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: LENNEP 5 SW, MT **COOP ID: 244954**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 5,600 Feet** **Lat: 46˚22N** **Lon: 110˚36W**

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	27.7	8.3	18.0	59	1981	22	27.8	1981	-38	1962	21	.9	1979	1457	0	.0	.0	.3	16.9	30.4	7.4
Feb	32.2	11.1	21.7	63	1990	28	31.3	1991	-44	1989	3	7.6	1989	1214	0	.0	.0	1.0	11.5	27.6	4.8
Mar	38.2	16.7	27.5	66+	1994	16	35.8	1992	-30+	1976	2	19.8	1975	1164	0	.0	.0	5.2	6.2	29.4	1.9
Apr	47.5	23.7	35.6	79	1987	28	43.0	1987	-10	1975	1	25.9	1975	882	0	.0	.0	14.6	1.6	25.3	.2
May	57.4	32.1	44.8	83+	1987	15	49.4	1987	14+	1995	1	40.3	1974	628	0	.0	.0	25.2	.2	15.4	.0
Jun	66.9	39.8	53.4	90	1988	19	61.3	1988	18	1969	13	48.4	1998	353	4	.0	@	29.3	.0	3.5	.0
Jul	74.6	43.7	59.2	98	1960	20	64.8	1985	28+	1981	8	51.3	1993	210	29	.0	.4	31.0	.0	.5	.0
Aug	75.3	43.0	59.2	96	1961	5	66.8	1971	20	1992	25	54.2	1987	214	32	.0	.4	30.9	.0	1.0	.0
Sep	63.9	34.2	49.1	95	1959	12	55.9	1998	10+	1985	29	43.0	1985	482	4	.0	@	27.4	.2	9.1	.0
Oct	52.3	26.0	39.2	81+	1992	2	44.7	1988	-14	1991	30	33.9	1984	802	0	.0	.0	19.8	1.2	21.4	.3
Nov	36.2	16.2	26.2	69	1999	8	38.0	1999	-32	1959	16	11.1	1985	1163	0	.0	.0	4.6	9.5	27.5	2.4
Dec	28.7	10.0	19.4	62	1959	3	27.7	1999	-40+	1983	24	3.1	1983	1416	0	.0	.0	.5	16.2	30.4	5.3
Ann	50.1	25.4	37.8	98	Jul 1960	20	66.8	Aug 1971	-44	Feb 1989	3	.9	Jan 1979	9985	69	.0	.8	189.8	63.5	221.5	22.3

\+ 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: 1959-2001

(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	.98	.91	.85	1970	20	2.61	1975	.17	1981
Feb	.69	.62	.71	1970	27	1.55	1980	.05	1990
Mar	.97	1.00	.72	1967	29	1.97	1975	.08	1973
Apr	1.32	1.28	1.65	1976	27	3.04	1976	.14	1987
May	2.48	2.38	1.55	1996	24	5.18	1981	.83	1973
Jun	2.64	2.56	1.80	1980	15	6.18	1997	.46	1985
Jul	1.83	1.53	1.37	1978	5	4.03	1993	.21	1996
Aug	1.57	1.46	1.91	1974	20	4.37	1993	.16	1994
Sep	1.35	1.21	1.46	1970	8	3.19	1985	.06	1979
Oct	1.11	.97	1.33	1975	21	3.72	1975	.00	1987
Nov	.89	.85	.90	1972	26	1.89+	1985	.06	1990
Dec	.90	.65	1.00	1977	1	2.91	1977	.25	1979
Ann	16.73	16.22	1.91	Aug 1974	20	6.18	Jun 1997	.00	Oct 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.1	3.5	.3	.0
Feb	5.9	2.7	.1	.0
Mar	8.4	4.0	@	.0
Apr	8.7	4.7	.2	.1
May	11.1	7.4	1.3	.2
Jun	10.9	7.5	1.2	.3
Jul	8.0	5.2	1.0	.2
Aug	7.9	5.2	.6	.2
Sep	6.5	4.4	.5	.1
Oct	6.2	3.5	.5	.1
Nov	7.0	3.2	.2	.0
Dec	7.7	3.7	.1	@
Ann	96.4	55.0	6.0	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	.15	.23	.38	.51	.65	.80	.98	1.19	1.48	1.94	2.39
Feb	.12	.18	.28	.38	.48	.58	.70	.84	1.04	1.35	1.64
Mar	.29	.38	.52	.63	.75	.87	1.00	1.16	1.36	1.68	1.97
Apr	.26	.38	.57	.75	.93	1.12	1.34	1.60	1.95	2.51	3.04
May	.92	1.15	1.49	1.76	2.03	2.30	2.60	2.94	3.38	4.05	4.67
Jun	.75	1.00	1.38	1.71	2.03	2.37	2.74	3.18	3.75	4.64	5.47
Jul	.32	.48	.74	.99	1.25	1.53	1.85	2.23	2.75	3.58	4.38
Aug	.36	.50	.73	.94	1.15	1.37	1.61	1.91	2.30	2.91	3.50
Sep	.20	.31	.50	.69	.88	1.10	1.34	1.64	2.05	2.71	3.34
Oct	.17	.32	.51	.66	.81	.97	1.15	1.36	1.64	2.07	2.48
Nov	.15	.23	.36	.48	.61	.74	.90	1.08	1.33	1.74	2.13
Dec	.22	.31	.44	.55	.67	.79	.92	1.08	1.29	1.63	1.94
Ann	11.27	12.30	13.64	14.66	15.57	16.46	17.38	18.40	19.65	21.46	23.04

\+ 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: 1959-2001
(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	21.2	21.5	10	9
Feb	12.3	11.1	9	9
Mar	5.9	-99.9	5	2
Apr	11.7	12.5	1	0
May	1.6	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.4	.0	#	0
Oct	4.9	2.0	#	0
Nov	11.5	13.3	2	1
Dec	12.9	11.4	6	5
Ann	82.4	-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	8.2	1999	5	32.2	1999	31	1997	13	23	1997
Feb	8.0	1996	25	21.7	1999	26	1997	27	21	1997
Mar	12.0	1995	25	29.5	1996	26	1997	3	20	1997
Apr	9.0	1995	9	19.0	1997	12	1997	12	8	1997
May	7.0	1995	13	7.0	1995	7	1995	13	#+	2000
Jun	.5	1995	9	.7	1995	#+	1996	19	#+	1996
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	2.4	2000	22	3.8	2000	2	2000	22	#+	2000
Oct	12.5	1996	26	20.3	1996	12	1996	26	2	1996
Nov	7.5	1996	19	23.5	1996	14	1996	27	6	1996
Dec	11.6	1998	4	21.7	1999	30	1996	29	18	1996
Ann	12.5	Oct 1996	26	32.2	Jan 1999	31	Jan 1997	13	23	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9	-9.9
Mar	5.9	2.9	1.1	.4	.1
Apr	4.3	2.5	.6	.2	.0
May	.8	.5	.2	.1	.0
Jun	.1	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.4	.2	.0	.0	.0
Oct	1.6	.7	.3	.1	.1
Nov	6.4	2.9	.8	.3	.0
Dec	7.8	3.5	1.5	.7	.1
Ann	-9.9	-9.9	-9.9	-9.9	-9.9

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	3.0	1.2	.4	.0
May	.4	.1	.1	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	.0	.0	.0
Oct	1.2	.6	.3	.1
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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	62	53	47	41	36	31	26	19	10
32	96	87	81	75	70	65	60	53	44
28	123	116	111	106	102	98	93	88	81
24	155	146	140	134	129	124	118	112	103
20	179	170	165	159	155	150	145	139	131
16	210	201	195	189	184	178	173	166	157

***** 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	1457	1214	1164	882	628	353	210	214	482	802	1163	1416	9985
60	1302	1074	1009	732	473	219	111	117	343	647	1013	1261	8301
57	1209	990	916	642	382	152	67	72	267	554	923	1168	7342
55	1147	934	854	582	323	114	43	49	221	492	863	1106	6728
50	992	794	699	436	192	44	12	16	125	340	713	951	5314
32	479	328	210	66	3	0	0	0	0	20	254	439	1799

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	45	38	69	174	399	641	842	841	513	241	81	46	3930
55	0	0	0	0	6	65	172	178	44	0	0	0	465
57	0	0	0	0	2	42	133	139	29	0	0	0	345
60	0	0	0	0	0	20	85	90	15	0	0	0	210
65	0	0	0	0	0	4	29	32	4	0	0	0	69
70	0	0	0	0	0	0	7	9	0	0	0	0	16

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	1	12	75	219	430	628	623	349	139	17	0	0	1	13	88	307	737	1365	1988	2337	2476	2493	2493
45	0	0	0	29	114	287	473	469	222	63	0	0	0	0	0	29	143	430	903	1372	1594	1657	1657	1657
50	0	0	0	6	44	165	320	318	119	18	0	0	0	0	0	6	50	215	535	853	972	990	990	990
55	0	0	0	0	10	75	185	181	48	2	0	0	0	0	0	0	10	85	270	451	499	501	501	501
60	0	0	0	0	0	23	79	76	12	0	0	0	0	0	0	0	0	23	102	178	190	190	190	190
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	14	66	161	278	409	418	248	116	15	0	0	0	14	80	241	519	928	1346	1594	1710	1725	1725

(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.
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