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: VIENNA 2 WNW, MO **COOP ID: 238620**

Climate Division: MO 5 **NWS Call Sign:** **Elevation: 770 Feet** **Lat: 38˚12N** **Lon: 91˚59W**

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	39.1	16.4	27.8	77	1965	7	38.0	1990	-27	1977	17	13.3	1977	1154	0	.0	.0	7.4	9.7	27.9	2.8
Feb	45.5	21.2	33.4	82	1962	13	42.3	1976	-22	1979	9	20.7	1978	886	0	.0	.0	10.7	5.5	22.8	1.4
Mar	55.9	30.7	43.3	85+	1986	30	48.4	1973	-11+	1980	2	36.3	1996	673	0	.0	.0	20.5	1.2	16.5	.2
Apr	66.8	40.2	53.5	93	1987	21	61.2	1981	18+	1987	4	47.6	1983	353	7	.0	.2	27.2	.0	6.4	.0
May	75.5	49.5	62.5	91+	1987	22	68.3	1987	27	1976	3	57.7	1997	150	73	.0	.4	30.9	.0	.7	.0
Jun	83.5	59.0	71.3	102+	1988	25	75.3	1971	36	1972	1	67.2	1974	14	202	.2	5.3	30.0	.0	.0	.0
Jul	88.8	63.9	76.4	110	1980	31	83.7	1980	44+	1972	6	72.7	1996	0	352	1.3	15.6	31.0	.0	.0	.0
Aug	88.1	61.7	74.9	108	1980	1	81.7	1983	40+	1986	29	69.6	1992	6	312	1.4	13.6	31.0	.0	.0	.0
Sep	79.8	53.0	66.4	101	1984	2	71.2	1998	27+	1995	23	60.5	1974	77	120	.1	4.9	30.0	.0	.5	.0
Oct	69.3	40.8	55.1	96+	1963	10	60.9	1971	17	1981	24	49.5	1976	317	8	.0	.3	30.0	.0	6.2	.0
Nov	55.1	31.2	43.2	85	1968	1	50.1	1999	1	1991	8	35.5	1976	655	0	.0	.0	18.8	.9	15.8	.0
Dec	43.3	21.4	32.4	78	1991	9	39.6	1984	-27	1989	23	17.8	1983	1013	0	.0	.0	9.8	5.7	25.3	1.5
Ann	65.9	40.8	53.4	110	Jul 1980	31	83.7	Jul 1980	-27+	Dec 1989	23	13.3	Jan 1977	5298	1074	3.0	40.3	277.3	23.0	122.1	5.9

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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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	2.01	1.53	2.94	1950	3	4.90	1975	.00	1986
Feb	2.23	2.01	2.50	1985	23	4.70	1986	.20	1991
Mar	3.65	3.18	3.05	1977	28	8.14	1973	1.44	1986
Apr	4.17	3.48	3.75	1996	22	13.94	1994	.96	2000
May	4.78	4.58	5.50	1975	7	10.40	1995	1.88	1972
Jun	4.39	3.68	3.60	1998	5	11.28	1981	.03	1988
Jul	4.04	3.08	6.70	1998	26	12.90	1998	.58	1985
Aug	3.81	3.19	4.66	1978	27	9.36	1982	.95	1998
Sep	3.85	3.52	3.38	1996	24	12.14	1993	.76	1990
Oct	3.45	3.23	4.32	1969	12	8.21	1983	1.00	1999
Nov	4.13	3.47	4.35	1996	7	9.72	1985	.52	1989
Dec	3.09	2.57	5.50	1982	3	11.09	1982	.57	1976
Ann	43.60	43.61	6.70	Jul 1998	26	13.94	Apr 1994	.00	Jan 1986

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.1	4.7	1.1	.4
Feb	6.8	4.3	1.5	.5
Mar	9.1	6.8	2.6	.8
Apr	10.0	7.2	2.5	1.1
May	10.7	7.9	3.2	1.3
Jun	9.1	6.7	2.9	1.3
Jul	7.8	5.8	2.5	1.3
Aug	7.5	5.3	2.6	1.1
Sep	7.4	5.6	2.7	1.2
Oct	8.0	5.4	2.7	1.0
Nov	8.7	6.5	2.9	1.1
Dec	7.7	5.4	1.9	1.1
Ann	99.9	71.6	29.1	12.2

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	.48	.82	1.11	1.40	1.71	2.06	2.49	3.04	3.93	4.78
Feb	.37	.57	.89	1.20	1.51	1.85	2.24	2.72	3.35	4.38	5.36
Mar	1.32	1.66	2.15	2.57	2.97	3.37	3.81	4.33	4.98	6.00	6.93
Apr	.94	1.33	1.94	2.49	3.04	3.62	4.28	5.06	6.09	7.72	9.26
May	1.74	2.19	2.84	3.38	3.90	4.42	5.00	5.67	6.52	7.83	9.04
Jun	.47	.80	1.41	2.03	2.68	3.42	4.29	5.37	6.83	9.26	11.63
Jul	.62	.97	1.55	2.11	2.69	3.32	4.05	4.94	6.13	8.07	9.92
Aug	1.01	1.37	1.93	2.41	2.89	3.39	3.94	4.60	5.46	6.80	8.06
Sep	.82	1.17	1.74	2.25	2.77	3.32	3.93	4.68	5.66	7.22	8.70
Oct	1.05	1.38	1.86	2.28	2.69	3.12	3.58	4.13	4.84	5.94	6.97
Nov	.74	1.10	1.70	2.27	2.84	3.47	4.18	5.04	6.19	8.04	9.80
Dec	.61	.89	1.34	1.76	2.18	2.63	3.14	3.76	4.57	5.88	7.12
Ann	30.21	32.77	36.08	38.60	40.84	43.01	45.26	47.76	50.79	55.20	59.02

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	5.1	2.5	1	1
Feb	3.6	3.0	1	#
Mar	2.3	.0	#	#
Apr	.3	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.0	.0	0	0
Nov	1.7	.0	#	0
Dec	4.0	2.0	1	#
Ann	17.0	7.5	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	12.0	1982	31	25.1	1979	12	1979	31	7	1979
Feb	9.5	1975	24	11.5+	1978	15	1984	28	7	1978
Mar	12.5	1989	6	12.5	1989	14	1989	7	4	1978
Apr	5.0	1980	14	5.0	1980	5	1980	14	#+	1982
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	.0	0	0	.0	0	0	0	0	0	0
Nov	6.5	1980	27	8.5	1980	8	1975	27	1	1980
Dec	9.5	1995	19	19.5	1973	12	1995	20	4	1995
Ann	12.5	Mar 1989	6	25.1	Jan 1979	15	Feb 1984	28	7+	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.5	2.4	.7	.2	@
Feb	1.6	1.4	.5	.1	.0
Mar	.8	.7	.4	.2	@
Apr	.1	.1	@	@	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.6	.5	.3	.1	.0
Dec	1.4	1.4	.3	.2	.0
Ann	7.0	6.5	2.2	.8	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	10.1	6.6	3.2	.4
Feb	4.8	3.6	2.7	.8
Mar	1.6	1.0	.6	.2
Apr	.1	@	@	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.9	.3	.2	.0
Dec	3.4	1.7	1.0	.0
Ann	20.9	13.2	7.7	1.4

+ 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	5/22	5/17	5/13	5/10	5/06	5/03	4/30	4/26	4/20
32	5/10	5/05	5/02	4/29	4/26	4/24	4/21	4/18	4/13
28	4/23	4/19	4/15	4/13	4/10	4/08	4/05	4/02	3/28
24	4/14	4/10	4/06	4/03	3/31	3/29	3/26	3/22	3/17
20	4/02	3/28	3/25	3/22	3/19	3/16	3/13	3/09	3/04
16	3/22	3/15	3/11	3/07	3/03	2/28	2/24	2/19	2/13

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	9/12	9/18	9/21	9/25	9/28	10/01	10/04	10/08	10/13
32	9/25	9/29	10/02	10/05	10/08	10/10	10/13	10/16	10/21
28	10/01	10/06	10/11	10/14	10/17	10/21	10/24	10/29	11/03
24	10/19	10/24	10/28	10/31	11/03	11/07	11/10	11/14	11/19
20	10/25	10/31	11/05	11/09	11/13	11/17	11/21	11/26	12/03
16	11/04	11/11	11/16	11/20	11/23	11/27	12/01	12/06	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	167	159	153	148	143	139	134	128	120
32	181	175	171	167	164	160	157	153	147
28	209	202	197	193	190	186	182	177	170
24	235	228	224	220	216	213	209	204	198
20	261	253	248	243	239	234	230	224	217
16	291	282	275	270	264	259	254	247	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.

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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	1154	886	673	353	150	14	0	6	77	317	655	1013	5298
60	999	746	519	224	74	2	0	1	28	189	508	858	4148
57	906	666	434	159	43	0	0	0	12	127	425	768	3540
55	844	613	377	123	28	0	0	0	7	93	370	710	3165
50	699	484	250	54	8	0	0	0	1	36	247	566	2345
32	253	140	21	0	0	0	0	0	0	0	23	174	611

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	122	178	371	645	946	1178	1375	1329	1033	715	358	184	8434
55	0	8	14	77	261	488	662	616	349	94	15	7	2591
57	0	4	9	54	214	428	600	554	295	66	9	3	2236
60	0	0	2	28	152	340	507	461	221	35	2	0	1748
65	0	0	0	7	73	202	352	312	120	8	0	0	1074
70	0	0	0	1	26	93	208	180	53	1	0	0	562

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	33	84	223	445	735	958	1155	1109	819	498	207	59	33	117	340	785	1520	2478	3633	4742	5561	6059	6266	6325
45	8	44	137	314	580	808	1000	954	669	355	126	29	8	52	189	503	1083	1891	2891	3845	4514	4869	4995	5024
50	1	16	74	199	429	658	845	799	522	232	66	11	1	17	91	290	719	1377	2222	3021	3543	3775	3841	3852
55	0	4	34	118	283	509	690	644	381	131	30	3	0	4	38	156	439	948	1638	2282	2663	2794	2824	2827
60	0	0	15	60	166	363	535	489	255	63	8	0	0	0	15	75	241	604	1139	1628	1883	1946	1954	1954
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	31	66	154	283	470	644	777	740	535	328	136	47	31	97	251	534	1004	1648	2425	3165	3700	4028	4164	4211

(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.
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