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: NORRIS MADISON PUMP HS, MT **COOP ID: 246157**

Climate Division: MT 2 **NWS Call Sign:** **Elevation: 4,745 Feet** **Lat: 45˚29N** **Lon: 111˚38W**

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	35.2	19.4	27.3	62	1981	22	35.9	1986	-32	1909	9	11.8	1979	1169	0	.0	.0	2.2	9.7	26.7	3.7
Feb	39.9	22.8	31.4	65+	1995	24	40.1	1991	-36	1933	9	16.2	1989	943	0	.0	.0	5.4	4.9	22.9	2.3
Mar	46.3	27.9	37.1	74+	1934	1	45.0	1986	-17	1920	6	31.1	1976	865	0	.0	.0	12.7	2.1	21.9	.3
Apr	55.1	34.2	44.7	88+	1910	27	52.6	1987	-4	1936	1	35.0	1975	610	0	.0	.0	21.6	.4	13.3	.0
May	64.3	42.0	53.2	94	1919	28	58.3	1992	17	1967	1	49.2	1975	370	3	.0	.0	29.0	.0	2.2	.0
Jun	73.7	49.0	61.4	97	1936	23	68.3	1988	29	1924	7	54.7	1998	159	49	.0	1.1	29.9	.0	.0	.0
Jul	82.4	54.6	68.5	101	1931	21	73.1	1985	31	1921	3	58.6	1993	54	163	.0	7.1	31.0	.0	.0	.0
Aug	82.3	54.1	68.2	102	1940	12	74.0	1971	33+	1992	25	62.0	1993	58	156	.1	6.8	31.0	.0	.0	.0
Sep	71.7	45.4	58.6	95+	1967	5	65.7	1990	13	1926	24	51.6	1985	236	42	.0	.8	29.0	.0	1.7	.0
Oct	59.1	37.1	48.1	88	1992	1	53.7	1988	-4	1935	30	42.6	1984	523	0	.0	.0	25.5	.4	8.2	.0
Nov	43.0	27.5	35.3	78+	1909	6	46.5	1999	-18	1959	16	22.5	1985	893	0	.0	.0	8.8	4.3	19.3	.7
Dec	35.6	20.6	28.1	66	1939	5	36.5	1980	-28	1924	18	15.6	1983	1145	0	.0	.0	2.6	9.7	26.3	2.5
Ann	57.4	36.2	46.8	102	Aug 1940	12	74.0	Aug 1971	-36	Feb 1933	9	11.8	Jan 1979	7025	413	.1	15.8	228.7	31.5	142.5	9.5

\+ 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: 1907-2001

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

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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	.57	.49	2.24	1910	1	1.59	1995	.01	1981
Feb	.47	.41	.72+	1986	18	1.77	1986	.10	1990
Mar	1.20	1.08	1.48	1962	28	2.89	1973	.22	1978
Apr	1.76	1.74	1.89	1958	22	3.36	1976	.45+	1985
May	3.18	2.80	5.04	1909	24	7.23	1978	1.04	1973
Jun	2.80	2.75	2.30	1957	16	5.97	1998	.24	1974
Jul	1.59	1.42	1.80	1987	11	4.57	1987	.00	1999
Aug	1.58	1.57	1.70	1910	24	3.39	1999	.23	1981
Sep	1.66	1.42	1.88	1973	1	4.16	1973	.07	1979
Oct	1.45	1.22	3.38	1913	5	4.55	2000	.00	1987
Nov	.73	.65	1.25	1947	3	2.08	1983	.19	1989
Dec	.57	.47	1.20	1909	2	1.76	1982	.00	1976
Ann	17.56	17.05	5.04	May 1909	24	7.23	May 1978	.00+	Jul 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.7	1.9	.1	.0
Feb	5.2	1.8	@	.0
Mar	8.1	4.1	.4	.0
Apr	8.7	4.9	.9	.1
May	11.4	7.7	1.7	.4
Jun	10.6	7.0	1.6	.3
Jul	7.6	4.5	.7	.1
Aug	7.6	4.5	.8	.2
Sep	6.1	4.3	.9	.2
Oct	6.1	4.1	1.0	.1
Nov	6.1	2.6	.1	.0
Dec	5.6	2.1	.1	.0
Ann	88.8	49.5	8.3	1.4

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	.06	.11	.19	.27	.35	.44	.55	.69	.88	1.18	1.48
Feb	.09	.14	.20	.27	.33	.40	.48	.57	.70	.90	1.09
Mar	.27	.38	.56	.72	.88	1.04	1.23	1.46	1.75	2.22	2.67
Apr	.62	.79	1.03	1.23	1.42	1.62	1.83	2.08	2.41	2.90	3.36
May	1.14	1.44	1.87	2.23	2.58	2.94	3.32	3.77	4.35	5.24	6.05
Jun	.84	1.11	1.51	1.85	2.18	2.53	2.91	3.36	3.95	4.86	5.70
Jul	.07	.20	.43	.66	.92	1.20	1.54	1.96	2.53	3.49	4.43
Aug	.33	.47	.70	.91	1.13	1.36	1.61	1.92	2.33	2.98	3.60
Sep	.21	.34	.58	.81	1.05	1.32	1.64	2.03	2.55	3.42	4.26
Oct	.22	.41	.66	.86	1.06	1.27	1.51	1.78	2.15	2.72	3.26
Nov	.23	.30	.40	.49	.58	.67	.76	.88	1.03	1.26	1.48
Dec	.10	.18	.28	.36	.43	.51	.60	.70	.84	1.04	1.24
Ann	13.06	13.94	15.07	15.93	16.68	17.41	18.15	18.97	19.97	21.40	22.63

\+ 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: 1907-2001
(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	13.4	15.0	4	2
Feb	7.1	7.2	2	1
Mar	17.6	13.0	3	2
Apr	8.6	7.0	1	#
May	1.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	2.1	.0	#	#
Nov	5.8	5.2	1	1
Dec	6.9	5.1	3	2
Ann	62.7	52.5	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	15.0	1975	26	25.0	1975	22	1979	24	14	1979
Feb	6.3	1999	26	13.0	1979	20	1979	16	16	1979
Mar	14.0	1977	2	38.0	1980	20	1973	26	14	1973
Apr	15.0	1983	3	21.0+	1976	27+	1984	26	11	1973
May	8.0	1978	5	8.1	1983	4	1984	1	#+	1999
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	4.5	1983	19	4.5	1983	2	1985	28	#+	1985
Oct	9.0	1989	28	14.0	1989	20	1985	8	2	1985
Nov	10.0	1973	1	20.0	1973	13+	1978	19	7	1978
Dec	10.0	1987	23	21.5	1973	14	1973	31	7	1982
Ann	15.0+	Apr 1983	3	38.0	Mar 1980	27+	Apr 1984	26	16	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.5	.9	.5	.1
Feb	2.5	2.1	.9	.2	.0
Mar	3.8	3.6	2.0	1.0	.2
Apr	1.5	1.4	.9	.6	.2
May	.3	.3	.1	@	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	@	.0	.0
Oct	.8	.7	.3	.1	.0
Nov	2.9	2.3	.6	.3	@
Dec	3.4	2.7	1.1	.4	@
Ann	18.3	15.7	6.8	3.1	.5

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	6.1	4.2	2.7	.4
Apr	1.6	1.0	.7	.3
May	.3	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.7	.5	.3	.0
Nov	6.5	3.1	1.5	.5
Dec	11.9	7.8	5.0	.8
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	6/12	6/07	6/03	5/31	5/28	5/25	5/21	5/18	5/12
32	5/21	5/16	5/13	5/10	5/08	5/05	5/02	4/29	4/24
28	5/07	5/02	4/29	4/26	4/23	4/20	4/17	4/13	4/08
24	5/02	4/24	4/19	4/14	4/10	4/05	4/01	3/26	3/19
20	4/22	4/15	4/09	4/05	4/01	3/27	3/23	3/17	3/10
16	4/12	4/03	3/28	3/23	3/18	3/13	3/08	3/02	2/22

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	9/07	9/11	9/14	9/16	9/18	9/20	9/23	9/26	9/29
32	9/14	9/19	9/22	9/25	9/28	10/01	10/03	10/07	10/12
28	9/24	9/29	10/03	10/06	10/09	10/12	10/15	10/19	10/24
24	10/06	10/12	10/17	10/21	10/25	10/29	11/02	11/06	11/13
20	10/16	10/23	10/28	11/01	11/05	11/08	11/12	11/17	11/24
16	10/26	11/01	11/05	11/09	11/12	11/16	11/19	11/24	11/30

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	132	125	121	117	113	109	105	100	93
32	164	157	151	147	142	138	134	128	121
28	190	183	177	173	168	164	159	154	147
24	230	219	211	204	197	191	184	175	164
20	250	239	231	224	217	211	204	196	184
16	268	258	250	244	238	232	226	218	208

***** 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	1169	943	865	610	370	159	54	58	236	523	893	1145	7025
60	1014	803	710	465	232	75	17	19	138	371	743	990	5577
57	921	719	617	382	162	41	8	8	92	284	656	897	4787
55	859	663	556	329	123	25	3	4	68	232	600	835	4297
50	706	530	410	213	52	6	0	0	25	121	462	683	3208
32	242	146	54	12	0	0	0	0	0	2	111	226	793

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	96	128	212	392	656	881	1133	1121	797	502	208	104	6230
55	0	0	1	19	66	216	423	412	174	19	7	0	1337
57	0	0	0	12	43	172	365	354	139	9	3	0	1097
60	0	0	0	5	20	116	281	272	94	3	0	0	791
65	0	0	0	0	3	49	163	156	42	0	0	0	413
70	0	0	0	0	0	15	80	74	15	0	0	0	184

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	9	30	68	198	426	657	906	892	576	299	74	14	9	39	107	305	731	1388	2294	3186	3762	4061	4135	4149
45	0	4	25	105	286	508	751	737	431	181	28	0	0	4	29	134	420	928	1679	2416	2847	3028	3056	3056
50	0	0	2	46	166	359	596	583	299	97	9	0	0	0	2	48	214	573	1169	1752	2051	2148	2157	2157
55	0	0	0	15	80	230	442	428	183	34	0	0	0	0	0	15	95	325	767	1195	1378	1412	1412	1412
60	0	0	0	0	27	116	297	283	90	8	0	0	0	0	0	0	27	143	440	723	813	821	821	821
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	13	46	125	254	399	575	570	362	185	30	0	0	13	59	184	438	837	1412	1982	2344	2529	2559	2559

(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