

Climatology of the United States

No. 20

1971-2000

Station: VANDALIA, MO

COOP ID: 238577

Climate Division: MO 2

NWS Call Sign:

Elevation: 760 Feet

Lat: 39°19N

Lon: 91°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	34.0	16.1	25.1	77	1950	24	36.6	1990	-20	1982	10	10.5	1977	1238	0	.0	.0	4.6	12.0	28.4	3.4
Feb	40.4	21.0	30.7	81	1972	29	39.8	1998	-16	1979	9	16.3	1978	961	0	.0	.0	7.7	6.4	23.4	1.6
Mar	52.0	30.9	41.5	84	1974	7	46.4	1973	-12+	1960	6	33.4	1984	729	0	.0	.0	19.1	1.5	16.8	.2
Apr	63.2	41.8	52.5	92	1987	21	59.9	1981	18	1957	12	46.0	1983	381	6	.0	.2	27.1	.0	4.6	.0
May	73.2	52.0	62.6	94	1962	18	68.2	1998	29	1976	3	58.1+	1997	152	77	.0	.7	31.0	.0	.2	.0
Jun	82.5	61.5	72.0	105	1988	24	75.9	1971	40	1989	9	66.8	1982	13	222	.3	7.1	30.0	.0	.0	.0
Jul	87.5	65.8	76.7	108	1980	30	82.6	1980	45	1972	6	72.5	1971	0	362	1.4	14.9	31.0	.0	.0	.0
Aug	86.0	63.7	74.9	106	1980	1	81.0	1983	41	1950	21	69.1	1992	9	314	1.3	11.6	31.0	.0	.0	.0
Sep	78.1	54.8	66.5	108	1954	5	72.2	1998	31	1995	24	59.6	1974	74	116	.0	4.0	30.0	.0	@	.0
Oct	67.1	43.4	55.3	92	1981	5	61.7	1971	20	1972	19	48.5	1976	315	12	.0	.2	29.8	.0	4.0	.0
Nov	51.6	32.1	41.9	88	1950	1	51.3	1999	-5	1964	30	34.3	1976	695	0	.0	.0	17.3	1.4	14.7	.1
Dec	39.1	21.6	30.4	74	1949	11	37.4	1982	-24+	1989	23	16.0	1983	1075	0	.0	.0	6.9	7.3	25.8	1.8
Ann	62.9	42.1	52.5	108+	Jul 1980	30	82.6	Jul 1980	-24+	Dec 1989	23	10.5	Jan 1977	5642	1109	3.0	38.7	265.5	28.6	117.9	7.1

+ 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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No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: VANDALIA, MO

COOP ID: 238577

Climate Division: MO 2

NWS Call Sign:

Elevation: 760 Feet Lat: 39°19N

Lon: 91°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	1.68	1.44	1.93	1996	18	4.30	1982	.06	1986	7.2	4.0	.9	.3	.22	.35	.59	.83	1.07	1.35	1.66	2.05	2.58	3.44	4.28
Feb	1.97	1.84	2.15	1959	10	4.17	1985	.13	1994	6.4	4.2	1.3	.4	.40	.58	.87	1.14	1.40	1.69	2.01	2.40	2.91	3.73	4.51
Mar	3.23	3.08	2.03	1992	19	9.50	1973	.65	1971	9.0	6.1	2.4	.6	.98	1.29	1.75	2.14	2.52	2.92	3.36	3.87	4.54	5.57	6.53
Apr	3.64	3.43	3.40	1975	24	10.76	1994	1.04	2000	9.7	6.8	2.1	.8	.92	1.26	1.79	2.26	2.72	3.21	3.75	4.40	5.24	6.57	7.82
May	5.04	5.11	5.11	1974	31	10.83	1974	1.41	1992	10.8	8.1	3.4	1.3	1.69	2.17	2.87	3.46	4.03	4.62	5.26	6.01	6.97	8.46	9.83
Jun	4.10	3.94	3.67	1970	13	9.34	1998	.70	1972	9.4	6.5	2.9	1.2	1.05	1.44	2.03	2.56	3.08	3.63	4.24	4.96	5.90	7.39	8.79
Jul	4.06	3.09	5.58	1991	10	14.27	1981	.17	1999	7.9	5.7	2.7	1.1	.41	.71	1.26	1.83	2.44	3.13	3.94	4.96	6.35	8.65	10.91
Aug	3.75	3.56	3.24	2000	23	7.55	2000	.13	1998	7.5	5.4	2.4	1.1	.61	.94	1.48	2.00	2.53	3.11	3.77	4.57	5.65	7.39	9.06
Sep	3.25	2.34	4.71	1965	16	16.00	1993	.66	1981	7.9	5.0	1.9	.8	.53	.81	1.28	1.73	2.19	2.70	3.27	3.97	4.91	6.43	7.88
Oct	3.11	2.76	2.90	1969	13	7.55	1986	.56	1989	8.3	5.6	1.9	.6	.88	1.17	1.62	2.01	2.39	2.78	3.22	3.74	4.40	5.45	6.43
Nov	3.46	2.94	3.26	1964	16	9.06	1985	.42	1976	8.6	6.3	2.7	1.0	.70	1.02	1.52	1.99	2.46	2.96	3.53	4.21	5.11	6.56	7.93
Dec	2.46	2.00	2.60	1949	21	6.22	1982	.52	1996	7.8	5.0	1.5	.7	.60	.83	1.19	1.51	1.82	2.16	2.53	2.97	3.55	4.48	5.34
Ann	39.75	39.66	5.58	Jul 1991	10	16.00	Sep 1993	.06	Jan 1986	100.5	68.7	26.1	9.9	26.47	28.97	32.22	34.71	36.93	39.10	41.35	43.84	46.89	51.35	55.23

+ 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: VANDALIA, MO

COOP ID: 238577

Climate Division: MO 2

NWS Call Sign:

Elevation: 760 Feet

Lat: 39°19N

Lon: 91°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	5.4	5.0	2	#	8.0	1995	19	21.5	1977	13	1999	7	8	1995	2.6	2.4	.5	.2	.0	8.4	5.0	3.0	.4
Feb	5.0	3.3	1	#	10.0	1975	24	16.5+	1978	12	1975	26	5	1979	1.8	1.6	.5	.2	@	5.6	3.5	2.4	.3
Mar	3.3	1.0	#	#	7.0	1980	13	23.0	1978	13	1978	8	7	1978	1.1	.8	.4	.2	.0	1.8	1.3	.9	.4
Apr	.6	.0	#	0	4.0	1971	6	4.5	1973	4+	1980	14	#+	1980	.2	.2	.1	.0	.0	.1	.1	.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	#	1993	31	#	1993	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.7	.0	#	0	8.0	1975	27	8.0+	1977	8	1977	27	1	1991	.4	.4	.2	.2	.0	.7	.4	.3	.0
Dec	4.8	2.4	1	#	10.0	1987	14	21.5	1973	9	1973	31	3	2000	2.0	1.5	.6	.2	@	3.2	2.3	.9	.0
Ann	20.8	11.7	N/A	N/A	10.0+	Dec 1987	14	23.0	Mar 1978	13+	Jan 1999	7	8	Jan 1995	8.1	6.9	2.3	1.0	@	19.8	12.6	7.5	1.1

+ 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

Complete documentation available from:

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Climate Division: MO 2

NWS Call Sign:

Elevation: 760 Feet

Lat: 39° 19N

Lon: 91° 29W

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	5/09	5/04	5/01	4/28	4/26	4/23	4/20	4/17	4/13
32	4/27	4/22	4/19	4/16	4/14	4/11	4/08	4/05	3/31
28	4/16	4/12	4/09	4/06	4/04	4/01	3/30	3/26	3/22
24	4/12	4/05	4/01	3/28	3/24	3/21	3/17	3/12	3/06
20	3/30	3/24	3/19	3/15	3/12	3/08	3/04	2/27	2/21
16	3/25	3/16	3/10	3/05	2/28	2/23	2/18	2/11	2/03
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	9/24	9/29	10/02	10/05	10/07	10/10	10/13	10/16	10/20
32	10/02	10/07	10/11	10/14	10/17	10/20	10/23	10/27	11/01
28	10/12	10/18	10/22	10/26	10/30	11/02	11/06	11/11	11/17
24	10/20	10/27	11/01	11/06	11/10	11/14	11/18	11/24	12/01
20	11/01	11/08	11/13	11/18	11/22	11/26	11/30	12/05	12/12
16	11/09	11/16	11/21	11/26	11/30	12/04	12/08	12/13	12/20
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	182	176	171	167	164	160	156	151	145
32	208	200	195	190	185	181	176	171	163
28	230	223	217	213	208	204	199	194	186
24	259	249	242	236	230	224	218	211	201
20	283	273	266	260	254	249	243	236	226
16	311	298	289	281	274	267	259	250	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.

Derived from 1971-2000 serially complete daily data

Complete documentation available from:

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Elevation: 760 Feet Lat: 39°19N Lon: 91°29W

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	1238	961	729	381	152	13	0	9	74	315	695	1075	5642
60	1083	821	574	248	76	2	0	1	26	192	547	920	4490
57	990	743	488	180	45	1	0	0	11	132	464	829	3883
55	928	690	430	141	30	0	0	0	6	99	409	771	3504
50	781	561	297	66	9	0	0	0	0	42	283	627	2666
32	313	200	36	0	0	0	0	0	0	0	34	214	797

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	98	163	330	615	948	1199	1385	1328	1032	720	329	162	8309
55	0	10	12	66	265	509	672	615	348	105	14	6	2622
57	0	6	8	46	218	449	610	553	293	76	9	2	2270
60	0	0	0	24	156	361	517	461	218	43	2	0	1782
65	0	0	0	6	77	222	362	314	116	12	0	0	1109
70	0	0	0	1	29	109	214	185	50	2	0	0	590

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	17	59	200	432	743	1000	1172	1116	837	519	185	41	17	76	276	708	1451	2451	3623	4739	5576	6095	6280	6321
45	4	27	118	304	590	850	1017	961	687	369	109	19	4	31	149	453	1043	1893	2910	3871	4558	4927	5036	5055
50	0	13	64	192	436	700	862	806	538	242	56	5	0	13	77	269	705	1405	2267	3073	3611	3853	3909	3914
55	0	2	32	109	293	550	707	651	393	143	23	1	0	2	34	143	436	986	1693	2344	2737	2880	2903	2904
60	0	1	9	54	170	402	552	496	263	63	6	0	0	1	10	64	234	636	1188	1684	1947	2010	2016	2016
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	10	40	128	264	463	673	795	753	545	320	109	29	10	50	178	442	905	1578	2373	3126	3671	3991	4100	4129

(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/normal/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