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: CHADRON 1 SSW, NE **COOP ID: 251575**

Climate Division: NE 1 **NWS Call Sign: CDR** **Elevation: 3,510 Feet** **Lat: 42˚49N** **Lon: 103˚00W**

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	35.1	10.4	22.8	70	1989	30	32.4	1990	-29	1949	21	7.2	1979	1310	0	.0	.0	5.4	11.4	30.0	6.9
Feb	40.9	15.3	28.1	76	1982	21	39.7	1999	-27	1982	9	15.7	1978	1034	0	.0	.0	8.8	7.3	26.2	4.0
Mar	49.3	23.0	36.2	83+	1978	30	42.1	1994	-26	1989	5	28.9	1996	895	0	.0	.0	16.4	3.7	25.5	1.1
Apr	58.9	32.9	45.9	93	1989	20	52.2	1981	-11	1975	2	39.2	1983	574	0	.0	.1	22.7	.8	15.0	.1
May	69.6	43.9	56.8	98+	1969	27	62.3	1985	16	1954	3	50.4	1995	276	20	.0	.7	29.7	.0	2.6	.0
Jun	81.0	53.4	67.2	107	1989	19	75.1	1988	26	1969	2	61.8	1998	66	132	.5	6.3	29.9	.0	.0	.0
Jul	88.6	59.6	74.1	110	1954	12	78.0	1974	38	1971	30	68.9+	1993	8	289	2.8	14.9	31.0	.0	.0	.0
Aug	87.8	58.1	73.0	108	1980	6	76.7	1983	36+	1965	31	67.7	1992	13	259	1.5	14.4	31.0	.0	.0	.0
Sep	77.2	46.1	61.7	104	1978	4	69.3	1998	17	1984	29	56.4	1993	170	70	.3	5.7	29.1	.0	1.8	.0
Oct	63.8	33.9	48.9	94	1953	1	52.1	1974	-7+	1991	31	44.6	1984	501	0	.0	.3	26.6	.5	11.5	.1
Nov	46.4	21.0	33.7	81	1999	8	46.7	1999	-20	1986	13	16.7	1985	938	0	.0	.0	12.9	5.2	25.4	1.2
Dec	37.8	12.4	25.1	72	1980	4	35.8	1999	-40	1989	22	5.4	1983	1236	0	.0	.0	6.6	9.1	29.5	5.1
Ann	61.4	34.2	47.8	110	Jul 1954	12	78.0	Jul 1974	-40	Dec 1989	22	5.4	Dec 1983	7021	770	5.1	42.4	250.1	38.0	167.5	18.5

\+ 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

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	.46	.43	1.07	1949	3	1.41	1984	.00	1989
Feb	.47	.31	1.50	2000	26	2.45	2000	.00+	1996
Mar	.91	.72	1.38	1983	5	3.22	2000	.12	1978
Apr	1.89	1.86	2.45	2000	19	4.78	2000	.25	1980
May	3.02	2.90	2.56	1988	20	6.83	1988	.60	1974
Jun	2.62	2.07	2.12	1997	3	6.85	1993	.14	2000
Jul	2.11	2.01	2.00	2001	10	5.53	1997	.48	1989
Aug	1.67	1.30	1.82	1979	19	5.00	1979	.02	1971
Sep	1.44	1.08	4.40	1986	18	5.82	1986	.03	1978
Oct	1.05	1.05	1.50	1995	5	3.64	1998	.00	1989
Nov	.57	.49	.70	1993	27	1.62	1998	.00	1989
Dec	.42	.40	.71	1987	27	1.89	1987	.00+	1992
Ann	16.63	17.18	4.40	Sep 1986	18	6.85	Jun 1993	.00+	Feb 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.1	1.5	.2	.0
Feb	4.5	1.6	.2	@
Mar	7.2	2.8	.2	.1
Apr	8.7	4.8	1.0	.2
May	11.1	6.1	1.9	.5
Jun	9.2	5.6	1.6	.4
Jul	8.5	4.8	1.2	.4
Aug	7.1	3.8	1.1	.4
Sep	6.5	3.3	.9	.2
Oct	5.1	2.7	.6	.1
Nov	4.6	2.2	.1	.0
Dec	4.6	1.4	.1	.0
Ann	82.2	40.6	9.1	2.3

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	.04	.10	.17	.24	.31	.38	.46	.56	.70	.92	1.12
Feb	.00	.00	.09	.16	.24	.34	.45	.59	.78	1.10	1.41
Mar	.12	.19	.32	.45	.58	.73	.90	1.11	1.39	1.86	2.32
Apr	.35	.52	.80	1.06	1.32	1.60	1.92	2.31	2.82	3.65	4.43
May	1.00	1.28	1.70	2.06	2.40	2.76	3.14	3.60	4.18	5.08	5.92
Jun	.51	.74	1.13	1.48	1.84	2.23	2.66	3.19	3.89	5.01	6.08
Jul	.78	.98	1.27	1.50	1.73	1.96	2.21	2.50	2.87	3.43	3.95
Aug	.15	.27	.49	.73	.98	1.27	1.61	2.04	2.63	3.61	4.57
Sep	.06	.13	.30	.49	.71	.97	1.30	1.73	2.33	3.37	4.42
Oct	.07	.18	.35	.50	.66	.84	1.04	1.30	1.64	2.19	2.73
Nov	.10	.17	.27	.35	.42	.50	.59	.69	.83	1.04	1.24
Dec	.00	.00	.08	.16	.24	.32	.42	.54	.70	.96	1.22
Ann	10.12	11.30	12.86	14.07	15.17	16.24	17.36	18.62	20.17	22.44	24.45

\+ 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: NE 1 **NWS Call Sign: CDR** **Elevation: 3,510 Feet** **Lat: 42°49N** **Lon: 103°00W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	7.2	7.6	2	1
Feb	6.1	5.5	1	1
Mar	8.3	4.7	1	1
Apr	3.4	2.7	#	1
May	.4	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.1	.0	#	0
Oct	2.0	1.1	#	0
Nov	6.1	4.3	1	0
Dec	8.2	8.0	2	1
Ann	41.8	33.9	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	8.0	1974	21	12.5	1974	20+	1976	4	8+	1988
Feb	10.0	2000	26	21.0	2000	14+	1986	15	6	1986
Mar	17.1	1988	12	34.7	1988	32	1988	12	5	1988
Apr	5.2	1988	22	10.5	2000	9	1975	2	1+	2000
May	4.4	1983	12	7.7	1979	4	1983	12	#	2000
Jun	.0	0	0	.0	0	0	0	0	#	1983
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	2.7	1985	28	2.7	1985	2+	1985	29	#	1985
Oct	9.0	1991	28	9.0	1991	7+	1997	26	1+	1997
Nov	11.0	1979	20	16.9	1985	12+	1985	30	6	1985
Dec	11.8	1975	31	18.3	1987	15+	1987	28	9+	1983
Ann	17.1	Mar 1988	12	34.7	Mar 1988	32	Mar 1988	12	9+	Dec 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.4	2.9	.5	.2	.0
Feb	4.0	2.2	.4	.1	@
Mar	4.3	2.4	.8	.3	.1
Apr	2.1	1.3	.4	.1	.0
May	.2	.1	.1	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.0	.0	.0	.0
Oct	.8	.7	.3	.1	.0
Nov	3.6	2.7	.4	.1	@
Dec	4.4	2.6	.9	.4	.1
Ann	24.9	14.9	3.8	1.3	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	17.0	8.9	5.1	.9
Feb	10.4	6.4	3.3	.5
Mar	7.0	3.0	1.6	.5
Apr	2.3	1.0	.5	.0
May	.1	.1	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.0	.0	.0
Oct	1.1	.6	.3	.0
Nov	6.6	3.4	2.1	.4
Dec	12.8	7.9	5.0	1.7
Ann	57.4	31.3	17.9	4.0

+ 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	6/03	5/30	5/26	5/23	5/21	5/18	5/15	5/12	5/07
32	5/25	5/20	5/17	5/13	5/11	5/08	5/05	5/01	4/26
28	5/09	5/05	5/02	4/29	4/27	4/25	4/22	4/19	4/15
24	5/06	4/30	4/26	4/22	4/19	4/15	4/11	4/07	4/01
20	4/23	4/18	4/14	4/10	4/07	4/04	3/31	3/28	3/22
16	4/12	4/06	4/02	3/29	3/26	3/23	3/19	3/15	3/09

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	141	134	130	125	122	118	114	109	102
32	161	153	147	142	138	133	128	123	115
28	185	177	171	165	161	156	151	145	136
24	205	196	190	185	180	175	170	164	155
20	224	217	211	207	202	198	194	188	181
16	248	240	234	228	224	219	214	208	200

***** 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	1310	1034	895	574	276	66	8	13	170	501	938	1236	7021
60	1155	894	740	428	161	22	1	3	88	348	788	1081	5709
57	1062	810	647	344	107	10	0	1	54	261	703	990	4989
55	1000	761	585	290	79	5	0	0	36	208	647	933	4544
50	853	630	437	175	30	0	0	0	11	100	508	788	3532
32	376	244	66	3	0	0	0	0	0	1	147	340	1177

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	89	134	194	419	768	1056	1304	1269	890	524	199	127	6973
55	0	7	0	16	133	371	591	556	236	18	9	6	1943
57	0	0	0	10	100	315	529	495	194	9	5	2	1659
60	0	0	0	4	61	238	437	404	138	3	0	0	1285
65	0	0	0	0	20	132	289	259	70	0	0	0	770
70	0	0	0	0	4	59	161	138	28	0	0	0	390

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	6	34	95	244	532	826	1062	1028	675	325	74	19	6	40	135	379	911	1737	2799	3827	4502	4827	4901	4920
45	0	7	45	147	385	676	907	873	530	206	33	4	0	7	52	199	584	1260	2167	3040	3570	3776	3809	3813
50	0	0	16	75	251	527	752	718	394	111	12	0	0	0	16	91	342	869	1621	2339	2733	2844	2856	2856
55	0	0	1	33	145	383	597	563	268	49	0	0	0	0	1	34	179	562	1159	1722	1990	2039	2039	2039
60	0	0	0	11	67	247	443	409	163	13	0	0	0	0	0	11	78	325	768	1177	1340	1353	1353	1353
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	16	39	96	181	334	521	679	657	434	242	70	28	16	55	151	332	666	1187	1866	2523	2957	3199	3269	3297

(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/normals/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.
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