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: HAMILTON, MT **COOP ID: 243885**

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 3,529 Feet** **Lat: 46˚14N** **Lon: 114˚10W**

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	34.4	16.8	25.6	63	1989	30	36.3	1994	-36	1937	21	5.3	1979	1222	0	.0	.0	3.4	10.0	27.6	4.2
Feb	40.8	20.2	30.5	71+	1995	24	38.6	1991	-39	1899	4	16.3	1989	966	0	.0	.0	7.0	4.9	25.0	1.9
Mar	49.7	26.3	38.0	82	1941	18	43.7	1992	-14	1955	26	32.9	1976	838	0	.0	.0	16.9	.9	25.3	.2
Apr	57.9	32.2	45.1	90	1936	18	50.3	1987	1	1936	1	38.3	1975	598	0	.0	.0	24.8	@	14.8	.0
May	66.3	39.2	52.8	102	1936	30	58.1	1993	18	1903	6	48.1	1974	383	3	.0	.3	30.1	.0	4.4	.0
Jun	74.2	45.3	59.8	100	1933	15	65.4	1986	24	1924	6	54.7	1981	184	27	.0	1.7	30.0	.0	.1	.0
Jul	82.8	49.3	66.1	105	1895	23	71.4	1998	31	1971	7	58.8	1993	83	114	.1	7.9	31.0	.0	@	.0
Aug	82.0	48.1	65.1	103	1969	24	70.2	1998	19+	1895	28	59.9	1980	95	97	@	6.7	31.0	.0	.1	.0
Sep	71.0	40.1	55.6	98+	1998	2	63.9	1998	10	1895	7	49.6	1985	305	21	.0	.6	29.5	.0	3.7	.0
Oct	58.7	31.0	44.9	90	1901	1	51.7	1988	-1+	1935	31	41.0	1971	625	0	.0	.0	26.1	.3	16.8	.0
Nov	42.3	23.2	32.8	76	1999	12	40.0	1999	-24+	1959	16	22.3	1985	967	0	.0	.0	8.0	3.9	24.7	.9
Dec	34.0	16.9	25.5	66+	1957	9	34.0	1980	-31+	1972	9	12.3	1983	1228	0	.0	.0	2.6	11.5	28.2	3.0
Ann	57.8	32.4	45.2	105	Jul 1895	23	71.4	Jul 1998	-39	Feb 1899	4	5.3	Jan 1979	7494	262	.1	17.2	240.4	31.5	170.7	10.2

\+ 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: 1895-2001

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

Issue Date: February 2004

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COOP ID: 243885

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 3,529 Feet** **Lat: 46˚14N** **Lon: 114˚10W**

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	1.11	.95	1.09	1974	15	3.51	1974	.17	1992
Feb	.86	.76	1.12+	1938	7	2.87	1986	.02	1991
Mar	.91	.84	.73	1951	5	2.14	1989	.21	1994
Apr	1.05	.96	1.34	1996	10	2.45	1996	.27	1977
May	1.75	1.74	2.23	1952	15	4.68	1980	.33	1999
Jun	1.62	1.57	1.93	1965	25	4.18	1993	.19	1978
Jul	1.00	.85	1.13+	1983	10	2.52	1998	.05	1971
Aug	1.14	1.02	1.74	1974	20	3.07	1975	.01	1988
Sep	1.07	1.01	1.70	1911	6	3.22	1985	.02+	1987
Oct	.78	.65	1.19	1911	11	3.73	1975	.01	1987
Nov	1.11	.91	1.55	1962	20	2.92	1998	.26	1982
Dec	1.14	1.00	1.58	1964	22	5.17	1996	.09	1976
Ann	13.54	12.89	2.23	May 1952	15	5.17	Dec 1996	.01+	Aug 1988

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.7	3.7	.4	@
Feb	8.1	2.9	.1	.0
Mar	10.6	3.1	.1	.0
Apr	9.9	3.2	.2	@
May	11.3	5.2	.7	.2
Jun	10.4	4.8	.6	.1
Jul	7.4	3.2	.3	.1
Aug	7.9	3.4	.4	.1
Sep	7.5	3.4	.4	@
Oct	7.2	2.2	.2	.1
Nov	10.6	3.4	.2	@
Dec	10.8	3.9	.2	.0
Ann	112.4	42.4	3.8	.6

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	.17	.26	.42	.57	.73	.91	1.11	1.36	1.69	2.24	2.76
Feb	.12	.19	.31	.43	.56	.70	.86	1.06	1.32	1.76	2.18
Mar	.25	.34	.47	.58	.70	.81	.94	1.10	1.30	1.61	1.90
Apr	.24	.33	.49	.63	.76	.91	1.07	1.27	1.53	1.94	2.33
May	.50	.67	.92	1.14	1.35	1.57	1.82	2.11	2.48	3.07	3.62
Jun	.36	.51	.75	.96	1.17	1.40	1.66	1.97	2.37	3.01	3.62
Jul	.10	.18	.31	.45	.60	.77	.97	1.22	1.56	2.13	2.68
Aug	.10	.18	.33	.49	.66	.86	1.09	1.38	1.78	2.46	3.12
Sep	.09	.16	.30	.45	.61	.80	1.02	1.30	1.68	2.32	2.95
Oct	.07	.12	.23	.34	.46	.59	.75	.96	1.23	1.70	2.16
Nov	.22	.32	.48	.63	.79	.95	1.13	1.35	1.65	2.12	2.57
Dec	.13	.22	.38	.54	.71	.90	1.12	1.40	1.77	2.39	2.99
Ann	8.99	9.85	10.97	11.82	12.58	13.33	14.10	14.96	16.00	17.54	18.87

\+ 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: 1895-2001
(3) Derived from 1971-2000 serially complete daily data

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Climate Division: MT 1 **NWS Call Sign:** **Elevation: 3,529 Feet** **Lat: 46˚14N** **Lon: 114˚10W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	19.9	-99.9	2	2
Feb	.6	-99.9	1	#
Mar	.5	-99.9	1	#
Apr	.3	.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	#	0
Oct	.4	.0	#	0
Nov	2.0	-99.9	1	#
Dec	3.6	-99.9	2	1
Ann	27.3	-9.9	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	4.8	1993	1	19.9	1989	12+	1980	10	9	1993
Feb	2.5	2000	11	2.5	2000	21	1975	8	7	1975
Mar	2.0	1998	17	2.0	1998	10	1980	5	9	1995
Apr	3.0	1972	16	3.0	1972	#+	1992	7	#+	1992
May	.0	0	0	.0	0	3	1978	23	#	1978
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	2	1983	18	#	1983
Oct	5.0	1973	31	5.0	1973	2	1991	27	#+	1999
Nov	8.0	1996	18	8.0	1996	22	1973	6	4	1993
Dec	3.5	1998	17	3.6	2000	12	1996	24	5	1996
Ann	8.0	Nov 1996	18	19.9	Jan 1989	22	Nov 1973	6	9+	Mar 1995

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9	-9.9
Mar	.6	.4	.0	.0	.0
Apr	.1	.1	.1	.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	.1	.1	.1	.1	.0
Nov	1.1	.8	.2	.0	.0
Dec	-9.9	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9	-9.9

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	.0	.0	.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	.0
Nov	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9
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	6/26	6/20	6/16	6/12	6/09	6/05	6/01	5/28	5/22
32	6/08	6/02	5/29	5/26	5/22	5/19	5/16	5/12	5/06
28	5/22	5/17	5/13	5/09	5/06	5/03	4/29	4/25	4/19
24	5/02	4/25	4/21	4/17	4/14	4/10	4/06	4/02	3/27
20	4/13	4/07	4/02	3/29	3/25	3/22	3/18	3/13	3/06
16	4/05	3/28	3/22	3/17	3/12	3/07	3/02	2/25	2/16

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	8/19	8/25	8/30	9/03	9/07	9/10	9/14	9/19	9/25
32	9/02	9/07	9/11	9/14	9/17	9/20	9/23	9/27	10/02
28	9/13	9/18	9/22	9/25	9/28	9/30	10/03	10/07	10/12
24	9/27	10/02	10/06	10/09	10/11	10/14	10/17	10/21	10/26
20	10/09	10/15	10/19	10/22	10/25	10/28	10/31	11/04	11/10
16	10/17	10/25	10/30	11/03	11/08	11/12	11/16	11/21	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	116	107	100	94	89	84	78	71	62
32	142	133	127	122	117	112	107	101	92
28	167	159	153	149	144	139	134	129	121
24	206	197	190	185	180	175	169	163	154
20	232	225	221	217	213	209	205	201	194
16	269	259	252	246	240	234	228	220	210

***** 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	1222	966	838	598	383	184	83	95	305	625	967	1228	7494
60	1067	826	683	449	242	89	28	36	190	471	817	1073	5971
57	974	742	590	363	171	49	13	17	134	379	727	980	5139
55	912	686	528	308	131	30	7	10	102	319	667	918	4618
50	769	554	379	184	55	6	0	2	44	184	524	763	3464
32	311	165	33	3	0	0	0	0	0	3	128	284	927

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	112	123	218	395	643	833	1055	1025	706	401	150	79	5740
55	0	0	0	9	61	173	349	322	118	4	0	0	1036
57	0	0	0	5	39	132	292	267	90	2	0	0	827
60	0	0	0	1	17	82	214	192	56	0	0	0	562
65	0	0	0	0	3	27	114	97	21	0	0	0	262
70	0	0	0	0	0	6	45	35	6	0	0	0	92

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	14	20	70	207	426	622	834	808	499	212	39	10	14	34	104	311	737	1359	2193	3001	3500	3712	3751	3761
45	0	2	22	109	281	472	679	653	357	109	11	0	0	2	24	133	414	886	1565	2218	2575	2684	2695	2695
50	0	0	1	45	161	325	524	498	222	45	3	0	0	0	1	46	207	532	1056	1554	1776	1821	1824	1824
55	0	0	0	16	76	194	371	347	116	13	0	0	0	0	0	16	92	286	657	1004	1120	1133	1133	1133
60	0	0	0	0	29	96	231	204	48	0	0	0	0	0	0	0	29	125	356	560	608	608	608	608
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	5	18	67	159	274	387	530	515	343	170	28	4	5	23	90	249	523	910	1440	1955	2298	2468	2496	2500

(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