

# Climatology of the United States

No. 20

1971-2000

Station: WASOLA, MO

COOP ID: 238754

Climate Division: MO 4

NWS Call Sign:

Elevation: 1,290 Feet Lat: 36°48N

Lon: 92°34W

## 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	42.6	22.1	32.4	84	1950	25	43.7	1989	-10	1963	24	19.0	1977	1012	0	.0	.0	10.3	7.0	25.0	1.5
Feb	48.5	25.9	37.2	83	1962	13	45.6	1976	-10	1951	2	25.5	1978	779	0	.0	.0	13.8	4.0	19.4	.8
Mar	58.9	35.0	47.0	88	1967	13	55.7	1986	-1	1960	5	39.5	1996	563	2	.0	.0	24.2	.5	12.5	@
Apr	68.6	44.1	56.4	93+	1987	20	62.4	1977	21+	1987	4	49.9	1983	278	19	.0	.2	28.7	.0	2.8	.0
May	76.1	54.2	65.2	95	1953	26	73.3	1987	29	1961	2	59.9	1976	102	106	.0	.3	31.0	.0	.1	.0
Jun	83.4	62.3	72.9	105	1952	29	76.3	1986	40	1974	24	68.1	1974	9	244	.1	4.5	30.0	.0	.0	.0
Jul	89.4	66.5	78.0	111	1954	14	84.5	1980	49	1967	14	74.8	1972	0	402	1.0	15.8	31.0	.0	.0	.0
Aug	88.3	64.7	76.5	105+	1964	4	83.2	1980	48+	1988	31	69.7	1992	5	361	.8	13.5	31.0	.0	.0	.0
Sep	80.3	57.0	68.7	104	2000	1	74.9	1998	31	1989	23	62.5	1974	48	158	.3	4.0	30.0	.0	.2	.0
Oct	70.5	46.0	58.3	95	1953	2	64.0	1971	19	1989	20	53.1	1976	229	20	.0	.2	30.3	.0	1.6	.0
Nov	56.6	35.6	46.1	85	1950	6	56.2	1999	4	1959	17	39.2	1996	569	2	.0	.0	21.6	.6	11.7	.0
Dec	46.0	25.4	35.7	78	1951	31	42.2	1971	-22	1989	23	21.2	1983	909	0	.0	.0	12.2	4.2	22.9	.9
Ann	67.4	44.9	56.2	111	Jul 1954	14	84.5	Jul 1980	-22	Dec 1989	23	19.0	Jan 1977	4503	1314	2.2	38.5	294.1	16.3	96.2	3.2

+ 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](http://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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National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

**Station: WASOLA, MO**

**COOP ID: 238754**

**Climate Division: MO 4**

**NWS Call Sign:**

**Elevation: 1,290 Feet Lat: 36°48N**

**Lon: 92°34W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	2.47	2.34	4.10	1999	1	7.07	1999	.09	1986	5.5	4.1	1.6	.7	.29	.48	.83	1.18	1.54	1.95	2.43	3.02	3.83	5.15	6.44
Feb	2.58	2.09	2.92	1950	12	7.07	1990	.00	1991	4.4	3.8	1.8	.9	.20	.48	.90	1.28	1.67	2.09	2.58	3.18	3.98	5.29	6.55
Mar	3.79	3.24	3.05	1974	10	8.69	1973	.94+	1986	6.6	5.5	2.9	1.0	1.13	1.49	2.03	2.50	2.95	3.42	3.94	4.54	5.33	6.56	7.70
Apr	3.89	3.55	3.22	1997	5	8.14	1973	.36	2000	6.9	5.6	2.6	1.0	.90	1.26	1.83	2.34	2.85	3.39	3.99	4.71	5.66	7.17	8.59
May	4.40	4.00	4.25	1956	15	11.59	1990	.12	1994	8.0	6.3	2.8	1.5	1.26	1.68	2.31	2.86	3.39	3.95	4.56	5.29	6.23	7.70	9.07
Jun	3.63	3.53	3.03	1974	7	7.06	2000	1.60	1971	7.2	5.8	2.6	.9	1.74	2.06	2.48	2.83	3.14	3.46	3.80	4.19	4.67	5.40	6.06
Jul	3.10	3.38	3.35	1996	30	6.09	1979	.00	1985	5.4	4.4	2.1	1.0	.76	1.20	1.71	2.11	2.49	2.87	3.29	3.77	4.39	5.35	6.23
Aug	2.89	2.92	5.24	1965	24	7.73	1982	.00	1998	5.7	4.4	2.1	.9	.13	.38	.80	1.23	1.68	2.20	2.80	3.56	4.59	6.31	7.99
Sep	4.15	3.56	5.14	1993	24	16.13	1993	.00	1999	5.6	4.7	2.5	1.6	.19	.55	1.16	1.77	2.42	3.16	4.02	5.10	6.58	9.03	11.42
Oct	3.16	2.62	3.50	1962	1	7.45	1991	.34	1989	5.3	4.3	2.4	.9	.70	.99	1.45	1.87	2.29	2.74	3.24	3.84	4.63	5.90	7.09
Nov	4.77	4.42	5.03	1985	19	10.32	1985	.64	1976	6.6	5.4	3.0	1.5	1.12	1.56	2.26	2.88	3.51	4.17	4.91	5.79	6.94	8.78	10.51
Dec	3.10	2.17	5.33	1982	3	11.62	1982	.47	1989	5.0	3.9	2.1	.9	.60	.88	1.33	1.75	2.18	2.63	3.15	3.77	4.60	5.92	7.18
Ann	41.93	42.92	5.33	Dec 1982	3	16.13	Sep 1993	.00+	Sep 1999	72.2	58.2	28.5	12.8	27.56	30.26	33.76	36.45	38.86	41.20	43.64	46.36	49.67	54.52	58.74

+ 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

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**Climate Division: MO 4**

**NWS Call Sign:**

**Elevation: 1,290 Feet**

**Lat: 36°48N**

**Lon: 92°34W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	3.7	2.0	1	#	9.0	1977	9	12.0	1977	12	1996	2	6	1984	1.0	.6	.4	.2	.0	.1	.0	.0	.0
Feb	3.9	2.3	#	0	16.0	1980	8	20.5	1980	11	1993	15	1	1993	.9	.7	.4	.1	.1	.2	.1	.0	.0
Mar	.4	.0	#	0	3.5	1975	14	3.5	1975	14	1994	8	2	1994	.3	.2	.1	.0	.0	.1	.0	.0	.0
Apr	.3	.0	#	0	5.0	1971	5	6.5	1971	#	1997	12	#	1997	.1	.1	.1	.1	.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	#	1989	19	#	1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.3	.0	#	0	4.0	1974	30	6.0	1980	5	1975	27	#+	1998	.6	.4	.2	.0	.0	.2	.2	@	.0
Dec	.5	.0	#	0	3.0	1983	19	4.0	1983	9	1975	25	1	2000	.3	.1	.1	.0	.0	.1	.0	.0	.0
Ann	10.1	4.3	N/A	N/A	16.0	Feb 1980	8	20.5	Feb 1980	14	Mar 1994	8	6	Jan 1984	3.2	2.1	1.3	.4	.1	.7	.3	@	.0

+ 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	5/08	5/02	4/28	4/24	4/21	4/18	4/14	4/10	4/05
32	4/23	4/18	4/15	4/13	4/10	4/08	4/05	4/02	3/29
28	4/12	4/08	4/04	4/01	3/30	3/27	3/24	3/20	3/16
24	4/03	3/28	3/24	3/21	3/17	3/14	3/11	3/06	3/01
20	3/23	3/16	3/11	3/07	3/03	2/27	2/23	2/18	2/12
16	3/17	3/09	3/03	2/26	2/21	2/17	2/11	2/06	1/28
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	9/28	10/02	10/06	10/09	10/12	10/16	10/20	10/26
32	10/01	10/08	10/14	10/18	10/23	10/27	11/01	11/07	11/14
28	10/23	10/28	11/01	11/05	11/08	11/11	11/15	11/19	11/24
24	10/29	11/04	11/09	11/13	11/17	11/20	11/24	11/29	12/06
20	11/02	11/09	11/14	11/19	11/23	11/27	12/02	12/07	12/14
16	11/09	11/19	11/27	12/03	12/09	12/14	12/21	12/28	1/07
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	198	188	181	175	170	165	159	152	142
32	224	214	207	201	195	189	183	176	166
28	244	237	232	227	223	218	214	209	201
24	271	262	255	249	244	238	232	225	216
20	288	280	274	269	264	260	255	249	241
16	319	307	299	293	287	281	275	267	257

\* 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:

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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	1012	779	563	278	102	9	0	5	48	229	569	909	4503
60	857	641	420	166	42	1	0	0	14	120	430	756	3447
57	773	564	339	114	22	0	0	0	5	73	351	671	2912
55	713	512	289	85	13	0	0	0	2	50	302	612	2578
50	570	388	185	33	3	0	0	0	0	16	199	472	1866
32	184	88	12	0	0	0	0	0	0	0	17	120	421

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	195	233	474	731	1026	1225	1425	1379	1100	814	440	233	9275
55	12	13	38	125	326	535	712	666	412	151	35	13	3038
57	9	10	26	94	273	475	650	604	355	112	24	9	2641
60	0	3	14	57	201	386	557	511	273	65	13	1	2081
65	0	0	2	19	106	244	402	361	158	20	2	0	1314
70	0	0	0	4	43	124	252	225	76	3	0	0	727

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	61	120	284	514	783	996	1187	1143	870	579	245	83	61	181	465	979	1762	2758	3945	5088	5958	6537	6782	6865
45	30	68	179	374	628	846	1032	988	720	432	148	38	30	98	277	651	1279	2125	3157	4145	4865	5297	5445	5483
50	8	28	101	246	473	696	877	833	571	289	80	14	8	36	137	383	856	1552	2429	3262	3833	4122	4202	4216
55	0	7	50	144	325	546	722	678	427	168	36	1	0	7	57	201	526	1072	1794	2472	2899	3067	3103	3104
60	0	1	18	71	191	396	567	523	292	82	10	0	0	1	19	90	281	677	1244	1767	2059	2141	2151	2151
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	45	87	185	322	497	681	810	774	569	360	153	52	45	132	317	639	1136	1817	2627	3401	3970	4330	4483	4535

(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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)