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: FORT MORGAN, CO **COOP ID: 053038**

Climate Division: CO 4 **NWS Call Sign:** **Elevation: 4,332 Feet** **Lat: 40˚16N** **Lon: 103˚48W**

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	39.8	10.1	25.0	75	1982	27	34.5	1999	-32	1984	18	13.4	1979	1242	0	.0	.0	6.4	8.8	30.9	5.6
Feb	46.7	16.5	31.6	75+	1986	26	38.6	1992	-41	1951	1	21.1	1989	936	0	.0	.0	11.7	4.9	27.7	2.6
Mar	55.1	24.3	39.7	85	1963	29	44.8	1986	-22	1960	3	34.5	1987	785	0	.0	.0	19.5	2.2	25.7	.4
Apr	63.4	33.8	48.6	90+	1989	22	55.4	1981	-1	1975	2	42.8+	1983	494	2	.0	@	24.5	.6	12.4	@
May	73.0	44.8	58.9	99	2000	30	62.9	1998	23+	1999	7	51.9	1995	219	30	.0	1.0	29.9	.0	.8	.0
Jun	84.4	54.8	69.6	105	1990	28	73.8	1988	33+	1954	3	64.6	1983	33	170	.8	9.7	29.9	.0	.0	.0
Jul	91.1	59.9	75.5	107+	1989	10	79.8	2000	42+	1971	30	71.4	1994	1	327	3.0	18.2	31.0	.0	.0	.0
Aug	89.0	57.8	73.4	104	1970	3	78.8	1983	40+	1993	31	69.3	1992	8	269	1.0	15.4	31.0	.0	.0	.0
Sep	80.2	46.9	63.6	103	1998	6	71.0	1998	11	1985	30	57.5	1971	124	81	.2	5.8	29.2	@	1.1	.0
Oct	68.3	33.9	51.1	92+	2000	2	54.5	1979	5+	1997	26	46.7	1984	432	1	.0	.2	27.9	.3	12.0	.0
Nov	51.4	21.9	36.7	80	1999	5	44.3	1999	-19	1950	10	26.1	1985	851	0	.0	.0	16.0	3.6	27.1	.6
Dec	42.1	12.5	27.3	74	1998	1	36.1	1980	-26	1989	22	13.2	1983	1168	0	.0	.0	8.4	7.5	30.9	3.9
Ann	65.4	34.8	50.1	107+	Jul 1989	10	79.8	Jul 2000	-41	Feb 1951	1	13.2	Dec 1983	6293	880	5.0	50.3	265.4	27.9	168.6	13.1

\+ 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: 1948-2001

(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	.21	.18	.57	1990	20	.73	1990	.00	1983
Feb	.18	.10	.59	1950	8	.75	1987	.00+	1991
Mar	.74	.36	1.43	1983	5	2.66	1990	.00	1985
Apr	1.33	1.18	1.36	1973	25	3.40	1983	.05	1992
May	2.41	2.35	2.59	1987	25	6.46	1987	.26	1974
Jun	1.98	1.85	2.13	1966	8	3.82	1989	.53	1980
Jul	1.93	1.69	4.60	1956	31	6.20	1990	.33	1983
Aug	1.58	1.33	1.89	2000	4	3.46	2000	.02	1985
Sep	1.21	.95	2.33	1973	8	4.67	1973	.02	1978
Oct	.81	.50	1.70	1994	4	3.82	1994	.00	1980
Nov	.49	.41	1.06	1991	17	1.36+	1993	.00+	1984
Dec	.26	.22	.61	1982	25	.86	1992	.00+	1996
Ann	13.13	13.45	4.60	Jul 1956	31	6.46	May 1987	.00+	Dec 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.6	.9	@	.0
Feb	2.5	.8	.0	.0
Mar	3.8	1.9	.3	.1
Apr	6.0	3.5	.8	.1
May	9.1	5.3	1.5	.4
Jun	7.3	5.0	1.5	.2
Jul	7.3	4.5	1.2	.2
Aug	6.8	3.6	1.0	.2
Sep	5.4	3.0	.9	.1
Oct	3.5	2.2	.4	.1
Nov	3.6	1.6	.2	@
Dec	2.6	1.1	.1	.0
Ann	60.5	33.4	7.9	1.4

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	.03	.06	.09	.12	.16	.20	.26	.33	.46	.59
Feb	.00	.00	.02	.04	.07	.10	.15	.21	.29	.44	.59
Mar	.01	.03	.10	.19	.31	.45	.63	.87	1.22	1.84	2.47
Apr	.21	.32	.51	.69	.88	1.09	1.33	1.62	2.01	2.65	3.26
May	.46	.68	1.03	1.35	1.69	2.04	2.44	2.93	3.58	4.61	5.60
Jun	.66	.84	1.12	1.35	1.58	1.81	2.07	2.37	2.75	3.34	3.89
Jul	.46	.64	.92	1.17	1.42	1.69	1.99	2.34	2.81	3.55	4.24
Aug	.22	.36	.58	.80	1.03	1.28	1.58	1.93	2.41	3.20	3.96
Sep	.08	.15	.30	.47	.65	.87	1.13	1.47	1.94	2.73	3.52
Oct	.01	.04	.13	.23	.36	.52	.71	.97	1.34	1.98	2.64
Nov	.00	.04	.11	.19	.27	.36	.47	.60	.79	1.09	1.39
Dec	.00	.00	.02	.08	.13	.18	.25	.33	.44	.62	.80
Ann	8.96	9.76	10.78	11.56	12.26	12.94	13.64	14.42	15.37	16.75	17.95

+ 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: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

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Climate Division: CO 4 **NWS Call Sign:** **Elevation: 4,332 Feet** **Lat: 40°16N** **Lon: 103°48W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	4.2	3.5	1	0
Feb	1.9	1.0	#	#
Mar	5.2	3.3	#	0
Apr	2.4	1.5	#	0
May	.4	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.8	.0	#	0
Nov	3.5	1.7	#	0
Dec	4.2	4.0	#	0
Ann	22.6	15.0	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	10.0	1988	19	12.0	1990	11	1988	20	11	1988
Feb	3.0	1974	6	6.5	1974	8	1993	10	6	1993
Mar	14.0	1974	11	20.5	1974	5	1981	4	1	1981
Apr	12.0	1973	7	13.5	1973	3	1975	1	3	1975
May	3.0	1979	9	5.0	1979	#	1995	12	#	1995
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	.0	0	0	.0	0	0	0	0	0	0
Oct	6.0	1973	11	10.0	1997	2	1990	8	#+	1990
Nov	8.0	1979	21	17.8	1985	10	1972	1	6	1972
Dec	10.0	1979	28	12.0	1979	8	1985	11	2	1985
Ann	14.0	Mar 1974	11	20.5	Mar 1974	11	Jan 1988	20	11	Jan 1988

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.8	1.2	.5	.2	@
Feb	1.7	1.0	.1	.0	.0
Mar	2.1	1.6	.6	.3	@
Apr	1.1	1.0	.2	.1	@
May	.2	.2	@	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.3	.2	.1	.1	.0
Nov	1.4	1.1	.5	.2	.0
Dec	1.8	1.4	.5	.2	@
Ann	10.4	7.7	2.5	1.1	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	1.2	.1	.0	.0
Apr	.2	.0	.0	.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	.1	.0	.0	.0
Nov	.0	.0	.0	.0
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-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	5/20	5/16	5/14	5/12	5/10	5/08	5/06	5/03	4/30
32	5/12	5/09	5/06	5/04	5/02	4/30	4/28	4/25	4/22
28	5/03	4/28	4/24	4/21	4/18	4/16	4/12	4/09	4/04
24	4/25	4/20	4/16	4/13	4/10	4/07	4/04	3/31	3/26
20	4/17	4/11	4/07	4/04	4/01	3/29	3/25	3/21	3/15
16	4/09	4/02	3/28	3/24	3/20	3/16	3/12	3/07	2/28

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	9/15	9/19	9/22	9/24	9/26	9/29	10/01	10/04	10/08
32	9/21	9/26	9/29	10/02	10/05	10/07	10/10	10/13	10/18
28	9/30	10/05	10/09	10/12	10/15	10/18	10/21	10/24	10/29
24	10/05	10/11	10/15	10/19	10/22	10/25	10/29	11/02	11/08
20	10/17	10/23	10/27	10/30	11/03	11/06	11/10	11/14	11/19
16	10/24	10/30	11/03	11/07	11/10	11/13	11/17	11/21	11/27

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	152	148	144	141	139	136	133	130	126
32	172	166	162	158	155	151	148	144	138
28	198	192	187	182	178	175	170	165	159
24	220	211	205	200	194	189	184	177	169
20	239	231	225	220	215	211	206	200	192
16	260	251	245	239	234	229	224	217	208

***** 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	1242	936	785	494	219	33	1	8	124	432	851	1168	6293
60	1087	796	630	352	117	8	0	1	55	283	701	1013	5043
57	994	712	537	274	73	2	0	0	29	202	611	920	4354
55	932	656	475	226	51	1	0	0	17	154	554	858	3924
50	779	526	328	127	16	0	0	0	3	65	415	714	2973
32	307	152	21	0	0	0	0	0	0	0	81	265	826

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	88	140	260	498	834	1126	1348	1284	947	592	220	119	7456
55	0	0	0	33	172	437	635	571	274	33	3	0	2158
57	0	0	0	21	132	379	573	509	226	18	0	0	1858
60	0	0	0	10	83	294	480	417	162	7	0	0	1453
65	0	0	0	2	30	170	327	269	81	1	0	0	880
70	0	0	0	0	7	79	185	142	32	0	0	0	445

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	38	124	299	590	886	1099	1036	715	370	85	11	4	42	166	465	1055	1941	3040	4076	4791	5161	5246	5257
45	0	9	59	189	439	736	944	881	571	243	35	0	0	9	68	257	696	1432	2376	3257	3828	4071	4106	4106
50	0	0	18	103	299	588	789	726	431	136	6	0	0	0	18	121	420	1008	1797	2523	2954	3090	3096	3096
55	0	0	3	43	180	441	634	571	298	61	0	0	0	0	3	46	226	667	1301	1872	2170	2231	2231	2231
60	0	0	0	15	90	299	479	417	181	16	0	0	0	0	0	15	105	404	883	1300	1481	1497	1497	1497
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	20	62	132	220	364	554	701	660	455	294	92	36	20	82	214	434	798	1352	2053	2713	3168	3462	3554	3590

(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