

Climatography of the United States

No. 20

1971-2000

Station: MARSHALL, MO

COOP ID: 235298

Climate Division: MO 2

NWS Call Sign:

Elevation: 790 Feet

Lat: 39°07N

Lon: 93°13W

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	34.6	16.5	25.6	75	1950	24	37.1	1990	-16+	1977	17	11.7	1979	1222	0	.0	.0	4.5	11.3	27.9	3.3
Feb	41.3	21.7	31.5	82	1972	29	40.5	1976	-14	1988	12	19.0	1979	938	0	.0	.0	9.4	6.8	22.2	1.5
Mar	53.4	32.0	42.7	87	1986	29	47.8	1985	-14	1960	5	34.1	1984	691	0	.0	.0	20.4	1.2	14.8	.1
Apr	64.1	41.7	52.9	91	1986	25	59.5	1981	15	1975	3	45.5	1983	372	9	.0	.3	27.2	.0	3.4	.0
May	74.1	53.0	63.6	96	1967	27	69.2	1998	30	1976	3	58.7+	1997	134	90	.0	.7	31.0	.0	@	.0
Jun	83.1	62.0	72.6	104	1988	24	76.1	1988	43	1993	5	67.8	1982	10	235	.4	8.3	30.0	.0	.0	.0
Jul	88.1	66.7	77.4	112+	1974	21	84.2	1980	47	1972	5	73.3	1971	0	384	1.6	16.2	31.0	.0	.0	.0
Aug	86.3	64.1	75.2	105	1970	1	81.4	1983	43	1956	21	69.7	1992	7	323	1.2	12.7	31.0	.0	.0	.0
Sep	78.5	54.8	66.7	101+	2000	2	72.2	1998	31+	1984	30	59.1	1974	76	126	.1	4.8	30.0	.0	.1	.0
Oct	67.7	44.0	55.9	95+	1976	3	60.7	1971	20	1972	19	50.5	1976	293	9	.0	.2	29.9	.0	2.8	.0
Nov	51.9	32.3	42.1	82+	1964	12	50.6	1999	-3	1991	8	34.9	1976	688	0	.0	.0	18.3	1.5	13.4	.1
Dec	39.5	22.0	30.8	73	1948	13	36.9	1994	-24+	1989	24	15.5	1983	1062	0	.0	.0	7.5	7.1	25.7	1.6
Ann	63.6	42.6	53.1	112+	Jul 1974	21	84.2	Jul 1980	-24+	Dec 1989	24	11.7	Jan 1979	5493	1176	3.3	43.2	270.2	27.9	110.3	6.6

+ 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/normal/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

060-A

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: MARSHALL, MO

COOP ID: 235298

Climate Division: MO 2

NWS Call Sign:

Elevation: 790 Feet Lat: 39°07N

Lon: 93°13W

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	1.33	1.19	2.00	1967	26	3.62	1999	.03+	1986	6.3	3.4	.5	.2	.13	.23	.41	.60	.80	1.02	1.29	1.62	2.08	2.84	3.58
Feb	1.56	1.22	3.46	1985	22	4.53	1985	.26	1989	5.7	3.7	.9	.2	.23	.36	.59	.80	1.03	1.27	1.55	1.90	2.36	3.12	3.84
Mar	2.84	2.39	2.70	1972	12	9.69	1973	.78	1986	8.7	6.1	1.8	.5	.79	1.06	1.46	1.82	2.17	2.54	2.94	3.42	4.05	5.03	5.94
Apr	3.76	3.14	5.87	1973	21	11.67	1973	.58	2000	9.6	6.9	2.2	.9	.85	1.20	1.75	2.24	2.74	3.26	3.86	4.56	5.49	6.97	8.36
May	4.85	4.44	4.89	1990	16	11.74	1990	.75	1992	11.0	7.7	3.3	1.3	1.07	1.52	2.23	2.87	3.51	4.20	4.96	5.88	7.09	9.02	10.84
Jun	4.13	3.53	4.27	1991	1	9.87	1998	1.11	1972	9.6	6.5	2.8	1.4	1.34	1.74	2.31	2.81	3.28	3.77	4.31	4.94	5.75	7.00	8.16
Jul	3.62	3.58	3.26	1965	14	8.62	1992	.38	1997	8.2	5.5	2.3	.9	.87	1.21	1.74	2.21	2.68	3.17	3.73	4.39	5.25	6.63	7.92
Aug	3.10	2.91	4.65	1993	12	8.10	1993	.26	1984	7.7	5.1	2.1	1.0	.63	.91	1.37	1.78	2.20	2.65	3.16	3.77	4.58	5.87	7.10
Sep	4.01	3.26	5.81	1970	22	13.38	1973	.40+	1990	7.4	5.3	2.5	1.2	.51	.83	1.40	1.96	2.55	3.20	3.96	4.90	6.17	8.25	10.27
Oct	3.19	2.85	2.81	1957	23	6.80	1986	.65	1988	7.8	5.1	2.1	.7	.80	1.10	1.57	1.98	2.38	2.81	3.29	3.85	4.59	5.76	6.86
Nov	3.14	2.85	5.35	1977	1	8.52	1992	.08	1989	8.2	5.6	2.2	.7	.49	.75	1.21	1.64	2.09	2.58	3.14	3.83	4.76	6.26	7.69
Dec	1.80	1.78	1.78	1971	15	5.07	1971	.13	1976	6.9	4.0	1.3	.5	.22	.36	.62	.87	1.13	1.43	1.77	2.20	2.78	3.73	4.65
Ann	37.33	36.93	5.87	Apr 1973	21	13.38	Sep 1973	.03+	Jan 1986	97.1	64.9	24.0	9.5	24.15	26.61	29.81	32.27	34.48	36.64	38.89	41.39	44.45	48.93	52.84

+ 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

Complete documentation available from:
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Station: MARSHALL, MO

COOP ID: 235298

Climate Division: MO 2

NWS Call Sign:

Elevation: 790 Feet

Lat: 39°07N

Lon: 93°13W

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	2.4	.0	1	0	5.0	1977	3	14.0	1977	8	1985	10	5	1985	.9	.8	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
Feb	2.4	2.0	#	0	5.5	1976	2	7.5	1976	11	1993	28	3	1993	.7	.6	.2	.1	.0	.9	.1	.0	.0
Mar	.7	.0	#	0	8.0	1978	24	8.0	1978	9	1993	1	1	1993	.3	.3	.0	.0	.0	.0	.0	.0	.0
Apr	.1	.0	#	0	3.0	1973	9	3.0	1973	3	1994	6	#	1994	@	@	@	.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	#	1997	27	#	1997	#	1997	27	#	1997	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.0	.0	#	0	5.5	1975	26	5.5	1975	6	1975	26	#+	1997	.4	.4	.1	.1	.0	.2	.1	.1	.0
Dec	2.0	.0	#	0	10.5	1973	30	13.5	1973	8	2000	13	1	2000	.5	.4	.1	.1	.1	.1	.1	.1	.0
Ann	8.6	2.0	N/A	N/A	10.5	Dec 1973	30	14.0	Jan 1977	11	Feb 1993	28	5	Jan 1985	2.8	2.5	.6	.4	.1	-9.9	-9.9	-9.9	-9.9

+ 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:

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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	5/05	5/01	4/28	4/26	4/23	4/21	4/18	4/15	4/11
32	4/22	4/18	4/15	4/12	4/10	4/07	4/05	4/02	3/28
28	4/17	4/12	4/09	4/06	4/04	4/01	3/29	3/26	3/22
24	4/08	4/02	3/29	3/25	3/21	3/18	3/14	3/10	3/04
20	3/30	3/23	3/19	3/15	3/11	3/08	3/04	2/27	2/21
16	3/24	3/15	3/09	3/04	2/27	2/22	2/16	2/10	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	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/16	10/21
32	10/01	10/07	10/11	10/15	10/18	10/22	10/25	10/29	11/04
28	10/16	10/21	10/24	10/27	10/30	11/02	11/05	11/09	11/14
24	10/29	11/03	11/07	11/11	11/14	11/17	11/21	11/25	11/30
20	11/03	11/10	11/14	11/18	11/22	11/26	11/30	12/04	12/11
16	11/15	11/21	11/26	11/29	12/03	12/07	12/10	12/15	12/21
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	185	178	173	169	165	161	157	152	146
32	213	205	200	195	191	186	182	176	169
28	227	221	216	212	209	205	201	197	191
24	264	255	248	242	237	232	226	219	210
20	283	273	266	261	255	250	244	237	228
16	312	301	292	285	279	272	265	256	245

* 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	1222	938	691	372	134	10	0	7	76	293	688	1062	5493
60	1067	798	537	244	65	1	0	1	27	168	540	907	4355
57	974	721	452	179	37	0	0	0	12	108	457	816	3756
55	913	669	395	141	24	0	0	0	7	77	403	758	3387
50	769	540	266	68	7	0	0	0	0	28	278	615	2571
32	311	187	27	0	0	0	0	0	0	0	35	206	766

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	112	173	359	627	979	1216	1407	1338	1039	739	337	166	8492
55	1	11	14	78	290	526	694	625	356	103	15	6	2719
57	0	7	9	56	241	466	632	563	301	72	10	2	2359
60	0	0	1	31	176	377	539	471	226	39	3	0	1863
65	0	0	0	9	90	235	384	323	126	9	0	0	1176
70	0	0	0	2	35	118	236	191	57	1	0	0	640

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	19	74	227	464	787	1032	1207	1139	851	543	191	44	19	93	320	784	1571	2603	3810	4949	5800	6343	6534	6578
45	4	33	135	331	632	882	1052	984	701	397	111	15	4	37	172	503	1135	2017	3069	4053	4754	5151	5262	5277
50	0	14	75	212	478	732	897	829	558	266	53	5	0	14	89	301	779	1511	2408	3237	3795	4061	4114	4119
55	0	3	38	124	330	582	742	674	412	158	22	0	0	3	41	165	495	1077	1819	2493	2905	3063	3085	3085
60	0	0	15	60	200	433	587	519	285	79	6	0	0	0	15	75	275	708	1295	1814	2099	2178	2184	2184
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	13	50	145	282	497	699	822	773	558	336	115	29	13	63	208	490	987	1686	2508	3281	3839	4175	4290	4319

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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