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: STANFORD, MT **COOP ID: 247864**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,860 Feet** **Lat: 47˚09N** **Lon: 110˚13W**

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	35.2	12.9	24.1	70	1981	22	38.1	1986	-35	1972	27	7.9	1979	1270	0	.0	.0	5.2	10.4	27.5	8.6
Feb	39.5	17.1	28.3	73	1992	27	39.1	1991	-35+	1994	8	12.5	1989	1027	0	.0	.0	8.3	7.0	25.1	4.9
Mar	45.6	23.5	34.6	75+	1999	25	43.5	1986	-25	1978	3	25.1	1996	945	0	.0	.0	13.0	4.5	26.3	1.8
Apr	55.3	31.3	43.3	84+	1992	29	51.3	1987	-5+	1975	6	32.3	1975	651	0	.0	.0	21.1	1.0	18.7	.2
May	64.4	39.4	51.9	90	2001	12	56.4	1987	11	1967	3	46.0	1996	409	2	.0	.0	28.1	@	7.2	.0
Jun	73.0	46.8	59.9	101	1990	30	69.2	1988	23	1969	13	55.1	1998	187	35	@	.9	29.9	.0	.5	.0
Jul	80.3	51.6	66.0	98	1999	28	71.3	1985	29	1999	16	57.7	1993	80	109	.0	3.7	31.0	.0	.1	.0
Aug	80.8	51.3	66.1	100+	1990	6	73.2	1971	29+	1992	25	59.8	1974	107	139	@	4.0	30.9	.0	.1	.0
Sep	70.3	42.5	56.4	97	1979	8	63.6	1998	15	1965	18	47.9	1985	292	35	.0	.9	28.2	@	4.8	.0
Oct	59.4	33.5	46.5	87	1992	1	50.3	1974	-11	1991	29	41.0	1984	575	0	.0	.0	24.5	.9	14.6	.2
Nov	44.1	22.2	33.2	78	1975	4	43.5	1999	-24	1986	12	13.7	1985	956	0	.0	.0	11.1	5.1	24.4	2.5
Dec	37.0	14.9	26.0	69	1988	1	36.0	1999	-40+	1990	21	6.9	1983	1211	0	.0	.0	6.1	8.6	27.4	5.5
Ann	57.1	32.3	44.7	101	Jun 1990	30	73.2	Aug 1971	-40+	Dec 1990	21	6.9	Dec 1983	7710	320	.0	9.5	237.4	37.5	176.7	23.7

\+ 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: 1965-2001

(3) Derived from 1971-2000 serially complete daily data

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Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,860 Feet** **Lat: 47°09N** **Lon: 110°13W**

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	.69	.65	.85	1972	2	2.00	1972	.06	1987
Feb	.48	.41	.65	1982	22	1.01	1989	.08+	1992
Mar	.98	.97	.98	1995	25	1.89	1987	.14	1976
Apr	1.54	1.24	1.44	1976	26	3.87	1975	.39	1974
May	2.84	2.57	2.21	1980	25	8.72	1981	1.08	1983
Jun	2.86	2.60	3.10	1979	19	5.53	1975	.60	1974
Jul	2.13	1.62	2.26	1983	10	6.94	1993	.14	1984
Aug	1.86	1.56	1.74	1987	25	4.95	1985	.16	2000
Sep	1.46	1.29	1.40	1978	12	3.71	1985	.03	1990
Oct	.98	.85	1.24	1975	13	2.41	1975	.02	1987
Nov	.63	.69	.55	1999	26	1.27	1989	.08	1988
Dec	.68	.55	.54	1984	23	1.64	1977	.24+	1994
Ann	17.13	15.93	3.10	Jun 1979	19	8.72	May 1981	.02	Oct 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.4	2.3	.1	.0
Feb	5.5	1.6	@	.0
Mar	8.2	3.6	.2	.0
Apr	8.6	4.2	.7	.1
May	11.9	6.9	1.7	.4
Jun	12.5	7.1	1.5	.4
Jul	9.2	5.1	1.1	.4
Aug	8.7	4.5	.9	.3
Sep	7.7	4.1	.6	.1
Oct	5.9	2.8	.6	.1
Nov	6.2	2.4	@	.0
Dec	7.7	2.5	@	.0
Ann	99.5	47.1	7.4	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	.10	.16	.26	.35	.45	.56	.69	.85	1.06	1.40	1.73
Feb	.08	.13	.20	.26	.33	.40	.49	.59	.72	.94	1.14
Mar	.26	.35	.49	.61	.74	.87	1.01	1.18	1.40	1.75	2.08
Apr	.31	.45	.67	.88	1.09	1.32	1.57	1.88	2.29	2.94	3.56
May	1.02	1.29	1.68	2.00	2.31	2.63	2.97	3.37	3.88	4.67	5.40
Jun	.94	1.21	1.61	1.95	2.28	2.62	2.99	3.42	3.97	4.83	5.63
Jul	.26	.43	.73	1.02	1.34	1.69	2.10	2.60	3.29	4.42	5.51
Aug	.29	.44	.71	.97	1.24	1.53	1.86	2.27	2.82	3.71	4.56
Sep	.20	.32	.53	.74	.95	1.18	1.45	1.78	2.23	2.96	3.66
Oct	.14	.23	.37	.51	.65	.80	.98	1.20	1.50	1.98	2.44
Nov	.14	.20	.29	.37	.45	.54	.64	.76	.92	1.17	1.40
Dec	.20	.26	.36	.44	.52	.61	.70	.81	.96	1.18	1.39
Ann	10.80	11.97	13.50	14.68	15.75	16.79	17.87	19.08	20.57	22.75	24.66

\+ 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: 1965-2001
(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	12.9	10.6	3	2
Feb	6.5	6.5	4	1
Mar	8.4	6.7	2	1
Apr	9.7	6.0	1	#
May	3.2	.0	#	0
Jun	#	.0	#	0
Jul	.0	.0	0	0
Aug	.1	.0	0	0
Sep	1.4	.0	#	0
Oct	5.3	2.5	#	#
Nov	5.7	5.0	1	1
Dec	11.4	9.4	2	2
Ann	64.6	46.7	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	16.0	1972	2	34.0	1972	28	1972	2	20	1972
Feb	9.0	1982	22	14.0	1978	40	1978	1	32	1978
Mar	9.0	1971	31	19.0	1971	33	1978	5	19	1978
Apr	18.0	1973	20	34.0	1982	28	1975	7	14	1975
May	23.0	1982	29	37.0	1982	23	1982	29	2	1982
Jun	#	1979	8	#	1979	1	1982	1	#	1982
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	3.0	1992	23	3.0	1992	0	0	0	0	0
Sep	7.0	1973	14	10.0	1973	7	1973	15	1	1973
Oct	13.0	1973	31	21.0	1975	11	1980	16	2	1975
Nov	9.0	1975	24	11.0	1974	13	1973	6	5	1973
Dec	8.0	1974	12	21.0	1971	17	1971	26	10	1983
Ann	23.0	May 1982	29	37.0	May 1982	40	Feb 1978	1	32	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.4	3.3	.9	.2	.1
Feb	2.7	2.5	.6	.2	.0
Mar	2.9	2.8	.9	.3	.0
Apr	1.7	1.7	1.0	.3	.1
May	.6	.6	.2	.2	.1
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	@	@	@	.0	.0
Sep	.4	.4	.2	.1	.0
Oct	1.0	.9	.4	.3	.1
Nov	1.9	1.6	.6	.3	.0
Dec	3.1	2.9	1.0	.6	.0
Ann	17.7	16.7	5.8	2.5	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	9.6	7.1	5.6	4.2
Mar	5.4	3.5	2.5	1.5
Apr	1.7	1.0	.8	.4
May	.4	.2	.2	.1
Jun	@	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	.1	.1	.0
Oct	1.3	.9	.5	.1
Nov	3.1	1.4	.7	.0
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	7/08	6/30	6/25	6/21	6/17	6/12	6/08	6/03	5/27
32	6/20	6/13	6/08	6/04	5/31	5/27	5/22	5/17	5/10
28	5/27	5/22	5/18	5/16	5/13	5/10	5/07	5/04	4/29
24	5/12	5/07	5/03	4/30	4/27	4/24	4/20	4/17	4/11
20	4/29	4/24	4/20	4/17	4/14	4/11	4/08	4/05	3/31
16	4/22	4/16	4/12	4/09	4/05	4/02	3/30	3/26	3/20

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	9/14	9/20
32	9/04	9/08	9/11	9/13	9/16	9/18	9/20	9/23	9/27
28	9/12	9/16	9/19	9/22	9/24	9/27	9/29	10/02	10/06
24	9/18	9/23	9/27	9/30	10/04	10/07	10/10	10/14	10/19
20	9/25	10/01	10/05	10/09	10/13	10/16	10/20	10/25	10/31
16	10/08	10/13	10/17	10/21	10/24	10/27	10/31	11/04	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	104	95	88	83	77	72	66	60	50
32	130	122	117	112	107	103	98	92	84
28	154	147	142	137	133	129	125	120	113
24	180	173	168	163	159	155	150	145	138
20	202	195	190	185	181	176	172	167	159
16	221	214	209	205	201	197	193	188	181

***** 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	1270	1027	945	651	409	187	80	107	292	575	956	1211	7710
60	1115	887	790	506	267	95	25	48	185	421	808	1056	6203
57	1033	807	697	422	193	56	11	27	132	330	726	966	5400
55	974	755	635	369	151	36	6	18	102	272	669	912	4899
50	829	624	489	247	70	9	0	5	44	145	532	766	3760
32	389	242	99	20	0	0	0	0	0	3	173	329	1255

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	142	139	177	358	617	838	1052	1055	733	451	208	141	5911
55	14	8	0	17	54	183	346	360	145	6	13	11	1157
57	11	4	0	11	34	143	288	307	115	2	10	3	928
60	0	0	0	5	16	93	210	235	77	1	2	0	639
65	0	0	0	0	2	35	109	139	35	0	0	0	320
70	0	0	0	0	0	9	41	67	13	0	0	0	130

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	23	32	61	169	368	584	789	792	485	251	62	23	23	55	116	285	653	1237	2026	2818	3303	3554	3616	3639
45	6	8	20	86	234	435	634	638	350	148	23	4	6	14	34	120	354	789	1423	2061	2411	2559	2582	2586
50	0	0	4	43	123	292	479	485	231	78	8	0	0	0	4	47	170	462	941	1426	1657	1735	1743	1743
55	0	0	0	12	54	169	330	334	129	32	0	0	0	0	0	12	66	235	565	899	1028	1060	1060	1060
60	0	0	0	0	20	79	190	201	60	7	0	0	0	0	0	0	20	99	289	490	550	557	557	557
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	17	31	55	129	243	360	500	505	324	184	50	17	17	48	103	232	475	835	1335	1840	2164	2348	2398	2415

(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