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: ALBION 1 N, MT **COOP ID: 240088**

Climate Division: MT 7 **NWS Call Sign:** **Elevation: 3,312 Feet** **Lat: 45˚13N** **Lon: 104˚16W**

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	27.9	1.9	14.9	67	1981	23	28.0	1981	-39	1949	21	-.5	1979	1552	0	.0	.0	1.5	16.3	30.9	11.0
Feb	33.9	8.3	21.1	73	1982	21	32.2	1999	-46	1994	9	6.1	1979	1230	0	.0	.0	5.1	10.9	27.9	6.3
Mar	43.2	17.7	30.5	77+	1961	24	38.1	1986	-36	1998	11	20.9	1996	1072	0	.0	.0	12.0	5.6	29.8	2.4
Apr	55.6	28.7	42.2	91	1980	21	48.8	1977	-4	1997	11	34.8	1997	686	0	.0	@	21.3	1.2	20.8	.2
May	66.1	39.2	52.7	98	1980	22	59.7	1977	8	1954	3	47.6	1983	389	6	.0	.5	29.5	.0	5.8	.0
Jun	76.3	48.6	62.5	103	1970	27	73.7	1988	26	1969	13	56.5	1998	147	71	.3	3.3	29.9	.0	.4	.0
Jul	85.1	53.9	69.5	108+	1981	7	74.2	1983	33	1950	13	61.7	1992	52	192	1.5	10.9	31.0	.0	.0	.0
Aug	84.7	51.9	68.3	107	1975	7	75.9	1983	28+	1992	30	62.1	1992	66	168	.9	9.0	30.9	.0	.1	.0
Sep	73.3	39.7	56.5	104+	1978	5	64.2	1998	12	1958	30	50.6	1993	284	28	.2	2.8	28.9	.0	5.2	.0
Oct	59.4	28.5	44.0	95	1963	4	47.3	1979	-15	1991	31	38.6	1976	652	0	.0	@	24.6	.6	19.2	.1
Nov	41.1	15.6	28.4	80	1999	8	38.0	1999	-30+	1964	29	13.1	1985	1100	0	.0	.0	9.2	7.3	29.0	2.4
Dec	31.8	4.8	18.3	69	1973	1	29.6	1999	-48	1964	17	-1.8	1983	1447	0	.0	.0	3.0	13.1	30.9	8.6
Ann	56.5	28.2	42.4	108+	Jul 1981	7	75.9	Aug 1983	-48	Dec 1964	17	-1.8	Dec 1983	8677	465	2.9	26.5	226.9	55.0	200.0	31.0

\+ 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/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

Issue Date: February 2004

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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	.29	.26	.42	1996	4	.89	1996	.00+	1995
Feb	.31	.28	.58	1991	17	.95	1979	.00	1973
Mar	.52	.50	1.16	1977	29	1.07	1998	.00	1981
Apr	1.55	1.70	1.46	1994	26	3.65	1991	.16	1983
May	2.59	2.24	2.70	1982	15	5.85	1982	.69	1998
Jun	2.79	2.42	3.30	1976	14	7.21	1993	1.23	1987
Jul	1.92	1.91	1.87	1956	2	5.13	1979	.03	1991
Aug	1.44	1.40	2.24	1968	23	3.85	1999	.09	1994
Sep	.98	.80	1.27	1971	5	3.28	1986	.05	1975
Oct	1.12	.73	2.62	1971	2	4.74	1971	.13	1987
Nov	.48	.36	1.70	2000	1	2.43	2000	.04	1979
Dec	.32	.25	.46	1992	22	.97	1992	.00	1979
Ann	14.31	14.44	3.30	Jun 1976	14	7.21	Jun 1993	.00+	Jan 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.9	1.0	.0	.0
Feb	3.9	.9	@	.0
Mar	6.1	1.9	.2	@
Apr	7.5	3.8	1.0	@
May	10.6	5.9	1.5	.2
Jun	10.6	6.2	1.2	.4
Jul	8.9	4.5	1.1	.3
Aug	6.3	3.1	.7	.1
Sep	4.8	2.7	.5	.1
Oct	5.7	3.0	.6	.2
Nov	4.5	1.4	.1	@
Dec	4.4	1.2	.0	.0
Ann	77.2	35.6	6.9	1.3

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	.00	.00	.08	.14	.18	.24	.30	.37	.46	.61	.76
Feb	.01	.04	.09	.14	.18	.24	.31	.39	.50	.68	.86
Mar	.08	.15	.24	.31	.38	.46	.54	.64	.77	.97	1.16
Apr	.14	.25	.46	.67	.91	1.18	1.49	1.89	2.44	3.35	4.25
May	.72	.97	1.34	1.67	1.98	2.32	2.68	3.12	3.68	4.56	5.39
Jun	1.00	1.27	1.64	1.96	2.27	2.58	2.91	3.31	3.81	4.59	5.30
Jul	.27	.43	.71	.97	1.25	1.56	1.92	2.35	2.94	3.90	4.82
Aug	.24	.36	.57	.77	.97	1.20	1.45	1.76	2.17	2.84	3.48
Sep	.11	.19	.33	.46	.61	.77	.96	1.19	1.51	2.03	2.54
Oct	.13	.21	.37	.53	.69	.88	1.10	1.37	1.74	2.34	2.93
Nov	.06	.09	.16	.23	.30	.38	.47	.58	.74	.99	1.24
Dec	.02	.05	.10	.15	.20	.25	.32	.40	.51	.69	.86
Ann	9.55	10.45	11.62	12.51	13.31	14.08	14.89	15.78	16.88	18.47	19.86

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	2.6	2.0	4	4
Feb	3.8	2.0	3	1
Mar	4.3	4.0	2	1
Apr	4.3	5.0	1	#
May	.4	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	1.3	.0	#	0
Nov	4.3	5.5	1	1
Dec	4.2	3.3	3	1
Ann	25.4	21.8	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	7.0	1996	4	7.0	1996	16	1997	30	14	1997
Feb	5.0	1979	7	16.5	1979	24	1979	25	18	1979
Mar	6.0	1999	10	9.0	1999	23	1979	2	8+	1998
Apr	11.0	1994	26	11.0	1994	20	1984	27	5	1997
May	8.0	1983	12	8.0	1983	10	1983	12	2	1983
Jun	.0	0	0	.0	0	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	5.0	1984	23	5.0	1984	5	1984	23	#+	1993
Oct	5.0	1992	14	5.0	1992	5	1992	14	1	1991
Nov	6.0	1978	10	10.0	1978	10	1978	19	4	1978
Dec	9.0	1984	23	13.0+	1984	16	1983	29	13	1983
Ann	11.0	Apr 1994	26	16.5	Feb 1979	24	Feb 1979	25	18	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.5	2.4	.3	.1	.0
Feb	1.9	1.6	.5	.1	.0
Mar	2.5	2.3	.4	.3	.0
Apr	1.5	1.5	.7	.5	.1
May	.1	.1	.1	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.1	.1	.1	.0
Oct	.5	.5	.1	.1	.0
Nov	1.9	1.6	.4	.2	.0
Dec	2.2	1.8	.4	.2	.0
Ann	13.3	11.9	3.0	1.6	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	7.4	4.6	2.6	.8
Mar	5.8	3.4	2.1	.0
Apr	2.4	1.4	1.0	.6
May	.1	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.1	.1	.0
Oct	.8	.4	.1	.0
Nov	7.1	4.2	.9	.0
Dec	14.8	6.2	3.5	2.0
Ann	-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

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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	7/01	6/22	6/15	6/10	6/05	5/30	5/25	5/18	5/09
32	6/11	6/05	5/31	5/27	5/23	5/20	5/16	5/11	5/05
28	5/22	5/17	5/14	5/11	5/09	5/06	5/03	4/30	4/25
24	5/13	5/08	5/04	5/02	4/29	4/26	4/23	4/20	4/15
20	5/02	4/27	4/24	4/21	4/19	4/16	4/13	4/10	4/06
16	4/24	4/19	4/15	4/12	4/10	4/07	4/04	3/31	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	8/20	8/25	8/29	9/01	9/04	9/07	9/10	9/13	9/18
32	9/05	9/09	9/12	9/14	9/16	9/19	9/21	9/24	9/28
28	9/07	9/12	9/15	9/18	9/21	9/23	9/26	9/30	10/04
24	9/15	9/20	9/24	9/28	10/01	10/04	10/08	10/12	10/17
20	9/22	9/29	10/04	10/08	10/12	10/16	10/20	10/25	11/01
16	10/04	10/10	10/14	10/18	10/21	10/24	10/28	11/01	11/07

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	123	112	104	97	90	84	77	69	58
32	139	131	125	120	115	111	105	100	91
28	155	148	143	139	135	131	126	121	114
24	177	169	164	159	154	150	145	140	132
20	198	190	185	180	175	171	166	161	153
16	220	211	205	199	194	188	183	176	167

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1552	1230	1072	686	389	147	52	66	284	652	1100	1447	8677
60	1397	1090	917	538	253	71	17	25	174	498	950	1292	7222
57	1304	1012	824	451	184	40	9	13	120	405	860	1199	6421
55	1243	960	762	395	145	26	4	6	90	345	800	1137	5913
50	1092	829	609	266	69	7	0	1	36	204	657	984	4754
32	589	413	165	18	0	0	0	0	0	5	224	488	1902

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	60	107	116	322	641	913	1163	1125	734	376	115	64	5736
55	0	10	0	9	72	249	454	418	134	2	0	0	1348
57	0	6	0	5	50	203	397	362	104	1	0	0	1128
60	0	0	0	2	26	145	313	282	68	0	0	0	836
65	0	0	0	0	6	71	192	168	28	0	0	0	465
70	0	0	0	0	1	26	105	86	9	0	0	0	227

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	5	39	163	432	700	930	860	531	214	26	0	0	5	44	207	639	1339	2269	3129	3660	3874	3900	3900
45	0	0	8	83	292	551	775	705	387	117	9	0	0	0	8	91	383	934	1709	2414	2801	2918	2927	2927
50	0	0	0	36	170	403	620	552	259	53	0	0	0	0	0	36	206	609	1229	1781	2040	2093	2093	2093
55	0	0	0	11	82	263	465	401	155	13	0	0	0	0	0	11	93	356	821	1222	1377	1390	1390	1390
60	0	0	0	1	32	144	314	255	76	2	0	0	0	0	0	1	33	177	491	746	822	824	824	824
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	15	52	144	282	432	583	538	363	190	46	7	0	15	67	211	493	925	1508	2046	2409	2599	2645	2652

(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