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: JOLIET, MT **COOP ID: 244506**

Climate Division: MT 5 **NWS Call Sign:** **Elevation: 3,700 Feet** **Lat: 45˚29N** **Lon: 108˚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	33.8	9.6	21.7	63	1988	29	32.7	1981	-37	1997	12	5.6	1979	1343	0	.0	.0	4.3	10.3	29.1	7.4
Feb	40.2	15.1	27.7	73	1982	21	38.7	1991	-35	1989	3	11.7	1989	1047	0	.0	.0	8.9	5.5	25.7	4.1
Mar	48.9	23.0	36.0	78+	1999	25	44.0	1986	-22	1960	2	27.4	1996	902	0	.0	.0	18.2	2.1	26.2	1.1
Apr	57.6	30.4	44.0	87+	1987	28	51.3	1987	-4	1997	12	35.3	1975	630	0	.0	.0	24.5	.4	17.2	@
May	67.8	39.5	53.7	94	2001	14	58.4	1987	15	1968	11	49.0	1996	356	4	.0	.4	29.6	.0	4.5	.0
Jun	77.9	47.3	62.6	102	1988	23	72.3	1988	28	2000	1	57.5	1998	131	59	.1	4.2	29.9	.0	.2	.0
Jul	84.8	52.6	68.7	104+	1989	4	72.7	1989	32	1968	31	61.3	1993	42	158	.6	12.0	31.0	.0	.0	.0
Aug	83.8	50.8	67.3	104	1961	5	72.3	1971	29+	1992	25	62.4	1974	66	136	.2	11.0	31.0	.0	.1	.0
Sep	72.5	41.1	56.8	99	1983	1	65.2	1998	18+	1985	30	51.2	1984	275	28	.0	2.1	29.1	.0	3.2	.0
Oct	60.6	31.0	45.8	90	1992	1	50.8	1988	-10	1991	30	40.2	1984	595	0	.0	@	27.0	.3	13.7	.1
Nov	44.0	20.2	32.1	75+	1999	12	43.3	1999	-28	1959	13	16.2	1985	989	0	.0	.0	11.9	4.2	25.2	1.6
Dec	35.7	11.9	23.8	69	1980	15	31.5	1999	-39	1983	24	8.1	1983	1277	0	.0	.0	4.8	8.2	29.1	4.8
Ann	59.0	31.0	45.0	104+	Jul 1989	4	72.7	Jul 1989	-39	Dec 1983	24	5.6	Jan 1979	7653	385	.9	29.7	250.2	31.0	174.2	19.1

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1951-2001

(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	.74	.67	.95	1975	26	2.16	1975	.11	1983
Feb	.63	.55	.64	1955	18	1.53	2000	.00+	1998
Mar	1.27	1.21	1.31	1973	23	3.38	1980	.18	1999
Apr	1.96	2.04	2.06	1964	25	4.84	1991	.34	1977
May	2.96	2.56	4.25	1978	18	9.50	1978	.59	1993
Jun	1.72	1.42	4.20	2001	14	4.58	1992	.49	1971
Jul	1.10	.86	1.45	1994	6	3.16	1987	.04	1976
Aug	1.08	.80	2.00	1987	15	3.75	1987	.00	1996
Sep	1.42	1.40	2.79	1978	18	4.85	1978	.00	1979
Oct	1.55	1.35	2.60	1974	31	3.96	1971	.05	1987
Nov	.70	.61	1.27	1957	1	2.05	1978	.14	1999
Dec	.64	.49	.62	1973	18	1.51	1989	.02	1976
Ann	15.77	15.59	4.25	May 1978	18	9.50	May 1978	.00+	Feb 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.2	2.6	.1	.0
Feb	5.2	2.5	@	.0
Mar	8.7	4.1	.5	.1
Apr	9.1	5.3	1.0	.2
May	10.3	6.2	1.8	.6
Jun	9.3	4.8	.9	.2
Jul	7.0	3.0	.6	.2
Aug	6.1	3.2	.4	.1
Sep	6.6	3.8	.8	.1
Oct	6.1	3.5	.9	.3
Nov	5.4	2.5	.1	.0
Dec	5.5	2.6	.1	.0
Ann	85.5	44.1	7.2	1.8

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	.16	.23	.33	.43	.53	.64	.76	.90	1.09	1.40	1.68
Feb	.00	.12	.25	.35	.45	.55	.66	.79	.97	1.24	1.51
Mar	.34	.46	.64	.80	.96	1.13	1.31	1.53	1.81	2.26	2.67
Apr	.45	.63	.92	1.18	1.43	1.71	2.01	2.38	2.86	3.62	4.34
May	.64	.92	1.35	1.74	2.14	2.56	3.03	3.60	4.34	5.54	6.66
Jun	.39	.55	.80	1.03	1.25	1.49	1.76	2.08	2.51	3.18	3.81
Jul	.16	.25	.41	.56	.72	.90	1.10	1.35	1.68	2.23	2.76
Aug	.10	.22	.40	.56	.72	.90	1.10	1.34	1.66	2.18	2.68
Sep	.11	.26	.48	.69	.91	1.15	1.42	1.75	2.20	2.93	3.64
Oct	.24	.37	.60	.81	1.03	1.27	1.55	1.89	2.34	3.08	3.79
Nov	.18	.25	.35	.44	.53	.62	.73	.85	1.01	1.27	1.51
Dec	.09	.14	.24	.33	.42	.52	.64	.78	.98	1.30	1.60
Ann	10.51	11.51	12.79	13.78	14.66	15.52	16.41	17.41	18.61	20.38	21.92

\+ 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: 1951-2001
(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	11.1	10.1	4	4
Feb	7.4	6.0	3	2
Mar	9.7	7.4	1	1
Apr	5.9	2.0	1	#
May	.8	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	1.1	.0	#	0
Oct	4.6	2.3	#	#
Nov	8.3	6.5	1	1
Dec	9.9	9.5	3	2
Ann	58.8	43.8	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	13.0	1975	26	28.8	1975	22	1975	27	13	1979
Feb	7.0	2000	25	20.4	1971	19	1975	8	15	1978
Mar	10.0	1977	29	27.1	1980	18	1978	1	9	1978
Apr	19.0	1997	5	24.3	1991	22	1984	26	3	1997
May	6.0	1981	11	6.0+	1995	6+	1984	1	#+	1995
Jun	.0	0	0	.0	0	1	1998	3	#	1998
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	5.0	2000	21	8.0	2000	7	2000	22	1	2000
Oct	14.0	1996	26	16.0	1996	11	1980	16	1	1993
Nov	9.5	1986	11	24.2	1978	14	1986	11	7	1978
Dec	10.7	1971	6	19.9	1978	17	1978	6	13	1978
Ann	19.0	Apr 1997	5	28.8	Jan 1975	22+	Apr 1984	26	15	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.7	3.2	1.4	.6	@
Feb	3.9	2.8	1.0	.2	.0
Mar	3.9	3.5	1.2	.5	@
Apr	1.9	1.8	.8	.4	.1
May	.2	.2	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.4	.3	.2	@	.0
Oct	1.2	1.1	.5	.2	.1
Nov	3.3	2.5	1.0	.3	.0
Dec	4.8	3.7	1.1	.3	@
Ann	24.3	19.1	7.3	2.6	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	22.1	15.8	10.0	3.5
Feb	13.0	8.4	5.8	2.5
Mar	7.5	4.1	2.5	.6
Apr	2.1	1.5	.9	.3
May	.2	.1	.1	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.3	.2	.1	.0
Oct	1.5	1.0	.7	.1
Nov	8.2	5.2	3.2	.5
Dec	19.3	12.2	7.5	1.6
Ann	74.2	48.5	30.8	9.1

+ 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	6/25	6/20	6/16	6/13	6/09	6/06	6/03	5/30	5/25
32	6/06	6/01	5/27	5/24	5/21	5/17	5/14	5/10	5/04
28	5/22	5/16	5/12	5/09	5/06	5/03	4/29	4/26	4/20
24	5/07	5/02	4/28	4/25	4/23	4/20	4/17	4/14	4/09
20	4/29	4/24	4/20	4/17	4/14	4/11	4/07	4/03	3/29
16	4/20	4/13	4/07	4/03	3/29	3/25	3/21	3/15	3/08

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	8/31	9/04	9/06	9/08	9/11	9/13	9/15	9/17	9/21
32	9/06	9/11	9/14	9/17	9/20	9/22	9/25	9/28	10/03
28	9/16	9/21	9/25	9/28	10/01	10/03	10/07	10/10	10/15
24	9/24	9/29	10/03	10/07	10/10	10/13	10/16	10/20	10/26
20	10/07	10/12	10/16	10/19	10/22	10/25	10/28	10/31	11/05
16	10/20	10/26	10/29	11/02	11/05	11/07	11/11	11/14	11/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	110	104	99	96	92	89	85	81	75
32	143	135	130	125	121	117	112	107	99
28	171	162	157	152	147	142	137	132	123
24	190	183	178	174	170	165	161	156	149
20	212	204	199	194	190	186	182	176	169
16	250	240	232	225	219	213	207	199	188

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1343	1047	902	630	356	131	42	66	275	595	989	1277	7653
60	1188	907	747	483	221	57	11	22	166	440	839	1122	6203
57	1095	823	654	398	153	28	3	10	114	349	749	1029	5405
55	1033	771	592	344	116	17	1	5	85	290	695	967	4916
50	887	641	447	221	48	3	0	1	33	161	555	815	3812
32	408	249	80	11	0	0	0	0	0	4	173	333	1258

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	87	127	201	371	671	918	1139	1094	743	432	175	79	6037
55	0	5	0	14	74	245	427	386	138	5	6	0	1300
57	0	0	0	8	50	196	367	329	107	2	0	0	1059
60	0	0	0	3	24	135	282	248	69	1	0	0	762
65	0	0	0	0	4	59	158	136	28	0	0	0	385
70	0	0	0	0	0	18	73	60	9	0	0	0	160

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	10	30	83	214	461	702	925	885	558	279	59	12	10	40	123	337	798	1500	2425	3310	3868	4147	4206	4218
45	0	8	30	117	316	552	770	730	410	160	22	0	0	8	38	155	471	1023	1793	2523	2933	3093	3115	3115
50	0	0	6	52	184	403	615	576	277	80	4	0	0	0	6	58	242	645	1260	1836	2113	2193	2197	2197
55	0	0	0	15	91	261	460	423	162	23	0	0	0	0	0	15	106	367	827	1250	1412	1435	1435	1435
60	0	0	0	2	32	144	310	271	72	4	0	0	0	0	0	2	34	178	488	759	831	835	835	835
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	5	33	88	181	314	448	582	558	379	219	52	9	5	38	126	307	621	1069	1651	2209	2588	2807	2859	2868

(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