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: RAYNESFORD 2 NNW, MT **COOP ID: 246902**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,215 Feet** **Lat: 47˚18N** **Lon: 110˚45W**

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	14.1	24.0	69	1981	22	37.2	1986	-38	1972	14	8.6	1979	1273	0	.0	.0	4.1	11.3	27.0	8.3
Feb	38.7	18.1	28.4	68+	1992	27	38.9	1991	-35+	1989	3	11.1	1989	1026	0	.0	.0	7.0	7.7	24.4	4.8
Mar	44.8	23.6	34.2	75	1978	29	43.8	1986	-24	1976	3	25.4	1996	955	0	.0	.0	11.3	4.0	25.9	1.7
Apr	54.9	30.7	42.8	85+	1987	28	50.5	1987	-10+	1975	2	29.2	1975	665	0	.0	.0	20.6	.9	18.9	.2
May	63.9	38.7	51.3	89+	2001	12	56.0	1985	19+	1983	13	45.0	1974	426	1	.0	.0	27.9	.0	7.4	.0
Jun	72.1	46.1	59.1	98	1990	30	66.9	1988	30+	1998	2	54.7	1998	204	26	.0	.6	29.9	.0	.3	.0
Jul	79.7	50.5	65.1	99	1999	28	70.7	1985	31	1999	16	56.5	1993	93	95	.0	3.3	31.0	.0	@	.0
Aug	80.3	50.6	65.5	99+	2000	9	72.1	1971	29	1992	23	59.4	1993	114	129	.0	3.9	30.9	.0	.2	.0
Sep	69.8	42.7	56.3	96+	1980	6	64.0	1998	16+	2000	23	49.2	1985	301	39	.0	1.0	27.8	.1	4.5	.0
Oct	58.4	34.8	46.6	89	1992	1	50.7	1979	-10+	1991	30	40.9	1984	570	0	.0	.0	23.9	1.0	13.8	.3
Nov	42.6	24.2	33.4	75+	1981	2	44.3	1999	-25	1985	23	16.1	1985	949	0	.0	.0	9.8	5.4	23.4	2.3
Dec	35.7	17.0	26.4	65	1988	1	35.9	1979	-38	1983	24	9.1	1983	1198	0	.0	.0	4.9	9.5	26.6	5.5
Ann	56.2	32.6	44.4	99+	Aug 2000	9	72.1	Aug 1971	-38+	Dec 1983	24	8.6	Jan 1979	7774	290	.0	8.8	229.1	39.9	172.4	23.1

\+ 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: 1970-2001

(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	.80	.74	.68	1972	2	2.14	1978	.08	1987
Feb	.63	.53	.82	1982	22	1.50	1989	.18	1983
Mar	1.26	1.12	1.68	1995	25	2.57	1995	.35	1976
Apr	1.58	1.42	1.36	1976	26	3.24	1973	.38	1981
May	2.98	2.70	2.43	1980	25	8.17	1981	.81	1973
Jun	2.93	2.77	2.10	1997	11	7.08	1997	.88	1985
Jul	1.91	1.46	2.74	1983	10	8.78	1993	.10	1984
Aug	1.67	1.33	1.39	1986	12	4.29	1989	.15	1983
Sep	1.70	1.47	1.97	1978	12	4.98	1985	.00	1990
Oct	1.20	1.14	1.23	1983	15	3.01	1975	.18	1990
Nov	.86	.89	.80	1975	25	1.70	1983	.10	1988
Dec	.87	.74	.69	1977	2	1.98	1996	.24	1980
Ann	18.39	17.47	2.74	Jul 1983	10	8.78	Jul 1993	.00	Sep 1990

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.1	3.2	@	.0
Feb	6.5	2.2	.1	.0
Mar	9.5	4.2	.3	.1
Apr	9.3	4.5	.7	.2
May	11.7	7.2	1.8	.4
Jun	12.0	7.3	1.8	.4
Jul	8.7	4.5	1.1	.3
Aug	8.0	4.2	.9	.3
Sep	7.6	4.9	.9	.2
Oct	6.9	3.9	.4	.1
Nov	7.1	3.0	.2	.0
Dec	8.4	3.1	.1	.0
Ann	103.8	52.2	8.3	2.0

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	.24	.36	.47	.57	.69	.82	.97	1.17	1.49	1.80
Feb	.19	.25	.34	.42	.49	.57	.66	.76	.89	1.09	1.28
Mar	.49	.61	.77	.91	1.04	1.17	1.32	1.48	1.69	2.02	2.31
Apr	.46	.61	.83	1.03	1.22	1.42	1.64	1.90	2.24	2.77	3.26
May	1.01	1.29	1.70	2.05	2.39	2.73	3.11	3.55	4.12	4.99	5.80
Jun	.85	1.13	1.55	1.91	2.26	2.63	3.04	3.52	4.14	5.11	6.01
Jul	.22	.37	.64	.91	1.19	1.51	1.88	2.33	2.95	3.98	4.97
Aug	.17	.30	.53	.76	1.01	1.29	1.63	2.04	2.60	3.54	4.46
Sep	.27	.50	.79	1.03	1.26	1.50	1.77	2.09	2.50	3.16	3.77
Oct	.34	.45	.63	.77	.92	1.07	1.24	1.44	1.69	2.10	2.47
Nov	.25	.33	.45	.56	.67	.77	.90	1.04	1.22	1.51	1.78
Dec	.25	.33	.45	.56	.67	.78	.90	1.05	1.24	1.53	1.81
Ann	11.93	13.13	14.70	15.91	16.99	18.05	19.15	20.37	21.87	24.06	25.98

\+ 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: 1970-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

Snow Fall >= Thresholds

Snow Depth >= Thresholds

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	21.1	23.5	6	4	11.0	1972	2	36.5	1978	43	1979	31	35	1979	5.9	5.1	2.2	.4	.1	23.6	19.1	14.7	8.9
Feb	12.7	13.0	5	2	10.0	1982	22	19.5	1979	46	1979	8	40	1979	3.6	3.1	1.0	.5	@	14.6	11.0	8.1	5.2
Mar	21.6	22.0	3	3	25.0	1995	25	46.0	1995	39	1995	28	13	1978	4.7	4.5	2.0	.6	.2	11.1	7.9	4.7	2.2
Apr	10.5	8.8	1	#	14.0	1973	21	36.5	1975	27	1973	21	8	1975	1.9	1.8	1.0	.5	.1	2.9	2.1	1.5	.6
May	3.2	.0	#	0	10.0	1982	29	19.0	1982	19	1982	29	2	1982	.5	.5	.3	.1	@	.6	.4	.2	.1
Jun	.1	.0	#	0	4.0	1981	14	4.0	1981	4	1982	1	#	1982	@	@	@	.0	.0	@	@	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	#	0	.0	0	0	.0	0	5	1992	23	#	1992	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.5	.0	#	0	5.0	1973	15	5.0	1973	7	1988	18	#+	2000	.2	.2	.1	@	.0	.1	@	@	.0
Oct	7.3	3.5	#	#	9.0	1981	12	29.5	1975	11+	1991	31	2	1998	.9	.9	.5	.2	.0	1.2	.8	.3	.0
Nov	10.8	10.8	2	2	8.0	1975	25	23.0	1978	17	1978	20	7	1978	2.4	2.3	1.2	.4	.0	9.3	6.9	5.1	1.1
Dec	20.0	18.5	5	4	10.0	1996	19	48.0	1996	40	1996	30	19	1978	5.2	4.7	1.9	.9	.1	16.7	12.9	9.4	2.9
Ann	107.8	100.1	N/A	N/A	25.0	Mar 1995	25	48.0	Dec 1996	46	Feb 1979	8	40	Feb 1979	25.3	23.1	10.2	3.6	.5	80.1	61.1	44.0	21.0

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

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	8/18	8/24	8/29	9/02	9/06	9/09	9/13	9/18	9/24
32	8/31	9/05	9/09	9/12	9/15	9/18	9/22	9/25	10/01
28	9/13	9/17	9/21	9/24	9/27	9/30	10/03	10/07	10/12
24	9/20	9/26	9/30	10/03	10/07	10/10	10/14	10/18	10/24
20	9/29	10/04	10/08	10/12	10/15	10/18	10/21	10/25	10/31
16	10/07	10/13	10/17	10/20	10/24	10/27	10/30	11/04	11/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	109	99	92	85	79	74	67	60	50
32	137	129	123	117	113	108	103	96	88
28	160	153	148	143	139	135	131	126	119
24	192	183	176	171	166	160	155	148	139
20	208	199	193	188	184	179	174	168	160
16	227	219	213	208	204	199	194	188	180

***** 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	1273	1026	955	665	426	204	93	114	301	570	949	1198	7774
60	1118	886	800	522	283	106	32	52	195	417	799	1043	6253
57	1031	809	707	438	207	63	14	30	143	327	719	953	5441
55	976	757	645	385	163	41	8	20	113	272	662	899	4941
50	830	626	499	264	79	11	0	6	54	152	524	753	3798
32	385	250	103	26	0	0	0	0	0	4	165	318	1251

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	135	148	171	351	599	812	1025	1038	728	457	206	143	5813
55	13	10	0	20	48	162	320	345	151	12	12	11	1104
57	6	7	0	13	30	124	265	292	121	5	9	3	875
60	0	0	0	7	13	77	189	222	83	2	0	0	593
65	0	0	0	0	1	26	95	129	39	0	0	0	290
70	0	0	0	0	0	6	33	59	15	0	0	0	113

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	22	32	59	159	358	569	776	784	481	254	66	26	22	54	113	272	630	1199	1975	2759	3240	3494	3560	3586
45	4	8	21	86	225	420	621	629	347	149	25	4	4	12	33	119	344	764	1385	2014	2361	2510	2535	2539
50	0	1	4	38	118	278	467	475	226	80	11	0	0	1	5	43	161	439	906	1381	1607	1687	1698	1698
55	0	0	0	10	53	160	316	326	129	35	1	0	0	0	0	10	63	223	539	865	994	1029	1030	1030
60	0	0	0	1	20	71	181	189	60	9	0	0	0	0	0	1	21	92	273	462	522	531	531	531
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	7	23	46	118	235	347	488	497	316	177	36	8	7	30	76	194	429	776	1264	1761	2077	2254	2290	2298

(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