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: HARLEM 4 W, MT **COOP ID: 243929**

Climate Division: MT 3 **NWS Call Sign:** **Elevation: 2,362 Feet** **Lat: 48˚33N** **Lon: 108˚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	26.0	1.2	13.6	65	1992	28	30.5	1992	-50	1969	24	-2.1	1982	1593	0	.0	.0	2.1	17.1	30.6	13.0
Feb	34.7	8.3	21.5	74+	1995	24	36.0	1991	-48	1994	8	4.6	1979	1218	0	.0	.0	5.7	10.4	27.6	6.6
Mar	46.6	18.9	32.8	79	1999	25	42.5	1986	-37	1996	6	22.8	1996	1000	0	.0	.0	14.7	4.3	28.6	2.2
Apr	60.4	29.2	44.8	92	2001	28	50.6	1987	-10	1967	22	35.1	1975	606	0	.0	@	24.7	.5	18.3	.1
May	70.4	39.5	55.0	98	1980	22	61.5	1988	10	1954	2	46.8	1974	328	16	.0	1.0	29.8	.0	5.1	.0
Jun	78.9	47.9	63.4	107	1988	4	73.5	1988	26	1951	1	57.3	1981	116	68	.4	3.6	30.0	.0	.2	.0
Jul	85.2	51.5	68.4	106	1960	22	73.8	1998	36	1951	11	61.5	1993	47	151	1.1	9.9	31.0	.0	.0	.0
Aug	84.9	50.2	67.6	107+	1998	6	73.9	1998	30	1950	19	60.6	1977	91	169	.8	10.8	31.0	.0	@	.0
Sep	73.2	39.2	56.2	102	1983	1	64.7	1998	13	1995	21	49.9	1985	294	29	.1	2.3	29.2	.0	4.8	.0
Oct	60.7	28.7	44.7	90	1960	6	48.3	1986	-20+	1991	30	39.4	1984	629	0	.0	.0	26.5	.5	19.5	.2
Nov	41.3	15.1	28.2	80+	1999	12	38.8	1999	-35+	1985	23	10.0	1985	1105	0	.0	.0	9.7	6.8	28.4	3.1
Dec	30.0	4.6	17.3	69	1951	1	31.4	1999	-44	1983	24	-4.4	1983	1478	0	.0	.0	3.0	14.3	30.6	9.5
Ann	57.7	27.9	42.8	107+	Aug 1998	6	73.9	Aug 1998	-50	Jan 1969	24	-4.4	Dec 1983	8505	433	2.4	27.6	237.4	53.9	193.7	34.7

+ 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

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	.41	.29	.50+	1982	5	2.05	1982	.00+	1995
Feb	.32	.23	.50+	1990	17	1.14	1986	.00	1983
Mar	.38	.38	.90	1950	6	1.00	1998	.00	1973
Apr	.73	.66	.90	1967	20	1.87	1979	.01	1988
May	1.96	1.68	1.85	1982	29	5.63	1986	.26	1976
Jun	2.20	2.02	3.20	1995	6	6.26	1995	.09	1985
Jul	1.81	1.58	3.76	1978	3	5.95	1978	.03	1994
Aug	1.02	.70	2.45	1966	20	3.67	1974	.05	1988
Sep	1.35	.81	5.76	1986	25	8.73	1986	.02	1990
Oct	.55	.50	.92	1962	14	1.16	1981	.06	1987
Nov	.39	.43	.51	1976	25	.85	1998	.00+	1982
Dec	.41	.30	.88	1989	5	1.53	1977	.00	1991
Ann	11.53	11.36	5.76	Sep 1986	25	8.73	Sep 1986	.00+	Jan 1995

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	1.6	@	.0
Feb	3.8	1.0	@	.0
Mar	4.5	1.3	@	.0
Apr	6.1	2.1	.3	.0
May	9.7	4.4	.9	.4
Jun	10.3	5.2	1.1	.2
Jul	7.2	3.9	1.0	.3
Aug	6.5	2.9	.4	.1
Sep	6.2	2.9	.6	.1
Oct	4.5	2.0	.1	.0
Nov	4.6	1.4	@	.0
Dec	5.3	1.1	.2	.0
Ann	73.5	29.8	4.6	1.1

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	.02	.09	.17	.26	.37	.51	.71	1.04	1.39
Feb	.02	.04	.09	.14	.19	.24	.31	.39	.50	.68	.86
Mar	.04	.08	.14	.20	.25	.31	.38	.47	.58	.75	.92
Apr	.08	.13	.23	.33	.44	.57	.71	.89	1.14	1.55	1.95
May	.39	.56	.85	1.12	1.38	1.67	2.00	2.39	2.91	3.74	4.53
Jun	.35	.54	.86	1.16	1.48	1.82	2.21	2.69	3.33	4.37	5.36
Jul	.15	.27	.51	.76	1.04	1.35	1.73	2.20	2.86	3.95	5.03
Aug	.07	.13	.26	.39	.55	.73	.95	1.23	1.63	2.29	2.95
Sep	.05	.12	.27	.44	.65	.90	1.21	1.62	2.19	3.19	4.19
Oct	.09	.14	.22	.29	.37	.45	.55	.67	.82	1.07	1.31
Nov	.00	.00	.15	.22	.28	.34	.42	.50	.61	.78	.95
Dec	.01	.04	.09	.15	.22	.29	.39	.50	.67	.95	1.23
Ann	6.50	7.39	8.57	9.51	10.35	11.19	12.07	13.07	14.30	16.12	17.74

+ 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	3.0	1.0	3	#	6.0	1982	5	8.6	1999	18	1971	31	8	1971	2.7	1.5	.2	.0	.0	-9.9	-9.9	-9.9	-9.9
Feb	4.0	2.8	2	#	6.8	1986	6	17.3	1986	18	1971	1	12	1971	2.5	1.2	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
Mar	3.3	3.5	1	0	4.0	1975	26	11.0	1975	12	1972	2	10	1972	1.5	1.0	.2	.0	.0	3.2	1.7	.4	.0
Apr	1.4	.0	#	0	6.0	1975	7	11.0	1975	10	1975	8	2	1975	.4	.4	.1	@	.0	.8	.4	.4	.1
May	#	.0	#	0	#	1976	5	#	1976	#	1980	26	#	1980	.0	.0	.0	.0	.0	.0	.0	.0	.0
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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	#	.0	0	0	#	1985	28	#	1985	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.3	.0	#	0	5.0	1985	8	5.1	1991	#+	1997	13	#+	1997	.4	.2	.1	@	.0	.0	.0	.0	.0
Nov	1.8	1.0	#	0	5.5	1978	12	7.0	1986	8	1978	14	4	1978	1.6	.7	.1	.1	.0	2.4	2.0	1.6	.0
Dec	3.1	.8	1	#	6.8	1982	2	10.4	1972	12	1975	2	5	1978	2.6	1.0	.2	.1	.0	-9.9	-9.9	-9.9	-9.9
Ann	16.9	9.1	N/A	N/A	6.8+	Feb 1986	6	17.3	Feb 1986	18+	Feb 1971	1	12	Feb 1971	11.7	6.0	1.1	.3	.0	-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	6/17	6/12	6/08	6/05	6/02	5/30	5/27	5/23	5/18
32	6/03	5/29	5/25	5/22	5/19	5/16	5/13	5/09	5/04
28	5/21	5/16	5/13	5/10	5/07	5/04	5/01	4/28	4/23
24	5/06	5/02	4/29	4/26	4/23	4/21	4/18	4/15	4/11
20	4/30	4/25	4/21	4/18	4/15	4/12	4/09	4/05	3/31
16	4/20	4/15	4/11	4/08	4/04	4/01	3/29	3/25	3/20

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	8/16	8/22	8/26	8/30	9/02	9/05	9/09	9/13	9/19
32	9/05	9/09	9/11	9/14	9/16	9/18	9/20	9/22	9/26
28	9/13	9/17	9/19	9/22	9/24	9/26	9/28	10/01	10/05
24	9/17	9/23	9/27	9/30	10/04	10/07	10/10	10/15	10/20
20	9/28	10/04	10/08	10/11	10/15	10/18	10/22	10/26	11/01
16	10/03	10/09	10/13	10/17	10/20	10/23	10/27	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	112	105	100	95	91	87	83	78	71
32	139	132	127	123	119	114	110	105	98
28	160	153	148	143	139	135	131	126	119
24	186	178	172	167	163	158	153	147	139
20	207	199	192	187	182	177	172	166	157
16	225	216	209	203	198	192	187	180	170

***** 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	1593	1218	1000	606	328	116	47	91	294	629	1105	1478	8505
60	1438	1086	845	461	205	47	12	40	183	474	955	1323	7069
57	1347	1008	753	378	146	23	5	23	128	382	865	1230	6288
55	1287	955	693	325	113	14	0	15	98	323	809	1169	5801
50	1145	825	549	209	51	2	0	4	41	190	669	1028	4713
32	652	426	157	11	0	0	0	0	0	7	254	544	2051

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	81	132	180	395	711	942	1128	1101	725	402	140	89	6026
55	4	18	3	19	111	266	415	403	133	4	4	1	1381
57	2	15	1	12	82	215	358	348	104	2	0	0	1139
60	0	8	0	5	48	149	272	273	68	0	0	0	823
65	0	0	0	0	16	68	151	169	29	0	0	0	433
70	0	0	0	0	3	21	69	91	11	0	0	0	195

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	1	9	48	215	488	724	908	881	517	232	26	2	1	10	58	273	761	1485	2393	3274	3791	4023	4049	4051
45	0	0	13	114	340	574	753	726	373	124	8	0	0	0	13	127	467	1041	1794	2520	2893	3017	3025	3025
50	0	0	0	55	206	425	598	571	244	53	1	0	0	0	0	55	261	686	1284	1855	2099	2152	2153	2153
55	0	0	0	17	101	281	443	418	134	13	0	0	0	0	0	17	118	399	842	1260	1394	1407	1407	1407
60	0	0	0	3	44	153	290	271	55	2	0	0	0	0	0	3	47	200	490	761	816	818	818	818
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	19	67	194	329	456	568	557	360	204	35	5	1	20	87	281	610	1066	1634	2191	2551	2755	2790	2795

(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