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: GOLDBUTTE 7 N, MT **COOP ID: 243617**

Climate Division: MT 3 **NWS Call Sign:** **Elevation: 3,498 Feet** **Lat: 48˚59N** **Lon: 111˚24W**

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	31.4	8.1	19.8	65	1981	21	35.6	1986	-42	1950	15	3.4	1982	1403	0	.0	.0	3.5	12.8	28.2	10.4
Feb	36.1	12.6	24.4	73	1992	27	37.3	1991	-36+	1996	1	10.5	1989	1138	0	.0	.0	6.0	9.1	25.1	6.8
Mar	44.2	20.4	32.3	73+	1966	30	41.5	1986	-35	1951	8	24.3	1996	1015	0	.0	.0	12.5	5.6	26.5	2.4
Apr	56.0	29.2	42.6	86+	1987	28	50.1	1987	-15	1975	5	30.5	1975	673	0	.0	.0	22.3	.9	18.3	.2
May	65.4	37.7	51.6	93	1980	21	57.4	1988	8	1967	3	47.0	1996	419	1	.0	.1	29.0	.0	7.5	.0
Jun	72.9	44.6	58.8	98+	1988	22	66.6	1988	27+	1995	8	55.0	1976	210	21	.0	.8	30.0	.0	.8	.0
Jul	79.9	48.3	64.1	102	1960	19	69.1	2000	31	1999	17	56.9	1993	105	76	.0	3.8	31.0	.0	.1	.0
Aug	79.6	47.5	63.6	105	1961	5	70.1	1971	28+	1993	26	57.7	1993	143	97	.1	4.0	30.9	.0	.6	.0
Sep	68.7	39.2	54.0	97	1998	2	61.1	1998	9	1970	13	45.7	1985	351	19	.0	.6	27.9	.1	5.5	.0
Oct	57.3	31.0	44.2	88	1980	7	48.8	1974	-19	1991	29	38.5	1984	647	0	.0	.0	24.0	1.1	16.1	.3
Nov	40.9	19.1	30.0	74+	1976	4	40.4	1999	-32	1955	13	10.8	1985	1051	0	.0	.0	8.7	6.4	24.8	3.0
Dec	33.3	11.4	22.4	67	1988	4	34.4	1999	-46	1968	29	2.9	1983	1323	0	.0	.0	3.9	11.5	28.1	7.6
Ann	55.5	29.1	42.3	105	Aug 1961	5	70.1	Aug 1971	-46	Dec 1968	29	2.9	Dec 1983	8478	214	.1	9.3	229.7	47.5	181.6	30.7

\+ 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: 1948-2001

(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	.42	.35	.76	1982	24	1.21	1982	.02	1995
Feb	.33	.29	.69	1958	26	.92	1994	.05+	1998
Mar	.70	.66	.86	1981	30	2.08	1981	.00	1973
Apr	1.10	1.11	1.04	1999	28	3.52	1978	.08	1988
May	2.17	2.06	2.39	1980	25	4.54	1990	.61	1992
Jun	2.63	2.62	2.84	1970	13	5.21	1995	.18	1985
Jul	1.45	.98	2.16	2001	31	5.73	1978	.17	1973
Aug	1.76	1.48	2.44	1993	17	4.54	1987	.27	1979
Sep	1.46	1.08	2.45	1996	17	4.94	1986	.00	1990
Oct	.74	.53	1.05	1966	13	3.25	1994	.06	1974
Nov	.51	.46	.72	1989	12	1.77	1989	.00	1972
Dec	.42	.34	.38	1995	10	1.79	1989	.06	1991
Ann	13.69	12.96	2.84	Jun 1970	13	5.73	Jul 1978	.00+	Sep 1990

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.5	1.4	@	.0
Feb	5.1	1.1	.0	.0
Mar	7.0	2.3	.2	.0
Apr	7.2	3.1	.4	@
May	9.4	5.1	1.3	.3
Jun	9.7	5.8	1.3	.6
Jul	7.2	3.3	.8	.2
Aug	7.6	3.8	1.1	.3
Sep	6.6	3.6	.8	.2
Oct	5.8	2.4	.3	.0
Nov	5.8	1.9	.1	.0
Dec	5.9	1.4	.0	.0
Ann	83.8	35.2	6.3	1.6

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	.09	.15	.21	.27	.34	.42	.51	.64	.86	1.06
Feb	.07	.10	.15	.19	.24	.28	.34	.40	.48	.61	.73
Mar	.05	.12	.24	.34	.44	.56	.70	.86	1.08	1.45	1.80
Apr	.17	.26	.42	.57	.73	.90	1.10	1.35	1.68	2.21	2.72
May	.62	.83	1.14	1.41	1.67	1.95	2.25	2.61	3.07	3.80	4.47
Jun	.62	.86	1.25	1.59	1.93	2.29	2.70	3.18	3.81	4.82	5.76
Jul	.13	.23	.42	.62	.84	1.10	1.40	1.77	2.29	3.16	4.01
Aug	.32	.47	.73	.97	1.21	1.48	1.78	2.14	2.63	3.41	4.15
Sep	.11	.27	.50	.72	.94	1.18	1.46	1.81	2.27	3.02	3.74
Oct	.09	.15	.25	.36	.47	.59	.73	.91	1.14	1.54	1.92
Nov	.05	.11	.19	.27	.34	.43	.52	.63	.78	1.03	1.26
Dec	.07	.10	.16	.22	.28	.35	.42	.51	.63	.83	1.02
Ann	7.94	8.97	10.33	11.40	12.37	13.32	14.33	15.45	16.84	18.90	20.72

\+ 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: 1948-2001
(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	9.7	7.3	2	2	10.0	1982	24	25.0	1982	19	1994	19	5	1989	5.1	4.5	1.4	.3	@	6.9	2.9	1.4	.3
Feb	6.7	5.6	1	1	6.0	1974	19	17.0	1989	15	1994	25	7	1994	4.1	3.7	.9	.2	.0	4.8	2.0	.7	.0
Mar	12.1	14.9	2	1	16.0	1990	13	29.0	1990	22	1990	14	6	1990	4.8	4.5	1.8	.8	.1	4.8	2.1	.9	.0
Apr	8.3	7.5	1	#	14.0	1997	4	22.5	1979	19	1975	10	7	1975	2.8	2.8	1.1	.4	.1	2.2	1.5	1.0	.5
May	2.2	1.0	#	0	8.0	1983	9	12.0	1983	12	1983	10	1	1983	.8	.8	.2	.2	.0	.3	.2	.2	@
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	.2	.0	0	0	5.0	1992	23	5.0	1992	0	0	0	0	0	.1	.1	.1	@	.0	.0	.0	.0	.0
Sep	.6	.0	#	0	4.0	1972	24	7.0	1985	4	1985	6	#+	2000	.3	.3	.2	.0	.0	.2	.1	.0	.0
Oct	4.5	2.5	#	#	9.0	1985	7	19.0	1994	12	1991	27	2	1991	2.0	1.8	.5	.3	.0	1.3	.5	.3	.0
Nov	8.3	6.5	1	1	8.0	1996	19	27.0	1996	25	1996	26	8	1996	3.9	3.6	1.1	.3	.0	5.3	3.0	1.6	.4
Dec	8.4	7.5	1	1	6.0	1996	29	22.0	1992	19	1996	29	4	1996	4.3	3.9	1.2	.1	.0	5.8	3.6	1.4	.1
Ann	61.0	52.8	N/A	N/A	16.0	Mar 1990	13	29.0	Mar 1990	25	Nov 1996	26	8	Nov 1996	28.2	26.0	8.5	2.6	.2	31.6	15.9	7.5	1.3

+ 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	7/25	7/17	7/11	7/05	7/01	6/26	6/21	6/15	6/06
32	6/23	6/17	6/12	6/08	6/04	5/31	5/27	5/22	5/16
28	5/29	5/24	5/21	5/19	5/16	5/13	5/11	5/07	5/03
24	5/17	5/12	5/08	5/05	5/02	4/29	4/26	4/22	4/16
20	5/05	4/29	4/25	4/22	4/19	4/15	4/12	4/08	4/02
16	4/30	4/23	4/19	4/15	4/11	4/07	4/03	3/30	3/23

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	8/10	8/15	8/19	8/23	8/26	8/29	9/02	9/05	9/11
32	8/12	8/19	8/24	8/28	9/01	9/05	9/10	9/15	9/21
28	9/02	9/08	9/12	9/15	9/18	9/21	9/25	9/28	10/04
24	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/09	10/14
20	9/24	9/29	10/03	10/07	10/10	10/14	10/17	10/21	10/27
16	9/30	10/07	10/11	10/15	10/19	10/22	10/26	10/31	11/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	86	75	68	62	56	50	43	36	25
32	116	106	100	94	89	83	78	71	62
28	145	138	133	129	124	120	116	111	104
24	173	165	159	155	150	146	141	135	128
20	201	192	185	179	174	169	163	156	147
16	216	207	200	195	190	185	179	173	164

***** 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	1403	1138	1015	673	419	210	105	143	351	647	1051	1323	8478
60	1248	998	860	528	275	108	37	71	231	492	901	1168	6917
57	1161	923	767	443	198	64	16	41	171	400	813	1077	6074
55	1107	871	705	389	155	41	9	28	136	340	759	1025	5565
50	961	740	556	266	72	10	0	9	66	205	619	878	4382
32	497	345	141	25	0	0	0	0	0	8	222	422	1660

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	118	131	149	342	605	802	994	977	658	384	162	123	5445
55	14	13	0	16	47	153	290	292	104	3	8	12	952
57	7	9	0	10	29	116	236	244	79	2	3	2	737
60	1	0	0	5	12	70	163	180	49	0	0	0	480
65	0	0	0	0	1	21	76	97	19	0	0	0	214
70	0	0	0	0	0	4	23	39	6	0	0	0	72

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	12	25	47	173	387	583	770	750	450	219	43	17	12	37	84	257	644	1227	1997	2747	3197	3416	3459	3476
45	0	5	18	87	251	433	615	596	315	124	17	1	0	5	23	110	361	794	1409	2005	2320	2444	2461	2462
50	0	0	0	39	136	288	461	442	194	56	5	0	0	0	0	39	175	463	924	1366	1560	1616	1621	1621
55	0	0	0	13	61	162	310	295	100	19	0	0	0	0	0	13	74	236	546	841	941	960	960	960
60	0	0	0	2	22	71	172	165	42	6	0	0	0	0	0	2	24	95	267	432	474	480	480	480
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	3	17	42	136	259	362	492	478	305	159	27	3	3	20	62	198	457	819	1311	1789	2094	2253	2280	2283

(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

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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