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: ST CHARLES ELM POINT, MO **COOP ID: 237397**

Climate Division: MO 2 **NWS Call Sign:** **Elevation: 467 Feet** **Lat: 38˚49N** **Lon: 90˚31W**

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	37.5	18.7	28.1	76	1950	24	40.0	1990	-20+	1930	18	13.8	1977	1143	0	.0	.0	5.8	11.4	27.7	2.9
Feb	43.7	23.0	33.4	83	1932	10	41.8	1999	-14	1996	3	20.4	1978	885	0	.0	.0	8.9	6.0	22.7	1.1
Mar	54.6	32.7	43.7	93	1929	24	49.3	1977	-7	1978	6	36.2	1984	663	0	.0	.0	19.8	1.2	16.4	.2
Apr	66.0	42.8	54.4	94	1989	28	62.7	1981	17	1920	5	48.7	1983	330	13	.0	.3	27.2	.0	4.2	.0
May	75.6	52.7	64.2	101+	1934	31	70.1	1987	30	1978	2	59.5	1981	126	98	.0	1.1	30.9	.0	@	.0
Jun	84.2	62.0	73.1	106	1931	30	77.6	1971	41	1972	1	68.3	1982	9	252	.1	7.1	30.0	.0	.0	.0
Jul	88.8	66.6	77.7	115	1954	14	81.8	1980	47+	1972	7	73.9	1996	0	392	1.1	14.4	31.0	.0	.0	.0
Aug	87.0	63.7	75.4	112	1934	9	80.7	1983	43+	1986	30	69.9	1992	8	329	.8	11.4	31.0	.0	.0	.0
Sep	80.1	55.2	67.7	106+	1954	5	72.8	1998	31+	1983	24	62.0	1974	52	130	.1	4.1	30.0	.0	@	.0
Oct	68.9	43.5	56.2	97	1953	2	62.9	1971	19	1925	30	50.1	1987	290	17	.0	.1	30.0	.0	3.9	.0
Nov	54.5	34.1	44.3	87+	1968	1	52.1	1999	-4	1929	30	37.3	1976	620	0	.0	.0	18.2	.9	14.8	.0
Dec	42.2	23.6	32.9	77	1948	15	41.1	1982	-18+	1989	23	20.7	1983	995	0	.0	.0	8.8	6.3	25.3	1.0
Ann	65.3	43.2	54.3	115	Jul 1954	14	81.8	Jul 1980	-20+	Jan 1930	18	13.8	Jan 1977	5121	1231	2.1	38.5	271.6	25.8	115.0	5.2

\+ 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: 1918-2001

(3) Derived from 1971-2000 serially complete daily data

Issue Date: February 2004

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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	2.23	1.82	3.94	1950	4	5.73	1993	.05	1986
Feb	2.33	1.78	2.81	1986	2	6.33	1986	.45	1991
Mar	3.44	3.15	2.95	1977	28	7.28	1998	1.10+	1986
Apr	4.12	3.39	3.87	1996	29	10.97	1994	1.25	1988
May	4.47	3.69	4.79	1995	17	13.31	1995	1.30	1979
Jun	3.62	2.85	4.50	1957	15	11.05	1985	.45	1972
Jul	4.00	3.65	5.88	1987	7	10.57	1981	.23	1997
Aug	3.03	2.71	5.42	1946	16	5.74	1987	.10	1971
Sep	3.00	2.42	3.30	1920	8	9.15	1993	.10	1979
Oct	3.08	2.88	3.39	1986	4	6.45	1986	.67	1971
Nov	3.79	3.37	5.25	1946	1	8.98	1985	.48	1989
Dec	3.02	2.45	3.40	1982	3	8.20	1971	.44	1989
Ann	40.13	39.61	5.88	Jul 1987	7	13.31	May 1995	.05	Jan 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.0	4.7	1.3	.5
Feb	7.1	4.2	1.4	.6
Mar	10.3	7.2	2.3	.6
Apr	10.9	7.7	2.8	.8
May	10.2	7.5	2.8	1.0
Jun	8.0	5.9	2.3	1.0
Jul	8.5	5.9	2.8	1.3
Aug	7.1	5.1	2.2	.9
Sep	7.3	5.0	2.1	.9
Oct	8.3	5.7	2.0	.8
Nov	9.7	6.8	2.6	.9
Dec	7.9	5.2	1.9	1.0
Ann	103.3	70.9	26.5	10.3

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	.22	.38	.68	.99	1.32	1.70	2.15	2.72	3.49	4.77	6.02
Feb	.46	.67	1.02	1.33	1.65	1.99	2.37	2.84	3.45	4.43	5.36
Mar	1.32	1.64	2.10	2.48	2.84	3.21	3.61	4.07	4.65	5.56	6.38
Apr	1.07	1.46	2.06	2.58	3.10	3.65	4.25	4.97	5.91	7.39	8.77
May	1.26	1.68	2.32	2.88	3.43	4.00	4.63	5.37	6.34	7.85	9.27
Jun	.57	.88	1.41	1.91	2.42	2.99	3.63	4.42	5.48	7.20	8.85
Jul	1.01	1.38	1.97	2.48	2.99	3.53	4.13	4.84	5.77	7.24	8.62
Aug	.42	.67	1.11	1.53	1.97	2.45	3.01	3.70	4.63	6.14	7.60
Sep	.42	.67	1.10	1.52	1.95	2.43	2.99	3.67	4.59	6.09	7.54
Oct	.79	1.08	1.52	1.92	2.31	2.72	3.18	3.72	4.43	5.55	6.60
Nov	.77	1.11	1.67	2.18	2.69	3.24	3.86	4.61	5.59	7.17	8.67
Dec	.61	.89	1.33	1.74	2.15	2.58	3.08	3.67	4.46	5.71	6.90
Ann	27.09	29.56	32.76	35.20	37.39	39.51	41.71	44.16	47.14	51.48	55.26

\+ 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: 1918-2001
(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	3.5	3.0	1	#
Feb	3.4	3.2	#	0
Mar	1.5	.0	#	0
Apr	.2	.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	.8	.0	#	0
Dec	2.0	1.0	#	0
Ann	11.4	7.2	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	10.0	1982	30	12.6	1982	14	1977	14	10	1978
Feb	10.0	1993	16	10.0	1984	10	1993	26	1	1993
Mar	7.0	1974	24	7.0+	1990	8	1978	8	3	1978
Apr	4.0	1971	6	4.0	1971	4	1971	6	#	1971
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	7.4	1975	27	7.4	1975	7	1975	27	#	1975
Dec	10.0	1973	31	10.0	1990	5	2000	14	#+	2000
Ann	10.0+	Feb 1993	16	12.6	Jan 1982	14	Jan 1977	14	10	Jan 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.0	1.4	.6	.2	.1
Feb	1.2	1.0	.6	.2	@
Mar	.5	.4	.2	.2	.0
Apr	@	@	@	.0	.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	.2	.2	.1	.1	.0
Dec	.8	.6	.3	.1	@
Ann	4.7	3.6	1.8	.8	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	.2	.2	.2	.0
Apr	.1	.1	.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	.1	.1	.0
Dec	.2	.0	.0	.0
Ann	-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

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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	5/05	5/01	4/28	4/25	4/22	4/19	4/16	4/11
32	4/27	4/22	4/18	4/15	4/12	4/10	4/07	4/03	3/29
28	4/15	4/11	4/08	4/05	4/02	3/30	3/27	3/24	3/20
24	4/06	4/01	3/29	3/26	3/23	3/21	3/18	3/14	3/09
20	3/26	3/20	3/15	3/11	3/07	3/03	2/27	2/22	2/16
16	3/15	3/08	3/03	2/27	2/23	2/19	2/15	2/10	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	9/25	9/29	10/02	10/04	10/07	10/09	10/12	10/15	10/19
32	10/02	10/07	10/11	10/14	10/17	10/20	10/24	10/27	11/02
28	10/18	10/23	10/27	10/30	11/02	11/05	11/09	11/13	11/18
24	10/22	10/29	11/03	11/08	11/12	11/16	11/20	11/25	12/02
20	11/06	11/12	11/16	11/20	11/24	11/27	12/01	12/05	12/12
16	11/15	11/22	11/26	11/30	12/04	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	184	177	172	168	164	160	155	150	143
32	212	203	197	192	187	182	177	171	162
28	234	227	222	218	214	210	205	200	193
24	259	250	243	238	233	228	222	216	207
20	287	278	272	266	261	256	250	244	235
16	309	300	294	288	283	278	272	266	257

***** 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	1143	885	663	330	126	9	0	8	52	290	620	995	5121
60	988	745	515	208	59	1	0	0	15	172	474	840	4017
57	895	667	428	149	33	0	0	0	5	117	392	748	3434
55	834	615	372	115	21	0	0	0	2	87	338	690	3074
50	690	487	250	51	6	0	0	0	0	35	221	546	2286
32	250	146	24	0	0	0	0	0	0	0	16	156	592

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	130	185	384	672	995	1233	1415	1344	1068	750	386	184	8746
55	1	10	19	97	303	543	702	631	381	124	18	5	2834
57	0	6	13	71	253	484	640	569	323	92	11	1	2463
60	0	0	7	41	186	395	547	476	243	54	4	0	1953
65	0	0	0	13	98	252	392	329	130	17	0	0	1231
70	0	0	0	3	40	131	241	197	55	3	0	0	670

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	31	74	212	449	758	998	1173	1100	832	509	195	52	31	105	317	766	1524	2522	3695	4795	5627	6136	6331	6383
45	9	36	126	314	603	848	1018	945	682	360	116	26	9	45	171	485	1088	1936	2954	3899	4581	4941	5057	5083
50	3	15	71	205	449	698	863	790	533	234	60	8	3	18	89	294	743	1441	2304	3094	3627	3861	3921	3929
55	0	4	32	117	303	548	708	635	388	136	26	3	0	4	36	153	456	1004	1712	2347	2735	2871	2897	2900
60	0	0	13	61	184	400	553	480	260	66	8	0	0	0	13	74	258	658	1211	1691	1951	2017	2025	2025
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	24	57	138	272	477	677	801	742	541	323	124	41	24	81	219	491	968	1645	2446	3188	3729	4052	4176	4217

(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