

Climatology of the United States

No. 20

1971-2000

Station: ROY 8 NE, MT

COOP ID: 247228

Climate Division: MT 4

NWS Call Sign:

Elevation: 3,445 Feet Lat: 47° 26N

Lon: 108° 51W

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	31.7	7.7	19.7	69+	1992	31	33.9	1992	-41+	1997	11	2.7	1979	1405	0	.0	.0	4.2	13.4	29.5	11.0
Feb	37.8	13.1	25.5	72	1992	27	38.2	1991	-39	1996	2	8.1	1989	1108	0	.0	.0	7.7	8.9	26.2	6.5
Mar	46.5	21.9	34.2	78	1999	25	43.2	1986	-33	1989	4	24.5	1996	955	0	.0	.0	13.9	4.8	27.1	1.8
Apr	57.6	31.0	44.3	90	1980	20	51.0	1987	-5+	1986	14	34.3	1975	621	0	.0	@	23.0	.8	17.2	.1
May	67.5	40.3	53.9	96	1980	22	59.2	1985	10+	1954	3	48.0	1996	350	6	.0	.2	29.4	.0	4.3	.0
Jun	76.9	48.4	62.7	103	1984	29	72.6	1988	29+	1969	14	57.7	1998	133	63	.3	2.9	30.0	.0	.1	.0
Jul	84.6	53.0	68.8	105+	1963	22	73.7	1985	36	1972	4	60.3	1993	53	169	.7	9.3	31.0	.0	.0	.0
Aug	84.6	52.0	68.3	107+	1983	6	75.6	1971	30	1992	25	62.0	1977	83	186	.7	10.4	31.0	.0	@	.0
Sep	72.9	42.0	57.5	103	1983	1	65.3	1998	16	1985	29	49.8	1985	267	39	.1	2.0	28.8	@	3.1	.0
Oct	61.1	32.1	46.6	92	1992	1	50.3	1979	-11	1991	29	41.3	1984	571	0	.0	.1	25.9	.6	14.8	.2
Nov	43.7	19.6	31.7	78+	1999	12	41.7	1999	-29	1959	13	12.7	1985	1001	0	.0	.0	11.8	6.2	26.2	2.6
Dec	34.3	10.4	22.4	69	1956	29	34.7	1999	-41	1989	21	2.7	1983	1323	0	.0	.0	4.9	11.4	29.6	7.7
Ann	58.3	31.0	44.6	107+	Aug 1983	6	75.6	Aug 1971	-41+	Jan 1997	11	2.7+	Dec 1983	7870	463	1.8	24.9	241.6	46.1	178.1	29.9

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
		Means/Medians(1)		Extremes						Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution											
Month	Mean	Median	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	.50	.43	.66	1971	30	1.99	1971	.00+	1992	4.7	1.9	.1	.0	.00	.03	.10	.18	.26	.36	.47	.62	.82	1.16	1.50	
Feb	.31	.21	.72	1982	22	1.04	1982	.01	1992	3.6	1.1	@	.0	.03	.05	.09	.13	.18	.23	.30	.38	.49	.68	.87	
Mar	.81	.74	1.60	1977	29	2.07	1977	.17	1994	6.1	2.8	.2	@	.19	.27	.39	.49	.60	.71	.83	.98	1.17	1.47	1.76	
Apr	1.14	.98	1.94	1955	3	3.47	1975	.20	1977	6.2	3.4	.5	.1	.23	.33	.50	.65	.81	.97	1.16	1.39	1.69	2.17	2.62	
May	2.73	2.69	2.60	1988	7	6.25	1981	.46	1992	9.9	5.9	1.5	.4	.81	1.07	1.46	1.79	2.12	2.46	2.84	3.28	3.86	4.76	5.59	
Jun	2.30	2.00	2.71	1991	21	6.14	1991	.43	1979	9.9	5.9	1.3	.3	.53	.75	1.08	1.39	1.69	2.01	2.36	2.79	3.35	4.24	5.08	
Jul	1.97	1.73	2.17	1948	11	5.79	1993	.06	1971	7.3	4.6	1.3	.3	.17	.31	.57	.84	1.14	1.49	1.89	2.40	3.10	4.28	5.43	
Aug	1.53	1.14	2.19	1985	3	5.61	1985	.09	1994	6.8	3.9	.7	.3	.17	.28	.49	.71	.94	1.19	1.49	1.87	2.38	3.22	4.05	
Sep	1.22	.95	2.24	1978	12	5.21	1978	.15	1979	6.1	3.3	.6	.2	.12	.21	.37	.54	.73	.93	1.18	1.48	1.90	2.60	3.28	
Oct	.73	.68	.92	1957	19	1.62	1980	.00	1987	4.4	2.3	.2	.0	.19	.29	.41	.50	.59	.68	.77	.88	1.02	1.23	1.43	
Nov	.44	.38	.44	1959	23	1.18	1975	.03	1982	4.4	1.9	.0	.0	.05	.08	.14	.21	.27	.35	.43	.54	.68	.92	1.16	
Dec	.50	.44	.64	1989	14	2.30	1989	.00+	1991	4.7	1.7	.1	.0	.00	.04	.13	.21	.29	.38	.49	.62	.81	1.11	1.41	
Ann	14.18	13.70	2.71	Jun 1991	21	6.25	May 1981	.00+	Jan 1992	74.1	38.7	6.5	1.6	8.34	9.39	10.78	11.87	12.85	13.82	14.83	15.97	17.38	19.45	21.29	

+ 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

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Lon: 108° 51W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	8.1	6.0	6	5	12.0	1997	9	25.0	1977	42	1978	31	31	1978	3.9	3.8	1.1	.3	@	16.3	13.0	10.7	6.2
Feb	5.4	4.0	6	2	9.0	1982	22	15.0	1978	56	1978	19	46	1978	2.6	2.6	.5	.2	.0	11.8	9.3	6.7	3.9
Mar	8.1	6.5	4	1	18.0	1977	29	22.0	1996	42	1978	7	34	1978	3.5	3.5	1.1	.2	.1	8.9	7.9	5.7	2.8
Apr	4.3	3.0	1	#	12.0	1973	20	16.0	1975	21	1977	1	8	1975	1.4	1.4	.7	.3	@	2.6	2.3	1.7	.7
May	.9	.0	#	0	5.0	1983	12	10.0	1983	6	1983	13	1	1983	.4	.4	.1	@	.0	.2	.1	.1	.0
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	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.2	.0	#	0	3.0	1983	30	3.0+	1984	#	1984	26	#	1984	.1	.1	@	.0	.0	.0	.0	.0	.0
Oct	2.3	1.0	#	#	8.0	1981	12	12.0+	1981	12	1981	14	2	1985	.7	.7	.3	.1	.0	1.2	.8	.7	.1
Nov	5.6	4.5	1	#	6.0	1991	6	19.0	1975	18	1978	30	10	1978	2.7	2.7	.8	.1	.0	6.3	4.5	2.7	1.4
Dec	8.0	5.5	4	2	8.0	1972	2	35.0	1977	26	1978	13	18	1978	3.7	3.7	.8	.4	.0	15.4	10.7	8.2	4.6
Ann	42.9	30.5	N/A	N/A	18.0	Mar 1977	29	35.0	Dec 1977	56	Feb 1978	19	46	Feb 1978	19.0	18.9	5.4	1.6	.1	62.7	48.6	36.5	19.7

+ Also occurred on an earlier date(s) #Denotes trace amounts

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-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	6/19	6/13	6/09	6/05	6/02	5/30	5/26	5/22	5/16
32	5/29	5/25	5/21	5/18	5/16	5/13	5/10	5/07	5/02
28	5/18	5/13	5/10	5/07	5/04	5/01	4/28	4/25	4/20
24	5/07	5/02	4/29	4/26	4/23	4/20	4/17	4/14	4/09
20	4/25	4/20	4/16	4/13	4/10	4/07	4/03	3/31	3/25
16	4/17	4/12	4/08	4/05	4/01	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	8/24	8/29	9/01	9/04	9/07	9/10	9/13	9/17	9/22
32	9/06	9/10	9/13	9/15	9/18	9/20	9/23	9/26	9/30
28	9/15	9/19	9/22	9/24	9/27	9/29	10/01	10/04	10/08
24	9/20	9/26	9/30	10/04	10/08	10/11	10/15	10/19	10/26
20	9/26	10/03	10/07	10/11	10/15	10/18	10/22	10/27	11/02
16	10/09	10/15	10/19	10/23	10/26	10/30	11/02	11/07	11/13
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	122	113	107	102	97	92	86	80	71
32	140	135	131	128	124	121	118	114	109
28	165	158	153	149	145	141	137	132	125
24	191	182	177	172	167	162	157	151	143
20	212	203	197	192	187	182	177	171	163
16	234	224	218	212	207	202	196	190	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
65	1405	1108	955	621	350	133	53	83	267	571	1001	1323	7870
60	1253	979	800	476	217	59	16	36	162	416	851	1168	6433
57	1164	900	708	392	152	30	8	20	111	325	767	1076	5653
55	1107	848	648	339	116	18	2	14	83	266	711	1019	5171
50	963	720	503	220	49	3	0	3	32	140	571	876	4080
32	499	344	120	13	0	0	0	0	0	3	192	415	1586

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	117	160	188	382	679	920	1140	1126	763	455	182	115	6227
55	12	20	3	18	81	248	429	427	156	5	10	6	1415
57	7	16	1	11	56	200	372	371	124	2	6	1	1167
60	3	11	0	5	28	138	288	294	85	1	0	0	853
65	0	0	0	0	6	63	169	186	39	0	0	0	463
70	0	0	0	0	0	20	86	104	15	0	0	0	225

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	10	24	56	192	444	690	902	885	537	260	50	13	10	34	90	282	726	1416	2318	3203	3740	4000	4050	4063
45	3	4	20	100	300	540	747	730	396	152	22	1	3	7	27	127	427	967	1714	2444	2840	2992	3014	3015
50	0	0	1	46	178	391	592	575	262	78	5	0	0	0	1	47	225	616	1208	1783	2045	2123	2128	2128
55	0	0	0	11	83	248	439	422	155	27	0	0	0	0	0	11	94	342	781	1203	1358	1385	1385	1385
60	0	0	0	1	31	135	287	281	73	8	0	0	0	0	0	1	32	167	454	735	808	816	816	816
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	10	31	64	151	286	426	564	559	355	202	49	15	10	41	105	256	542	968	1532	2091	2446	2648	2697	2712

(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/normal/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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

- U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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