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: AUSTIN 1 W, MT **COOP ID: 240375**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,790 Feet** **Lat: 46˚38N** **Lon: 112˚16W**

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	27.9	11.7	19.8	63	1953	11	28.4	1986	-33+	1972	27	4.9	1979	1402	0	.0	.0	.7	14.6	30.0	7.6
Feb	33.5	15.8	24.7	62	1995	24	33.4	1991	-38	1989	4	6.6	1989	1131	0	.0	.0	2.3	9.0	26.9	4.0
Mar	42.0	21.4	31.7	70	1986	27	40.7	1986	-29	1955	25	24.9	1996	1033	0	.0	.0	8.1	4.1	28.2	1.4
Apr	52.5	28.5	40.5	80+	1980	20	47.9	1987	-6	1975	1	29.4	1975	736	0	.0	.0	18.0	.8	21.7	.1
May	61.6	35.8	48.7	86+	1986	30	53.2	1987	10	1954	2	44.0	1975	505	0	.0	.0	27.4	.0	9.5	.0
Jun	70.1	42.6	56.4	99	1974	25	62.7	1988	23	1969	13	52.1	1998	273	12	.0	.3	29.8	.0	1.2	.0
Jul	78.0	47.5	62.8	97+	1973	10	69.2	1985	31	1972	2	54.2	1993	135	65	.0	2.0	31.0	.0	.1	.0
Aug	77.1	46.9	62.0	100	1961	5	67.1	1971	26	1992	25	56.2	1993	155	62	.0	1.2	30.9	.0	.2	.0
Sep	65.8	38.9	52.4	92+	1998	5	59.5	1998	12	2000	23	44.6	1985	392	12	.0	.1	28.1	.1	5.5	.0
Oct	52.6	31.1	41.9	80+	1997	1	46.6	1988	-9	1991	30	37.5	1984	717	0	.0	.0	21.0	.8	16.5	.2
Nov	35.5	20.5	28.0	68	1965	1	37.2	1999	-28+	1959	13	11.8	1985	1111	0	.0	.0	4.6	8.3	27.1	2.3
Dec	28.4	13.2	20.8	59+	1980	26	28.5	1999	-41	1983	24	4.9	1983	1370	0	.0	.0	.8	15.4	30.0	5.4
Ann	52.1	29.5	40.8	100	Aug 1961	5	69.2	Jul 1985	-41	Dec 1983	24	4.9+	Dec 1983	8960	151	.0	3.6	202.7	53.1	196.9	21.0

\+ 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: 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	1.05	.98	1.40	1972	11	3.21	1972	.17	1987
Feb	.78	.73	.80	1958	13	2.21	1986	.10	1977
Mar	.98	.94	.66	1984	14	1.75	1981	.30	1999
Apr	1.40	1.30	1.48	1975	26	3.93	1975	.00	1977
May	2.44	2.28	1.86	1981	22	6.57	1980	.65	1979
Jun	2.07	1.82	2.09	1969	25	4.82	1980	.10	1985
Jul	1.69	1.34	3.69	1983	10	4.96	1983	.00	1973
Aug	1.48	1.11	1.22	1974	20	4.82	1993	.04	1988
Sep	1.41	1.15	1.45	1995	8	4.86	1985	.22	1979
Oct	1.12	.92	1.00	1993	28	3.04	1997	.03	1987
Nov	1.18	1.03	.96	1955	20	3.06	1995	.18	1979
Dec	1.08	1.14	.96	1977	2	2.66	1977	.10	1997
Ann	16.68	15.76	3.69	Jul 1983	10	6.57	May 1980	.00+	Apr 1977

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.3	3.8	.2	@
Feb	7.2	3.0	.1	.0
Mar	8.7	3.7	.2	.0
Apr	9.1	4.7	.5	@
May	11.9	7.2	1.2	.2
Jun	10.2	5.8	1.1	.2
Jul	6.9	4.1	.7	.1
Aug	7.6	4.2	.7	.1
Sep	7.2	4.2	.6	.1
Oct	6.6	3.9	.4	@
Nov	8.3	4.1	.4	.0
Dec	9.0	3.8	.2	.0
Ann	102.0	52.5	6.3	.7

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	.21	.31	.46	.60	.75	.90	1.07	1.28	1.55	1.99	2.41
Feb	.18	.25	.36	.47	.57	.67	.80	.94	1.13	1.43	1.72
Mar	.36	.45	.58	.69	.80	.90	1.02	1.16	1.33	1.60	1.85
Apr	.41	.61	.84	1.01	1.16	1.32	1.49	1.69	1.94	2.32	2.66
May	.70	.94	1.28	1.59	1.88	2.19	2.53	2.93	3.45	4.26	5.02
Jun	.45	.64	.94	1.22	1.49	1.78	2.11	2.51	3.03	3.86	4.64
Jul	.06	.19	.43	.67	.94	1.25	1.61	2.07	2.70	3.75	4.79
Aug	.18	.30	.51	.72	.93	1.18	1.46	1.81	2.29	3.07	3.83
Sep	.20	.32	.52	.72	.92	1.15	1.40	1.72	2.14	2.83	3.50
Oct	.08	.14	.28	.44	.61	.81	1.05	1.35	1.78	2.50	3.21
Nov	.26	.37	.54	.70	.85	1.02	1.20	1.43	1.72	2.19	2.63
Dec	.25	.35	.51	.65	.79	.94	1.11	1.31	1.58	2.00	2.40
Ann	10.26	11.43	12.97	14.16	15.23	16.29	17.39	18.62	20.13	22.36	24.32

\+ 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)

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	14.9	14.0	5	4	9.0	1971	9	27.0	1989	20	1979	14	13	1979	4.1	3.7	1.6	.6	.0	-9.9	-9.9	-9.9	-9.9
Feb	7.4	8.0	4	3	6.0	1975	7	16.0	1993	16+	1997	13	15	1997	3.6	3.4	.8	.3	.0	-9.9	-9.9	-9.9	-9.9
Mar	6.5	6.0	3	2	11.0	1994	23	17.5	1990	18	1989	3	8+	1997	2.8	2.8	1.3	.6	.1	8.8	3.9	1.9	.0
Apr	4.8	4.0	#	#	12.0	1999	29	17.0	1999	13	1975	8	3	1975	1.5	1.5	.3	.3	.1	.6	.2	.1	.0
May	.4	.0	#	0	8.0	1999	9	8.0	1999	16	1983	10	1	1983	.2	.2	.2	@	.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	.3	.0	#	0	7.3	1992	23	7.3	1992	7	1992	23	#	1992	@	@	@	@	.0	@	@	@	.0
Sep	.6	.0	#	0	7.0	1983	19	9.0	1983	5	1982	13	#+	1984	.2	.1	.1	@	.0	@	@	.0	.0
Oct	2.6	1.0	#	#	4.0	1973	31	12.0	1980	6	1975	22	1	1991	.8	.8	.3	.0	.0	.9	.4	@	.0
Nov	5.0	3.0	1	1	10.0	1996	19	12.5	1998	16	1978	19	5	1978	2.8	2.6	.9	.2	.1	5.4	2.9	.6	.2
Dec	12.8	13.0	3	3	8.0	1990	18	20.5	1996	18	1996	29	11	1985	4.6	4.1	1.4	.6	.0	-9.9	-9.9	-9.9	-9.9
Ann	55.3	49.0	N/A	N/A	12.0	Apr 1999	29	27.0	Jan 1989	20	Jan 1979	14	15	Feb 1997	20.6	19.2	6.9	2.6	.3	-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	7/17	7/10	7/04	6/30	6/26	6/22	6/17	6/12	6/05
32	6/21	6/16	6/12	6/09	6/06	6/02	5/30	5/26	5/21
28	6/04	5/29	5/25	5/22	5/19	5/16	5/13	5/09	5/03
24	5/13	5/08	5/04	5/01	4/28	4/25	4/21	4/18	4/12
20	4/25	4/19	4/15	4/12	4/09	4/06	4/03	3/30	3/24
16	4/23	4/16	4/11	4/07	4/03	3/30	3/26	3/21	3/14

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	92	83	77	71	66	61	56	49	41
32	115	109	105	101	98	94	90	86	80
28	150	142	136	131	126	121	116	110	102
24	188	179	173	167	162	157	152	145	137
20	213	204	197	192	186	181	175	169	160
16	233	224	217	212	206	201	195	189	179

***** 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	1402	1131	1033	736	505	273	135	155	392	717	1111	1370	8960
60	1247	991	878	586	354	155	58	75	264	562	961	1215	7346
57	1154	907	785	498	269	101	29	43	199	470	871	1122	6448
55	1092	851	723	441	217	72	17	28	160	408	811	1060	5880
50	937	712	569	306	111	23	3	7	83	262	665	905	4583
32	433	284	140	28	0	0	0	0	0	11	226	398	1520

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	54	77	130	282	518	729	953	930	610	317	105	50	4755
55	0	0	0	6	21	111	257	245	81	1	0	0	722
57	0	0	0	2	12	80	207	198	59	1	0	0	559
60	0	0	0	0	3	45	143	137	35	0	0	0	363
65	0	0	0	0	0	12	65	62	12	0	0	0	151
70	0	0	0	0	0	2	19	19	3	0	0	0	43

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	29	115	297	509	737	716	416	168	19	0	0	1	30	145	442	951	1688	2404	2820	2988	3007	3007
45	0	0	1	52	170	360	582	561	284	84	2	0	0	0	1	53	223	583	1165	1726	2010	2094	2096	2096
50	0	0	0	16	83	223	427	407	169	33	0	0	0	0	0	16	99	322	749	1156	1325	1358	1358	1358
55	0	0	0	0	30	118	280	264	83	10	0	0	0	0	0	0	30	148	428	692	775	785	785	785
60	0	0	0	0	4	47	146	136	25	0	0	0	0	0	0	0	4	51	197	333	358	358	358	358
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	27	96	204	321	469	461	278	117	13	0	0	1	28	124	328	649	1118	1579	1857	1974	1987	1987

(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