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: WINIFRED, MT **COOP ID: 249033**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 3,243 Feet** **Lat: 47˚34N** **Lon: 109˚23W**

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	29.8	5.5	17.7	67	1992	31	31.4	1992	-48	1950	3	.6	1979	1468	0	.0	.0	3.3	13.2	29.5	10.4
Feb	36.9	12.0	24.5	71	1995	25	36.3	1991	-38	1996	2	8.9	1989	1136	0	.0	.0	7.2	8.6	26.2	6.2
Mar	45.1	20.3	32.7	76	1993	23	41.3	1986	-29	1951	7	23.8	1996	1001	0	.0	.0	14.0	4.1	27.3	1.7
Apr	56.2	30.2	43.2	90	1980	20	50.2	1980	-10	1986	14	33.4	1975	654	0	.0	@	22.3	.9	18.4	.1
May	65.7	39.5	52.6	95	1980	22	57.4	1988	7	1954	2	47.3	1974	388	3	.0	.3	29.0	.0	4.8	.0
Jun	75.3	47.5	61.4	102+	1988	4	71.6	1988	26	1951	2	57.3	1998	157	49	.2	2.8	29.9	.0	.2	.0
Jul	82.6	51.2	66.9	103+	1963	22	71.5	1985	33	1972	4	59.7	1993	66	125	.3	8.4	31.0	.0	.0	.0
Aug	83.3	50.1	66.7	107	1983	6	72.9	1983	29	1992	25	59.4	1974	97	150	.5	9.6	31.0	.0	.1	.0
Sep	71.3	39.9	55.6	100	1983	1	64.4	1998	15+	1995	20	47.3	1985	313	31	@	2.0	28.5	@	4.9	.0
Oct	59.1	28.9	44.0	90	1964	13	47.1	1979	-17	1991	29	38.0	1984	651	0	.0	.0	25.3	.5	18.1	.2
Nov	42.5	17.7	30.1	80+	1999	8	40.8	1999	-31	1985	23	11.1	1985	1047	0	.0	.0	11.1	5.8	26.7	2.9
Dec	33.4	8.7	21.1	65+	1980	16	33.8	1999	-43	1989	22	-.4	1983	1362	0	.0	.0	4.6	10.9	29.5	7.2
Ann	56.8	29.3	43.0	107	Aug 1983	6	72.9	Aug 1983	-48	Jan 1950	3	-.4	Dec 1983	8340	358	1.0	23.1	237.2	44.0	185.7	28.7

\+ 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

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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	.73	.76	.70	1975	18	1.64	1971	.03	1973
Feb	.42	.44	.64	1982	22	.88	1979	.01	1992
Mar	.88	.87	1.30	1977	29	1.59	1977	.11	1994
Apr	1.33	1.11	1.77	1973	20	3.58	1975	.11	1983
May	2.76	2.42	2.90	1962	21	7.78	1981	.83	1992
Jun	2.79	2.55	2.90	1965	26	5.86	1993	.77	1979
Jul	1.89	1.87	2.30	1983	10	5.74	1993	.04	1984
Aug	1.66	1.14	2.14	1964	20	6.29	1985	.12	2000
Sep	1.34	1.07	2.05	1978	12	5.11	1986	.02	1990
Oct	.80	.69	1.11	1958	20	2.14	1980	.00	1987
Nov	.59	.61	.80	1959	22	1.23	1991	.07	1987
Dec	.72	.54	.84	1977	16	2.68	1977	.00	1999
Ann	15.91+	15.05+	2.90+	Jun 1965	26	7.78	May 1981	.00+	Dec 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.8	2.5	.1	.0
Feb	5.1	1.5	.1	.0
Mar	7.2	3.0	.3	.1
Apr	7.1	3.7	.7	.1
May	10.0	5.9	1.5	.5
Jun	11.2	6.3	1.5	.4
Jul	7.9	4.7	1.0	.3
Aug	7.4	4.0	.9	.3
Sep	6.7	3.4	.7	.2
Oct	5.5	2.6	.4	@
Nov	5.5	2.1	.0	.0
Dec	6.9	2.6	.1	.0
Ann	88.3	42.3	7.3	1.9

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	.10	.15	.26	.36	.47	.59	.72	.89	1.12	1.50	1.86
Feb	.07	.11	.17	.23	.29	.35	.43	.51	.63	.82	1.01
Mar	.28	.36	.48	.59	.69	.80	.91	1.05	1.22	1.49	1.74
Apr	.20	.32	.51	.69	.89	1.09	1.33	1.63	2.02	2.66	3.28
May	.82	1.08	1.48	1.82	2.15	2.49	2.87	3.31	3.89	4.79	5.62
Jun	.93	1.20	1.58	1.91	2.23	2.56	2.91	3.33	3.86	4.69	5.46
Jul	.19	.33	.59	.85	1.14	1.46	1.83	2.30	2.95	4.01	5.06
Aug	.20	.33	.57	.80	1.04	1.32	1.64	2.03	2.57	3.45	4.31
Sep	.14	.24	.42	.61	.81	1.03	1.30	1.63	2.08	2.83	3.57
Oct	.14	.25	.39	.50	.61	.72	.84	.98	1.17	1.47	1.75
Nov	.09	.14	.22	.30	.39	.48	.59	.73	.90	1.20	1.48
Dec	.04	.11	.22	.33	.44	.56	.71	.88	1.13	1.53	1.92
Ann	10.14	11.21	12.61	13.69	14.66	15.60	16.59	17.69	19.03	21.01	22.74

+ 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

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	4.7	-99.9	2	0
Feb	14.0	-99.9	2	0
Mar	1.5	-99.9	0	0
Apr	3.0	-99.9	#	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	1.5	-99.9	0	0
Nov	1.8	-99.9	0	0
Dec	2.0	-99.9	1	0
Ann	28.5	-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	4.0	1979	22	14.0	1979	20	1979	22	16	1979
Feb	8.0	1979	14	14.0	1979	20	1979	1	13	1979
Mar	4.0	1980	3	6.0	1979	5	1980	4	3	1980
Apr	4.0	1979	23	12.0	1979	6	1979	5	#	1979
May	.0	0	0	.0	0	0	0	0	0	0
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	#	1989	30	#	1989	0	0	0	0	0
Oct	6.0	1985	7	6.0+	1985	0	0	0	0	0
Nov	3.5	1978	13	3.5	1978	0	0	0	0	0
Dec	4.0	1978	4	4.0	1978	18	1990	18	10	1978
Ann	8.0	Feb 1979	14	14.0+	Feb 1979	20+	Feb 1979	1	16	Jan 1979

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	-9.9	-9.9	-9.9	-9.9	-9.9
Apr	-9.9	-9.9	-9.9	-9.9	-9.9
May	-9.9	-9.9	-9.9	-9.9	-9.9
Jun	-9.9	-9.9	-9.9	-9.9	-9.9
Jul	-9.9	-9.9	-9.9	-9.9	-9.9
Aug	-9.9	-9.9	-9.9	-9.9	-9.9
Sep	-9.9	-9.9	-9.9	-9.9	-9.9
Oct	-9.9	-9.9	-9.9	-9.9	-9.9
Nov	-9.9	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9	-9.9
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	.2	.2	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
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	6/29	6/22	6/17	6/12	6/08	6/03	5/30	5/24	5/17
32	6/02	5/29	5/25	5/22	5/19	5/16	5/13	5/10	5/05
28	5/19	5/14	5/11	5/08	5/06	5/03	4/30	4/27	4/22
24	5/08	5/03	4/30	4/27	4/25	4/22	4/19	4/16	4/11
20	5/01	4/26	4/22	4/19	4/16	4/13	4/10	4/06	4/01
16	4/19	4/13	4/09	4/06	4/03	3/30	3/27	3/23	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	8/15	8/21	8/25	8/29	9/01	9/04	9/08	9/12	9/18
32	9/04	9/08	9/10	9/12	9/14	9/16	9/18	9/21	9/24
28	9/10	9/14	9/17	9/19	9/21	9/24	9/26	9/29	10/03
24	9/17	9/22	9/26	9/29	10/02	10/05	10/09	10/12	10/18
20	9/29	10/04	10/08	10/11	10/14	10/17	10/20	10/24	10/29
16	10/10	10/15	10/19	10/22	10/26	10/29	11/01	11/05	11/10

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	113	103	96	90	85	79	73	66	57
32	137	130	125	121	117	114	110	105	98
28	157	150	146	142	138	135	131	126	120
24	180	173	168	164	160	156	152	147	140
20	202	194	189	184	180	176	171	166	159
16	228	220	215	210	205	201	196	190	182

***** 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	1468	1136	1001	654	388	157	66	97	313	651	1047	1362	8340
60	1313	996	846	507	248	75	19	42	202	496	897	1207	6848
57	1222	922	753	422	176	41	8	24	146	404	807	1114	6039
55	1163	869	691	367	136	25	4	16	114	344	753	1054	5536
50	1021	738	544	244	60	6	0	4	52	204	613	913	4399
32	539	343	135	17	0	0	0	0	0	6	213	440	1693

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	94	131	157	353	639	882	1082	1076	708	377	156	101	5756
55	5	13	1	14	61	217	372	379	132	2	6	2	1204
57	2	10	0	8	40	173	315	325	104	1	0	0	978
60	0	0	0	3	19	117	233	251	70	0	0	0	693
65	0	0	0	0	3	49	125	150	31	0	0	0	358
70	0	0	0	0	0	14	51	75	12	0	0	0	152

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	9	20	56	180	423	663	859	849	500	229	46	10	9	29	85	265	688	1351	2210	3059	3559	3788	3834	3844
45	0	4	21	95	281	514	704	694	359	128	19	0	0	4	25	120	401	915	1619	2313	2672	2800	2819	2819
50	0	0	2	47	158	365	549	539	234	60	7	0	0	0	2	49	207	572	1121	1660	1894	1954	1961	1961
55	0	0	0	11	73	226	395	387	133	22	0	0	0	0	0	11	84	310	705	1092	1225	1247	1247	1247
60	0	0	0	0	26	118	251	245	59	2	0	0	0	0	0	0	26	144	395	640	699	701	701	701
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	5	27	56	144	272	405	536	539	344	193	47	12	5	32	88	232	504	909	1445	1984	2328	2521	2568	2580

(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