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: COHAGEN, MT **COOP ID: 241875**

Climate Division: MT 6 **NWS Call Sign:** **Elevation: 2,715 Feet** **Lat: 47˚03N** **Lon: 106˚37W**

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	30.5	4.9	17.7	68	1992	31	31.2	1986	-44+	1969	25	.7	1979	1467	0	.0	.0	2.3	14.4	30.1	11.8
Feb	38.1	11.4	24.8	74	1995	24	36.4	1991	-42+	1996	2	9.2	1989	1127	0	.0	.0	6.4	9.1	27.1	6.7
Mar	48.7	20.2	34.5	78+	1993	23	44.1	1986	-35	1996	8	23.3	1996	947	0	.0	.0	15.2	4.4	27.5	2.1
Apr	61.4	29.7	45.6	91	1980	20	53.4	1987	-11	1986	15	37.8	1975	584	0	.0	@	24.8	.5	18.5	.1
May	71.6	39.7	55.7	102	1988	29	62.4	1988	14	1997	19	50.1	1974	305	16	@	.9	30.0	@	6.1	.0
Jun	81.1	48.9	65.0	109	1988	5	77.6	1988	28	1969	13	58.9	1998	108	108	.6	5.1	30.0	.0	.4	.0
Jul	88.5	53.3	70.9	106+	1999	24	75.1	1998	36	1971	8	63.0	1993	31	214	2.1	13.3	31.0	.0	.0	.0
Aug	88.4	52.1	70.3	109	1995	7	76.9	1983	28+	1994	31	64.5	1977	52	214	2.1	12.9	31.0	.0	.2	.0
Sep	76.3	40.9	58.6	104	1983	1	66.0	1998	13	1995	21	53.4	1986	234	41	.2	3.2	29.2	.0	4.7	.0
Oct	62.8	30.7	46.8	93+	1997	2	50.1	1974	-16	1991	30	42.2	1972	566	0	.0	.1	26.3	.4	16.6	.2
Nov	44.1	18.0	31.1	80	1999	12	40.5	1999	-29	1985	29	13.5	1985	1019	0	.0	.0	10.9	6.2	27.0	3.1
Dec	33.6	8.1	20.9	69	1979	4	32.5	1999	-42+	1990	22	1.6	1983	1369	0	.0	.0	3.7	12.5	30.3	8.8
Ann	60.4	29.8	45.2	109+	Aug 1995	7	77.6	Jun 1988	-44+	Jan 1969	25	.7	Jan 1979	7809	593	5.0	35.5	240.8	47.5	188.5	32.8

\+ 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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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	.44	.31	.48	1996	3	1.84	1971	.00	1973
Feb	.28	.25	.31	1978	12	1.00	1979	.00	1990
Mar	.49	.47	.34	2000	30	1.10	1996	.04	1999
Apr	1.02	.70	1.23	1969	25	3.08	1989	.11	1983
May	2.09	1.80	2.52	1975	6	5.71	1978	.66+	1998
Jun	2.07	1.91	2.22	1992	30	6.96	1991	.18	1974
Jul	1.65	1.31	2.41	1989	14	7.75	1993	.08	1984
Aug	1.07	.99	2.61	1972	14	4.03	1972	.18	1996
Sep	1.32	1.02	1.95	1986	25	4.73	1986	.10	1989
Oct	.91	.78	1.56	1971	18	3.26	1971	.04	1987
Nov	.42	.34	.43	1998	3	1.10	1998	.00	1972
Dec	.45	.39	.61	1989	5	1.44	1989	.01	1997
Ann	12.21	12.10	2.61	Aug 1972	14	7.75	Jul 1993	.00+	Feb 1990

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.6	1.5	.0	.0
Feb	3.7	1.0	@	.0
Mar	5.8	1.9	.0	.0
Apr	6.7	3.0	.5	.1
May	9.5	5.3	1.2	.2
Jun	9.0	5.7	1.2	.3
Jul	6.9	3.6	1.3	.2
Aug	5.0	2.6	.6	.1
Sep	5.2	2.9	.7	.3
Oct	4.8	2.4	.5	.1
Nov	4.9	1.5	.0	.0
Dec	5.1	1.6	@	.0
Ann	72.2	33.0	6.0	1.3

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	.02	.06	.12	.18	.25	.33	.42	.54	.69	.96	1.21
Feb	.02	.04	.09	.13	.17	.22	.27	.34	.43	.59	.74
Mar	.13	.18	.25	.31	.38	.44	.51	.60	.71	.88	1.04
Apr	.12	.19	.34	.48	.63	.80	.99	1.24	1.57	2.12	2.65
May	.56	.76	1.06	1.32	1.58	1.86	2.16	2.52	2.99	3.73	4.42
Jun	.40	.59	.89	1.17	1.46	1.76	2.11	2.52	3.08	3.96	4.81
Jul	.14	.25	.47	.70	.95	1.24	1.58	2.01	2.60	3.59	4.56
Aug	.13	.22	.37	.52	.67	.85	1.05	1.30	1.64	2.20	2.75
Sep	.11	.20	.37	.56	.76	.99	1.27	1.61	2.09	2.89	3.68
Oct	.10	.17	.29	.42	.55	.71	.88	1.11	1.41	1.91	2.40
Nov	.04	.09	.16	.22	.28	.35	.43	.52	.64	.85	1.04
Dec	.05	.08	.15	.21	.28	.35	.44	.55	.70	.95	1.20
Ann	7.24	8.13	9.32	10.24	11.08	11.90	12.76	13.72	14.92	16.68	18.23

\+ 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

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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	6.3	5.0	4	3
Feb	3.5	2.0	4	1
Mar	5.4	4.5	2	1
Apr	3.2	1.0	#	#
May	1.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	1.0	.0	#	#
Nov	4.1	3.0	1	#
Dec	6.0	5.0	3	2
Ann	30.7	20.5	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	1980	6	21.0	1989	19	1979	31	17	1979
Feb	7.0	1978	12	17.0	1978	35	1979	24	29	1979
Mar	5.0	1980	25	21.0	1996	33	1979	4	20	1978
Apr	12.0	1989	27	20.0	1989	9	1996	1	2	1979
May	10.0	1983	12	16.0	1983	11	1983	12	1	1983
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	2.0	1972	25	2.0+	1984	1+	2000	22	#+	2000
Oct	8.0	1985	7	10.0	1985	10	1985	8	1	1985
Nov	6.0	1993	23	13.0	1985	11	1985	30	6	2000
Dec	5.0	1977	30	18.0	1977	15	1971	31	8	1985
Ann	12.0	Apr 1989	27	21.0+	Mar 1996	35	Feb 1979	24	29	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.7	3.5	.5	.1	.0
Feb	2.3	2.2	.4	.1	.0
Mar	2.5	2.5	.6	.2	.0
Apr	1.1	1.0	.4	.2	@
May	.3	.3	.2	.1	@
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.1	.0	.0	.0
Oct	.5	.5	.1	@	.0
Nov	2.5	2.2	.3	.1	.0
Dec	3.7	3.4	.7	.1	.0
Ann	16.8	15.7	3.2	.9	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.9	13.7	10.8	5.3
Feb	10.5	6.4	5.1	2.5
Mar	7.7	4.7	2.5	1.4
Apr	1.9	1.1	.6	.0
May	.1	.1	.1	@
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.0	.0	.0
Oct	.7	.3	.1	@
Nov	6.4	3.3	2.2	.2
Dec	16.1	10.1	6.8	1.2
Ann	62.4	39.7	28.2	10.6

+ 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

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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	6/24	6/18	6/14	6/10	6/06	6/03	5/30	5/26	5/20
32	6/10	6/04	5/31	5/27	5/24	5/20	5/17	5/12	5/06
28	5/21	5/17	5/14	5/11	5/09	5/06	5/04	5/01	4/26
24	5/11	5/06	5/03	4/30	4/27	4/25	4/22	4/19	4/14
20	5/03	4/28	4/24	4/20	4/17	4/14	4/11	4/07	4/01
16	4/26	4/19	4/14	4/10	4/06	4/02	3/28	3/23	3/16

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	8/27	8/30	9/03	9/06	9/10	9/15	9/21
32	8/27	9/01	9/05	9/08	9/11	9/14	9/17	9/21	9/26
28	9/05	9/10	9/13	9/16	9/19	9/22	9/25	9/28	10/03
24	9/13	9/19	9/23	9/26	9/30	10/03	10/06	10/10	10/16
20	9/23	9/30	10/05	10/09	10/13	10/17	10/21	10/25	11/01
16	10/02	10/08	10/13	10/18	10/22	10/25	10/30	11/04	11/11

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	103	97	92	88	83	78	72	64
32	127	121	117	113	110	106	102	98	92
28	153	146	141	137	133	128	124	119	112
24	175	168	163	159	154	150	146	141	133
20	202	194	188	183	178	173	168	162	153
16	223	215	208	203	198	193	188	182	173

***** 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	1467	1127	947	584	305	108	31	52	234	566	1019	1369	7809
60	1315	998	792	439	184	47	9	19	133	412	869	1214	6431
57	1226	919	700	356	126	25	2	9	86	321	782	1121	5673
55	1169	866	641	303	94	16	1	5	61	263	729	1060	5208
50	1025	738	497	189	37	3	0	1	20	141	588	919	4158
32	553	358	124	7	0	0	0	0	0	4	202	445	1693

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	109	155	200	413	733	989	1206	1185	797	461	173	99	6520
55	12	19	4	19	115	315	493	477	168	7	9	1	1639
57	7	16	2	11	85	264	433	419	133	3	3	0	1376
60	3	11	0	5	49	196	347	336	90	1	0	0	1038
65	0	0	0	0	16	108	214	214	41	0	0	0	593
70	0	0	0	0	3	47	116	121	15	0	0	0	302

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	63	214	487	740	948	928	555	259	44	7	2	17	80	294	781	1521	2469	3397	3952	4211	4255	4262
45	0	0	20	123	340	590	793	773	410	144	16	0	0	0	20	143	483	1073	1866	2639	3049	3193	3209	3209
50	0	0	4	58	205	441	638	618	280	67	3	0	0	0	4	62	267	708	1346	1964	2244	2311	2314	2314
55	0	0	0	20	112	301	484	464	165	25	0	0	0	0	0	20	132	433	917	1381	1546	1571	1571	1571
60	0	0	0	4	45	178	336	316	81	4	0	0	0	0	0	4	49	227	563	879	960	964	964	964
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	24	76	186	326	470	591	581	382	216	49	7	1	25	101	287	613	1083	1674	2255	2637	2853	2902	2909

(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