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: HERON 2 NW, MT **COOP ID: 244084**

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 2,240 Feet** **Lat: 48˚04N** **Lon: 115˚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	31.7	19.8	25.8	61	1913	30	33.4	1981	-39	1927	21	11.7	1979	1217	0	.0	.0	@	13.3	29.5	3.1
Feb	37.3	22.6	30.0	59+	1995	24	36.5	1992	-32	1936	15	20.4	1989	981	0	.0	.0	1.0	5.5	26.2	1.5
Mar	46.1	26.7	36.4	73	1915	22	42.8	1992	-22	1955	4	30.7	1976	886	0	.0	.0	9.4	.7	25.5	.2
Apr	57.4	31.8	44.6	88+	1977	25	49.3	1987	-10	1936	2	39.9	1975	612	0	.0	.0	23.0	.0	17.3	.0
May	66.4	38.3	52.4	96	1936	30	58.5	1993	19	1954	1	48.4+	1996	394	1	.0	.3	30.2	.0	6.3	.0
Jun	73.2	43.9	58.6	99	1924	30	63.2+	1992	25+	1951	1	54.6	1976	207	13	.0	1.0	29.9	.0	1.1	.0
Jul	80.6	46.6	63.6	105+	1939	28	69.2	1998	29+	1924	29	57.8	1993	104	62	@	5.0	31.0	.0	.1	.0
Aug	80.3	45.7	63.0	106	1961	4	66.8	1986	21+	1969	31	58.2	1995	118	56	.0	4.8	31.0	.0	.2	.0
Sep	69.6	39.5	54.6	97+	1944	12	60.7	1998	9	1926	24	50.4	1971	322	8	.0	.4	29.7	.0	4.1	.0
Oct	55.1	32.6	43.9	87+	1943	4	49.0	1988	4	1935	31	40.5	1984	656	0	.0	.0	23.0	.1	16.2	.0
Nov	39.2	28.0	33.6	69	1923	17	38.9	1999	-16	1955	15	22.4	1985	942	0	.0	.0	2.3	4.2	22.1	.4
Dec	31.9	21.3	26.6	66	1912	5	33.1	1979	-35	1968	30	18.3	1983	1190	0	.0	.0	.2	14.0	28.7	1.7
Ann	55.7	33.1	44.4	106	Aug 1961	4	69.2	Jul 1998	-39	Jan 1927	21	11.7	Jan 1979	7629	140	@	11.5	210.7	37.8	177.3	6.9

\+ 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: 1912-2001

(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	4.27	4.23	2.24	1954	22	9.95	1974	.58	1985
Feb	3.38	3.20	1.88	1963	3	7.08	1982	.61	1993
Mar	2.68	2.40	1.61	1921	17	6.19	1997	.46	1992
Apr	2.22	2.10	1.37	1996	23	4.82	1993	.21	1977
May	2.81	2.45	10.18	1956	4	7.32	1998	1.30	1979
Jun	2.62	2.32	3.22	1992	13	6.08	1981	.63+	1989
Jul	1.46	1.15	1.55	1915	17	5.64	1993	.00	1973
Aug	1.35	1.12	2.94	1970	2	7.22	1976	.07	2000
Sep	1.72	1.55	1.73	1968	15	4.62	1985	.00	1990
Oct	2.24	1.67	1.77	1955	9	5.67	1995	.03	1974
Nov	4.55	4.56	2.17	1964	24	9.38	1989	.92	1979
Dec	4.46	4.69	2.32	1922	9	8.20	1996	.76	1985
Ann	33.76	33.15	10.18	May 1956	4	9.95	Jan 1974	.00+	Sep 1990

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	16.6	10.9	2.7	.5
Feb	13.8	8.8	1.8	.5
Mar	15.2	8.1	1.2	.1
Apr	11.6	6.8	.9	.1
May	13.2	7.6	1.4	.2
Jun	12.3	7.2	1.3	.2
Jul	7.6	4.3	.7	@
Aug	6.9	3.9	.6	.1
Sep	8.5	4.7	.8	@
Oct	11.3	6.3	1.2	.1
Nov	17.0	11.4	2.7	.7
Dec	17.0	11.4	2.6	.3
Ann	151.0	91.4	17.9	2.8

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	1.39	1.80	2.39	2.90	3.39	3.90	4.45	5.10	5.94	7.24	8.44
Feb	.97	1.29	1.78	2.20	2.61	3.03	3.51	4.06	4.78	5.91	6.97
Mar	.85	1.11	1.48	1.80	2.11	2.44	2.79	3.20	3.73	4.56	5.33
Apr	.63	.84	1.16	1.44	1.71	1.99	2.31	2.68	3.16	3.91	4.62
May	1.10	1.36	1.73	2.04	2.33	2.63	2.95	3.32	3.79	4.51	5.16
Jun	.73	.97	1.35	1.68	2.00	2.34	2.72	3.16	3.73	4.63	5.48
Jul	.09	.23	.46	.67	.90	1.15	1.44	1.80	2.28	3.08	3.85
Aug	.10	.18	.35	.54	.74	.98	1.27	1.63	2.14	2.99	3.83
Sep	.25	.47	.76	1.00	1.25	1.50	1.78	2.12	2.56	3.26	3.92
Oct	.25	.43	.74	1.05	1.39	1.76	2.20	2.74	3.47	4.69	5.88
Nov	1.51	1.94	2.57	3.11	3.63	4.16	4.75	5.43	6.30	7.67	8.92
Dec	1.68	2.10	2.69	3.19	3.66	4.15	4.67	5.27	6.05	7.24	8.32
Ann	25.06	26.77	28.95	30.60	32.05	33.45	34.89	36.48	38.40	41.16	43.54

\+ 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: 1912-2001
(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	25.9	24.7	15	12
Feb	15.7	15.2	16	15
Mar	6.9	6.6	9	6
Apr	1.3	.5	1	#
May	.1	.0	#	0
Jun	#	.0	0	0
Jul	#	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.5	.0	#	0
Nov	8.6	6.5	2	1
Dec	23.7	18.0	7	4
Ann	82.7	71.5	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	13.0	1982	23	56.7	1972	42	1997	24	34	1997
Feb	14.0	1981	12	35.7	1985	44	1997	13	37	1997
Mar	13.0	1996	4	21.7	1996	47	1997	15	38	1997
Apr	3.5	2000	14	6.0	1982	21	1975	3	7	1975
May	1.0	1978	4	1.0	1978	#+	1999	4	#+	1999
Jun	#	1979	6	#	1979	0	0	0	0	0
Jul	#	1999	4	#	1999	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1978	17	#+	1978	0	0	0	0	0
Oct	3.0	1975	23	3.9	1984	2	1984	29	#+	1994
Nov	9.7	1973	25	28.4	1973	22	1996	25	8	1996
Dec	12.5	1992	20	68.3	1996	43	1996	29	26	1996
Ann	14.0	Feb 1981	12	68.3	Dec 1996	47	Mar 1997	15	38	Mar 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	11.9	7.8	3.3	1.5	.2
Feb	7.8	5.2	1.9	.9	.1
Mar	5.3	3.0	.6	.2	@
Apr	1.4	.7	@	.0	.0
May	.3	@	.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	.6	.2	@	.0	.0
Nov	6.5	3.5	1.0	.5	.0
Dec	12.2	8.1	2.8	1.4	.1
Ann	46.0	28.5	9.6	4.5	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	28.2	27.4	24.6	18.0
Feb	25.6	24.4	23.9	19.9
Mar	17.2	16.3	15.2	11.7
Apr	1.0	.9	.8	.5
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	.2	.0	.0	.0
Nov	8.2	4.3	1.7	.2
Dec	24.2	18.2	12.8	5.8
Ann	104.6	91.5	79.0	56.1

+ 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	7/18	7/10	7/05	7/01	6/27	6/23	6/19	6/13	6/06
32	6/24	6/17	6/11	6/07	6/02	5/29	5/24	5/19	5/11
28	5/23	5/18	5/14	5/10	5/07	5/04	5/01	4/27	4/21
24	5/05	4/28	4/23	4/19	4/15	4/11	4/07	4/02	3/26
20	4/22	4/14	4/08	4/03	3/30	3/25	3/20	3/14	3/06
16	3/29	3/22	3/16	3/11	3/07	3/03	2/26	2/20	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	8/09	8/15	8/19	8/22	8/26	8/29	9/01	9/06	9/11
32	8/29	9/03	9/07	9/10	9/13	9/16	9/20	9/23	9/29
28	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/10	10/15
24	9/24	10/01	10/06	10/10	10/14	10/18	10/23	10/28	11/04
20	10/08	10/16	10/22	10/27	10/31	11/05	11/10	11/16	11/24
16	10/24	11/02	11/09	11/15	11/21	11/26	12/02	12/09	12/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	85	76	70	64	59	54	48	42	33
32	132	122	115	108	103	97	90	83	73
28	169	161	155	150	145	140	135	129	121
24	213	202	195	188	182	175	169	161	150
20	246	235	228	221	215	209	203	195	185
16	295	282	273	265	258	250	243	233	221

***** 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	1217	981	886	612	394	207	104	118	322	656	942	1190	7629
60	1062	841	731	462	247	99	35	44	195	501	792	1035	6044
57	969	757	638	373	169	54	14	20	132	408	702	942	5178
55	907	701	576	315	126	32	7	11	97	347	642	880	4641
50	752	561	422	182	47	6	0	1	35	199	492	725	3422
32	261	136	40	1	0	0	0	0	0	1	92	230	761

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	67	79	177	380	630	796	980	962	676	369	140	63	5319
55	0	0	0	3	43	138	275	260	83	1	0	0	803
57	0	0	0	1	24	100	219	206	58	0	0	0	608
60	0	0	0	0	9	55	147	138	31	0	0	0	380
65	0	0	0	0	1	13	62	56	8	0	0	0	140
70	0	0	0	0	0	1	15	14	1	0	0	0	31

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	0	0	24	165	391	563	741	727	446	151	17	0	0	0	24	189	580	1143	1884	2611	3057	3208	3225	3225
45	0	0	0	71	244	413	586	572	300	60	1	0	0	0	0	71	315	728	1314	1886	2186	2246	2247	2247
50	0	0	0	23	126	267	431	418	171	15	0	0	0	0	0	23	149	416	847	1265	1436	1451	1451	1451
55	0	0	0	5	46	146	278	267	72	2	0	0	0	0	0	5	51	197	475	742	814	816	816	816
60	0	0	0	0	11	56	144	133	18	0	0	0	0	0	0	0	11	67	211	344	362	362	362	362
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	24	131	267	363	478	473	300	107	3	0	0	0	24	155	422	785	1263	1736	2036	2143	2146	2146

(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