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: INGOMAR 14 NE, MT **COOP ID: 244386**

Climate Division: MT 7 **NWS Call Sign:** **Elevation: 2,795 Feet** **Lat: 46˚44N** **Lon: 107˚12W**

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	31.0	3.9	17.5	70	1992	31	31.3	1992	-49	1969	24	-.4	1979	1475	0	.0	.0	3.0	14.5	30.4	12.3
Feb	38.5	11.0	24.8	77	1992	27	38.3	1991	-45	1971	7	8.5	1979	1127	0	.0	.0	7.5	9.0	27.1	7.0
Mar	48.8	20.6	34.7	79+	1986	28	44.1	1986	-35	1960	3	23.6	1996	938	0	.0	.0	15.8	3.7	28.2	1.9
Apr	60.7	30.4	45.6	90	1980	20	51.8	1987	0	1986	14	37.9	1975	584	0	.0	@	24.9	.6	17.8	@
May	70.7	40.3	55.5	99+	1988	30	61.2	1988	16	1968	11	49.8	1996	310	14	.0	.9	30.2	@	4.2	.0
Jun	80.1	49.6	64.9	107	1988	20	76.6	1988	28+	1993	4	59.1	1998	107	102	.4	4.9	30.0	.0	.2	.0
Jul	88.3	54.6	71.5	109	1960	19	75.2	2000	33	1972	4	63.2	1993	27	225	1.9	14.7	31.0	.0	.0	.0
Aug	87.8	52.9	70.4	108	1995	7	76.9	1971	30+	1992	25	64.6	1974	54	220	1.4	14.1	31.0	.0	.1	.0
Sep	75.8	41.2	58.5	102	1983	1	66.2	1998	13	1985	30	53.0	1985	238	43	.1	3.1	29.3	.0	4.3	.0
Oct	62.6	29.9	46.3	94	1963	4	50.4	1979	-17	1991	30	42.0	1984	580	0	.0	.1	26.9	.4	18.5	.2
Nov	43.9	16.7	30.3	78+	1999	7	38.7	1999	-32	1993	24	12.6	1985	1041	0	.0	.0	10.8	6.3	27.8	3.6
Dec	34.0	6.7	20.4	69	1979	4	32.3	1999	-54	1989	22	-.4	1983	1385	0	.0	.0	4.2	12.2	30.3	9.3
Ann	60.2	29.8	45.0	109	Jul 1960	19	76.9	Aug 1971	-54	Dec 1989	22	-.4+	Dec 1983	7866	604	3.8	37.8	244.6	46.7	188.9	34.3

\+ 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: 1953-2001

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

Issue Date: February 2004

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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	.44	.35	.46	1971	31	1.47	1971	.01	1992
Feb	.28	.19	.34	1986	4	.89	2000	.00+	1997
Mar	.52	.41	.61	1954	11	1.49	1996	.10	1976
Apr	1.07	.79	2.25	1998	25	4.56	1998	.03	1983
May	2.26	2.04	1.73	1981	27	5.04	1981	.89	1994
Jun	2.30	1.67	4.35	1997	6	7.71	1997	.45	1977
Jul	1.49	1.17	2.30	1993	26	7.35	1993	.03	1973
Aug	.91	.66	1.47	1974	20	2.72	1972	.06	1994
Sep	1.27	.78	2.87	1986	25	6.54	1986	.01	1990
Oct	.81	.69	1.05	1993	7	2.23	1971	.01	1987
Nov	.48	.35	.85	1957	1	1.35	1998	.01	1972
Dec	.47	.37	.70	1989	5	1.75	1977	.06	1976
Ann	12.30	11.61	4.35	Jun 1997	6	7.71	Jun 1997	.00+	Feb 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	1.7	.0	.0
Feb	3.9	.9	.0	.0
Mar	6.3	1.9	.0	.0
Apr	7.0	3.0	.2	.1
May	9.4	5.5	1.6	.4
Jun	9.0	5.5	1.3	.3
Jul	6.8	3.5	.8	.3
Aug	5.0	2.4	.4	.1
Sep	5.5	2.7	.7	.3
Oct	4.5	2.4	.4	.1
Nov	4.6	1.8	@	.0
Dec	5.5	1.7	.1	.0
Ann	73.3	33.0	5.5	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	.03	.06	.11	.17	.24	.32	.41	.53	.69	.97	1.24
Feb	.00	.02	.07	.11	.16	.21	.27	.35	.45	.62	.78
Mar	.12	.17	.25	.31	.38	.45	.54	.63	.76	.96	1.15
Apr	.10	.18	.33	.48	.64	.82	1.04	1.31	1.68	2.29	2.90
May	.71	.92	1.24	1.52	1.78	2.05	2.36	2.71	3.16	3.87	4.53
Jun	.48	.69	1.03	1.34	1.65	1.98	2.35	2.80	3.40	4.34	5.24
Jul	.08	.16	.34	.54	.77	1.04	1.37	1.80	2.39	3.41	4.42
Aug	.13	.20	.33	.46	.59	.74	.90	1.11	1.39	1.84	2.27
Sep	.06	.13	.28	.45	.65	.88	1.17	1.53	2.05	2.93	3.82
Oct	.07	.12	.22	.34	.46	.60	.77	.98	1.27	1.76	2.25
Nov	.06	.09	.16	.23	.30	.38	.47	.59	.74	1.00	1.25
Dec	.06	.09	.16	.23	.30	.37	.47	.58	.73	.98	1.23
Ann	7.47	8.35	9.50	10.40	11.22	12.01	12.85	13.78	14.93	16.63	18.12

\+ 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: 1953-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Snow (inches)

Snow Totals

Means/Medians (1)

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	9.0	7.0	4	2	11.0	1971	30	34.0	1971	20	1978	31	18	1978	4.5	3.6	1.1	.2	@	17.2	13.7	10.1	4.6
Feb	4.6	3.0	3	2	6.0	1988	9	19.0	1979	25	1979	24	19	1979	2.5	2.1	.5	.1	.0	12.3	9.8	6.8	4.0
Mar	5.1	4.0	1	#	6.0	1985	2	17.5	1996	24	1979	4	6	1979	3.2	2.1	.5	.2	.0	6.6	3.8	2.5	.6
Apr	3.1	2.0	#	0	7.0	1982	7	10.5	1982	9	1975	8	1	1975	1.3	1.2	.4	.2	.0	1.2	.3	.2	.0
May	1.2	.0	#	0	24.0	1983	12	28.0	1983	18	1983	12	1	1983	.2	.2	.1	@	@	.2	.1	.1	@
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	.6	.0	#	0	5.0	1984	23	10.0	1984	2	1984	23	#	1984	.2	.2	.1	@	.0	@	.0	.0	.0
Oct	1.5	.0	#	0	10.0	1985	7	13.0	1985	7	1985	9	1	1985	.6	.5	.2	.1	@	.5	.2	.1	.0
Nov	5.8	4.0	1	1	10.0	1978	19	25.5	1978	20	1978	27	9	1978	2.5	2.2	.9	.2	@	7.5	4.5	2.5	1.1
Dec	7.3	5.5	3	1	14.0	1984	23	34.0	1977	19	1977	10	10	1985	3.9	3.0	1.1	.3	@	15.3	11.0	7.0	2.4
Ann	38.2	25.5	N/A	N/A	24.0	May 1983	12	34.0+	Dec 1977	25	Feb 1979	24	19	Feb 1979	18.9	15.1	4.9	1.3	@	60.8	43.4	29.3	12.7

+ 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	6/30	6/22	6/17	6/12	6/08	6/03	5/29	5/24	5/16
32	5/30	5/26	5/23	5/20	5/18	5/16	5/13	5/10	5/06
28	5/25	5/19	5/15	5/11	5/08	5/05	5/01	4/27	4/21
24	5/11	5/05	5/01	4/28	4/25	4/21	4/18	4/14	4/08
20	4/26	4/21	4/17	4/14	4/11	4/08	4/05	4/01	3/27
16	4/17	4/11	4/07	4/04	4/01	3/28	3/25	3/21	3/15

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	8/27	8/31	9/03	9/06	9/09	9/11	9/14	9/17	9/21
32	9/05	9/08	9/11	9/13	9/15	9/17	9/19	9/22	9/26
28	9/09	9/13	9/17	9/20	9/23	9/25	9/28	10/02	10/07
24	9/19	9/25	9/29	10/03	10/07	10/10	10/14	10/18	10/24
20	9/27	10/03	10/07	10/11	10/14	10/17	10/21	10/25	10/31
16	10/05	10/11	10/15	10/19	10/23	10/26	10/30	11/03	11/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	115	107	101	97	92	88	83	77	70
32	137	131	127	123	119	116	112	108	102
28	161	153	147	142	137	132	127	121	113
24	189	180	174	169	164	159	154	148	140
20	209	201	195	190	185	181	176	170	162
16	227	219	214	209	204	200	195	190	182

***** 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	1475	1127	938	584	310	107	27	54	238	580	1041	1385	7866
60	1323	1001	784	438	187	46	7	21	137	426	891	1230	6491
57	1235	921	692	354	128	24	1	10	90	335	804	1137	5731
55	1177	869	632	302	95	15	0	6	65	276	750	1075	5262
50	1033	742	488	187	38	3	0	1	22	151	610	933	4208
32	562	367	115	6	0	0	0	0	0	5	218	454	1727

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	110	165	199	412	727	985	1222	1189	796	447	167	92	6511
55	12	23	3	18	110	310	509	481	170	6	9	0	1651
57	8	19	2	11	80	259	448	424	136	2	3	0	1392
60	3	14	0	4	46	191	361	341	93	1	0	0	1054
65	0	0	0	0	14	102	225	220	43	0	0	0	604
70	0	0	0	0	3	43	123	127	16	0	0	0	312

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	3	16	59	217	493	753	981	946	567	244	38	6	3	19	78	295	788	1541	2522	3468	4035	4279	4317	4323
45	0	1	18	119	347	603	826	791	420	132	11	0	0	1	19	138	485	1088	1914	2705	3125	3257	3268	3268
50	0	0	2	57	210	455	671	637	288	59	0	0	0	0	2	59	269	724	1395	2032	2320	2379	2379	2379
55	0	0	0	16	107	308	516	484	172	20	0	0	0	0	0	16	123	431	947	1431	1603	1623	1623	1623
60	0	0	0	2	45	181	363	334	83	3	0	0	0	0	0	2	47	228	591	925	1008	1011	1011	1011
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	33	79	184	329	472	616	596	389	216	48	12	2	35	114	298	627	1099	1715	2311	2700	2916	2964	2976

(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