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: ROGERS PASS 9 NNE, MT **COOP ID: 247159**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,200 Feet** **Lat: 47˚11N** **Lon: 112˚17W**

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	32.0	10.4	21.2	60	1989	30	33.4	1986	-39	1972	27	8.2	1972	1357	0	.0	.0	2.6	12.8	28.2	7.7
Feb	38.0	15.5	26.8	64	1992	1	40.2	1991	-39+	1989	4	8.4	1989	1071	0	.0	.0	5.6	7.0	24.7	4.7
Mar	44.3	21.7	33.0	73	1978	29	39.9	1992	-25	1976	3	23.6	1975	993	0	.0	.0	10.2	3.8	26.5	1.5
Apr	53.5	29.4	41.5	82+	1992	30	47.9	1987	-5+	1975	4	29.5	1975	706	0	.0	.0	19.7	1.2	19.7	.2
May	62.5	37.6	50.1	87	1980	21	54.6	1985	14	1967	3	44.9	1974	464	0	.0	.1	27.6	.0	7.3	.0
Jun	70.9	44.7	57.8	94	1970	3	65.7	1988	23	1969	14	52.2	1976	234	19	.0	.7	29.6	.0	.4	.0
Jul	79.6	49.1	64.4	100	1973	10	69.3	1985	31	1972	19	55.8	1993	110	89	@	4.4	31.0	.0	@	.0
Aug	79.3	48.1	63.7	100	1969	22	69.7	1983	28	1992	25	57.0	1985	150	109	.0	3.5	30.9	.0	.2	.0
Sep	68.8	39.0	53.9	95+	1998	6	61.3	1998	9	2000	23	44.9	1985	363	30	.0	.6	27.7	.1	5.2	.0
Oct	57.2	31.8	44.5	90	1992	2	48.6	1983	-9	1984	31	37.8	1984	636	0	.0	@	23.0	.8	14.5	.3
Nov	40.3	20.5	30.4	71	1999	15	42.9	1999	-28	1985	22	9.6	1985	1038	0	.0	.0	7.7	5.4	24.2	2.6
Dec	33.6	13.4	23.5	60+	1990	10	34.2	1979	-39	1968	29	8.3	1983	1287	0	.0	.0	2.1	10.9	28.3	5.0
Ann	55.0	30.1	42.6	100+	Jul 1973	10	69.7	Aug 1983	-39+	Feb 1989	4	8.2	Jan 1972	8409	247	@	9.3	217.7	42.0	179.2	22.0

\+ 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: 1964-2001

(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	.79	.65	.90	1966	3	3.50	1974	.06	1987
Feb	.63	.59	.60	1972	27	2.00	1986	.00	1973
Mar	1.13	.90	1.86	1987	19	4.06	1981	.20	1992
Apr	1.57	1.35	1.90	1975	26	5.34	1975	.02	1981
May	3.30	3.18	2.68	1983	9	7.68	1980	.50	1973
Jun	2.58	2.05	2.98	1975	19	6.35	1980	.00	1973
Jul	1.71	1.19	2.40	1983	10	7.04	1987	.10	1985
Aug	1.82	1.27	2.00	1971	30	6.00	1985	.10	1994
Sep	1.61	1.28	1.90	1986	1	6.86	1986	.00+	1992
Oct	1.20	.87	1.45	1975	13	5.18	1975	.00+	1987
Nov	.66	.61	.85	1970	24	2.06	1998	.00	1992
Dec	.77	.63	1.50	1968	28	1.94	1977	.05	1997
Ann	17.77	18.48	2.98	Jun 1975	19	7.68	May 1980	.00+	Nov 1992

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	2.6	.2	.0
Feb	4.6	2.3	.1	.0
Mar	6.4	3.5	.3	.1
Apr	6.8	4.3	.8	.1
May	10.7	6.6	2.1	.5
Jun	9.6	6.2	1.5	.4
Jul	6.7	4.0	.9	.3
Aug	6.6	4.1	1.2	.2
Sep	5.0	3.4	.9	.3
Oct	4.8	2.9	.7	.2
Nov	4.4	2.4	.1	.0
Dec	5.3	2.9	.2	.0
Ann	76.7	45.2	9.0	2.1

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	.27	.38	.50	.63	.78	.97	1.22	1.63	2.03
Feb	.06	.14	.24	.33	.43	.53	.64	.78	.96	1.25	1.53
Mar	.18	.28	.44	.60	.76	.93	1.14	1.38	1.71	2.25	2.76
Apr	.18	.30	.52	.74	.97	1.23	1.54	1.92	2.43	3.28	4.10
May	.86	1.17	1.65	2.07	2.48	2.92	3.41	3.98	4.73	5.92	7.03
Jun	.32	.64	1.07	1.44	1.81	2.21	2.65	3.18	3.88	5.00	6.06
Jul	.13	.25	.47	.70	.97	1.27	1.63	2.08	2.71	3.77	4.81
Aug	.16	.29	.53	.78	1.06	1.38	1.75	2.22	2.86	3.94	5.00
Sep	.00	.15	.43	.68	.95	1.24	1.59	2.00	2.58	3.52	4.44
Oct	.00	.11	.32	.51	.71	.93	1.19	1.50	1.92	2.63	3.31
Nov	.10	.18	.29	.39	.48	.57	.68	.81	.98	1.25	1.50
Dec	.16	.23	.34	.44	.55	.66	.79	.94	1.14	1.46	1.76
Ann	10.77	12.04	13.72	15.02	16.20	17.35	18.56	19.91	21.58	24.03	26.19

\+ 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: 1964-2001
(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	12.0	10.3	4	2	16.0	1989	23	38.0	1989	20	1979	31	15	1979	3.2	2.8	1.3	.7	.2	-9.9	-9.9	-9.9	-9.9
Feb	13.1	8.8	4	2	12.0	1986	15	34.2	1986	26	1987	25	16	1987	3.0	2.7	1.6	.8	.2	8.1	6.2	3.8	2.1
Mar	17.8	17.0	2	1	16.0	1981	18	47.5	1981	27	1977	30	5	1977	3.3	2.9	1.5	.8	.4	5.5	3.8	1.9	.7
Apr	11.0	8.8	1	#	24.0	1984	26	25.0	1989	36	1976	27	11	1975	2.1	1.9	1.2	.6	.3	1.5	.9	.7	.3
May	7.1	.0	#	0	29.0	1983	9	44.0	1982	29	1983	9	4	1983	.8	.8	.6	.4	.2	.9	.7	.4	.2
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	1.0	1972	19	1.0	1972	0	0	0	0	0	@	@	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	#	0	.0	0	0	.0	0	4	1992	23	#	1992	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	3.6	.0	#	0	12.0	1982	14	20.0	1984	12	1984	23	1	1984	.5	.4	.4	.4	.2	.5	.3	.2	@
Oct	3.4	.8	#	#	14.0	1980	15	16.0	1981	24	1985	7	3	1975	.7	.7	.4	.3	.1	.9	.5	.2	.0
Nov	9.9	8.0	2	1	9.0	1986	6	21.0	1978	18	1973	7	6	1978	2.4	2.2	1.2	.2	.0	5.2	3.5	2.5	.8
Dec	7.8	8.6	3	2	12.0	1984	23	12.0	1986	18	1985	10	10	1978	3.7	2.8	1.4	.8	.1	12.9	9.2	5.9	1.3
Ann	85.7	62.3	N/A	N/A	29.0	May 1983	9	47.5	Mar 1981	36	Apr 1976	27	16	Feb 1987	19.7	17.2	9.6	5.0	1.7	-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	7/04	6/28	6/23	6/19	6/16	6/12	6/08	6/04	5/28
32	6/16	6/10	6/05	6/01	5/28	5/24	5/20	5/15	5/08
28	5/30	5/24	5/19	5/16	5/12	5/09	5/05	4/30	4/24
24	5/10	5/05	5/02	4/28	4/25	4/22	4/19	4/15	4/10
20	5/03	4/28	4/23	4/20	4/17	4/13	4/10	4/06	3/31
16	4/19	4/13	4/09	4/05	4/02	3/29	3/26	3/22	3/16

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	8/26	8/30	9/02	9/06	9/09	9/13	9/19
32	9/04	9/08	9/11	9/14	9/16	9/19	9/21	9/24	9/29
28	9/08	9/14	9/19	9/22	9/26	9/30	10/03	10/08	10/14
24	9/18	9/25	9/30	10/04	10/08	10/12	10/16	10/21	10/28
20	10/02	10/08	10/13	10/17	10/21	10/25	10/29	11/02	11/09
16	10/07	10/14	10/20	10/24	10/28	11/02	11/06	11/12	11/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	106	96	89	83	78	72	66	59	50
32	134	126	120	115	111	106	101	95	88
28	164	154	148	142	136	131	125	118	108
24	193	183	176	170	165	160	154	147	137
20	211	202	196	191	187	182	177	171	162
16	241	230	222	215	209	202	196	188	177

***** 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	1357	1071	993	706	464	234	110	150	363	636	1038	1287	8409
60	1202	931	838	556	314	126	42	79	249	482	889	1132	6840
57	1109	847	745	471	231	78	20	49	191	392	808	1039	5980
55	1050	798	683	415	182	52	12	34	157	336	751	978	5448
50	907	667	534	284	86	14	1	13	87	206	613	834	4246
32	433	272	121	25	0	0	0	0	0	11	231	364	1457

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	99	125	151	309	559	775	1002	982	657	397	184	100	5340
55	3	7	0	9	28	137	301	303	124	10	14	1	937
57	0	0	0	5	15	103	248	255	98	4	10	0	738
60	0	0	0	0	5	61	177	192	66	1	1	0	503
65	0	0	0	0	0	19	89	109	30	0	0	0	247
70	0	0	0	0	0	4	31	48	12	0	0	0	95

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	5	19	41	143	334	548	778	750	443	223	42	5	5	24	65	208	542	1090	1868	2618	3061	3284	3326	3331
45	0	1	10	68	203	399	623	598	312	121	13	0	0	1	11	79	282	681	1304	1902	2214	2335	2348	2348
50	0	0	0	26	101	262	468	445	188	55	2	0	0	0	0	26	127	389	857	1302	1490	1545	1547	1547
55	0	0	0	5	42	143	316	298	99	20	0	0	0	0	0	5	47	190	506	804	903	923	923	923
60	0	0	0	2	15	62	179	169	41	3	0	0	0	0	0	2	17	79	258	427	468	471	471	471
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	10	31	112	217	337	491	479	307	157	23	0	0	10	41	153	370	707	1198	1677	1984	2141	2164	2164

(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