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: MOORCROFT 3 S, WY **COOP ID: 486395**

Climate Division: WY 6 **NWS Call Sign:** **Elevation: 4,325 Feet** **Lat: 44˚13N** **Lon: 104˚56W**

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	31.0	4.5	17.8	66	1981	24	28.8	1981	-37	1949	24	2.0	1979	1466	0	.0	.0	1.4	14.5	30.7	9.2
Feb	36.3	10.1	23.2	68+	1995	26	33.3	1992	-43	1996	3	10.8	1989	1170	0	.0	.0	4.9	9.0	27.7	5.1
Mar	45.4	18.5	32.0	78	1986	29	39.0	1986	-26+	1996	9	23.9	1996	1025	0	.0	.0	13.1	5.0	28.2	1.8
Apr	55.4	27.3	41.4	89	1992	30	47.6	1987	-4+	1997	12	33.8	1997	710	0	.0	@	20.3	1.1	18.7	.2
May	66.3	38.1	52.2	94+	1992	18	58.7	1994	8	1954	3	46.9	1995	405	8	.0	.3	28.8	.0	5.9	.0
Jun	77.4	47.9	62.7	107	1988	25	74.8	1988	26	1989	1	54.8	1998	159	88	.3	3.3	29.9	.0	.2	.0
Jul	86.3	53.8	70.1	108	1989	9	74.3	1989	34+	1987	13	63.0	1993	31	187	1.2	11.4	31.0	.0	.0	.0
Aug	85.5	51.5	68.5	105	1995	8	74.9	1983	33+	1992	30	61.8	1974	60	167	.2	11.6	31.0	.0	.0	.0
Sep	74.1	40.7	57.4	101	1978	6	65.5	1998	17+	1991	18	52.4	1974	263	34	.1	2.6	28.9	.1	4.4	.0
Oct	59.8	28.9	44.4	90	1963	4	48.0	1999	-17	1991	30	39.5	1993	640	0	.0	.0	24.1	.8	18.1	.1
Nov	43.4	17.2	30.3	76	1999	13	43.4	1999	-26	1959	16	20.4	2000	1042	0	.0	.0	10.0	6.3	27.6	1.8
Dec	33.7	6.7	20.2	66+	1995	2	28.9	1999	-46	1990	22	3.1	1983	1389	0	.0	.0	3.2	12.2	30.6	6.8
Ann	57.9	28.8	43.4	108	Jul 1989	9	74.9	Aug 1983	-46	Dec 1990	22	2.0	Jan 1979	8360	484	1.8	29.2	226.6	49.0	192.1	25.0

\+ 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

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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	.30	.80	1991	23	1.21	1977	.07	1990
Feb	.34	.32	.62	1987	15	.98	1987	.00+	1998
Mar	.71	.55	.95	1950	26	1.97	1987	.14+	1978
Apr	1.30	1.17	2.50	1984	26	4.39	1984	.35	1987
May	2.44	1.95	2.53	1978	7	12.07	1978	.47	1973
Jun	2.33	2.18	2.33	1964	17	4.74	1999	.56	1996
Jul	1.81	1.62	2.30	1982	25	3.94	1982	.39	1975
Aug	1.36	1.27	2.20	1960	17	4.10	1993	.00	1997
Sep	1.06	.92	2.28	1951	3	2.86	1998	.04	1975
Oct	1.26	.85	1.90	1995	5	4.65	1994	.04	2000
Nov	.54	.55	.77	1986	7	1.27	1985	.00	1995
Dec	.38	.30	.40	1948	24	1.01	1977	.00+	1997
Ann	13.94	13.34	2.53	May 1978	7	12.07	May 1978	.00+	Feb 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.5	1.2	@	.0
Feb	4.5	1.2	.1	.0
Mar	5.6	2.8	.3	.0
Apr	7.4	3.5	.4	.1
May	9.3	5.7	1.5	.5
Jun	8.5	5.4	1.5	.4
Jul	6.6	4.2	1.0	.2
Aug	5.2	3.3	.7	.1
Sep	4.8	2.7	.6	.2
Oct	5.2	2.9	.7	.3
Nov	4.8	2.0	.2	.0
Dec	5.3	1.5	.0	.0
Ann	72.7	36.4	7.0	1.8

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	.08	.12	.18	.23	.29	.35	.42	.50	.61	.78	.94
Feb	.00	.00	.09	.16	.22	.28	.35	.44	.56	.73	.90
Mar	.14	.20	.30	.40	.50	.60	.72	.86	1.05	1.35	1.64
Apr	.30	.42	.61	.78	.95	1.13	1.33	1.57	1.88	2.38	2.85
May	.43	.65	1.00	1.34	1.68	2.05	2.47	2.98	3.66	4.75	5.80
Jun	.71	.93	1.26	1.54	1.82	2.11	2.42	2.79	3.27	4.01	4.71
Jul	.54	.71	.97	1.19	1.41	1.63	1.88	2.17	2.54	3.13	3.67
Aug	.06	.17	.37	.56	.78	1.02	1.31	1.67	2.16	2.99	3.80
Sep	.10	.17	.32	.46	.62	.81	1.02	1.29	1.66	2.27	2.88
Oct	.08	.16	.31	.49	.68	.91	1.18	1.53	2.02	2.85	3.67
Nov	.07	.13	.22	.30	.38	.46	.55	.67	.81	1.05	1.27
Dec	.00	.05	.12	.18	.24	.31	.39	.48	.61	.81	1.01
Ann	8.51	9.50	10.80	11.81	12.72	13.61	14.55	15.59	16.88	18.78	20.44

\+ 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	5.8	4.5	2	1	8.0	1991	23	20.0	1994	14	1993	13	9	1993	4.6	2.0	.7	.1	.0	12.1	2.4	.3	.0
Feb	4.4	4.0	2	1	6.0	1990	13	10.5	1978	11	1990	16	9	1978	3.0	1.8	.4	.1	.0	13.8	5.4	3.7	1.0
Mar	5.4	4.0	#	#	6.0	1990	6	14.5	1990	7	1977	30	2	1977	2.8	1.9	.6	.1	.0	4.0	1.9	.5	.0
Apr	4.8	2.0	#	#	8.0	1994	26	23.1	1990	7	1975	8	1	1977	2.0	1.3	.6	.4	.0	1.4	.8	.4	.0
May	2.9	.0	1	0	16.0	1978	7	55.0	1978	54	1978	8	26	1978	.7	.5	.3	.3	.1	.1	.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	.5	.0	#	0	5.0	2000	22	6.8	2000	1	1994	21	#+	1995	.2	.2	.1	@	.0	@	.0	.0	.0
Oct	2.5	1.0	#	0	7.0	1973	9	10.0+	1989	7	1973	9	1	1991	1.1	.9	.3	.2	.0	.9	.4	.3	.0
Nov	6.3	6.3	#	#	6.0	1991	29	11.3	2000	11	1991	30	2	1991	3.1	1.7	.3	.1	.0	2.9	1.3	.5	.1
Dec	5.6	5.1	2	1	9.0	1990	14	13.0	1990	18	1989	22	10	1989	3.8	2.3	.7	.2	.0	10.8	4.8	2.3	.3
Ann	38.2	26.9	N/A	N/A	16.0	May 1978	7	55.0	May 1978	54	May 1978	8	26	May 1978	21.3	12.6	4.0	1.5	.1	46.0	17.0	8.0	1.4

+ 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	6/16	6/11	6/07	6/03	5/30	5/25	5/20	5/13
32	6/09	6/02	5/29	5/25	5/21	5/17	5/13	5/09	5/02
28	5/23	5/17	5/13	5/09	5/06	5/03	4/29	4/25	4/19
24	5/10	5/05	5/01	4/27	4/24	4/21	4/18	4/14	4/08
20	4/28	4/24	4/20	4/17	4/15	4/12	4/09	4/06	4/01
16	4/19	4/13	4/09	4/06	4/02	3/30	3/26	3/22	3/17

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	129	119	112	106	100	95	89	82	72
32	139	132	127	123	120	116	112	107	100
28	164	157	152	147	143	139	135	129	122
24	186	178	173	168	164	159	155	149	142
20	210	201	195	189	184	178	173	166	157
16	232	225	219	215	210	206	201	196	188

***** 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	1466	1170	1025	710	405	159	31	60	263	640	1042	1389	8360
60	1311	1030	870	560	270	85	8	21	158	485	892	1234	6924
57	1218	946	777	473	200	52	2	10	108	394	802	1141	6123
55	1156	890	715	416	159	36	1	6	80	334	742	1079	5614
50	1002	760	562	283	79	13	0	1	31	199	602	925	4457
32	495	335	135	20	0	0	0	0	0	6	188	425	1604

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	52	89	133	300	626	919	1179	1130	761	389	136	59	5773
55	0	0	0	6	72	266	467	423	151	4	0	0	1389
57	0	0	0	3	50	222	406	365	119	2	0	0	1167
60	0	0	0	0	28	164	319	284	79	1	0	0	875
65	0	0	0	0	8	88	187	167	34	0	0	0	484
70	0	0	0	0	2	38	92	83	12	0	0	0	227

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	9	53	172	416	704	949	913	556	229	44	4	0	9	62	234	650	1354	2303	3216	3772	4001	4045	4049
45	0	0	16	93	278	554	794	758	417	129	18	0	0	0	16	109	387	941	1735	2493	2910	3039	3057	3057
50	0	0	2	45	163	408	639	603	285	59	2	0	0	0	2	47	210	618	1257	1860	2145	2204	2206	2206
55	0	0	0	12	80	272	485	449	175	19	0	0	0	0	0	12	92	364	849	1298	1473	1492	1492	1492
60	0	0	0	4	32	157	333	300	89	3	0	0	0	0	0	4	36	193	526	826	915	918	918	918
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	14	59	141	272	440	598	576	377	190	47	9	0	14	73	214	486	926	1524	2100	2477	2667	2714	2723

(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

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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