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: CLEARWATER DAM, MO **COOP ID: 231674**

Climate Division: MO 5 **NWS Call Sign:** **Elevation: 660 Feet** **Lat: 37˚08N** **Lon: 90˚47W**

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	42.4	20.1	31.3	77	1952	26	39.9	1990	-19	1963	24	18.4	1977	1045	0	.0	.0	8.7	6.9	27.4	2.0
Feb	49.4	24.2	36.8	87	1962	13	45.4	1976	-18	1951	2	26.4	1978	789	0	.0	.0	13.2	3.8	22.1	.6
Mar	59.5	33.3	46.4	89+	1967	14	52.2	1976	-2	1960	5	39.8	1996	577	0	.0	.0	23.4	.5	15.6	.0
Apr	70.9	42.2	56.6	95	1965	23	63.9	1981	19	1962	3	50.5	1983	271	17	.0	.5	28.8	.0	4.2	.0
May	79.1	51.4	65.3	97+	1953	27	71.3	1987	29+	1960	1	60.4	1976	99	107	.0	1.5	31.0	.0	.1	.0
Jun	86.9	60.6	73.8	106	1952	29	77.3	1984	41	1972	1	68.3	1974	5	267	.2	10.1	30.0	.0	.0	.0
Jul	91.7	65.6	78.7	110+	1980	17	84.5	1980	48+	1972	6	74.0	1971	0	423	1.9	20.1	31.0	.0	.0	.0
Aug	89.7	63.5	76.6	109	1980	1	82.7	1983	41+	1986	30	72.0	1992	4	362	1.7	15.9	31.0	.0	.0	.0
Sep	81.4	56.0	68.7	106	1954	3	73.3	1998	32	1967	29	62.6	1974	44	154	.2	5.3	30.0	.0	.0	.0
Oct	70.5	43.5	57.0	99	1953	3	62.5	1971	19+	1981	25	52.0	1976	264	17	.0	.2	30.5	.0	3.9	.0
Nov	57.3	33.7	45.5	86+	1968	1	50.3	1990	-1	1950	25	37.9	1976	585	0	.0	.0	21.4	.2	15.1	.0
Dec	46.1	24.4	35.3	78	1951	31	43.3	1971	-13	1983	25	23.4	1983	923	0	.0	.0	11.5	3.8	24.0	.6
Ann	68.7	43.2	56.0	110+	Jul 1980	17	84.5	Jul 1980	-19	Jan 1963	24	18.4	Jan 1977	4606	1347	4.0	53.6	290.5	15.2	112.4	3.2

\+ 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: 1948-2001

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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	3.11	2.80	3.70	1982	31	9.27	1982	.14	1986
Feb	3.07	2.70	3.00	1989	3	8.03	1989	.63	1983
Mar	4.50	4.21	3.83	1977	28	9.53	1977	1.35	1972
Apr	4.50	3.84	5.18	1983	30	10.71	1983	.80	2000
May	4.48	3.74	4.65	1957	23	10.42	1981	1.80	1994
Jun	3.72	3.38	5.22	2000	19	9.65	1998	.56	1984
Jul	3.87	3.33	4.06	1964	29	9.48	1987	.12	1974
Aug	3.55	3.03	4.08	1982	16	14.31	1982	.55	1995
Sep	3.36	2.68	4.68	1966	27	9.98	1992	.22	1976
Oct	3.14	2.70	2.80	1998	6	11.24	1984	.46	1971
Nov	4.82	5.24	4.20	1994	5	10.05	1994	.33	1976
Dec	3.99	2.89	5.95	1982	3	17.90	1982	.73	1989
Ann	46.11	45.22	5.95	Dec 1982	3	17.90	Dec 1982	.12	Jul 1974

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.5	5.4	1.8	.8
Feb	7.7	5.3	2.2	.8
Mar	10.7	7.5	3.3	1.1
Apr	10.1	6.8	2.8	1.3
May	10.3	7.4	3.1	1.2
Jun	9.0	5.9	2.7	1.0
Jul	8.1	6.1	2.6	1.2
Aug	7.4	5.2	2.2	1.1
Sep	7.4	4.8	2.0	.9
Oct	7.5	5.2	2.3	.8
Nov	9.1	6.5	3.1	1.6
Dec	8.5	5.8	2.7	1.1
Ann	104.3	71.9	30.8	12.9

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	.54	.82	1.27	1.70	2.13	2.61	3.14	3.80	4.67	6.08	7.43
Feb	.89	1.18	1.62	2.00	2.37	2.76	3.19	3.69	4.34	5.37	6.32
Mar	1.51	1.93	2.56	3.09	3.60	4.12	4.69	5.37	6.23	7.56	8.79
Apr	.88	1.28	1.94	2.55	3.16	3.83	4.57	5.48	6.67	8.59	10.42
May	1.68	2.10	2.70	3.20	3.68	4.16	4.69	5.30	6.08	7.28	8.38
Jun	.81	1.15	1.69	2.19	2.68	3.21	3.80	4.51	5.45	6.95	8.36
Jul	.55	.87	1.42	1.96	2.52	3.14	3.85	4.73	5.91	7.84	9.69
Aug	.64	.96	1.48	1.96	2.45	2.98	3.59	4.33	5.30	6.88	8.38
Sep	.48	.76	1.25	1.71	2.20	2.73	3.35	4.10	5.12	6.77	8.37
Oct	.62	.90	1.36	1.78	2.21	2.67	3.19	3.82	4.65	5.99	7.26
Nov	1.00	1.44	2.14	2.79	3.44	4.14	4.92	5.87	7.11	9.11	11.00
Dec	.77	1.13	1.72	2.26	2.80	3.39	4.06	4.86	5.93	7.64	9.27
Ann	31.72	34.47	38.01	40.72	43.13	45.47	47.89	50.57	53.84	58.59	62.71

\+ 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

Complete documentation available from:
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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	1.9	.0	1	#
Feb	2.2	.0	1	#
Mar	.7	.0	#	0
Apr	.0	.0	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
Nov	.3	.0	#	0
Dec	.1	.0	#	0
Ann	5.2	.0	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	6.7	1978	17	12.9	1978	12	1978	21	5	1978
Feb	6.5	1980	8	12.7	1980	11	1982	4	6	1985
Mar	3.0	1978	3	6.0	1978	10+	1999	15	1+	1999
Apr	.0	0	0	.0	0	0	0	0	0	0
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	#	1989	19	#	1989	0	0	0	0	0
Nov	6.0	1980	27	6.0	1980	6	1980	27	1	1980
Dec	1.0	1985	20	1.0	1985	7	1984	6	1	1983
Ann	6.7	Jan 1978	17	12.9	Jan 1978	12	Jan 1978	21	6	Feb 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.1	.6	.1	.1	.0
Feb	.8	.6	.4	.1	.0
Mar	.3	.2	@	.0	.0
Apr	.0	.0	.0	.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	@	@	@	@	.0
Dec	.2	.1	.0	.0	.0
Ann	2.4	1.5	.5	.2	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	2.4	1.2	1.0	.7
Feb	3.2	2.6	1.7	.3
Mar	.5	.2	.1	.0
Apr	.0	.0	.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	.2	.1	.1	.0
Dec	.1	.0	.0	.0
Ann	6.4	4.1	2.9	1.0

+ 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	5/14	5/08	5/04	5/01	4/27	4/24	4/20	4/16	4/10
32	4/28	4/23	4/19	4/16	4/13	4/11	4/08	4/04	3/30
28	4/15	4/10	4/07	4/04	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	3/15	3/10
20	3/25	3/19	3/15	3/11	3/08	3/04	2/28	2/24	2/18
16	3/16	3/09	3/03	2/27	2/23	2/19	2/14	2/09	2/02

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	9/28	10/01	10/04	10/07	10/09	10/11	10/13	10/16	10/20
32	10/08	10/12	10/15	10/17	10/20	10/22	10/25	10/28	11/01
28	10/20	10/24	10/27	10/30	11/01	11/04	11/06	11/09	11/14
24	10/28	11/03	11/06	11/09	11/12	11/15	11/18	11/22	11/27
20	11/05	11/11	11/15	11/19	11/22	11/26	11/29	12/03	12/09
16	11/14	11/22	11/27	12/02	12/07	12/11	12/16	12/21	12/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	183	176	172	168	164	160	156	151	145
32	206	200	196	192	189	185	182	177	171
28	231	225	220	216	213	209	205	200	194
24	254	247	242	237	233	229	225	220	213
20	280	273	268	263	259	255	250	245	237
16	319	307	299	292	286	280	273	265	254

***** 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	1045	789	577	271	99	5	0	4	44	264	585	923	4606
60	890	649	432	157	40	0	0	0	11	149	439	768	3535
57	797	570	348	104	20	0	0	0	4	96	357	678	2974
55	736	518	296	76	12	0	0	0	2	68	304	621	2633
50	592	391	186	27	2	0	0	0	0	24	190	479	1891
32	177	80	10	0	0	0	0	0	0	0	10	115	392

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	154	215	457	736	1031	1252	1446	1382	1101	775	415	215	9179
55	0	8	29	122	330	562	733	669	412	131	19	8	3023
57	0	4	19	90	276	502	671	607	355	96	12	4	2636
60	0	0	10	53	203	412	578	514	272	56	4	0	2102
65	0	0	0	17	107	267	423	362	154	17	0	0	1347
70	0	0	0	3	43	141	272	224	71	3	0	0	757

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	39	92	251	508	792	1018	1205	1148	871	532	226	67	39	131	382	890	1682	2700	3905	5053	5924	6456	6682	6749
45	14	46	156	366	637	868	1050	993	721	384	133	32	14	60	216	582	1219	2087	3137	4130	4851	5235	5368	5400
50	2	17	82	241	483	718	895	838	571	255	71	13	2	19	101	342	825	1543	2438	3276	3847	4102	4173	4186
55	0	2	37	140	334	568	740	683	423	148	31	1	0	2	39	179	513	1081	1821	2504	2927	3075	3106	3107
60	0	0	15	72	198	418	585	528	285	68	9	0	0	0	15	87	285	703	1288	1816	2101	2169	2178	2178
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	35	78	174	328	509	686	802	765	565	351	148	49	35	113	287	615	1124	1810	2612	3377	3942	4293	4441	4490

(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