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: VALIER, MT **COOP ID: 248501**

Climate Division: MT 3 **NWS Call Sign:** **Elevation: 3,810 Feet** **Lat: 48˚19N** **Lon: 112˚15W**

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	32.3	11.5	21.9	63	1981	22	36.9	1986	-43	1943	24	6.1	1982	1336	0	.0	.0	3.4	11.8	28.5	9.3
Feb	37.3	15.8	26.6	69	1992	27	39.2	1977	-49	1936	15	11.6	1989	1077	0	.0	.0	6.2	8.0	25.1	6.0
Mar	44.4	22.8	33.6	76	1928	26	42.4	1986	-35	1932	10	25.1	1989	973	0	.0	.0	12.0	4.3	26.7	2.0
Apr	55.2	31.4	43.3	85	1987	28	50.1	1987	-21	1935	2	31.2	1975	651	0	.0	.0	21.9	.8	18.5	.2
May	64.6	40.4	52.5	91	1986	30	56.7	1987	2	1938	16	47.0	1996	390	2	.0	.1	29.2	.0	5.0	.0
Jun	72.5	48.1	60.3	101	1936	27	67.4	1988	28	1949	18	56.3	1981	174	33	.0	.7	30.0	.0	.1	.0
Jul	79.6	52.5	66.1	101	1936	22	70.5	1985	25+	1947	11	58.5	1993	74	106	@	3.0	31.0	.0	@	.0
Aug	80.0	51.8	65.9	103	1961	5	72.0	1971	28	1992	24	60.8+	1987	95	123	@	3.6	31.0	.0	.1	.0
Sep	69.9	43.1	56.5	99	1950	3	63.4	1990	4	1934	25	47.9	1985	290	34	.0	.4	28.2	@	3.7	.0
Oct	58.9	34.1	46.5	88+	1992	1	51.4	1974	-15	1919	27	40.6	1984	575	0	.0	.0	24.9	1.0	14.1	.3
Nov	41.5	22.1	31.8	78	1962	3	40.0	1987	-29	1921	19	13.0	1985	995	0	.0	.0	8.5	5.3	24.4	2.5
Dec	34.0	14.7	24.4	74	1939	5	35.2	1999	-42	1968	29	5.4	1983	1261	0	.0	.0	3.3	10.3	28.2	6.2
Ann	55.9	32.4	44.1	103	Aug 1961	5	72.0	Aug 1971	-49	Feb 1936	15	5.4	Dec 1983	7891	298	.0	7.8	229.6	41.5	174.4	26.5

\+ 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: 1911-2001

(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	.31	.25	2.10	1918	25	1.27	1972	.00	1995
Feb	.24	.19	.50	1925	25	.93	1986	.02	1995
Mar	.50	.38	10.04	1937	21	1.80	1987	.02	1973
Apr	.92	.87	2.25	1951	30	2.24	1999	.00+	1987
May	2.24	2.02	2.52	1964	2	5.16	1981	.70	1999
Jun	2.63	2.24	4.50	1964	8	8.21	1991	.49	1985
Jul	1.33	.88	3.01	1970	13	4.58	1993	.11	1991
Aug	1.65	1.34	2.11	1986	31	5.46	1989	.05	1996
Sep	1.14	.75	1.92	1985	12	5.43	1985	.05	1981
Oct	.60	.43	1.51	1992	4	2.33	1975	.00	1987
Nov	.37	.31	.83	1930	12	1.20	1978	.03	1984
Dec	.29	.25	1.00+	1927	6	.96	1977	.00+	1997
Ann	12.22	12.00	10.04	Mar 1937	21	8.21	Jun 1991	.00+	Dec 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	1.0	.0	.0
Feb	3.9	.9	.0	.0
Mar	5.2	1.7	.1	.0
Apr	5.9	2.6	.4	.1
May	9.2	5.2	1.3	.3
Jun	10.0	6.0	1.5	.6
Jul	6.5	3.6	.6	.1
Aug	6.9	3.6	1.0	.3
Sep	5.9	3.1	.6	.2
Oct	4.8	2.1	.2	@
Nov	4.7	1.1	@	.0
Dec	4.6	1.0	.0	.0
Ann	72.4	31.9	5.7	1.6

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	.01	.04	.08	.13	.18	.23	.30	.38	.50	.69	.88
Feb	.04	.06	.09	.13	.16	.20	.24	.30	.37	.48	.60
Mar	.05	.08	.15	.22	.29	.38	.48	.61	.78	1.07	1.36
Apr	.00	.11	.28	.42	.57	.74	.93	1.15	1.46	1.96	2.45
May	.69	.90	1.22	1.49	1.76	2.03	2.33	2.69	3.15	3.86	4.52
Jun	.53	.76	1.15	1.50	1.86	2.24	2.68	3.20	3.89	5.00	6.05
Jul	.06	.13	.29	.46	.67	.91	1.21	1.60	2.15	3.08	4.02
Aug	.16	.28	.50	.73	.98	1.26	1.59	2.01	2.58	3.53	4.46
Sep	.08	.15	.30	.45	.63	.83	1.08	1.39	1.82	2.55	3.27
Oct	.03	.09	.18	.27	.36	.47	.59	.74	.94	1.27	1.60
Nov	.05	.08	.14	.19	.24	.30	.37	.45	.56	.74	.92
Dec	.00	.03	.09	.13	.18	.23	.29	.36	.46	.61	.76
Ann	6.32	7.32	8.69	9.77	10.77	11.76	12.81	14.01	15.49	17.72	19.70

\+ 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: 1911-2001
(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	7.7	5.0	2	1
Feb	3.2	2.0	2	1
Mar	4.9	4.5	1	1
Apr	3.5	2.0	#	#
May	.2	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	#	0
Sep	.1	.0	#	0
Oct	.9	.0	#	#
Nov	3.5	2.0	1	1
Dec	4.1	4.0	1	1
Ann	28.1	19.5	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	1971	10	25.0	1972	15	1978	31	8	1978
Feb	5.0	1980	29	7.0	2000	17	1978	18	13	1978
Mar	5.0	1983	2	12.5	1982	11	1978	6	5	1978
Apr	6.0	1979	23	11.0	1979	12	1990	28	2	1997
May	2.0	1979	1	2.0+	1981	6	1989	28	#+	1999
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	1	1992	24	#	1992
Sep	2.0	1988	11	2.0+	1988	1+	1995	18	#+	1995
Oct	3.0	1981	11	4.0+	1981	6	1985	8	1	1991
Nov	7.0	1988	14	7.5	1973	11	1978	22	5	1978
Dec	7.0	1972	2	11.0	1972	14	1996	29	6	1978
Ann	7.0+	Nov 1988	14	25.0	Jan 1972	17	Feb 1978	18	13	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.4	1.5	.6	.4	.0
Feb	1.7	1.0	.2	.1	.0
Mar	1.6	1.4	.6	.1	.0
Apr	.8	.8	.2	.1	.0
May	.1	.1	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.0	.0	.0
Oct	.4	.4	@	.0	.0
Nov	1.4	.9	.1	.1	.0
Dec	2.0	1.5	.2	.1	.0
Ann	10.5	7.7	1.9	.9	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.8	4.3	2.1	.5
Feb	6.0	2.5	1.2	.0
Mar	3.9	1.9	.8	.0
Apr	1.2	.6	.2	.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	.4	.1	.0	.0
Nov	3.8	1.1	.2	.0
Dec	8.5	3.0	.4	.0
Ann	32.6	13.5	4.9	.5

+ 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	6/27	6/21	6/16	6/11	6/07	6/03	5/30	5/25	5/18
32	6/08	6/02	5/29	5/25	5/21	5/17	5/13	5/09	5/02
28	5/15	5/11	5/09	5/06	5/04	5/02	4/30	4/28	4/24
24	5/07	5/01	4/28	4/24	4/21	4/18	4/15	4/11	4/06
20	4/25	4/20	4/16	4/13	4/10	4/07	4/03	3/31	3/25
16	4/16	4/11	4/08	4/05	4/02	3/30	3/28	3/24	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	8/29	9/02	9/05	9/07	9/09	9/12	9/14	9/17	9/21
32	9/04	9/09	9/12	9/15	9/18	9/20	9/23	9/26	10/01
28	9/15	9/20	9/23	9/26	9/29	10/02	10/05	10/09	10/14
24	9/24	9/29	10/03	10/07	10/10	10/13	10/17	10/21	10/26
20	10/03	10/08	10/13	10/16	10/20	10/23	10/26	10/31	11/05
16	10/12	10/18	10/23	10/27	10/31	11/03	11/07	11/12	11/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	118	109	103	98	93	89	83	77	69
32	144	135	129	124	119	114	109	102	94
28	167	160	155	151	147	143	139	134	127
24	196	187	181	176	171	166	161	155	146
20	215	207	201	197	192	188	183	177	170
16	234	226	220	215	211	206	201	195	187

***** 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	1336	1077	973	651	390	174	74	95	290	575	995	1261	7891
60	1186	945	818	506	249	84	22	39	183	421	845	1106	6404
57	1103	866	725	422	176	46	9	20	131	330	763	1017	5608
55	1044	813	665	368	135	28	4	13	101	272	707	963	5113
50	900	685	519	246	59	6	0	3	44	149	568	817	3996
32	454	308	124	19	0	0	0	0	0	4	193	373	1475

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	140	155	174	358	635	849	1055	1051	734	452	188	136	5927
55	18	16	1	17	58	187	346	351	145	8	11	12	1170
57	15	13	0	10	36	145	289	296	115	3	8	5	935
60	5	8	0	4	16	93	209	221	77	1	0	0	634
65	0	0	0	0	2	33	106	123	34	0	0	0	298
70	0	0	0	0	0	8	38	53	13	0	0	0	112

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	11	23	48	166	394	606	801	794	491	252	44	11	11	34	82	248	642	1248	2049	2843	3334	3586	3630	3641
45	0	2	15	87	252	456	646	639	357	146	17	1	0	2	17	104	356	812	1458	2097	2454	2600	2617	2618
50	0	0	0	36	136	310	493	485	227	70	3	0	0	0	0	36	172	482	975	1460	1687	1757	1760	1760
55	0	0	0	9	59	178	339	334	124	26	0	0	0	0	0	9	68	246	585	919	1043	1069	1069	1069
60	0	0	0	1	20	84	199	194	54	5	0	0	0	0	0	1	21	105	304	498	552	557	557	557
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	3	18	45	130	251	371	502	499	317	171	28	2	3	21	66	196	447	818	1320	1819	2136	2307	2335	2337

(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