

Climatology of the United States

No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: RAYMOND BORDER STATION, MT

1971-2000

COOP ID: 246893

Climate Division: MT 6

NWS Call Sign:

Elevation: 2,350 Feet Lat: 49°00N

Lon: 104°35W

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	19.5	-.8	9.4	54	1987	12	24.0	1992	-44	1954	20	-9.8	1982	1726	0	.0	.0	.2	22.7	30.7	16.0
Feb	27.9	7.3	17.6	68	1992	27	29.0	1998	-41	1996	1	.4	1979	1327	0	.0	.0	1.6	14.8	27.6	9.7
Mar	39.8	17.6	28.7	77	1978	30	39.5	1986	-31	1962	1	19.9	1996	1125	0	.0	.0	8.5	8.9	28.6	3.9
Apr	56.7	29.6	43.2	91+	1980	20	51.4	1987	-15	1975	2	32.7	1979	658	2	.0	.1	21.3	1.1	19.0	.2
May	69.0	40.7	54.9	101	1980	22	61.1	1988	12	1967	2	48.4	1974	331	16	@	.8	29.6	.0	5.2	.0
Jun	77.4	49.7	63.6	106+	1988	8	76.8	1988	22	1969	12	58.7+	1993	136	92	.5	2.6	30.0	.0	.2	.0
Jul	83.1	53.7	68.4	110	1963	22	73.8	1989	36+	1954	1	60.8	1993	61	165	.6	6.7	31.0	.0	.0	.0
Aug	83.1	52.3	67.7	107	1983	6	75.1	1983	32+	1980	30	61.2	1974	88	172	.5	8.1	30.9	.0	.1	.0
Sep	71.5	42.1	56.8	100+	1991	1	63.6	1998	10	1961	30	49.9	1984	280	33	.1	1.7	28.7	.0	3.5	.0
Oct	58.5	31.4	45.0	93	1992	1	49.7	1980	-7	1957	25	38.6	1984	622	0	.0	.1	23.8	1.0	16.7	.1
Nov	36.3	16.3	26.3	74+	1999	8	38.8	1999	-29	1985	27	12.0	1985	1162	0	.0	.0	5.3	11.3	27.8	3.9
Dec	24.0	3.5	13.8	58	1979	19	25.8	1997	-41	1983	23	-4.0	1983	1588	0	.0	.0	.5	20.2	30.9	12.4
Ann	53.9	28.6	41.3	110	Jul 1963	22	76.8	Jun 1988	-44	Jan 1954	20	-9.8	Jan 1982	9104	480	1.7	20.1	211.4	80.0	190.3	46.2

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1950-2001

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

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Station: RAYMOND BORDER STATION, MT

COOP ID: 246893

Climate Division: MT 6

NWS Call Sign:

Elevation: 2,350 Feet Lat: 49°00N

Lon: 104°35W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.21	.17	.35+	1983	5	1.23	1977	.00+	1997	3.3	.7	.0	.0	.00	.00	.00	.04	.08	.13	.18	.26	.36	.53	.70
Feb	.16	.07	.91	1955	22	.79	1978	.00+	2000	2.7	.8	.0	.0	.00	.00	.00	.01	.05	.09	.13	.19	.28	.42	.56
Mar	.41	.27	.78	1995	13	1.87	1995	.00+	1998	3.6	1.6	.1	.0	.00	.00	.03	.09	.16	.25	.36	.50	.70	1.05	1.40
Apr	.86	.81	1.25	1992	18	2.68	1975	.00+	1987	5.1	2.5	.5	.1	.00	.11	.28	.41	.55	.70	.87	1.07	1.34	1.79	2.21
May	2.03	1.83	1.98	1965	6	4.77	1972	.15	1980	8.6	5.7	1.2	.2	.34	.52	.81	1.09	1.38	1.69	2.05	2.48	3.06	4.00	4.90
Jun	2.96	2.73	3.32	1953	3	7.41	1991	.44	1974	9.9	6.4	2.0	.6	.75	1.03	1.46	1.84	2.22	2.62	3.06	3.58	4.27	5.35	6.36
Jul	2.35	2.02	3.84	1993	22	11.34	1993	.16	1984	8.0	5.1	1.4	.5	.40	.61	.95	1.27	1.60	1.96	2.37	2.86	3.53	4.59	5.62
Aug	1.53	1.43	1.95	1960	25	4.16	1974	.10	1971	6.8	3.8	.9	.2	.22	.35	.57	.78	1.00	1.24	1.53	1.87	2.33	3.09	3.82
Sep	1.37	1.08	1.98	1954	13	5.06	1978	.12	1974	6.6	3.5	.7	.2	.13	.23	.42	.61	.82	1.05	1.33	1.67	2.15	2.93	3.70
Oct	.65	.34	1.60	1989	27	3.01	1998	.00	1993	3.9	1.8	.4	.1	.01	.03	.10	.19	.29	.41	.57	.77	1.07	1.58	2.10
Nov	.27	.24	.63	1962	29	.75	2000	.00+	1999	3.1	1.0	@	.0	.00	.00	.03	.08	.13	.18	.25	.34	.46	.66	.86
Dec	.28	.20	.50	1975	31	1.03	1973	.00+	1997	3.5	1.1	@	.0	.00	.00	.00	.08	.14	.20	.27	.36	.48	.67	.85
Ann	13.08	12.59	3.84	Jul 1993	22	11.34	Jul 1993	.00+	Feb 2000	65.1	34.0	7.2	1.9	8.31	9.19	10.35	11.24	12.04	12.82	13.64	14.55	15.66	17.30	18.74

+ 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: 1950-2001

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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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Station: RAYMOND BORDER STATION, MT

COOP ID: 246893

Climate Division: MT 6

NWS Call Sign:

Elevation: 2,350 Feet

Lat: 49°00N

Lon: 104°35W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	2.5	2.0	1	#	3.0	1972	20	8.0	1971	10	1971	25	7	1971	1.2	.8	.1	.0	.0	-9.9	-9.9	-9.9	-9.9
Feb	1.3	.0	#	#	3.0	1988	20	9.5	1972	3+	2000	9	#+	2000	.6	.4	.1	.0	.0	-9.9	-9.9	-9.9	-9.9
Mar	1.6	.1	0	0	6.0	1990	13	8.0	1972	16	1975	31	3	1975	1.0	.6	.3	.1	.0	-9.9	-9.9	-9.9	-9.9
Apr	.7	.0	#	0	6.0	1979	12	9.8	1979	1+	2000	14	#+	2000	.3	.2	.1	.1	.0	.1	.0	.0	.0
May	.2	.0	0	0	6.0	1979	7	6.0	1979	0	0	0	0	0	@	@	@	@	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.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	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	#	.0	0	0	#	1993	13	#+	1993	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.0	#	0	4.0	1980	22	4.0	1971	3	1971	19	#+	2000	.2	.2	.1	.0	.0	.2	.1	.0	.0
Nov	.9	.3	#	0	6.0	2000	2	6.0	2000	4	1973	6	#+	1997	.8	.2	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
Dec	1.6	-99.9	1	0	4.0	1973	14	7.9	1977	4+	1996	27	2+	2000	1.0	.6	.1	.0	.0	-9.9	-9.9	-9.9	-9.9
Ann	9.2	-9.9	N/A	N/A	6.0+	Nov 2000	2	9.8	Apr 1979	16	Mar 1975	31	7	Jan 1971	5.1	3.0	1.0	.3	.0	-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

Complete documentation available from:

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Climatography of the United States

No. 20 1971-2000

Station: RAYMOND BORDER STATION, MT

COOP ID: 246893

Climate Division: MT 6

NWS Call Sign:

Elevation: 2,350 Feet

Lat: 49° 00N

Lon: 104° 35W

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	6/09	6/04	6/01	5/29	5/26	5/23	5/20	5/16	5/11
32	5/30	5/25	5/22	5/19	5/16	5/14	5/11	5/08	5/03
28	5/19	5/14	5/11	5/08	5/06	5/03	4/30	4/27	4/23
24	5/12	5/07	5/03	4/30	4/27	4/24	4/21	4/18	4/13
20	5/03	4/27	4/23	4/20	4/17	4/13	4/10	4/06	3/31
16	4/23	4/17	4/13	4/10	4/07	4/04	3/31	3/27	3/22
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	8/21	8/26	8/30	9/03	9/06	9/09	9/13	9/17	9/23
32	9/04	9/09	9/13	9/16	9/19	9/21	9/24	9/28	10/03
28	9/12	9/17	9/21	9/24	9/27	10/01	10/04	10/08	10/13
24	9/21	9/26	9/30	10/03	10/06	10/09	10/12	10/16	10/22
20	9/29	10/05	10/09	10/12	10/15	10/19	10/22	10/26	11/01
16	10/11	10/16	10/20	10/24	10/27	10/30	11/03	11/07	11/13
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	126	118	112	107	102	98	93	87	79
32	146	138	133	129	124	120	116	110	103
28	168	160	154	149	144	139	134	129	120
24	183	175	170	165	161	157	152	147	139
20	207	198	192	186	181	176	171	164	155
16	228	219	213	208	203	198	193	186	178

* 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

Complete documentation available from:

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of the United States
No. 20
1971-2000**

Station: RAYMOND BORDER STATION, MT

COOP ID: 246893

Climate Division: MT 6 NWS Call Sign: Elevation: 2,350 Feet Lat: 49°00N Lon: 104°35W

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	1726	1327	1125	658	331	136	61	88	280	622	1162	1588	9104
60	1571	1187	970	517	208	65	20	38	173	468	1012	1433	7662
57	1478	1103	878	436	148	37	10	21	121	378	922	1340	6872
55	1416	1047	817	385	115	24	6	14	92	321	862	1278	6377
50	1264	922	674	271	53	7	0	3	38	195	720	1123	5270
32	752	485	243	37	0	0	0	0	0	10	281	615	2423

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	49	82	140	371	708	947	1127	1107	743	411	110	49	5844
55	0	0	2	29	110	280	420	409	145	8	0	0	1403
57	0	0	0	20	81	233	362	354	114	4	0	0	1168
60	0	0	0	11	48	172	279	277	76	1	0	0	864
65	0	0	0	2	16	92	165	172	33	0	0	0	480
70	0	0	0	0	3	38	83	94	12	0	0	0	230

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	1	30	183	478	714	888	867	517	226	23	0	0	1	31	214	692	1406	2294	3161	3678	3904	3927	3927
45	0	1	6	101	333	565	733	712	374	127	8	0	0	1	7	108	441	1006	1739	2451	2825	2952	2960	2960
50	0	0	0	50	214	417	578	558	247	59	0	0	0	0	0	50	264	681	1259	1817	2064	2123	2123	2123
55	0	0	0	20	112	272	423	408	148	19	0	0	0	0	0	20	132	404	827	1235	1383	1402	1402	1402
60	0	0	0	6	47	156	274	261	75	3	0	0	0	0	0	6	53	209	483	744	819	822	822	822
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	3	33	147	310	449	561	548	334	171	21	0	0	3	36	183	493	942	1503	2051	2385	2556	2577	2577

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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