

Climatology of the United States

No. 20

1971-2000

Station: MILES CITY AP, MT

COOP ID: 245690

Climate Division: MT 7

NWS Call Sign: MLS

Elevation: 2,628 Feet Lat: 46° 26N

Lon: 105° 53W

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	27.3	7.4	17.4	72	1992	31	31.9	1992	-37+	1996	30	.2	1979	1477	0	.0	.0	1.5	16.8	30.3	10.3
Feb	35.2	14.3	24.8	73	1992	27	36.4	1998	-37	1939	10	7.3	1989	1126	0	.0	.0	5.5	10.6	26.5	5.5
Mar	46.1	23.7	34.9	83	1943	29	44.1	1986	-28	1996	8	22.9	1996	933	0	.0	.0	13.4	5.1	25.3	1.7
Apr	58.8	34.5	46.7	92	1980	21	53.3	1987	5+	1997	8	38.8	1975	553	1	.0	.1	23.1	.8	12.0	.0
May	69.5	44.9	57.2	100	1988	29	62.4	1985	15	1954	3	51.5	1996	267	25	@	1.0	29.8	.0	1.5	.0
Jun	79.9	54.2	67.1	106	1988	26	78.9	1988	32+	1951	2	60.4	1998	81	143	.7	5.6	30.0	.0	.0	.0
Jul	87.9	60.2	74.1	109+	1980	23	79.2	2000	41	1945	1	64.1	1993	20	300	3.1	14.3	31.0	.0	.0	.0
Aug	86.8	58.9	72.9	110+	1995	7	80.4	1983	35	1966	22	65.8	1977	41	284	1.8	13.1	31.0	.0	.0	.0
Sep	74.0	46.8	60.4	106	1983	1	69.4	1998	19	1995	21	54.9	1986	208	69	.2	3.3	28.9	.0	1.6	.0
Oct	60.0	35.3	47.7	95	1997	2	50.7	1979	-8	1991	30	43.3	1984	537	0	.0	.2	24.9	.5	10.2	.1
Nov	41.8	21.6	31.7	81	1999	12	42.3	1999	-27	2000	12	14.4	1985	1000	0	.0	.0	9.5	7.5	25.8	2.7
Dec	30.6	10.5	20.6	69	1939	5	33.1	1999	-38	1983	24	.9	1983	1377	0	.0	.0	2.6	14.5	30.3	7.1
Ann	58.2	34.4	46.3	110+	Aug 1995	7	80.4	Aug 1983	-38	Dec 1983	24	.2	Jan 1979	7620	822	5.8	37.6	231.2	55.8	163.5	27.4

+ 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: 1937-2001

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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	.50	.34	.76	1996	3	1.78	1971	.03	2000	7.3	1.5	@	.0	.04	.07	.13	.20	.28	.36	.47	.60	.79	1.10	1.40
Feb	.34	.28	1.10	1942	22	1.19	1978	.01	1992	5.8	.8	.1	.0	.02	.04	.08	.12	.17	.24	.31	.41	.55	.78	1.02
Mar	.58	.47	1.40	1942	24	1.33	1995	.12	1978	7.3	1.9	.1	.0	.10	.15	.24	.32	.40	.49	.59	.71	.87	1.13	1.39
Apr	1.40	1.15	2.06	1989	27	4.22	1973	.02	1983	7.9	3.6	.7	.2	.09	.18	.35	.54	.76	1.01	1.31	1.69	2.23	3.14	4.04
May	2.19	1.49	2.30	1978	17	6.81	1978	.28	1980	10.9	5.7	1.2	.3	.42	.62	.94	1.24	1.54	1.86	2.23	2.67	3.25	4.19	5.08
Jun	2.42	2.13	2.71	1964	18	6.44	1991	.70	1988	10.4	5.9	1.5	.3	.66	.89	1.24	1.55	1.85	2.16	2.51	2.92	3.46	4.30	5.09
Jul	1.61	1.47	2.22	1985	29	6.32	1993	.00	1988	7.7	3.9	.8	.3	.07	.21	.44	.68	.93	1.22	1.56	1.98	2.56	3.52	4.46
Aug	1.16	.85	1.66	1968	23	3.34	1972	.05	1996	6.4	2.8	.5	.2	.18	.28	.44	.61	.77	.96	1.17	1.42	1.77	2.33	2.86
Sep	1.19	.87	2.67	1941	7	4.02	1973	.03	1979	6.4	2.8	.7	.2	.07	.14	.29	.45	.63	.85	1.10	1.44	1.90	2.69	3.47
Oct	1.13	.88	2.11	1971	1	6.31	1971	.01	1987	6.2	2.5	.6	.1	.07	.14	.28	.44	.61	.81	1.05	1.37	1.80	2.54	3.27
Nov	.52	.41	1.17	1957	1	2.17	1978	.10	1982	6.0	1.9	.1	.0	.08	.12	.19	.27	.34	.42	.52	.64	.79	1.05	1.30
Dec	.45	.34	.80	1938	29	1.24	1971	.02	1997	7.0	1.5	.0	.0	.04	.07	.13	.19	.26	.34	.43	.55	.71	.99	1.26
Ann	13.49	13.22	2.71	Jun 1964	18	6.81	May 1978	.00	Jul 1988	89.3	34.8	6.3	1.6	7.32	8.40	9.84	10.97	12.01	13.04	14.13	15.36	16.88	19.15	21.17

+ 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: 1937-2001

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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	5.3	4.2	3	3	8.4	1991	1	17.2	1971	15	1991	2	9	1972	6.0	1.9	.4	.1	.0	21.5	14.5	9.6	1.4
Feb	3.5	2.0	3	2	6.1	2000	25	12.5	2000	21+	1978	18	14	1978	4.6	1.1	.3	.1	.0	13.4	9.7	7.7	3.0
Mar	4.2	3.1	1	1	5.6	1985	2	16.9	1996	15+	1996	9	7	1996	4.5	1.8	.2	@	.0	9.2	5.3	2.9	.7
Apr	3.5	1.9	#	0	15.0	1989	27	15.6	1989	16	1989	28	2	1997	1.7	1.0	.4	.2	@	2.0	1.2	.8	.2
May	1.0	.0	#	0	6.4	1983	11	12.0	1983	11	1983	13	1	1983	.5	.3	.1	.1	.0	.2	.1	.1	@
Jun	#	.0	#	0	#	1973	18	#	1973	0	0	0	#	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	.4	.0	#	0	7.1	1972	25	7.1	1972	3	1972	25	#	1984	.2	.2	@	@	.0	.1	@	.0	.0
Oct	1.3	.0	#	0	4.0	1991	23	7.7	1991	4+	1991	24	1	1991	.9	.5	.1	.0	.0	.7	.2	.0	.0
Nov	3.6	2.1	1	0	8.0	1977	19	16.8	1978	16	1977	24	7	2000	3.5	1.5	.3	.1	.0	6.7	3.3	2.3	.6
Dec	4.5	3.4	2	1	4.8	1971	6	13.9	1977	14+	1996	31	6+	1985	5.8	1.9	.3	.0	.0	16.6	9.1	5.9	.3
Ann	27.3	16.7	N/A	N/A	15.0	Apr 1989	27	17.2	Jan 1971	21+	Feb 1978	18	14	Feb 1978	27.7	10.2	2.1	.6	@	70.4	43.4	29.3	6.2

+ 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	5/26	5/22	5/19	5/17	5/14	5/12	5/09	5/06	5/02
32	5/19	5/14	5/11	5/08	5/06	5/03	4/30	4/27	4/22
28	5/06	5/02	4/29	4/27	4/24	4/22	4/19	4/16	4/12
24	4/29	4/23	4/19	4/15	4/12	4/09	4/05	4/01	3/26
20	4/16	4/12	4/08	4/05	4/02	3/31	3/28	3/24	3/19
16	4/12	4/06	4/02	3/29	3/26	3/22	3/18	3/14	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	9/08	9/12	9/15	9/18	9/20	9/23	9/25	9/28	10/02
32	9/13	9/18	9/22	9/25	9/28	10/01	10/04	10/08	10/13
28	9/21	9/27	10/02	10/05	10/09	10/12	10/16	10/21	10/27
24	10/01	10/08	10/12	10/17	10/20	10/24	10/28	11/02	11/09
20	10/16	10/21	10/25	10/28	10/31	11/03	11/07	11/10	11/16
16	10/24	10/29	11/01	11/04	11/07	11/10	11/13	11/16	11/21
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	144	139	135	131	128	125	122	118	112
32	166	159	154	149	145	141	136	131	124
28	191	183	177	172	167	162	157	151	143
24	216	207	201	195	191	186	180	174	166
20	233	226	220	215	211	207	202	196	189
16	250	242	236	231	226	221	216	209	201

* 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	1477	1126	933	553	267	81	20	41	208	537	1000	1377	7620
60	1325	1000	779	410	156	32	6	16	119	384	850	1222	6299
57	1235	921	690	330	105	16	1	8	78	296	766	1129	5575
55	1177	869	633	280	77	9	0	4	56	241	710	1071	5127
50	1034	742	490	174	29	1	0	1	20	126	570	929	4116
32	559	366	129	8	0	0	0	0	0	3	193	458	1716

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	105	164	219	446	782	1052	1302	1266	851	489	183	104	6963
55	9	22	10	29	145	371	589	557	217	14	10	4	1977
57	6	18	4	19	111	318	528	498	179	6	6	0	1693
60	2	14	1	9	69	243	441	414	130	2	0	0	1325
65	0	0	0	1	25	143	300	284	69	0	0	0	822
70	0	0	0	0	6	70	183	179	31	0	0	0	469

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	2	15	74	252	543	825	1067	1029	625	283	46	4	2	17	91	343	886	1711	2778	3807	4432	4715	4761	4765
45	0	3	28	149	395	675	912	874	478	172	16	0	0	3	31	180	575	1250	2162	3036	3514	3686	3702	3702
50	0	0	4	78	264	525	757	719	344	83	3	0	0	0	4	82	346	871	1628	2347	2691	2774	2777	2777
55	0	0	1	32	148	379	602	564	224	38	0	0	0	0	1	33	181	560	1162	1726	1950	1988	1988	1988
60	0	0	0	8	73	244	450	412	125	10	0	0	0	0	0	8	81	325	775	1187	1312	1322	1322	1322
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	1	18	64	167	326	512	684	656	383	186	36	2	1	19	83	250	576	1088	1772	2428	2811	2997	3033	3035

(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/normal/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 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/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