

# Climatology of the United States

No. 20

1971-2000

Station: GARDINER, MT

COOP ID: 243378

Climate Division: MT 5

NWS Call Sign:

Elevation: 5,275 Feet Lat: 45°02N

Lon: 110°42W

## 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	32.7	14.3	23.5	58	1981	22	32.8	1981	-30+	1997	12	9.1	1979	1287	0	.0	.0	.5	13.2	29.8	5.7
Feb	38.5	18.3	28.4	62+	1995	21	37.0	1992	-31+	1989	4	14.2	1989	1025	0	.0	.0	2.8	5.6	26.2	2.8
Mar	46.8	24.5	35.7	70+	1972	22	43.5	1986	-16	1965	18	29.5	1976	912	0	.0	.0	12.1	2.1	25.5	.7
Apr	57.0	31.4	44.2	85	1987	27	51.8	1987	4	1982	8	33.6	1975	623	0	.0	.0	21.7	.3	18.4	.0
May	66.6	39.3	53.0	90	1987	15	57.8+	1994	11	1982	5	47.6	1975	379	4	.0	@	29.2	.0	6.2	.0
Jun	76.5	46.5	61.5	98+	2000	6	70.4	1988	25	1979	8	55.2	1998	160	54	.0	1.8	29.7	.0	.5	.0
Jul	84.9	52.5	68.7	103+	1960	22	73.9	1989	30	1957	4	60.1	1993	48	162	@	8.4	31.0	.0	.1	.0
Aug	83.9	51.5	67.7	102	1961	3	72.2	1971	30+	1965	29	63.2	1993	55	138	@	7.2	31.0	.0	.2	.0
Sep	73.3	42.4	57.9	95+	1967	6	64.0	1990	12	1983	20	51.6	1985	247	33	.0	.6	28.7	.0	3.3	.0
Oct	60.2	33.9	47.1	87+	1992	2	52.0	1988	-8	1991	29	41.1	1984	556	0	.0	.0	25.0	.4	13.3	.1
Nov	41.3	22.8	32.1	70+	1965	1	43.7	1999	-23	1959	16	20.9	1985	989	0	.0	.0	6.9	4.4	25.1	.9
Dec	32.2	15.3	23.8	55	1995	1	30.2	1980	-30+	1990	21	14.0	1990	1279	0	.0	.0	.9	13.5	29.2	3.8
Ann	57.8	32.7	45.3	103+	Jul 1960	22	73.9	Jul 1989	-31+	Feb 1989	4	9.1	Jan 1979	7560	391	.0	18.0	219.5	39.5	177.8	14.0

+ 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](http://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: 1956-2001

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

059-A

# 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: GARDINER, MT

COOP ID: 243378

Climate Division: MT 5

NWS Call Sign:

Elevation: 5,275 Feet Lat: 45°02N

Lon: 110°42W

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	.37	.30	1.40	1962	7	1.83	1999	.00	1994	5.9	1.5	.1	.0	.01	.03	.08	.14	.20	.27	.35	.46	.60	.85	1.10
Feb	.33	.21	2.00	1994	19	2.00	1994	.00+	1997	3.6	1.2	.1	.1	.00	.00	.05	.10	.15	.22	.30	.40	.54	.79	1.03
Mar	.63	.44	.98	1974	2	2.33	1995	.00	1978	7.1	2.7	.2	.0	.03	.08	.18	.27	.37	.48	.61	.77	.99	1.36	1.72
Apr	.61	.63	.73	1958	22	1.46	1975	.04	1987	5.9	2.0	.1	.0	.08	.13	.22	.31	.40	.49	.61	.75	.94	1.25	1.55
May	1.70	1.61	1.70	1988	7	3.69	1991	.41+	1995	8.6	4.8	.9	.2	.46	.62	.86	1.08	1.29	1.51	1.76	2.05	2.43	3.02	3.58
Jun	1.35	1.16	1.87	1992	16	3.99	1998	.08	1991	9.4	4.6	.5	@	.21	.33	.53	.71	.91	1.12	1.36	1.65	2.04	2.68	3.29
Jul	1.21	1.26	.90+	1977	21	2.76	1977	.29	1980	8.4	3.9	.4	.0	.25	.36	.54	.70	.86	1.04	1.24	1.47	1.79	2.29	2.76
Aug	.88	.77	.81	1968	20	2.79	1972	.00	1988	6.9	2.8	.3	.0	.06	.16	.30	.43	.56	.71	.88	1.09	1.37	1.82	2.26
Sep	.94	.88	1.05+	1966	15	2.85	1972	.01	1979	6.7	3.5	.4	.0	.07	.12	.24	.37	.52	.68	.89	1.14	1.50	2.10	2.69
Oct	.71	.60	1.00+	1994	2	1.77	1983	.00	1987	5.3	2.4	.3	.1	.10	.19	.31	.41	.51	.62	.74	.88	1.06	1.35	1.63
Nov	.67	.61	1.00	1996	14	1.79	1992	.00	1990	5.6	1.6	.3	@	.08	.17	.28	.38	.47	.58	.69	.83	1.01	1.30	1.58
Dec	.46	.38	.60	1998	4	2.18	1981	.01	1986	7.0	1.6	.1	.0	.04	.08	.14	.21	.28	.35	.45	.56	.72	.99	1.25
Ann	9.86	10.41	2.00	Feb 1994	19	3.99	Jun 1998	.00+	Feb 1997	80.4	32.6	3.7	.4	6.24	6.91	7.79	8.46	9.08	9.67	10.30	10.99	11.84	13.09	14.19

+ 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: 1956-2001

(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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### 1971-2000

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151 Patton Avenue  
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[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

Station: GARDINER, MT

COOP ID: 243378

Climate Division: MT 5

NWS Call Sign:

Elevation: 5,275 Feet

Lat: 45°02N

Lon: 110°42W

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	4.0	1.9	2	3	9.0	1997	10	10.0	1997	13	1998	12	4+	1998	2.3	1.2	.4	.1	.0	-9.9	-9.9	-9.9	-9.9
Feb	1.0	.8	1	#	2.5	1984	10	2.5	1984	6	1975	9	3	1975	1.4	.4	.0	.0	.0	-9.9	-9.9	-9.9	-9.9
Mar	4.3	2.1	#	#	7.0	1974	2	15.9	1975	7	1996	5	3	1976	1.8	.9	.3	.1	.0	1.4	.6	.1	.0
Apr	1.8	.1	#	0	8.0	1984	11	10.5	1984	10	1975	7	2	1975	.6	.4	.2	.1	.0	.0	.0	.0	.0
May	.8	.0	#	0	4.5	2000	11	4.7	2000	2	1991	10	#+	2000	.2	.2	.1	.0	.0	.0	.0	.0	.0
Jun	#	.0	#	0	#	1996	29	#	1996	#	1999	6	#	1999	.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	.4	2000	22	.4	2000	#+	2000	22	#+	2000	.1	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	#	0	.3	1994	3	.3	1994	1	1996	26	#+	2000	.3	.0	.0	.0	.0	.0	.0	.0	.0
Nov	3.9	2.7	#	#	6.5	1982	9	10.0	1982	6	1975	30	1+	2000	1.9	.9	.1	.1	.0	1.6	.8	.4	.0
Dec	5.5	6.0	2	1	6.0	1998	4	8.5	1971	8	1994	5	4	1971	2.9	1.5	.3	.2	.0	-9.9	-9.9	-9.9	-9.9
Ann	21.3	13.6	N/A	N/A	9.0	Jan 1997	10	15.9	Mar 1975	13	Jan 1998	12	4+	Jan 1998	11.5	5.5	1.4	.6	.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: GARDINER, MT**

**COOP ID: 243378**

**Climate Division: MT 5**

**NWS Call Sign:**

**Elevation: 5,275 Feet**

**Lat: 45° 02N**

**Lon: 110° 42W**

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	7/05	6/27	6/22	6/17	6/12	6/07	6/03	5/28	5/20
32	6/15	6/08	6/04	5/31	5/27	5/23	5/19	5/14	5/08
28	5/25	5/19	5/15	5/12	5/09	5/06	5/03	4/29	4/23
24	5/12	5/06	5/01	4/28	4/24	4/21	4/17	4/13	4/07
20	4/30	4/24	4/19	4/15	4/11	4/08	4/04	3/30	3/24
16	4/26	4/18	4/12	4/06	4/02	3/28	3/22	3/16	3/08
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	8/27	9/01	9/05	9/08	9/10	9/13	9/16	9/20	9/24
32	9/02	9/07	9/12	9/15	9/18	9/22	9/25	9/29	10/05
28	9/12	9/18	9/22	9/26	9/29	10/02	10/06	10/10	10/15
24	9/27	10/03	10/07	10/11	10/14	10/18	10/21	10/26	11/01
20	10/08	10/14	10/18	10/21	10/24	10/27	10/31	11/04	11/09
16	10/14	10/21	10/26	10/30	11/02	11/06	11/10	11/15	11/22
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	114	105	99	94	90	85	80	74	65
32	135	128	122	118	114	110	105	100	93
28	164	157	151	146	142	138	133	127	120
24	199	190	183	178	172	167	161	154	145
20	221	212	205	200	195	190	184	178	169
16	248	236	228	221	214	207	200	192	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

Complete documentation available from:  
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**Climatography  
of the United States  
No. 20  
1971-2000**

**Station: GARDINER, MT**

**COOP ID: 243378**

**Climate Division: MT 5      NWS Call Sign:      Elevation: 5,275 Feet    Lat: 45°02N      Lon: 110°42W**

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	1287	1025	912	623	379	160	48	55	247	556	989	1279	7560
60	1132	885	757	477	242	78	14	17	145	404	839	1124	6114
57	1039	801	664	392	173	44	5	6	97	317	749	1031	5318
55	977	745	602	339	134	28	2	3	71	263	689	969	4822
50	822	605	455	218	60	7	0	0	26	148	547	814	3702
32	315	189	76	12	0	0	0	0	0	4	149	298	1043

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	51	88	187	379	648	884	1136	1106	776	471	151	42	5919
55	0	0	1	16	69	222	426	397	157	17	1	0	1306
57	0	0	0	9	46	178	367	338	123	9	0	0	1070
60	0	0	0	3	22	122	283	255	81	3	0	0	769
65	0	0	0	0	4	54	162	138	33	0	0	0	391
70	0	0	0	0	0	18	77	59	10	0	0	0	164

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	1	10	50	166	394	625	868	850	530	245	35	3	1	11	61	227	621	1246	2114	2964	3494	3739	3774	3777
45	0	0	17	83	255	477	713	695	389	140	13	0	0	0	17	100	355	832	1545	2240	2629	2769	2782	2782
50	0	0	0	34	145	335	558	540	257	63	0	0	0	0	0	34	179	514	1072	1612	1869	1932	1932	1932
55	0	0	0	11	61	202	404	388	152	20	0	0	0	0	0	11	72	274	678	1066	1218	1238	1238	1238
60	0	0	0	0	21	103	258	240	67	3	0	0	0	0	0	0	21	124	382	622	689	692	692	692
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	6	36	128	264	397	553	545	357	181	23	0	0	6	42	170	434	831	1384	1929	2286	2467	2490	2490

(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](http://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](http://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.

- 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/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)