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: TORRINGTON EXP FARM, WY **COOP ID: 488995**

Climate Division: WY 8 **NWS Call Sign:** **Elevation: 4,098 Feet** **Lat: 42˚05N** **Lon: 104˚13W**

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	39.5	10.3	24.9	70	1953	11	35.0	1986	-39	1930	17	8.8	1979	1243	0	.0	.0	8.1	8.4	30.1	7.3
Feb	45.0	14.9	30.0	75+	1999	26	37.7	1999	-33	1936	8	15.0	1993	982	0	.0	.0	11.7	5.2	26.9	4.0
Mar	52.0	23.0	37.5	85	1943	29	45.3	1986	-26	1948	11	31.8	1996	853	0	.0	.0	18.3	2.3	27.2	.8
Apr	61.2	30.7	46.0	91	1989	22	52.7	1977	-17	1975	2	39.8	1983	572	0	.0	.1	24.1	.5	17.9	@
May	71.0	41.3	56.2	100	1939	30	61.6	1994	11	1983	11	50.0	1995	289	15	.0	.9	29.5	.0	3.8	.0
Jun	82.4	50.2	66.3	105+	1990	28	72.7	1988	29+	1969	14	60.8	1998	71	110	.5	7.7	29.9	.0	.1	.0
Jul	89.1	55.5	72.3	111	1977	18	75.2	1989	39+	1972	4	67.7	1992	5	229	2.2	15.6	31.0	.0	.0	.0
Aug	87.3	53.1	70.2	105	1960	4	74.4	2000	32	1964	28	65.9	1992	25	185	.8	14.1	31.0	.0	.0	.0
Sep	77.7	41.9	59.8	101	1960	4	66.4	1998	10	1926	25	55.5	1985	192	36	@	4.5	29.3	.0	4.2	.0
Oct	65.4	29.7	47.6	92	1947	5	51.1	1973	-9	1991	31	44.6+	1982	541	0	.0	.2	27.2	.3	20.1	@
Nov	49.2	18.8	34.0	83	1999	1	42.7	1999	-23	1985	30	23.0	1985	930	0	.0	.0	15.0	3.6	28.1	1.7
Dec	41.0	11.3	26.2	77	1941	3	33.6	1980	-43	1923	31	13.5	1983	1205	0	.0	.0	8.8	7.3	29.8	5.8
Ann	63.4	31.7	47.6	111	Jul 1977	18	75.2	Jul 1989	-43	Dec 1923	31	8.8	Jan 1979	6908	575	3.5	43.1	263.9	27.6	188.2	19.6

\+ 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: 1922-2001

(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	.31	.25	.80	1922	3	.85+	2000	.00	1989
Feb	.40	.27	.88	1953	9	1.29	1993	.00	1977
Mar	.70	.52	1.36	1946	15	2.31	1990	.13	1997
Apr	1.68	1.47	2.64	1945	13	3.48	1984	.15	1992
May	2.54	2.31	2.97	1997	25	6.13	1997	.26	1973
Jun	2.09	1.68	5.44	1955	27	5.18	1993	.11	1980
Jul	1.78	1.52	2.00	1941	12	3.79	1992	.22	1989
Aug	1.19	1.06	1.30	1926	22	2.59	1980	.03	1995
Sep	1.27	.85	2.73	1973	11	4.71	1973	.22	1992
Oct	.95	.70	1.69	1970	7	3.25	1986	.04	1973
Nov	.57	.48	1.62	1922	4	1.33	2000	.00+	1976
Dec	.36	.29	.70	1936	17	.97	1994	.00+	1976
Ann	13.84	13.80	5.44	Jun 1955	27	6.13	May 1997	.00+	Jan 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	1.1	@	.0
Feb	3.5	1.4	@	.0
Mar	5.3	2.4	.2	.0
Apr	7.5	4.4	1.0	.2
May	9.8	5.5	1.6	.4
Jun	8.7	4.9	1.2	.3
Jul	7.6	4.7	.9	.2
Aug	6.3	3.0	.8	@
Sep	5.9	3.3	.7	.1
Oct	4.7	2.5	.7	.1
Nov	4.0	1.8	.2	.0
Dec	3.9	1.2	.0	.0
Ann	71.5	36.2	7.3	1.3

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	.02	.06	.11	.15	.20	.25	.31	.38	.48	.64	.79
Feb	.01	.03	.08	.14	.20	.28	.37	.49	.65	.93	1.21
Mar	.12	.18	.28	.38	.48	.58	.70	.85	1.05	1.36	1.67
Apr	.47	.63	.87	1.08	1.28	1.50	1.74	2.02	2.38	2.96	3.49
May	.42	.65	1.02	1.36	1.72	2.11	2.56	3.10	3.83	5.00	6.13
Jun	.39	.58	.89	1.17	1.46	1.77	2.12	2.55	3.12	4.02	4.89
Jul	.39	.56	.82	1.05	1.29	1.54	1.82	2.16	2.60	3.31	3.98
Aug	.14	.23	.40	.57	.74	.94	1.17	1.46	1.85	2.49	3.11
Sep	.15	.25	.43	.60	.79	1.00	1.24	1.55	1.95	2.63	3.28
Oct	.09	.16	.29	.42	.57	.73	.92	1.16	1.48	2.02	2.55
Nov	.00	.09	.20	.29	.38	.48	.59	.72	.89	1.17	1.43
Dec	.00	.04	.10	.16	.22	.28	.36	.45	.58	.79	.99
Ann	9.53	10.35	11.41	12.22	12.94	13.64	14.37	15.17	16.15	17.57	18.80

\+ 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: 1922-2001
(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	4.8	4.6	1	1	5.0	1978	16	12.3	1978	14	1976	3	4	1988	3.8	2.4	.4	.1	.0	10.9	5.2	2.3	.2
Feb	4.9	2.8	1	1	7.0	1990	13	23.4	1993	10	1993	27	7	1993	2.8	2.0	.7	.2	.0	6.4	3.7	2.0	.2
Mar	4.9	3.9	1	#	7.0	1988	10	24.5	1990	9	1989	2	2	1993	2.5	1.6	.8	.4	.0	4.1	1.9	1.0	.0
Apr	3.2	2.4	#	#	10.0	1986	3	11.0	1975	20	1993	13	1	1997	1.3	1.0	.3	.2	@	1.4	.4	.1	@
May	.1	.0	#	0	4.0	1979	9	4.0	1979	4	1979	9	#+	1991	.2	.1	.1	.0	.0	.1	.1	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1999	28	#	1999	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	#	0	.0	0	0	.0	0	#	1994	15	#	1994	.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	.4	.0	#	0	4.5	1974	12	4.5	1974	3+	2000	24	#+	2000	.2	.1	.1	.0	.0	.1	.1	.0	.0
Oct	2.1	1.0	#	0	10.0	1997	25	10.0	1997	10	1997	25	1	1997	.8	.7	.3	.1	@	.7	.2	.1	@
Nov	4.8	3.5	1	#	8.0	1979	21	17.0	1985	12	1979	21	2	1993	2.4	1.8	.7	.3	.0	5.2	1.9	.7	.0
Dec	6.8	6.4	1	1	14.0	1975	31	17.5	1975	14	1975	31	7	1985	3.6	2.5	.7	.3	@	11.3	6.0	2.8	.2
Ann	32.0	24.6	N/A	N/A	14.0	Dec 1975	31	24.5	Mar 1990	20	Apr 1993	13	7+	Feb 1993	17.6	12.2	4.1	1.6	@	40.2	19.5	9.0	.6

+ 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	6/16	6/09	6/05	6/01	5/28	5/24	5/20	5/15	5/09
32	5/30	5/25	5/21	5/18	5/15	5/12	5/09	5/06	5/01
28	5/15	5/11	5/08	5/05	5/03	5/01	4/28	4/25	4/21
24	5/05	5/01	4/27	4/25	4/22	4/19	4/16	4/13	4/09
20	4/30	4/24	4/19	4/15	4/11	4/08	4/04	3/30	3/24
16	4/19	4/13	4/08	4/04	4/01	3/28	3/24	3/19	3/13

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	130	123	117	113	108	104	99	94	86
32	143	138	134	130	127	124	120	116	110
28	166	160	156	152	148	145	141	137	131
24	189	182	176	172	168	164	159	154	147
20	215	205	199	193	188	182	177	170	161
16	238	227	219	213	207	200	194	186	175

***** 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	1243	982	853	572	289	71	5	25	192	541	930	1205	6908
60	1088	842	698	425	169	24	0	5	96	387	780	1050	5564
57	995	758	605	341	113	10	0	2	56	296	690	957	4823
55	933	702	543	288	82	5	0	1	36	238	630	895	4353
50	784	570	394	172	31	0	0	0	8	117	491	740	3307
32	312	180	41	3	0	0	0	0	0	1	117	262	916

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	92	122	211	422	748	1029	1248	1183	834	483	177	80	6629
55	0	0	0	16	117	344	535	471	180	7	0	0	1670
57	0	0	0	9	86	289	473	410	140	3	0	0	1410
60	0	0	0	3	49	213	380	320	90	1	0	0	1056
65	0	0	0	0	15	110	229	185	36	0	0	0	575
70	0	0	0	0	3	42	103	82	10	0	0	0	240

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	9	32	96	229	514	793	1004	946	604	275	61	19	9	41	137	366	880	1673	2677	3623	4227	4502	4563	4582
45	1	6	40	130	367	643	849	791	461	160	24	2	1	7	47	177	544	1187	2036	2827	3288	3448	3472	3474
50	0	1	11	61	235	495	694	636	323	73	3	0	0	1	12	73	308	803	1497	2133	2456	2529	2532	2532
55	0	0	0	24	128	350	539	482	205	25	0	0	0	0	0	24	152	502	1041	1523	1728	1753	1753	1753
60	0	0	0	4	57	217	386	331	108	3	0	0	0	0	0	4	61	278	664	995	1103	1106	1106	1106
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	26	55	111	200	344	496	627	592	414	263	85	31	26	81	192	392	736	1232	1859	2451	2865	3128	3213	3244

(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