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: ENDERLIN 2 W, ND **COOP ID: 322695**

Climate Division: ND 9 **NWS Call Sign:** **Elevation: 1,150 Feet** **Lat: 46˚37N** **Lon: 97˚38W**

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	18.0	-2.2	7.9	50	1981	25	22.6	1990	-36+	1994	15	-6.5	1979	1773	0	.0	.0	.1	25.8	31.0	18.5
Feb	25.5	4.8	15.2	66	1958	26	28.8	1987	-37	1994	9	-2.3	1979	1396	0	.0	.0	1.0	18.5	27.9	12.2
Mar	37.4	17.9	27.7	78+	1986	29	36.7	2000	-35	1962	1	17.1	1975	1159	0	.0	.0	4.6	9.9	28.8	4.2
Apr	55.8	31.2	43.5	99	1980	22	51.6	1987	-8+	1975	4	32.6	1975	649	3	.0	.2	20.0	1.1	18.7	.3
May	71.1	43.6	57.4	99+	1966	23	65.6	1977	19	1955	8	49.1	1979	276	38	.0	.8	29.7	.0	3.4	.0
Jun	79.2	52.9	66.1	99+	1968	4	74.4	1988	31	1953	6	60.7	1982	78	108	.2	3.3	30.0	.0	.0	.0
Jul	84.5	57.3	70.9	106	1983	15	76.0	1983	38+	1997	6	63.9	1992	24	207	.5	6.1	31.0	.0	.0	.0
Aug	83.1	54.4	68.8	108	1965	14	75.4	1983	33	1968	15	62.1	1977	54	171	.6	6.1	31.0	.0	.0	.0
Sep	72.1	44.3	58.2	102+	1983	3	63.7+	1998	17	1974	22	52.4	1974	232	27	.1	1.7	29.5	.0	3.0	.0
Oct	58.1	32.4	45.3	92	1976	1	50.9	1973	6	1976	27	40.1	1976	611	0	.0	.1	23.8	.2	15.9	.0
Nov	36.8	17.8	27.3	75	1975	5	39.1	1999	-25	1985	24	15.7	1985	1131	0	.0	.0	5.6	11.3	28.3	2.5
Dec	23.4	4.0	13.7	60	1969	2	26.2	1999	-32+	1983	24	.5	1983	1590	0	.0	.0	.5	23.3	31.0	12.7
Ann	53.8	29.9	41.8	108	Aug 1965	14	76.0	Jul 1983	-37	Feb 1994	9	-6.5	Jan 1979	8973	554	1.4	18.3	206.8	90.1	188.0	50.4

\+ 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: 1952-2001

(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	.58	.50	.68	1982	2	1.61	1994	.00	2000
Feb	.38	.36	1.08	1958	27	1.50	1979	.00	1997
Mar	.85	.74	1.45	1966	3	2.32	1983	.00+	1997
Apr	1.42	1.21	1.65	1986	18	4.26	1986	.04	1996
May	2.62	2.51	6.15	1970	29	6.39	1998	.29	1976
Jun	3.40	2.71	7.18	1975	29	14.25	1975	.77	1974
Jul	3.42	3.25	5.20	1981	14	8.22	1995	.35	1976
Aug	2.20	2.06	4.26	1962	11	5.11	1974	.39	1976
Sep	2.02	1.90	2.97	1970	7	7.32	1999	.22	1974
Oct	1.77	1.21	3.40	1961	11	5.36	1982	.20	1993
Nov	.56	.44	1.72	1952	18	1.45	1996	.02+	1997
Dec	.38	.30	1.15	1960	5	1.25	1996	.00+	1998
Ann	19.60	19.23	7.18	Jun 1975	29	14.25	Jun 1975	.00+	Jan 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.7	2.3	.2	.0
Feb	5.1	2.2	.1	.0
Mar	6.5	3.3	.4	@
Apr	7.2	4.0	.8	.3
May	10.2	6.0	1.7	.4
Jun	7.2	4.8	1.2	.5
Jul	9.4	5.0	1.6	.8
Aug	9.0	5.5	1.4	.4
Sep	7.1	3.9	1.3	.6
Oct	5.9	3.3	1.2	.4
Nov	5.1	2.3	.2	.1
Dec	3.8	1.1	@	.0
Ann	81.2	43.7	10.1	3.5

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	.19	.27	.36	.46	.57	.71	.90	1.21	1.51
Feb	.02	.05	.11	.16	.22	.29	.37	.47	.60	.82	1.04
Mar	.00	.00	.27	.42	.56	.71	.88	1.09	1.34	1.77	2.17
Apr	.15	.25	.45	.64	.86	1.10	1.38	1.73	2.21	3.00	3.78
May	.67	.92	1.30	1.63	1.97	2.32	2.70	3.16	3.77	4.72	5.61
Jun	.83	1.15	1.64	2.08	2.52	2.99	3.50	4.12	4.93	6.20	7.40
Jul	.84	1.16	1.66	2.11	2.55	3.01	3.53	4.14	4.95	6.22	7.42
Aug	.84	1.04	1.34	1.58	1.81	2.04	2.30	2.59	2.97	3.54	4.07
Sep	.37	.55	.85	1.12	1.40	1.71	2.05	2.46	3.01	3.90	4.74
Oct	.14	.26	.49	.73	1.00	1.31	1.68	2.15	2.79	3.88	4.94
Nov	.03	.06	.13	.20	.29	.39	.51	.67	.90	1.28	1.65
Dec	.00	.03	.09	.15	.22	.29	.37	.48	.62	.86	1.09
Ann	12.58	13.89	15.59	16.90	18.07	19.22	20.42	21.75	23.38	25.78	27.87

\+ 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: 1952-2001
(3) Derived from 1971-2000 serially complete daily data

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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	13.6	11.5	8	7	9.0	1996	18	22.0	1994	30	1982	31	18	1982	5.0	4.2	1.3	.9	.0	-9.9	-9.9	-9.9	-9.9
Feb	5.8	4.4	9	7	8.0	1996	27	12.0	1974	33	1982	14	26	1982	3.4	2.3	.3	.1	.0	-9.9	-9.9	-9.9	-9.9
Mar	7.3	8.0	4	2	9.0	1982	20	18.0	1995	18	1982	10	12	1982	2.6	2.5	1.0	.2	.0	-9.9	-9.9	-9.9	-9.9
Apr	1.8	.0	#	0	7.0	1976	3	7.0	1976	7	1976	3	3	1975	.3	.2	.2	.1	.0	1.8	1.6	1.1	.0
May	.1	.0	0	0	1.0	1976	2	1.0	1976	0	0	0	0	0	.1	.1	.0	.0	.0	.0	.0	.0	.0
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	#	.0	#	0	#	1995	21	#	1995	#	1995	21	#	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	#	.0	#	0	#	1995	20	#+	1995	2	1971	30	#+	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	4.4	1.0	#	0	6.0	1996	17	18.5	1996	15	1985	26	5	1985	2.2	1.9	.5	.1	.0	-9.9	-9.9	-9.9	-9.9
Dec	5.7	2.0	3	#	5.0	1981	12	18.5	1996	17	1985	20	15	1985	2.8	2.5	.8	.1	.0	-9.9	-9.9	-9.9	-9.9
Ann	38.7	26.9	N/A	N/A	9.0+	Jan 1996	18	22.0	Jan 1994	33	Feb 1982	14	26	Feb 1982	16.4	13.7	4.1	1.5	.0	-9.9	-9.9	-9.9	-9.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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

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	9/05	9/09	9/11	9/13	9/15	9/17	9/19	9/22	9/25
32	9/12	9/16	9/19	9/21	9/23	9/25	9/28	9/30	10/04
28	9/19	9/24	9/28	10/01	10/04	10/07	10/10	10/13	10/18
24	9/27	10/02	10/05	10/09	10/12	10/15	10/18	10/21	10/27
20	10/03	10/09	10/13	10/17	10/20	10/24	10/27	11/01	11/07
16	10/15	10/20	10/24	10/27	10/31	11/03	11/06	11/10	11/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	136	129	124	120	116	112	108	103	96
32	153	148	144	140	137	134	131	127	121
28	175	168	163	159	155	151	147	142	136
24	194	187	183	179	175	171	167	162	155
20	215	208	202	198	194	189	185	179	172
16	235	227	222	218	214	209	205	200	192

***** 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	1773	1396	1159	649	276	78	24	54	232	611	1131	1590	8973
60	1618	1256	1004	508	173	27	6	17	127	457	981	1435	7609
57	1525	1172	911	428	123	12	0	7	79	367	891	1342	6857
55	1463	1116	850	377	96	6	0	4	54	309	831	1280	6386
50	1308	980	705	264	45	1	0	0	16	183	685	1125	5312
32	780	527	260	34	0	0	0	0	0	8	247	604	2460

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	30	55	124	377	785	1020	1206	1140	786	419	107	36	6085
55	0	0	1	31	168	336	493	430	150	8	0	0	1617
57	0	0	0	21	134	282	431	372	114	3	0	0	1357
60	0	0	0	12	90	207	344	289	72	1	0	0	1015
65	0	0	0	3	38	108	207	171	27	0	0	0	554
70	0	0	0	0	13	42	106	86	8	0	0	0	255

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	0	13	168	530	778	954	895	547	215	18	0	0	0	13	181	711	1489	2443	3338	3885	4100	4118	4118
45	0	0	4	96	385	628	799	740	406	121	8	0	0	0	4	100	485	1113	1912	2652	3058	3179	3187	3187
50	0	0	0	47	255	478	644	585	273	56	0	0	0	0	0	47	302	780	1424	2009	2282	2338	2338	2338
55	0	0	0	17	149	333	489	431	163	22	0	0	0	0	0	17	166	499	988	1419	1582	1604	1604	1604
60	0	0	0	5	73	204	337	283	82	6	0	0	0	0	0	5	78	282	619	902	984	990	990	990
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	13	131	336	490	622	575	346	159	19	0	0	0	13	144	480	970	1592	2167	2513	2672	2691	2691

(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