

Climatology of the United States

No. 20

1971-2000

Station: CARROLLTON, MO

COOP ID: 231340

Climate Division: MO 1

NWS Call Sign:

Elevation: 705 Feet

Lat: 39° 21N

Lon: 93° 29W

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	35.3	15.5	25.4	74	1950	24	36.3	1990	-23	1949	30	11.7	1979	1227	0	.0	.0	4.4	11.0	27.8	3.4
Feb	42.2	20.5	31.4	80	1972	29	40.2	1998	-19	1979	9	18.0	1978	943	0	.0	.0	9.3	6.8	22.3	1.8
Mar	54.8	31.2	43.0	87	1986	29	47.9	1986	-16	1960	5	35.5	1984	683	0	.0	.0	20.2	1.0	15.2	.1
Apr	65.8	41.0	53.4	93+	1989	26	60.9	1981	14	1975	3	46.4	1983	356	8	.0	.4	27.5	.0	4.3	.0
May	76.4	52.6	64.5	98+	1998	20	70.5	1987	29+	1976	3	59.5	1997	116	100	.0	1.1	31.0	.0	.1	.0
Jun	85.5	62.1	73.8	105+	1988	24	77.5	1971	41	1966	1	68.9	1982	5	268	.4	9.5	30.0	.0	.0	.0
Jul	90.4	66.6	78.5	114	1954	14	85.5	1980	47+	1972	6	75.0	1971	0	420	2.0	17.7	31.0	.0	.0	.0
Aug	88.8	64.4	76.6	108+	1984	29	83.1	1983	42	1950	21	71.0	1992	4	364	.9	13.2	31.0	.0	.0	.0
Sep	80.7	55.0	67.9	105	2000	1	73.5	1998	28	1984	30	61.3	1974	57	144	.2	4.4	30.0	.0	.2	.0
Oct	69.4	43.5	56.5	93+	1997	4	62.1	1971	17	1952	29	50.6	1976	278	13	.0	.1	29.8	.0	3.3	.0
Nov	52.8	31.2	42.0	81	1999	14	51.0	1999	-5	1991	8	34.7	1976	690	0	.0	.0	17.6	1.2	14.7	@
Dec	40.4	21.0	30.7	73	2001	6	36.3	1994	-24	1989	23	15.5	1983	1065	0	.0	.0	6.5	6.8	25.8	1.6
Ann	65.2	42.1	53.6	114	Jul 1954	14	85.5	Jul 1980	-24	Dec 1989	23	11.7	Jan 1979	5424	1317	3.5	46.4	268.3	26.8	113.7	6.9

+ 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/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

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**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: CARROLLTON, MO

COOP ID: 231340

Climate Division: MO 1

NWS Call Sign:

Elevation: 705 Feet Lat: 39°21N

Lon: 93°29W

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	1.52	1.36	2.23	1971	3	3.79	1982	.07	1986	6.6	3.8	.8	.2	.21	.34	.55	.77	.99	1.23	1.51	1.86	2.33	3.09	3.82
Feb	1.67	1.50	2.47	1997	21	4.77	1997	.25	1991	7.0	4.0	1.0	.2	.41	.57	.81	1.03	1.24	1.47	1.72	2.02	2.42	3.04	3.63
Mar	2.88	2.54	2.46	1954	25	8.94	1973	.89	1995	10.0	6.3	1.8	.6	.89	1.17	1.57	1.92	2.26	2.61	3.00	3.45	4.04	4.95	5.80
Apr	3.90	3.83	2.84	1973	20	9.05	1994	.53	1980	11.0	6.6	2.5	.9	1.00	1.37	1.93	2.43	2.93	3.45	4.02	4.71	5.61	7.02	8.35
May	4.94	4.40	3.55	1981	18	11.96	1995	1.24	1992	12.8	8.3	3.5	1.3	1.69	2.16	2.84	3.41	3.97	4.53	5.15	5.88	6.80	8.24	9.56
Jun	4.55	3.99	4.93	1966	13	10.76	1998	1.52	1992	10.5	6.5	2.8	1.3	1.44	1.88	2.52	3.06	3.59	4.14	4.74	5.44	6.34	7.75	9.06
Jul	4.31	3.99	3.85	1981	27	10.25	1981	.42	1997	8.8	5.9	3.1	1.3	.79	1.18	1.81	2.40	2.99	3.64	4.37	5.26	6.43	8.33	10.14
Aug	3.98	3.74	4.71	1955	6	10.63	1982	.03	1984	9.3	5.7	2.5	1.1	.42	.72	1.27	1.82	2.42	3.09	3.87	4.85	6.19	8.40	10.56
Sep	4.42	3.60	6.26	1961	13	13.33	1993	.58	1979	8.8	6.1	3.0	1.3	.85	1.25	1.90	2.50	3.10	3.75	4.49	5.38	6.56	8.46	10.26
Oct	3.52	3.62	6.19	1998	4	11.25	1998	.52	1988	8.6	5.3	2.4	1.0	.62	.93	1.45	1.93	2.42	2.95	3.56	4.30	5.28	6.86	8.36
Nov	3.02	2.86	3.98	1964	15	7.50	1983	.07	1989	8.8	5.3	2.1	.8	.52	.78	1.22	1.63	2.06	2.52	3.05	3.69	4.54	5.92	7.24
Dec	2.18	1.82	2.56	1982	5	7.05	1982	.05	1996	7.5	4.1	1.6	.4	.25	.42	.73	1.03	1.36	1.72	2.14	2.66	3.38	4.55	5.69
Ann	40.89	40.08	6.26	Sep 1961	13	13.33	Sep 1993	.03	Aug 1984	109.7	67.9	27.1	10.4	25.99	28.75	32.35	35.14	37.64	40.08	42.63	45.47	48.95	54.07	58.54

+ 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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Station: CARROLLTON, MO

COOP ID: 231340

Climate Division: MO 1

NWS Call Sign:

Elevation: 705 Feet

Lat: 39°21N

Lon: 93°29W

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	7.1	5.7	2	1	9.2	1979	13	23.6	1979	18	1979	14	13	1979	4.0	2.4	1.0	.3	.0	11.9	8.2	5.3	1.0
Feb	6.5	5.2	2	1	15.0	1993	25	22.0	1993	18	1979	9	12	1979	3.5	2.1	.7	.2	.1	8.6	6.0	3.8	1.5
Mar	3.2	1.7	#	#	7.5	1978	24	14.5	1978	15	1978	4	6	1978	1.5	1.0	.3	.2	.0	2.0	1.2	.8	.3
Apr	.5	.0	#	0	4.0	1973	9	4.0	1973	3	1973	9	#+	1993	.3	.2	@	.0	.0	.1	@	.0	.0
May	#	.0	0	0	#	1994	31	#	1994	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	.2	.0	#	0	5.2	1996	23	5.2	1996	1	1996	23	#+	1996	.1	@	@	@	.0	@	.0	.0	.0
Nov	1.5	.4	#	0	7.5	1975	26	7.5	1975	8	1975	26	1	1991	.9	.6	.1	@	.0	.8	.3	.1	.0
Dec	3.4	1.4	1	#	7.6	1978	31	13.4	1973	11	1987	15	3	1989	2.8	1.3	.3	.1	.0	4.4	1.7	.9	.1
Ann	22.4	14.4	N/A	N/A	15.0	Feb 1993	25	23.6	Jan 1979	18+	Feb 1979	9	13	Jan 1979	13.1	7.6	2.4	.8	.1	27.8	17.4	10.9	2.9

+ 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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NWS Call Sign:

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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	5/10	5/06	5/03	4/30	4/28	4/25	4/23	4/20	4/15
32	4/30	4/25	4/21	4/18	4/15	4/13	4/10	4/06	4/01
28	4/17	4/13	4/10	4/08	4/05	4/03	3/31	3/28	3/24
24	4/09	4/04	3/31	3/27	3/24	3/21	3/17	3/13	3/07
20	3/31	3/24	3/19	3/15	3/11	3/07	3/02	2/25	2/18
16	3/24	3/16	3/10	3/05	2/28	2/23	2/18	2/12	2/04
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	9/20	9/25	9/29	10/02	10/05	10/09	10/12	10/16	10/21
32	9/28	10/03	10/07	10/10	10/13	10/17	10/20	10/24	10/29
28	10/14	10/18	10/22	10/25	10/28	10/30	11/02	11/06	11/11
24	10/28	11/03	11/06	11/10	11/13	11/16	11/19	11/23	11/28
20	11/04	11/10	11/14	11/18	11/21	11/25	11/28	12/02	12/08
16	11/14	11/21	11/25	11/29	12/03	12/07	12/11	12/16	12/22
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	181	174	168	164	160	156	151	146	139
32	203	196	190	185	180	176	171	165	157
28	222	216	212	208	205	201	198	193	188
24	256	248	242	238	233	229	224	218	211
20	284	274	267	261	255	249	243	236	226
16	310	299	291	284	277	271	264	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

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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	1227	943	683	356	116	5	0	4	57	278	690	1065	5424
60	1072	803	529	228	53	1	0	0	18	158	542	910	4314
57	979	726	444	163	29	0	0	0	7	102	457	817	3724
55	918	674	387	126	18	0	0	0	3	73	403	758	3360
50	773	545	260	57	5	0	0	0	0	27	277	614	2558
32	312	191	27	0	0	0	0	0	0	0	31	200	761

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	108	172	367	642	1007	1253	1443	1383	1076	758	331	159	8699
55	1	11	15	78	312	563	730	670	390	118	13	3	2904
57	0	7	10	55	261	503	668	608	333	85	7	0	2537
60	0	0	2	30	192	414	575	515	254	48	2	0	2032
65	0	0	0	8	100	268	420	364	144	13	0	0	1317
70	0	0	0	1	41	141	268	225	67	2	0	0	745

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	15	64	219	464	779	1029	1205	1137	851	523	180	37	15	79	298	762	1541	2570	3775	4912	5763	6286	6466	6503
45	4	27	128	331	624	879	1050	982	701	381	98	12	4	31	159	490	1114	1993	3043	4025	4726	5107	5205	5217
50	0	10	69	211	471	729	895	827	554	249	51	4	0	10	79	290	761	1490	2385	3212	3766	4015	4066	4070
55	0	2	31	123	324	579	740	672	409	140	20	1	0	2	33	156	480	1059	1799	2471	2880	3020	3040	3041
60	0	0	10	61	195	431	585	518	280	68	3	0	0	0	10	71	266	697	1282	1800	2080	2148	2151	2151
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	14	51	142	290	496	696	816	772	557	320	106	23	14	65	207	497	993	1689	2505	3277	3834	4154	4260	4283

(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 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