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: DEER LODGE 3 W, MT **COOP ID: 242275**

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 4,850 Feet** **Lat: 46˚23N** **Lon: 112˚48W**

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	35.0	10.6	22.8	57	1971	19	34.7	1994	-36+	1996	30	4.4	1979	1307	0	.0	.0	1.5	12.7	30.2	8.4
Feb	40.1	15.2	27.7	66+	1995	23	35.9	1991	-37+	1989	3	10.5	1989	1045	0	.0	.0	3.7	6.6	27.4	4.2
Mar	47.7	21.2	34.5	73+	1986	28	42.4	1986	-22	1976	2	26.9	1975	946	0	.0	.0	10.5	2.5	29.5	1.2
Apr	57.5	25.8	41.7	83	1992	30	46.5	1987	-2	1975	1	31.2	1975	701	0	.0	.0	20.2	.4	24.9	.1
May	64.9	32.9	48.9	89	1986	28	53.3	1993	7	1967	2	44.4	1974	499	0	.0	.0	27.8	.0	15.1	.0
Jun	73.0	39.2	56.1	94	1974	19	61.9	1988	22+	1987	3	50.7	1998	276	8	.0	.5	29.9	.0	4.6	.0
Jul	80.3	42.8	61.6	97+	2000	31	66.3	1985	26+	1997	11	54.2	1993	153	46	.0	2.8	30.9	.0	1.2	.0
Aug	80.4	41.4	60.9	100+	1969	24	66.9	1971	20+	1995	12	55.1	1987	173	46	.0	3.3	30.9	.0	2.4	.0
Sep	70.8	33.3	52.1	94	1967	5	58.4	1990	9	1985	29	46.9	1985	392	4	.0	.5	28.7	@	14.2	.0
Oct	59.6	26.1	42.9	87	1992	1	49.2	1988	-8	1971	29	39.7	1984	687	0	.0	.0	23.8	.3	25.5	.1
Nov	44.1	17.8	31.0	73	1999	12	39.7	1999	-38	1959	13	18.7	1985	1022	0	.0	.0	7.6	5.5	27.9	3.3
Dec	35.1	10.6	22.9	60	1980	16	31.6	1980	-40+	1983	24	10.3	1983	1306	0	.0	.0	1.8	14.1	30.0	7.1
Ann	57.4	26.4	41.9	100+	Aug 1969	24	66.9	Aug 1971	-40+	Dec 1983	24	4.4	Jan 1979	8507	104	.0	7.1	217.3	42.1	232.9	24.4

+ 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: 1959-2001

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

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Climate Division: MT 1 **NWS Call Sign:** **Elevation: 4,850 Feet** **Lat: 46˚23N** **Lon: 112˚48W**

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	.33	.29	.68	1962	7	1.14	1975	.02+	1994
Feb	.28	.26	.49	1975	7	.90	1986	.00	1992
Mar	.47	.43	1.29	1992	17	1.63	1982	.00	1994
Apr	.69	.64	.86	1975	26	1.87	1975	.00	1977
May	1.89	1.66	1.44	1980	25	5.90	1980	.44	1979
Jun	1.62	1.40	1.34	2001	4	3.80	1980	.29	1985
Jul	1.49	1.43	2.13	1997	31	4.26	1997	.15	1973
Aug	1.38	1.27	.91	1991	28	3.53	1993	.00	1988
Sep	1.10	.86	1.53	1968	20	4.34	1995	.00	1994
Oct	.57	.39	.80	1975	13	2.90	1975	.00	1987
Nov	.40	.40	.40	1974	13	1.02	1973	.00	1997
Dec	.38	.27	.85	1996	26	1.25	1996	.00	1997
Ann	10.60	10.05	2.13	Jul 1997	31	5.90	May 1980	.00+	Dec 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.7	.9	@	.0
Feb	4.9	1.1	.0	.0
Mar	7.2	1.1	@	@
Apr	7.2	2.0	.2	.0
May	11.8	5.6	.7	.1
Jun	10.5	4.9	.6	@
Jul	6.6	3.7	.7	.1
Aug	7.5	4.5	.6	.0
Sep	5.9	3.1	.6	.1
Oct	4.4	2.0	.2	.0
Nov	5.8	1.5	.0	.0
Dec	5.9	1.2	@	.0
Ann	84.4	31.6	3.6	.3

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	.02	.04	.08	.12	.17	.23	.30	.40	.52	.75	.96
Feb	.02	.05	.09	.13	.18	.23	.28	.35	.44	.60	.74
Mar	.02	.06	.13	.20	.28	.36	.46	.58	.75	1.02	1.29
Apr	.06	.13	.24	.35	.45	.56	.69	.85	1.07	1.41	1.74
May	.66	.84	1.09	1.31	1.52	1.74	1.97	2.24	2.59	3.14	3.63
Jun	.39	.54	.78	.99	1.20	1.42	1.67	1.96	2.35	2.96	3.53
Jul	.18	.30	.51	.71	.93	1.18	1.46	1.82	2.29	3.08	3.84
Aug	.20	.38	.61	.80	1.00	1.20	1.43	1.70	2.05	2.61	3.14
Sep	.05	.14	.30	.46	.63	.83	1.06	1.36	1.76	2.43	3.08
Oct	.04	.10	.19	.27	.36	.45	.56	.70	.89	1.19	1.48
Nov	.04	.09	.15	.21	.27	.33	.41	.49	.61	.80	.97
Dec	.03	.06	.12	.18	.24	.30	.37	.46	.59	.78	.97
Ann	6.26	7.04	8.07	8.88	9.61	10.32	11.08	11.92	12.96	14.50	15.85

+ 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: 1959-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Climate Division: MT 1 **NWS Call Sign:** **Elevation: 4,850 Feet** **Lat: 46°23N** **Lon: 112°48W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	10.3	9.8	3	1
Feb	8.0	7.2	3	1
Mar	3.2	-99.9	1	1
Apr	3.5	2.4	#	0
May	.0	.0	#	0
Jun	#	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.1	.0	#	0
Oct	2.5	.6	#	#
Nov	8.4	8.5	1	#
Dec	6.8	5.4	2	1
Ann	42.8	-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	12.3	1977	15	20.7	1982	19	1979	31	15	1979
Feb	14.8	1975	7	17.4	1975	28	1975	9	17	1979
Mar	9.7	1980	4	15.9	1980	13	1980	5	4	1979
Apr	7.4	1975	26	11.8	1976	9	1975	27	2	1975
May	.3	1971	16	.3	1971	2	1975	1	#	1975
Jun	#	1979	7	#	1979	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	1.2	1972	27	1.2	1972	#	1973	14	#	1973
Oct	5.5	1980	15	13.6	1980	5+	1980	17	1	1980
Nov	6.5	1973	6	18.6	1973	18	1973	8	4	1973
Dec	6.4	1971	26	16.0	1978	13	1978	10	10	1978
Ann	14.8	Feb 1975	7	20.7	Jan 1982	28	Feb 1975	9	17	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.6	3.5	.6	.4	.1
Feb	4.1	2.5	.4	.1	.1
Mar	5.2	2.8	.8	.2	.0
Apr	3.5	1.8	.5	.3	.0
May	.1	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.0	.0	.0
Oct	1.2	.6	.4	.1	.0
Nov	4.2	2.7	.8	.2	.0
Dec	6.7	2.5	.4	.1	.0
Ann	31.7	16.5	3.9	1.4	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	16.4	12.6	8.6	3.8
Feb	12.0	8.9	7.2	4.0
Mar	7.3	4.0	1.5	.6
Apr	1.2	.8	.4	.0
May	.1	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.5	.3	.2	.0
Nov	5.4	3.2	1.9	.2
Dec	9.5	5.3	3.4	1.1
Ann	52.4	35.1	23.2	9.7

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	52	44	38	33	29	24	19	13	5
32	79	71	64	59	54	50	44	38	30
28	110	101	95	90	85	80	75	68	60
24	141	134	129	124	120	116	112	107	99
20	175	166	159	154	149	143	138	131	122
16	205	196	190	184	179	174	169	163	154

***** 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	1307	1045	946	701	499	276	153	173	392	687	1022	1306	8507
60	1152	905	791	551	346	153	70	87	255	532	872	1151	6865
57	1059	821	698	464	259	97	35	49	183	439	782	1058	5944
55	997	765	636	408	204	67	21	31	141	377	722	996	5365
50	845	633	483	274	97	18	5	9	60	227	580	841	4072
32	359	227	77	18	0	0	0	0	0	5	170	337	1193

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	75	105	154	308	524	723	916	896	602	341	139	54	4837
55	0	0	0	7	15	100	224	214	53	0	0	0	613
57	0	0	0	3	8	70	176	169	35	0	0	0	461
60	0	0	0	0	1	36	118	114	17	0	0	0	286
65	0	0	0	0	0	8	46	46	4	0	0	0	104
70	0	0	0	0	0	1	12	13	0	0	0	0	26

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	4	26	107	264	471	667	641	355	137	22	2	0	4	30	137	401	872	1539	2180	2535	2672	2694	2696
45	0	0	3	45	148	326	512	487	227	61	5	0	0	0	3	48	196	522	1034	1521	1748	1809	1814	1814
50	0	0	0	12	62	202	360	338	121	18	0	0	0	0	0	12	74	276	636	974	1095	1113	1113	1113
55	0	0	0	0	17	94	216	199	45	1	0	0	0	0	0	0	17	111	327	526	571	572	572	572
60	0	0	0	0	0	34	100	90	11	0	0	0	0	0	0	0	0	34	134	224	235	235	235	235
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	9	37	117	217	337	461	463	304	155	22	0	0	9	46	163	380	717	1178	1641	1945	2100	2122	2122

(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