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: ILIAD, MT **COOP ID: 244368**

Climate Division: MT 3 **NWS Call Sign:** **Elevation: 2,965 Feet** **Lat: 47˚48N** **Lon: 109˚49W**

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	28.4	6.3	17.4	68	1992	31	31.4	1992	-48	1969	24	.4	1979	1476	0	.0	.0	3.0	15.0	30.2	10.6
Feb	36.1	13.5	24.8	74	1992	27	36.7	1991	-35+	1996	2	7.7	1979	1125	0	.0	.0	7.0	9.9	27.0	6.3
Mar	46.4	22.2	34.3	78	1993	23	42.4	1986	-28	1960	3	24.9	1996	953	0	.0	.0	15.0	3.9	27.2	1.5
Apr	58.3	32.3	45.3	90	1980	20	52.1	1980	1	1975	6	35.7	1975	590	0	.0	@	23.7	.7	17.0	.0
May	68.1	41.0	54.6	97	1966	26	58.3	1985	22+	1968	11	49.1	1996	327	4	.0	.4	29.6	.0	3.4	.0
Jun	77.0	49.0	63.0	102	1988	4	71.3	1988	24	1969	13	58.2	1998	123	64	.1	3.1	29.9	.0	.1	.0
Jul	84.2	53.0	68.6	107	1963	22	72.8	1975	31	1966	4	60.8	1993	52	163	.6	8.8	31.0	.0	.4	.0
Aug	84.1	52.3	68.2	112	1961	5	75.2	1971	31	1992	25	62.4	1980	73	172	.9	10.1	30.9	.0	.1	.0
Sep	72.3	41.4	56.9	101	1967	5	64.8	1998	15+	1965	26	48.8	1985	285	41	.0	1.9	28.6	.0	4.5	.0
Oct	59.5	30.6	45.1	90	1964	13	48.9	1979	-15	1991	28	38.7	1991	618	0	.0	.0	25.7	.8	16.8	.3
Nov	41.6	18.5	30.1	79	1975	5	40.3	1999	-31	1959	13	9.8	1985	1050	0	.0	.0	10.2	6.5	27.4	2.9
Dec	31.5	9.4	20.5	68	1980	15	32.9	1999	-43+	1989	22	-.9	1983	1381	0	.0	.0	4.1	12.6	30.3	7.5
Ann	57.3	30.8	44.1	112	Aug 1961	5	75.2	Aug 1971	-48	Jan 1969	24	-.9	Dec 1983	8053	444	1.6	24.3	238.7	49.4	184.4	29.1

\+ 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: 1950-2001

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

Issue Date: February 2004

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Climate Division: MT 3 **NWS Call Sign:** **Elevation: 2,965 Feet** **Lat: 47°48N** **Lon: 109°49W**

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	.58	.56	.78	1996	3	1.65	1971	.00+	1988
Feb	.43	.44	.80	1982	22	1.01	1978	.00+	1990
Mar	.68	.62	.79	1993	27	1.87	1996	.00	1994
Apr	1.15	.94	1.90	1991	28	2.96	1989	.00	1983
May	2.34	2.06	2.32	1997	26	5.25	1982	.38	1992
Jun	2.28	1.79	3.00	1974	20	6.32	1993	.76	1985
Jul	1.57	1.34	2.37	1983	10	3.97	1983	.00	1984
Aug	1.36	1.19	2.02	1968	15	5.28	1985	.00	1988
Sep	1.14	.78	1.60	1988	18	4.48	1986	.00	1990
Oct	.67	.65	1.18	1967	3	1.56	1998	.00	1987
Nov	.48	.38	1.00	1959	14	1.28	1978	.00+	2000
Dec	.41	.31	.70	1977	16	2.61	1977	.00+	2000
Ann	13.09	12.66	3.00	Jun 1974	20	6.32	Jun 1993	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	1.4	.2	.0
Feb	3.5	1.0	@	.0
Mar	4.5	2.2	.2	.0
Apr	4.4	2.8	.6	.1
May	7.7	5.5	1.2	.3
Jun	7.7	5.4	1.3	.3
Jul	5.4	3.6	1.0	.2
Aug	4.9	3.1	.9	.2
Sep	4.1	3.0	.5	.1
Oct	3.3	2.1	.3	.0
Nov	3.7	1.4	.1	.0
Dec	3.2	1.2	.1	.0
Ann	57.2	32.7	6.4	1.2

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	.11	.22	.33	.45	.58	.74	.96	1.31	1.66
Feb	.00	.08	.17	.24	.30	.37	.45	.53	.65	.84	1.02
Mar	.07	.15	.26	.36	.46	.57	.69	.84	1.03	1.35	1.65
Apr	.16	.31	.51	.67	.83	1.00	1.19	1.42	1.72	2.19	2.63
May	.57	.78	1.12	1.43	1.73	2.05	2.40	2.83	3.38	4.26	5.09
Jun	.67	.89	1.21	1.49	1.77	2.05	2.37	2.74	3.22	3.97	4.67
Jul	.15	.34	.59	.82	1.05	1.30	1.59	1.93	2.39	3.13	3.83
Aug	.05	.16	.35	.55	.77	1.01	1.30	1.67	2.17	3.01	3.84
Sep	.06	.17	.35	.51	.69	.89	1.12	1.40	1.79	2.43	3.04
Oct	.09	.17	.29	.38	.48	.58	.69	.83	1.01	1.29	1.56
Nov	.00	.00	.13	.22	.31	.40	.50	.61	.77	1.01	1.24
Dec	.00	.00	.00	.08	.17	.27	.38	.52	.71	1.02	1.33
Ann	7.54	8.53	9.84	10.86	11.79	12.71	13.67	14.76	16.10	18.08	19.83

\+ 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:
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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	2.1	-99.9	1	1
Feb	1.2	-99.9	#	#
Mar	1.7	.0	1	#
Apr	1.7	.0	#	0
May	.4	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.1	.0	0	0
Sep	.0	.0	0	0
Oct	.9	.0	#	0
Nov	4.4	3.5	1	0
Dec	1.8	1.1	1	#
Ann	14.3	-9.9	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	1994	18	10.5	1993	9	1999	10	4	1999
Feb	6.0	1972	22	6.0+	1972	5+	2000	20	3	1975
Mar	5.0	1977	29	5.0	1977	6+	1996	23	6	1972
Apr	9.0	1995	9	9.0	1995	6	1997	4	#+	2000
May	8.0	1982	29	8.0+	1982	6	1974	13	#+	1996
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	1.0	1992	23	1.0	1992	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	6.0	1981	13	8.0	1981	4	1996	20	#+	2000
Nov	4.5	1995	6	12.5	1995	7	1975	27	7	1975
Dec	8.0	1998	28	8.0	1998	5	1972	2	3	1977
Ann	9.0	Apr 1995	9	12.5	Nov 1995	9	Jan 1999	10	7	Nov 1975

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.2	.7	.3	.1	.0
Feb	1.1	1.0	.3	.1	.0
Mar	.7	.4	.1	.1	.0
Apr	.4	.4	.2	.1	.0
May	.1	.1	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.1	.1	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.4	.2	.1	.1	.0
Nov	1.1	1.0	.4	.0	.0
Dec	1.0	.9	.4	.2	.0
Ann	6.1	4.8	1.9	.8	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	-9.9	-9.9	-9.9	-9.9
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.1	.0	.0	.0
Nov	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9
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

Complete documentation available from:
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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	7/22	7/11	7/02	6/25	6/18	6/11	6/04	5/26	5/15
32	6/28	6/17	6/09	6/02	5/26	5/19	5/12	5/04	4/23
28	5/27	5/19	5/13	5/09	5/04	4/29	4/24	4/19	4/11
24	5/02	4/28	4/25	4/22	4/20	4/18	4/15	4/12	4/08
20	4/25	4/19	4/15	4/12	4/09	4/05	4/02	3/29	3/23
16	4/16	4/10	4/07	4/03	3/31	3/28	3/25	3/21	3/15

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	119	105	95	87	79	71	62	53	39
32	153	139	129	121	113	105	97	87	73
28	170	160	154	148	143	137	131	125	115
24	192	184	178	172	168	163	158	152	143
20	217	207	200	194	189	183	177	170	161
16	235	227	221	216	211	206	201	195	187

***** 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	1476	1125	953	590	327	123	52	73	285	618	1050	1381	8053
60	1322	993	798	449	194	50	15	29	181	464	900	1226	6621
57	1232	915	705	367	129	24	7	16	129	373	819	1135	5851
55	1172	862	645	316	94	14	2	9	100	314	763	1076	5367
50	1030	734	499	205	35	2	0	2	45	183	624	933	4292
32	549	349	113	12	0	0	0	0	0	7	239	462	1731

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	96	148	183	412	700	931	1134	1122	746	412	179	104	6167
55	6	17	2	25	81	255	424	418	156	5	13	5	1407
57	3	14	0	17	54	205	366	363	125	2	10	2	1161
60	0	8	0	8	25	141	282	283	87	1	0	0	835
65	0	0	0	0	4	64	163	172	41	0	0	0	444
70	0	0	0	0	0	20	80	90	16	0	0	0	206

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	6	21	61	202	466	693	865	871	512	233	38	4	6	27	88	290	756	1449	2314	3185	3697	3930	3968	3972
45	0	3	20	112	321	543	710	716	373	129	13	2	0	3	23	135	456	999	1709	2425	2798	2927	2940	2942
50	0	0	1	51	187	394	555	563	245	58	3	0	0	0	1	52	239	633	1188	1751	1996	2054	2057	2057
55	0	0	0	16	91	256	401	413	136	18	0	0	0	0	0	16	107	363	764	1177	1313	1331	1331	1331
60	0	0	0	3	36	136	260	268	64	4	0	0	0	0	0	3	39	175	435	703	767	771	771	771
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	28	62	166	306	430	553	550	350	197	44	10	2	30	92	258	564	994	1547	2097	2447	2644	2688	2698

(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