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: ECHETA 2 NW, WY **COOP ID: 482881**

Climate Division: WY 5 **NWS Call Sign:** **Elevation: 4,000 Feet** **Lat: 44˚29N** **Lon: 105˚54W**

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	32.4	7.3	19.9	67	1981	23	32.7	1981	-42+	1997	11	-2.8	1979	1399	0	.0	.0	2.6	12.5	30.6	9.9
Feb	39.4	13.5	26.5	70+	1995	24	35.1	1999	-42	1989	3	12.3	1989	1081	0	.0	.0	6.9	7.9	27.8	5.5
Mar	48.7	21.7	35.2	78	1986	27	43.6	1986	-30	1978	3	27.4	1996	925	0	.0	.0	15.7	3.4	28.2	1.6
Apr	58.7	29.7	44.2	88+	1989	21	51.0	1987	0+	1997	12	37.9	1997	625	0	.0	.0	22.9	.8	19.4	.1
May	68.2	39.1	53.7	97	1969	27	59.0	1994	12	1967	4	49.2	1996	357	6	.0	.3	29.2	.0	5.9	.0
Jun	79.3	48.0	63.7	106	1983	23	74.9	1988	26	1969	14	57.7	1998	133	92	.7	4.7	29.8	.0	.3	.0
Jul	87.3	53.9	70.6	111	1981	6	75.3	1983	34+	1983	16	63.0	1993	39	213	2.1	14.1	31.0	.0	.0	.0
Aug	86.4	52.3	69.4	106+	1979	5	78.4	1983	28	1966	22	63.3+	1977	62	196	1.3	14.1	31.0	.0	@	.0
Sep	74.2	41.3	57.8	102	1978	5	65.6	1998	10+	1984	25	50.7	1984	255	37	.1	3.2	29.1	.1	4.5	.0
Oct	60.8	31.0	45.9	90+	1992	1	50.0	1973	-19	1991	30	40.9	1984	591	0	.0	.1	26.1	.6	17.7	.1
Nov	43.0	18.5	30.8	78	1999	7	42.6	1999	-34	1975	30	15.4	1985	1028	0	.0	.0	11.0	5.8	27.5	2.8
Dec	34.1	9.1	21.6	68	1979	5	32.1	1980	-54	1983	24	2.1	1983	1346	0	.0	.0	3.7	11.8	30.3	7.7
Ann	59.4	30.5	44.9	111	Jul 1981	6	78.4	Aug 1983	-54	Dec 1983	24	-2.8	Jan 1979	7841	544	4.2	36.5	239.0	42.9	192.2	27.7

\+ 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: 1949-2001

(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	.54	.40	.69	1975	18	1.22	1971	.00+	1992
Feb	.55	.55	.75	1991	17	1.75	1980	.00	1974
Mar	.98	.78	1.10	1973	14	2.35	1998	.19	1979
Apr	2.21	1.89	2.90	1967	30	4.59	1984	.48	1987
May	2.93	2.46	2.25	1978	18	11.26	1978	.68	1973
Jun	2.38	1.97	2.81	1970	12	6.25	1975	.22	1971
Jul	1.36	1.18	1.55	1974	17	4.29	1987	.15	1988
Aug	1.15	.82	2.35	1980	15	5.61	1980	.00+	1981
Sep	1.40	1.06	1.98	1998	13	6.32	1986	.00	1975
Oct	1.62	1.25	1.75	1996	26	4.70	1982	.00+	1999
Nov	.83	.71	1.12	1987	2	2.11	1986	.00	1997
Dec	.56	.47	.75+	1983	4	1.69	1989	.00	1986
Ann	16.51	15.91	2.90	Apr 1967	30	11.26	May 1978	.00+	Oct 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	2.3	.1	.0
Feb	3.3	2.2	.1	.0
Mar	5.3	3.5	.4	.1
Apr	7.2	6.1	1.4	.3
May	8.2	7.2	1.9	.7
Jun	6.9	5.5	1.6	.4
Jul	4.9	3.7	.8	.2
Aug	4.9	2.9	.7	.2
Sep	4.4	3.5	.9	.2
Oct	4.6	4.0	1.1	.3
Nov	4.6	3.3	.2	@
Dec	5.0	2.4	.1	.0
Ann	63.8	46.6	9.3	2.4

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	.00	.14	.25	.33	.41	.49	.57	.67	.80	1.01	1.19
Feb	.03	.07	.15	.23	.32	.42	.53	.67	.87	1.19	1.50
Mar	.20	.29	.43	.57	.70	.84	1.00	1.19	1.45	1.85	2.24
Apr	.54	.75	1.07	1.36	1.64	1.94	2.27	2.67	3.19	4.01	4.78
May	.71	.98	1.41	1.79	2.17	2.57	3.01	3.54	4.24	5.34	6.38
Jun	.33	.52	.86	1.19	1.54	1.92	2.37	2.91	3.65	4.85	6.01
Jul	.22	.34	.53	.72	.91	1.12	1.36	1.65	2.05	2.68	3.29
Aug	.00	.07	.23	.41	.60	.82	1.08	1.41	1.88	2.66	3.43
Sep	.11	.26	.48	.69	.90	1.13	1.40	1.73	2.17	2.88	3.57
Oct	.00	.23	.54	.80	1.06	1.33	1.65	2.02	2.52	3.34	4.13
Nov	.16	.27	.41	.52	.63	.75	.87	1.02	1.20	1.50	1.77
Dec	.05	.11	.20	.28	.37	.46	.56	.69	.86	1.13	1.40
Ann	10.30	11.44	12.93	14.08	15.12	16.14	17.20	18.39	19.84	21.98	23.86

\+ 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: 1949-2001
(3) Derived from 1971-2000 serially complete daily data

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Climate Division: WY 5 **NWS Call Sign:** **Elevation: 4,000 Feet** **Lat: 44°29N** **Lon: 105°54W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	8.7	8.0	7	6
Feb	8.2	7.0	4	1
Mar	12.0	11.5	2	1
Apr	7.0	4.5	1	#
May	1.4	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.8	.0	#	0
Oct	3.1	.0	#	0
Nov	8.5	8.0	1	#
Dec	12.2	11.0	4	1
Ann	61.9	50.0	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	11.0	1997	9	21.5	1977	26	1977	19	18	1977
Feb	12.0	1977	23	32.0	1971	26	1979	1	26	1979
Mar	12.0	1996	23	33.1	1996	20	1977	30	6	1996
Apr	19.0	1997	5	34.0	1999	19	1997	5	6	1997
May	8.0	1986	9	13.0	1986	11	1986	9	1	1986
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	8.0	1984	24	14.0	1984	10	1984	24	#+	2000
Oct	8.0	1973	10	16.0	1971	15	1996	26	2	1996
Nov	8.0	1986	7	23.0	1986	15	1976	29	5	2000
Dec	10.0	1983	4	32.3	1989	24	1989	21	15	1983
Ann	19.0	Apr 1997	5	34.0	Apr 1999	26+	Feb 1979	1	26	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.6	3.4	1.1	.2	@
Feb	2.8	2.8	1.1	.3	@
Mar	4.0	3.7	1.7	.7	@
Apr	1.9	1.9	.9	.6	.2
May	.4	.4	.2	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.2	.1	.1	.0
Oct	1.0	1.0	.5	.2	.0
Nov	3.0	2.8	1.1	.2	.0
Dec	4.0	3.9	1.1	.3	.1
Ann	20.9	20.1	7.8	2.7	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	5.5	4.5	2.6	.7
Mar	-9.9	-9.9	-9.9	-9.9
Apr	2.2	1.5	1.0	.7
May	.1	.1	@	@
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	.0	.0	.0
Oct	.6	.4	.2	.0
Nov	6.3	5.2	2.4	.1
Dec	8.5	6.8	6.0	3.5
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	7/02	6/25	6/20	6/16	6/12	6/08	6/04	5/30	5/23
32	6/03	5/30	5/27	5/25	5/22	5/20	5/17	5/14	5/10
28	5/21	5/17	5/14	5/11	5/09	5/07	5/04	5/01	4/27
24	5/13	5/08	5/04	5/01	4/27	4/24	4/21	4/17	4/12
20	4/30	4/24	4/21	4/17	4/14	4/11	4/08	4/04	3/30
16	4/20	4/14	4/10	4/07	4/04	4/01	3/28	3/24	3/19

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	8/20	8/26	8/30	9/03	9/07	9/10	9/14	9/18	9/24
32	9/07	9/11	9/14	9/16	9/18	9/21	9/23	9/26	9/30
28	9/12	9/16	9/19	9/21	9/24	9/26	9/28	10/01	10/05
24	9/14	9/20	9/25	9/29	10/03	10/07	10/11	10/16	10/22
20	9/19	9/26	10/01	10/06	10/10	10/14	10/19	10/24	10/31
16	10/09	10/15	10/19	10/23	10/26	10/29	11/02	11/06	11/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	112	103	96	91	86	80	75	69	60
32	134	129	125	121	118	115	112	108	103
28	156	149	144	140	137	133	129	124	118
24	184	175	169	163	158	153	147	141	132
20	204	195	189	183	178	173	168	161	153
16	226	219	213	209	205	200	196	190	183

***** 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	1399	1081	925	625	357	133	39	62	255	591	1028	1346	7841
60	1244	941	770	477	222	63	12	24	152	437	878	1191	6411
57	1151	857	677	392	154	35	4	12	102	347	788	1098	5617
55	1089	801	615	337	116	23	2	7	75	289	728	1036	5118
50	947	673	466	213	47	6	0	1	28	165	590	891	4027
32	464	268	78	8	0	0	0	0	0	5	188	407	1418

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	88	112	176	373	672	948	1197	1157	772	436	150	84	6165
55	0	0	0	12	75	281	485	451	158	8	0	0	1470
57	0	0	0	7	51	234	426	395	124	4	0	0	1241
60	0	0	0	2	26	172	341	313	84	1	0	0	939
65	0	0	0	0	6	92	213	196	37	0	0	0	544
70	0	0	0	0	1	39	118	109	13	0	0	0	280

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	0	13	65	192	438	721	954	941	566	261	44	5	0	13	78	270	708	1429	2383	3324	3890	4151	4195	4200
45	0	0	26	102	296	571	799	786	427	150	17	0	0	0	26	128	424	995	1794	2580	3007	3157	3174	3174
50	0	0	4	43	180	424	644	632	293	75	1	0	0	0	4	47	227	651	1295	1927	2220	2295	2296	2296
55	0	0	0	13	88	286	490	477	175	25	0	0	0	0	0	13	101	387	877	1354	1529	1554	1554	1554
60	0	0	0	2	33	168	341	328	89	4	0	0	0	0	0	2	35	203	544	872	961	965	965	965
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	23	76	170	297	453	591	594	391	224	55	8	0	23	99	269	566	1019	1610	2204	2595	2819	2874	2882

(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