

Climatology of the United States No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: MELSTONE, MT

1971-2000

COOP ID: 245596

Climate Division: MT 4

NWS Call Sign:

Elevation: 2,920 Feet Lat: 46° 36N

Lon: 107° 52W

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	33.6	11.7	22.7	70	1953	9	37.1	1986	-43	1954	20	5.3	1979	1312	0	.0	.0	4.8	11.5	28.3	8.6
Feb	40.5	16.5	28.5	76	1992	27	40.3	1991	-36	1996	2	12.2	1989	1022	0	.0	.0	9.5	7.4	24.9	4.7
Mar	49.5	23.9	36.7	80	1987	5	45.6	1986	-29	1960	2	26.9	1996	878	0	.0	.0	16.9	3.1	25.2	1.2
Apr	60.2	32.3	46.3	92	1952	28	53.2	1987	1	1986	14	37.2	1975	563	0	.0	.0	24.8	.6	14.6	.0
May	70.2	41.6	55.9	97	1980	22	60.6	1985	8	1954	3	51.0	1974	295	13	.0	.9	29.8	@	3.4	.0
Jun	80.1	50.3	65.2	105	1988	5	75.5	1988	23	1969	14	60.2	1998	95	101	.5	5.4	30.0	.0	@	.0
Jul	87.7	55.1	71.4	108	1960	19	76.0	2000	35+	1952	1	62.2	1993	29	228	1.7	14.4	31.0	.0	.0	.0
Aug	87.2	54.3	70.8	110+	1957	5	76.4	1983	32	1992	25	64.5	1993	47	225	.9	13.3	31.0	.0	@	.0
Sep	75.2	44.2	59.7	106	1950	4	68.2	1998	18	1985	29	53.7+	1986	212	54	.1	2.8	29.2	.0	1.9	.0
Oct	62.5	34.5	48.5	92	1992	1	51.9	1974	-9	1991	30	43.2	1984	512	0	.0	.1	26.6	.4	11.8	.1
Nov	45.1	23.2	34.2	79+	1999	12	44.9	1999	-30	1955	27	16.7	1985	926	0	.0	.0	12.6	5.5	24.4	1.7
Dec	35.6	14.1	24.9	69+	1980	15	36.2	1999	-43	1983	24	5.3	1983	1245	0	.0	.0	5.0	10.2	28.3	6.1
Ann	60.6	33.5	47.1	110+	Aug 1957	5	76.4	Aug 1983	-43+	Dec 1983	24	5.3+	Dec 1983	7136	621	3.2	36.9	251.2	38.7	162.8	22.4

+ 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: 1948-2001

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

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COOP ID: 245596

Climate Division: MT 4

NWS Call Sign:

Elevation: 2,920 Feet Lat: 46°36N

Lon: 107°52W

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	.60	.45	.59	1971	31	2.00	1971	.03	1992	5.5	2.5	.1	.0	.07	.12	.20	.28	.37	.47	.59	.73	.92	1.24	1.55
Feb	.42	.32	1.20	1949	18	1.40	1986	.00	1992	3.9	1.6	.1	.0	.05	.10	.16	.22	.29	.35	.42	.51	.63	.82	1.00
Mar	.87	.89	1.13	1988	4	1.72	1988	.16	1978	6.7	2.9	.3	@	.25	.33	.46	.56	.67	.78	.90	1.05	1.23	1.52	1.80
Apr	1.49	1.32	2.45	1973	20	4.35	1991	.14	1981	7.7	4.4	.8	.1	.25	.38	.60	.80	1.01	1.24	1.50	1.82	2.24	2.92	3.58
May	2.72	2.35	2.19	1967	10	7.04	1978	1.07+	1991	9.9	6.1	1.6	.6	.83	1.09	1.48	1.81	2.13	2.47	2.83	3.26	3.82	4.69	5.49
Jun	2.42	2.21	2.87	1968	9	5.21	1997	.52	1996	10.5	6.6	1.3	.3	.73	.96	1.30	1.60	1.88	2.18	2.51	2.90	3.40	4.18	4.91
Jul	1.58	1.23	1.91	1962	14	7.90	1993	.12+	1988	7.5	4.2	.8	.1	.13	.23	.44	.66	.90	1.17	1.50	1.92	2.49	3.45	4.40
Aug	1.22	.95	2.22	1964	20	3.14	1985	.12	2000	5.6	3.1	.6	.2	.20	.30	.48	.64	.82	1.01	1.22	1.48	1.83	2.41	2.95
Sep	1.47	1.06	2.60	1978	12	5.87	1978	.00	1990	5.9	3.4	1.0	.3	.09	.23	.46	.68	.91	1.16	1.45	1.81	2.30	3.10	3.88
Oct	1.04	.95	1.30	1980	22	3.33	1980	.00	1987	5.2	2.5	.5	.2	.06	.16	.32	.48	.64	.82	1.03	1.28	1.63	2.21	2.76
Nov	.61	.57	1.00	1958	16	2.26	1978	.00	1972	4.7	2.3	.1	.0	.07	.15	.25	.34	.43	.52	.63	.76	.93	1.20	1.46
Dec	.60	.38	1.03	1955	23	2.10	1977	.05	1991	4.8	2.4	.1	.0	.05	.09	.16	.25	.34	.44	.57	.73	.95	1.32	1.68
Ann	15.04	15.03	2.87	Jun 1968	9	7.90	Jul 1993	.00+	Feb 1992	77.9	42.0	7.3	1.8	10.12	11.05	12.25	13.17	13.99	14.79	15.62	16.54	17.66	19.29	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

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Station: MELSTONE, MT

COOP ID: 245596

Climate Division: MT 4

NWS Call Sign:

Elevation: 2,920 Feet

Lat: 46° 36N

Lon: 107° 52W

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	9.2	6.6	4	2	8.0	1971	30	32.5	1971	34	1978	31	22	1978	5.0	4.1	1.1	.2	.0	15.7	10.0	6.0	2.2
Feb	4.8	4.0	4	1	10.0	1993	20	17.5	1986	36	1978	2	28	1979	3.2	2.6	.5	.2	@	9.1	5.9	4.2	2.3
Mar	7.6	7.0	2	#	10.0	1977	29	21.5	1996	29	1979	2	15	1979	4.2	3.5	.9	.2	@	6.4	3.4	2.0	.5
Apr	5.2	3.5	#	#	14.0	1982	7	22.0	1982	13	1973	20	2	1975	2.1	1.8	.7	.2	.1	1.9	.7	.3	.2
May	1.3	.0	#	0	15.0	1983	12	20.0	1983	12	1983	12	1	1983	.4	.4	.1	.1	@	.2	.1	.1	@
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1981	20	#	1981	.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	#	1996	17	#	1996	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.6	.0	#	0	5.0	1984	23	7.0	1984	3	1984	23	#+	2000	.2	.2	.1	@	.0	.1	@	.0	.0
Oct	2.3	1.0	#	0	12.0	1980	16	18.0	1980	10	1993	8	1	1993	.9	.7	.2	.1	.1	.9	.4	.2	.1
Nov	6.7	5.5	1	#	7.0	1978	19	21.5	1978	21	1978	27	11	1978	3.2	2.7	.9	.2	.0	6.3	3.2	2.2	1.3
Dec	8.0	5.5	3	1	13.5	1984	23	27.6	1989	26	1989	22	13	1978	4.1	3.5	1.0	.3	@	13.0	7.8	5.3	2.0
Ann	45.7	33.1	N/A	N/A	15.0	May 1983	12	32.5	Jan 1971	36	Feb 1978	2	28	Feb 1979	23.3	19.5	5.5	1.5	.2	53.6	31.5	20.3	8.6

+ 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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No. 20 1971-2000

Station: MELSTONE, MT

COOP ID: 245596

Climate Division: MT 4

NWS Call Sign:

Elevation: 2,920 Feet

Lat: 46° 36N

Lon: 107° 52W

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	6/05	6/01	5/28	5/25	5/23	5/20	5/17	5/13	5/09
32	5/26	5/21	5/18	5/15	5/12	5/10	5/07	5/04	4/29
28	5/13	5/08	5/05	5/02	4/30	4/27	4/24	4/21	4/17
24	5/02	4/28	4/24	4/21	4/19	4/16	4/13	4/10	4/05
20	4/22	4/17	4/13	4/10	4/07	4/04	4/01	3/28	3/23
16	4/13	4/07	4/03	3/31	3/28	3/25	3/21	3/17	3/12
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	9/05	9/09	9/11	9/13	9/15	9/17	9/19	9/22	9/25
32	9/12	9/17	9/20	9/23	9/25	9/28	10/01	10/04	10/08
28	9/19	9/23	9/27	9/30	10/03	10/06	10/09	10/12	10/17
24	9/26	10/02	10/06	10/09	10/13	10/16	10/20	10/24	10/30
20	10/08	10/14	10/19	10/23	10/26	10/30	11/02	11/07	11/13
16	10/20	10/26	10/31	11/04	11/07	11/11	11/15	11/20	11/26
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	132	126	122	118	115	112	108	104	99
32	154	148	143	139	135	131	127	123	116
28	173	167	163	159	155	152	148	144	138
24	199	191	186	181	176	172	167	161	153
20	229	219	213	207	201	196	190	183	174
16	248	240	234	229	224	219	214	208	199

* 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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Station: MELSTONE, MT

COOP ID: 245596

Climate Division: MT 4

NWS Call Sign:

Elevation: 2,920 Feet Lat: 46°36N Lon: 107°52W

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	1312	1022	878	563	295	95	29	47	212	512	926	1245	7136
60	1163	894	723	419	172	37	9	17	119	358	776	1090	5777
57	1079	815	631	338	115	18	2	8	76	269	694	1008	5053
55	1020	764	571	287	84	10	0	4	54	215	638	949	4596
50	876	638	428	177	31	1	0	0	18	103	501	804	3577
32	434	283	79	6	0	0	0	0	0	1	151	369	1323

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	145	185	224	434	741	996	1221	1201	832	513	216	148	6856
55	18	22	4	24	112	316	508	492	195	14	12	14	1731
57	15	18	2	15	81	263	448	434	158	6	9	12	1461
60	5	12	0	7	45	192	362	350	110	2	0	0	1085
65	0	0	0	0	13	101	228	225	54	0	0	0	621
70	0	0	0	0	2	41	127	129	21	0	0	0	320

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	19	38	87	241	514	772	986	969	606	304	66	20	19	57	144	385	899	1671	2657	3626	4232	4536	4602	4622
45	2	7	36	134	367	622	831	814	461	180	30	3	2	9	45	179	546	1168	1999	2813	3274	3454	3484	3487
50	0	0	8	70	231	473	676	659	321	95	9	0	0	0	8	78	309	782	1458	2117	2438	2533	2542	2542
55	0	0	0	22	118	327	521	504	202	38	0	0	0	0	0	22	140	467	988	1492	1694	1732	1732	1732
60	0	0	0	5	52	196	368	353	105	11	0	0	0	0	0	5	57	253	621	974	1079	1090	1090	1090
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	12	37	86	184	327	477	621	606	387	223	53	18	12	49	135	319	646	1123	1744	2350	2737	2960	3013	3031

(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

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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. 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