44.2	56.8	93+	1963	10	64.7	1971	16	1987	21	47.3	1988	291	36	.0	.2	30.3	.0	4.2	.0
Nov	54.6	32.8	43.7	80	1999	14	53.5	1999	-5	1986	13	37.1	1986	640	1	.0	.0	20.0	.6	15.3	@
Dec	44.2	24.0	34.1	73+	1998	6	42.2	1971	-20	1983	25	18.0	1983	957	0	.0	.0	11.0	4.4	25.0	1.3
Ann	65.9	43.2	54.6	106	Jul 1978	9	83.7	Jul 1980	-25	Jan 1985	20	17.2	Jan 1977	4967	1201	2.5	39.2	289.6	17.5	115.5	5.0

\+ 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	2.05	2.02	2.86	1966	1	5.02	1995	.05	1986
Feb	2.36	1.92	2.69	1999	7	5.95	1997	.23	1994
Mar	3.94	3.40	3.49	1973	10	10.08	1973	1.03	1972
Apr	4.20	4.39	3.43	1951	7	7.42	1983	.29	1989
May	4.65	4.59	3.98	1956	15	9.53	1990	.39	1994
Jun	4.41	3.73	3.75	1989	5	10.30	1977	1.02	1971
Jul	3.41	2.88	4.90	1979	28	10.42	1988	.95	1994
Aug	2.93	2.62	2.15	1948	14	7.45	1982	.40	2000
Sep	4.30	3.60	4.05	1998	15	11.54	1977	.18	1981
Oct	3.63	3.01	4.18	1967	30	8.27	1984	.35	1989
Nov	4.47	4.59	3.43	1974	4	8.70	1996	.46	1989
Dec	3.27	2.48	6.03	1982	3	12.13	1982	.67	1989
Ann	43.62	43.03	6.03	Dec 1982	3	12.13	Dec 1982	.05	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.9	4.6	1.2	.5
Feb	6.6	4.4	1.8	.6
Mar	8.5	6.5	2.7	1.0
Apr	9.5	6.8	2.9	1.4
May	10.5	7.9	3.2	1.1
Jun	9.2	6.7	2.7	1.3
Jul	7.1	5.1	2.4	1.0
Aug	6.8	5.1	1.9	.8
Sep	8.0	5.4	2.7	1.6
Oct	7.6	5.7	2.7	1.1
Nov	8.0	5.8	3.4	1.6
Dec	7.2	5.3	2.4	1.0
Ann	95.9	69.3	30.0	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	.19	.34	.62	.90	1.22	1.57	1.98	2.50	3.22	4.41	5.58
Feb	.50	.72	1.06	1.38	1.69	2.03	2.41	2.86	3.47	4.43	5.34
Mar	1.17	1.54	2.10	2.59	3.06	3.55	4.09	4.72	5.55	6.83	8.03
Apr	1.01	1.41	2.02	2.57	3.11	3.69	4.33	5.09	6.09	7.68	9.17
May	1.60	2.04	2.68	3.22	3.74	4.27	4.86	5.54	6.41	7.76	9.01
Jun	1.25	1.67	2.30	2.85	3.39	3.95	4.57	5.30	6.25	7.74	9.12
Jul	.99	1.32	1.80	2.22	2.64	3.06	3.54	4.09	4.82	5.95	7.00
Aug	.64	.91	1.34	1.73	2.12	2.53	3.00	3.56	4.30	5.47	6.58
Sep	.56	.90	1.51	2.11	2.74	3.44	4.25	5.25	6.60	8.82	10.97
Oct	.90	1.24	1.77	2.24	2.71	3.20	3.75	4.40	5.25	6.59	7.85
Nov	.81	1.20	1.86	2.46	3.09	3.76	4.52	5.45	6.68	8.66	10.55
Dec	.58	.87	1.34	1.79	2.25	2.74	3.30	3.98	4.89	6.36	7.76
Ann	28.32	31.18	34.90	37.76	40.32	42.82	45.43	48.33	51.87	57.06	61.60

\+ 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	5.8	3.5	#	#	8.5	1997	9	18.0	1979	9	1997	9	2	1997	2.4	1.9	.6	.2	.0	2.6	1.7	.9	.0
Feb	4.4	3.0	#	0	18.0	1980	8	23.0	1980	9	1993	16	2	1993	1.5	1.2	.5	.2	@	1.3	1.0	.4	.0
Mar	1.9	.0	#	0	12.0	1999	14	15.0	1994	12	1999	14	1+	1999	.7	.7	.3	.2	@	.9	.5	.3	.1
Apr	.3	.0	#	0	4.0	1971	5	4.0	1971	#+	1999	17	#+	1999	.1	.1	.1	.0	.0	.0	.0	.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	#	1996	23	#	1996	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.8	.0	#	0	5.0	1972	19	7.0	1975	4	1974	30	#+	1998	.3	.2	.2	@	.0	.1	.1	.0	.0
Dec	1.2	.0	#	0	5.0	1973	20	7.0+	1985	10	2000	14	4	2000	.6	.5	.2	.1	.0	.5	.2	.1	.0
Ann	14.4	6.5	N/A	N/A	18.0	Feb 1980	8	23.0	Feb 1980	12	Mar 1999	14	4	Dec 2000	5.6	4.6	1.9	.7	@	5.4	3.5	1.7	.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	5/21	5/15	5/10	5/06	5/03	4/29	4/25	4/20	4/14
32	5/06	4/30	4/26	4/22	4/18	4/15	4/11	4/06	3/31
28	4/25	4/19	4/15	4/11	4/07	4/03	3/31	3/26	3/20
24	4/14	4/08	4/04	4/01	3/28	3/25	3/22	3/17	3/12
20	4/09	4/01	3/26	3/21	3/17	3/12	3/07	3/02	2/22
16	3/29	3/20	3/14	3/08	3/03	2/26	2/20	2/14	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	9/13	9/19	9/24	9/28	10/02	10/05	10/09	10/14	10/20
32	9/23	9/30	10/05	10/09	10/13	10/17	10/21	10/26	11/02
28	10/02	10/10	10/16	10/21	10/26	10/31	11/05	11/11	11/19
24	10/11	10/20	10/26	11/01	11/06	11/11	11/17	11/23	12/02
20	10/20	10/29	11/05	11/11	11/16	11/22	11/28	12/04	12/14
16	10/29	11/09	11/17	11/24	12/01	12/07	12/14	12/22	1/02

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	183	172	164	157	151	145	138	130	119
32	209	198	190	183	177	170	164	156	144
28	238	225	216	208	201	194	186	177	165
24	258	245	237	229	222	215	207	199	186
20	285	271	261	252	244	235	227	216	202
16	310	295	285	276	269	261	253	244	231

***** 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	1081	820	624	337	116	14	0	10	77	291	640	957	4967
60	926	683	477	213	48	2	0	1	30	183	495	802	3860
57	833	605	391	152	24	0	0	0	15	131	413	718	3282
55	773	553	337	118	14	0	0	0	9	102	360	660	2926
50	630	427	219	53	3	0	0	0	2	48	243	518	2143
32	209	111	16	0	0	0	0	0	0	0	22	150	508

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	151	214	415	663	981	1194	1396	1355	1060	768	373	216	8786
55	2	12	23	91	282	504	683	642	379	157	21	12	2808
57	0	8	15	65	230	444	621	580	325	124	14	8	2434
60	0	3	8	36	161	356	528	488	250	83	5	0	1918
65	0	0	0	10	74	218	373	342	147	36	1	0	1201
70	0	0	0	1	24	109	231	212	72	12	0	0	661

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	44	98	240	460	737	952	1143	1104	825	537	198	64	44	142	382	842	1579	2531	3674	4778	5603	6140	6338	6402
45	15	52	146	325	582	802	988	949	675	389	116	32	15	67	213	538	1120	1922	2910	3859	4534	4923	5039	5071
50	1	21	79	206	429	652	833	794	529	257	60	10	1	22	101	307	736	1388	2221	3015	3544	3801	3861	3871
55	0	6	35	116	284	502	678	639	386	151	21	1	0	6	41	157	441	943	1621	2260	2646	2797	2818	2819
60	0	1	8	57	159	353	523	486	257	71	4	0	0	1	9	66	225	578	1101	1587	1844	1915	1919	1919
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	37	80	174	299	467	638	771	738	542	342	129	48	37	117	291	590	1057	1695	2466	3204	3746	4088	4217	4265

(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

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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