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: VICHY ROLLA NATL AP, MO **COOP ID: 238614**

Climate Division: MO 5 **NWS Call Sign: VIH** **Elevation: 1,102 Feet** **Lat: 38˚08N** **Lon: 91˚46W**

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	39.0	20.8	29.9	76+	1965	7	41.2	1990	-16	1982	10	17.1	1977	1089	0	.0	.0	6.9	9.6	25.8	2.2
Feb	45.3	25.8	35.6	82	1972	29	44.4	1976	-12	1996	3	22.5	1978	825	0	.0	.0	10.4	5.7	20.1	1.0
Mar	55.6	34.3	45.0	85	1955	10	50.4	1973	-7	1960	5	37.6	1984	622	0	.0	.0	20.1	1.0	13.6	.1
Apr	66.4	44.2	55.3	93	1965	22	62.0	1981	21	1975	3	49.1	1983	303	11	.0	.1	27.6	.0	2.9	.0
May	74.7	53.8	64.3	93+	1996	24	70.3	1987	30	1976	3	59.2	1981	120	97	.0	.3	30.9	.0	.1	.0
Jun	82.9	62.7	72.8	104	1952	29	77.2	1971	43	2000	6	68.3+	1982	9	243	.1	4.2	30.0	.0	.0	.0
Jul	88.0	67.5	77.8	113	1954	18	85.4	1980	49	1967	14	74.5	1996	0	394	.9	13.5	31.0	.0	.0	.0
Aug	86.7	65.3	76.0	104+	1980	1	82.6	1983	48+	1967	31	70.9	1992	6	347	.4	10.1	31.0	.0	.0	.0
Sep	78.5	57.4	68.0	102+	1954	4	74.4	1998	34	1995	22	60.7	1974	56	144	.0	3.1	30.0	.0	@	.0
Oct	67.9	46.7	57.3	93	1963	10	63.1	1971	22	1952	21	51.1	1976	260	21	.0	.1	29.9	.0	2.0	.0
Nov	53.9	35.8	44.9	85	1955	13	52.3	1990	3	1959	17	37.2	1976	605	0	.0	.0	18.2	1.1	11.7	.0
Dec	42.9	25.1	34.0	77	1991	8	41.4	1971	-11	1962	12	19.8	1983	961	0	.0	.0	9.4	5.7	23.3	1.1
Ann	65.2	45.0	55.1	113	Jul 1954	18	85.4	Jul 1980	-16	Jan 1982	10	17.1	Jan 1977	4856	1257	1.4	31.4	275.4	23.1	99.5	4.4

\+ 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

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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	1.69	1.21	2.12	1993	4	5.14	1975	.07	1986
Feb	1.93	1.78	2.19	1975	22	4.32	1985	.44	1996
Mar	3.51	3.21	3.13	1962	20	7.12	1973	.71	1971
Apr	3.90	3.41	4.07	1994	11	12.44	1994	1.12	1971
May	4.44	4.01	3.27	1967	13	11.24	1995	1.71	1972
Jun	3.65	2.88	3.58	1977	21	12.46	1977	.06	1980
Jul	3.90	3.63	3.24	1991	10	10.40	1981	.92	1974
Aug	3.67	3.47	3.49	1999	7	13.50	1982	.94	1996
Sep	3.48	2.89	3.48	1970	23	11.62	1993	.84	1990
Oct	3.26	3.07	4.57	1959	4	8.30	1986	.71	1999
Nov	4.10	3.57	5.60	1972	1	11.77	1985	.76	1976
Dec	2.88	2.50	4.13	1982	3	9.21	1982	.62	1976
Ann	40.41	39.40	5.60	Nov 1972	1	13.50	Aug 1982	.06	Jun 1980

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.7	4.1	1.1	.4
Feb	7.8	4.3	1.2	.5
Mar	10.4	7.0	2.4	.7
Apr	10.9	7.3	2.3	.8
May	12.1	7.8	3.1	1.3
Jun	10.4	6.8	2.8	1.0
Jul	8.8	5.5	2.6	1.2
Aug	8.4	5.8	2.6	1.2
Sep	8.1	6.0	2.6	1.2
Oct	8.8	5.4	2.2	.6
Nov	8.8	6.3	2.1	1.0
Dec	7.9	5.0	1.7	.6
Ann	110.1	71.3	26.7	10.5

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	.23	.37	.61	.85	1.10	1.37	1.68	2.07	2.59	3.44	4.27
Feb	.42	.60	.88	1.14	1.39	1.67	1.97	2.34	2.83	3.60	4.33
Mar	1.31	1.64	2.11	2.50	2.87	3.25	3.67	4.15	4.76	5.70	6.56
Apr	1.24	1.61	2.16	2.63	3.08	3.54	4.06	4.66	5.43	6.63	7.75
May	1.70	2.11	2.70	3.19	3.66	4.13	4.64	5.24	5.99	7.15	8.21
Jun	.52	.82	1.35	1.85	2.38	2.96	3.63	4.45	5.56	7.37	9.11
Jul	.94	1.31	1.88	2.38	2.89	3.42	4.02	4.72	5.65	7.12	8.51
Aug	.92	1.26	1.79	2.27	2.74	3.23	3.78	4.43	5.29	6.64	7.91
Sep	.92	1.25	1.76	2.20	2.63	3.09	3.60	4.20	4.98	6.21	7.36
Oct	1.09	1.39	1.85	2.23	2.60	2.98	3.40	3.88	4.51	5.47	6.37
Nov	.81	1.18	1.78	2.33	2.89	3.49	4.17	4.99	6.08	7.81	9.47
Dec	.58	.85	1.27	1.65	2.04	2.46	2.93	3.50	4.25	5.45	6.59
Ann	27.53	29.97	33.13	35.54	37.70	39.79	41.95	44.35	47.28	51.54	55.24

\+ 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	6.1	3.9	1	0	7.2	1996	2	17.0+	1979	12	1979	31	6	1979	3.5	2.8	.6	.3	.0	10.3	6.1	3.8	.3
Feb	4.0	2.9	1	0	6.9	1975	23	12.2	1975	12+	1982	11	6	1982	2.3	1.9	.5	.1	.0	6.9	4.4	3.0	.8
Mar	2.3	1.2	#	0	5.0	1975	9	8.2	1975	7+	1978	5	2	1978	1.5	1.1	.2	.1	.0	1.9	.6	.4	.0
Apr	.6	.0	#	0	4.0	1980	14	5.0	1980	4	1980	14	#	1982	.4	.3	.1	.0	.0	.2	.1	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1996	.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	#	1993	31	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.7	1.0	#	0	6.1	1975	26	6.1	1975	7	1975	27	1	1975	.8	.6	.2	.1	.0	1.2	.5	.3	.0
Dec	3.2	1.1	#	0	5.9	1995	19	11.5	1973	6+	1995	21	2	1995	1.7	1.3	.3	.1	.0	3.8	1.5	.5	.0
Ann	17.9	10.1	N/A	N/A	7.2	Jan 1996	2	17.0+	Jan 1979	12+	Feb 1982	11	6+	Feb 1982	10.2	8.0	1.9	.7	.0	24.3	13.2	8.0	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

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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	4/30	4/27	4/24	4/22	4/19	4/16	4/13	4/08
32	4/24	4/19	4/15	4/12	4/09	4/06	4/03	3/31	3/26
28	4/12	4/08	4/05	4/03	3/31	3/29	3/26	3/23	3/19
24	4/04	3/29	3/26	3/22	3/19	3/16	3/13	3/09	3/04
20	3/29	3/22	3/17	3/12	3/08	3/04	2/28	2/22	2/15
16	3/19	3/11	3/05	2/28	2/24	2/19	2/15	2/09	2/01

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	9/26	10/01	10/04	10/07	10/10	10/13	10/16	10/19	10/24
32	10/09	10/14	10/17	10/21	10/24	10/26	10/30	11/02	11/07
28	10/18	10/24	10/29	11/02	11/05	11/09	11/12	11/17	11/23
24	10/29	11/04	11/08	11/12	11/15	11/18	11/22	11/26	12/02
20	11/06	11/12	11/17	11/21	11/25	11/28	12/02	12/07	12/13
16	11/14	11/20	11/24	11/28	12/01	12/05	12/09	12/13	12/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	192	185	179	175	171	166	162	157	149
32	219	211	206	201	197	192	187	182	174
28	240	232	227	222	218	214	209	204	196
24	262	254	249	244	240	236	231	226	219
20	287	278	271	266	261	256	250	244	235
16	309	299	292	286	280	274	268	260	250

***** 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	1089	825	622	303	120	9	0	6	56	260	605	961	4856
60	934	688	473	182	54	1	0	0	17	148	463	807	3767
57	841	610	386	123	29	0	0	0	7	96	381	720	3193
55	781	557	331	91	18	0	0	0	3	70	330	663	2844
50	639	432	213	35	5	0	0	0	0	26	218	520	2088
32	219	115	15	0	0	0	0	0	0	0	19	149	517

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	153	214	416	698	1000	1225	1417	1364	1078	784	404	210	8963
55	3	13	20	99	304	535	704	651	392	141	25	11	2898
57	1	9	13	71	253	475	642	589	335	106	16	6	2516
60	0	3	6	40	185	386	549	497	256	64	9	0	1995
65	0	0	0	11	97	243	394	347	144	21	0	0	1257
70	0	0	0	2	38	124	246	213	67	4	0	0	694

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	42	101	244	481	771	995	1178	1137	852	554	225	66	42	143	387	868	1639	2634	3812	4949	5801	6355	6580	6646
45	13	52	149	344	616	845	1023	982	702	407	135	34	13	65	214	558	1174	2019	3042	4024	4726	5133	5268	5302
50	4	22	86	223	462	695	868	827	553	274	75	13	4	26	112	335	797	1492	2360	3187	3740	4014	4089	4102
55	0	9	42	131	317	545	713	672	411	165	38	3	0	9	51	182	499	1044	1757	2429	2840	3005	3043	3046
60	0	2	18	69	183	396	558	517	277	85	12	0	0	2	20	89	272	668	1226	1743	2020	2105	2117	2117
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	30	65	143	286	481	679	808	785	559	329	124	39	30	95	238	524	1005	1684	2492	3277	3836	4165	4289	4328

(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.
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