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: RYEGATE 18 NNW, MT **COOP ID: 247263**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,440 Feet** **Lat: 46˚32N** **Lon: 109˚21W**

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	32.1	9.0	20.6	66	1981	22	32.0	1986	-36	1996	30	5.7	1979	1379	0	.0	.0	3.6	12.5	29.8	8.8
Feb	38.3	13.5	25.9	73+	1992	29	38.7	1991	-41	1989	4	9.9	1989	1095	0	.0	.0	7.1	7.8	26.5	5.0
Mar	44.9	19.9	32.4	76+	1999	26	41.2	1992	-26	1989	4	23.6	1975	1011	0	.0	.0	12.3	4.1	28.7	1.7
Apr	54.7	28.5	41.6	86	1987	28	47.8	1987	-10	1975	1	32.3	1975	702	0	.0	.0	21.4	1.0	20.9	.1
May	64.0	37.9	51.0	93	2001	25	55.5+	1992	15+	1969	1	46.4	1996	437	2	.0	.0	28.7	@	8.5	.0
Jun	73.7	46.0	59.9	100+	1988	23	70.8	1988	21	1969	13	54.1	1998	198	44	.1	1.7	29.9	.0	.9	.0
Jul	80.9	51.1	66.0	102	1999	29	70.6	1985	32	1973	2	59.0	1993	87	118	.1	5.3	31.0	.0	@	.0
Aug	81.4	50.5	66.0	100	2001	4	73.0	1971	28	1992	25	59.7	1987	106	135	.0	5.6	31.0	.0	.1	.0
Sep	70.2	40.0	55.1	99	2000	16	63.6	1998	10+	1985	30	47.8	1985	322	25	.0	1.1	28.4	@	6.0	.0
Oct	58.6	30.1	44.4	94	1992	2	47.6	1974	-8	1991	30	39.1	1984	640	0	.0	.1	24.8	.6	18.5	.2
Nov	42.7	19.0	30.9	77	1999	13	41.3	1999	-26	1986	10	12.9	1985	1026	0	.0	.0	10.1	5.5	27.0	2.2
Dec	34.5	12.2	23.4	66	1997	15	31.7	1999	-42	1968	30	6.0	1983	1292	0	.0	.0	4.3	10.7	29.7	6.2
Ann	56.3	29.8	43.1	102	Jul 1999	29	73.0	Aug 1971	-42	Dec 1968	30	5.7	Jan 1979	8295	324	.2	13.8	232.6	42.2	196.6	24.2

\+ 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: 1962-2001

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

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: RYEGATE 18 NNW, MT **COOP ID: 247263**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,440 Feet** **Lat: 46˚32N** **Lon: 109˚21W**

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	.52	.47	.60	1988	11	1.56	1978	.05+	1992
Feb	.29	.24	.57	1967	21	.91	1986	.00+	1997
Mar	.62	.63	.87	1999	5	1.20	1996	.00	1973
Apr	1.10	.91	1.40	1973	20	2.78	1973	.06	1985
May	1.91	1.49	1.60	1995	13	4.82	1981	.17	1984
Jun	2.34	2.07	2.32	1964	8	6.56	1997	.36	1974
Jul	1.82	1.62	1.40	1975	30	5.21	1993	.15	1996
Aug	1.47	1.12	2.25	1990	20	4.25	1990	.06	1988
Sep	1.06	.85	1.37	1995	9	3.68	1986	.00	1990
Oct	.77	.64	1.30	1993	8	2.08	1975	.00	1988
Nov	.50	.47	.57	1994	13	1.41	1996	.00	1987
Dec	.47	.35	.60+	1998	4	1.48	1977	.00+	1993
Ann	12.87	12.88	2.32	Jun 1964	8	6.56	Jun 1997	.00+	Feb 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	2.1	@	.0
Feb	3.8	1.2	.0	.0
Mar	5.8	2.4	.1	.0
Apr	6.5	3.7	.3	.1
May	8.6	5.5	.9	.1
Jun	8.9	6.0	1.2	.4
Jul	7.1	4.9	.9	.3
Aug	5.9	3.7	.7	.2
Sep	4.7	3.1	.5	.1
Oct	3.8	2.4	.3	@
Nov	4.1	2.1	.1	.0
Dec	4.1	1.8	.1	.0
Ann	68.1	38.9	5.1	1.2

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	.07	.11	.19	.26	.33	.42	.52	.64	.80	1.06	1.32
Feb	.00	.00	.07	.12	.17	.23	.29	.36	.46	.63	.78
Mar	.05	.12	.22	.31	.41	.51	.62	.76	.95	1.26	1.55
Apr	.11	.19	.34	.50	.66	.85	1.07	1.34	1.72	2.34	2.95
May	.42	.60	.88	1.13	1.38	1.65	1.95	2.31	2.79	3.55	4.27
Jun	.50	.72	1.06	1.37	1.68	2.02	2.39	2.84	3.44	4.39	5.28
Jul	.20	.34	.59	.85	1.12	1.42	1.78	2.23	2.83	3.83	4.81
Aug	.16	.27	.47	.68	.90	1.14	1.43	1.79	2.28	3.09	3.88
Sep	.10	.23	.40	.56	.72	.89	1.08	1.31	1.62	2.12	2.60
Oct	.04	.12	.24	.35	.47	.60	.76	.95	1.21	1.65	2.06
Nov	.04	.10	.18	.25	.33	.41	.51	.62	.78	1.03	1.27
Dec	.00	.03	.09	.17	.24	.34	.44	.58	.77	1.10	1.42
Ann	7.40	8.37	9.67	10.68	11.60	12.51	13.47	14.54	15.87	17.83	19.57

\+ 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: 1962-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: RYEGATE 18 NNW, MT **COOP ID: 247263**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,440 Feet** **Lat: 46°32N** **Lon: 109°21W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	7.6	8.0	2	1
Feb	4.2	3.5	1	#
Mar	7.6	6.9	1	#
Apr	4.4	1.9	#	0
May	1.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.6	.0	#	0
Oct	3.2	2.0	#	0
Nov	5.9	4.0	1	#
Dec	8.1	5.3	1	1
Ann	42.6	31.6	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	6.0	1972	2	17.0	1993	20	1978	31	13	1978
Feb	6.0	1986	15	11.0	1993	20	1978	1	15	1978
Mar	13.0	1999	5	20.0	1996	14	1978	6	8	1978
Apr	16.0	1982	7	25.0	1982	16	1982	7	2	1982
May	6.0	1981	11	7.5	1981	6	1981	11	#+	1983
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	7.0	1983	19	7.0	1983	6	1983	19	#+	2000
Oct	12.0	1993	8	20.8	1975	11	1975	22	2	1975
Nov	8.0	1996	23	21.2	1996	14	1996	25	4	1985
Dec	12.0	1996	30	20.0	1996	20	1996	30	6	1978
Ann	16.0	Apr 1982	7	25.0	Apr 1982	20+	Dec 1996	30	15	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.5	3.0	1.0	.3	.0
Feb	3.1	1.8	.4	.1	.0
Mar	4.1	2.8	.8	.2	@
Apr	2.1	1.6	.6	.1	@
May	.4	.4	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.2	.1	@	.0
Oct	1.0	.8	.4	.1	@
Nov	3.0	2.3	.6	.3	.0
Dec	3.7	2.6	.9	.2	@
Ann	22.1	15.5	4.9	1.4	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	15.4	6.0	1.6	.0
Feb	8.9	4.7	1.8	.2
Mar	6.1	3.0	1.1	.2
Apr	1.5	.4	.1	@
May	.2	.1	@	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	@	@	.0
Oct	1.1	.5	.3	@
Nov	5.5	2.1	1.2	.0
Dec	10.4	5.9	1.9	.1
Ann	49.3	22.7	8.0	.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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: RYEGATE 18 NNW, MT **COOP ID: 247263**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,440 Feet** **Lat: 46˚32N** **Lon: 109˚21W**

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	7/12	7/06	7/01	6/27	6/24	6/21	6/17	6/13	6/07
32	6/21	6/15	6/10	6/05	6/02	5/29	5/24	5/20	5/13
28	6/03	5/28	5/23	5/19	5/15	5/12	5/08	5/03	4/27
24	5/16	5/11	5/07	5/04	5/01	4/28	4/25	4/21	4/16
20	5/01	4/27	4/25	4/22	4/20	4/18	4/16	4/13	4/09
16	4/25	4/20	4/16	4/13	4/10	4/07	4/04	3/31	3/26

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	8/13	8/19	8/23	8/26	8/30	9/02	9/06	9/10	9/15
32	9/03	9/06	9/09	9/11	9/14	9/16	9/18	9/21	9/25
28	9/08	9/13	9/17	9/20	9/23	9/26	9/29	10/02	10/07
24	9/16	9/21	9/24	9/27	9/30	10/03	10/06	10/09	10/14
20	9/23	9/29	10/03	10/06	10/09	10/12	10/16	10/20	10/25
16	10/02	10/08	10/13	10/16	10/20	10/23	10/27	11/01	11/07

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	91	82	76	71	66	61	56	50	41
32	127	119	113	108	103	99	93	87	79
28	151	144	138	134	130	125	121	116	108
24	174	166	161	156	151	147	142	136	128
20	189	183	179	175	171	168	164	160	153
16	217	208	202	197	192	188	182	176	168

***** 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: RYEGATE 18 NNW, MT **COOP ID: 247263**

Climate Division: MT 4 **NWS Call Sign:** **Elevation: 4,440 Feet** **Lat: 46˚32N** **Lon: 109˚21W**

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	1379	1095	1011	702	437	198	87	106	322	640	1026	1292	8295
60	1224	955	856	552	292	108	31	47	207	485	876	1137	6770
57	1131	871	763	465	214	67	15	26	150	393	786	1044	5925
55	1069	818	701	409	169	46	9	18	117	333	726	982	5397
50	923	688	553	276	80	15	1	5	54	197	588	837	4217
32	439	284	134	20	0	0	0	0	0	5	187	362	1431

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	83	114	147	309	588	836	1054	1052	693	389	151	93	5509
55	0	3	0	7	44	192	349	356	120	4	0	0	1075
57	0	0	0	3	27	153	293	303	93	2	0	0	874
60	0	0	0	0	12	104	217	231	61	0	0	0	625
65	0	0	0	0	2	44	118	135	25	0	0	0	324
70	0	0	0	0	0	14	48	64	9	0	0	0	135

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	4	13	45	149	351	590	804	797	465	211	40	7	4	17	62	211	562	1152	1956	2753	3218	3429	3469	3476
45	0	4	12	77	220	440	649	642	330	116	15	0	0	4	16	93	313	753	1402	2044	2374	2490	2505	2505
50	0	0	0	30	114	293	494	488	210	48	0	0	0	0	0	30	144	437	931	1419	1629	1677	1677	1677
55	0	0	0	5	41	175	342	340	111	16	0	0	0	0	0	5	46	221	563	903	1014	1030	1030	1030
60	0	0	0	0	10	81	204	201	44	2	0	0	0	0	0	0	10	91	295	496	540	542	542	542
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	24	52	131	245	375	510	508	324	178	42	7	2	26	78	209	454	829	1339	1847	2171	2349	2391	2398

(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