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: VELVA 3 NE, ND **COOP ID: 328990**

Climate Division: ND 2 **NWS Call Sign:** **Elevation: 1,535 Feet** **Lat: 48˚05N** **Lon: 100˚53W**

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	-3.8	7.1	55	1981	23	22.1	1990	-41	1976	6	-9.7	1982	1797	0	.0	.0	.1	23.4	30.8	16.8
Feb	25.6	3.6	14.6	67	1958	25	28.1	1998	-37+	1994	9	-2.2	1979	1411	0	.0	.0	1.1	16.6	27.7	10.9
Mar	37.5	15.0	26.3	78	1966	30	36.3	1986	-30+	1972	2	17.4	1996	1202	0	.0	.0	6.6	9.4	29.1	4.0
Apr	54.8	28.1	41.5	98	1980	21	49.8	1987	-12	1975	2	31.9	1979	707	1	.0	.1	19.9	1.4	18.9	.4
May	69.1	41.9	55.5	100	1980	22	64.6	1977	15	1967	3	49.9	1979	314	20	@	1.2	29.7	@	4.7	.0
Jun	77.2	51.5	64.4	104	1959	6	74.6	1988	27	1969	2	58.5	1993	114	94	.3	3.5	30.0	.0	.1	.0
Jul	82.3	55.8	69.1	106	1988	28	73.6	1974	34	1967	3	61.3	1993	47	173	.8	6.4	31.0	.0	.0	.0
Aug	81.3	52.6	67.0	106	1949	7	73.9	1983	29	1982	27	61.5	1985	83	142	.7	6.5	31.0	.0	.1	.0
Sep	70.2	42.0	56.1	108	1978	5	62.7	1998	13	1965	26	50.0	1984	288	21	.2	1.7	29.0	.0	2.7	.0
Oct	57.0	30.2	43.6	94+	1992	2	48.2	1973	-3	1991	31	38.5	1976	664	0	.0	.1	22.8	.9	15.7	.1
Nov	35.8	15.5	25.7	82	1975	5	35.8	1999	-25	1985	29	12.6	1985	1181	0	.0	.0	5.3	11.4	27.9	3.0
Dec	22.8	2.4	12.6	60	1979	4	27.2	1997	-38	1983	23	-3.2	1983	1625	0	.0	.0	.7	20.8	30.8	12.7
Ann	52.6	27.9	40.3	108	Sep 1978	5	74.6	Jun 1988	-41	Jan 1976	6	-9.7	Jan 1982	9433	451	2.0	19.5	207.2	83.9	188.5	47.9

\+ 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	.68	.58	2.83	1989	8	2.98	1989	.00	1990
Feb	.50	.42	.98	1958	27	1.60	1998	.05	1992
Mar	.78	.80	1.85	1985	28	2.24	1985	.09	1981
Apr	1.34	.87	2.36	1976	16	5.15	1975	.00	1994
May	2.30	1.84	3.27	1999	6	7.64	1999	.13	1980
Jun	3.22	3.16	3.57	1999	7	7.10	1982	.40	1974
Jul	2.80	2.62	3.60	1970	28	7.52	1993	.43	1984
Aug	1.83	1.47	2.35	1991	6	6.35	1980	.35	1979
Sep	1.62	1.55	2.03	1971	5	3.78	1971	.00	1992
Oct	1.61	.85	2.80	1991	30	9.13	1994	.08	1988
Nov	.92	.73	1.80	2000	1	4.32	2000	.00	1999
Dec	.50	.43	.75	1981	3	2.04	1977	.00	1989
Ann	18.10	17.77	3.60	Jul 1970	28	9.13	Oct 1994	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	2.4	.1	@
Feb	4.1	1.7	.1	.0
Mar	4.2	2.7	.3	@
Apr	4.8	2.6	.9	.3
May	7.1	4.6	1.4	.5
Jun	8.8	6.1	1.8	.6
Jul	8.0	5.9	1.8	.7
Aug	6.8	4.2	1.1	.4
Sep	5.9	3.7	.9	.3
Oct	3.9	2.6	1.1	.3
Nov	3.7	2.3	.7	.1
Dec	3.5	1.7	.2	.0
Ann	65.3	40.5	10.4	3.2

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	.07	.15	.26	.36	.46	.57	.69	.84	1.04	1.36	1.66
Feb	.07	.11	.18	.25	.32	.40	.50	.61	.76	1.01	1.25
Mar	.12	.19	.30	.41	.52	.64	.78	.96	1.19	1.56	1.93
Apr	.01	.05	.18	.35	.55	.81	1.14	1.58	2.22	3.34	4.48
May	.34	.53	.86	1.18	1.51	1.87	2.29	2.81	3.50	4.63	5.72
Jun	.93	1.24	1.70	2.10	2.48	2.89	3.34	3.87	4.55	5.62	6.61
Jul	.91	1.17	1.56	1.90	2.22	2.55	2.92	3.34	3.89	4.74	5.53
Aug	.42	.59	.86	1.10	1.34	1.59	1.88	2.22	2.66	3.37	4.04
Sep	.24	.45	.73	.95	1.18	1.41	1.68	1.99	2.40	3.04	3.65
Oct	.05	.12	.28	.48	.73	1.03	1.41	1.91	2.62	3.88	5.15
Nov	.01	.06	.16	.29	.44	.61	.83	1.11	1.51	2.20	2.89
Dec	.03	.08	.15	.23	.30	.39	.49	.61	.78	1.05	1.31
Ann	10.60	11.95	13.72	15.11	16.37	17.61	18.91	20.37	22.18	24.84	27.19

+ 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

Complete documentation available from:
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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.1	6.0	5	4
Feb	5.2	4.8	3	#
Mar	6.9	6.4	2	#
Apr	2.2	.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	#	0
Aug	.0	.0	0	0
Sep	.3	.0	#	0
Oct	2.7	.0	#	0
Nov	5.6	3.2	1	0
Dec	6.2	5.9	2	1
Ann	35.2	26.3	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	9.0	1980	6	14.1	1980	31	1989	11	18	1989
Feb	6.2	1972	29	14.1	1972	15	1974	28	13	1974
Mar	13.5	1985	28	19.0	1985	14	1976	15	8	1976
Apr	21.5	1997	6	21.5	1997	9	1986	14	1	1972
May	.3	1983	15	.3	1983	#+	1991	5	#+	1991
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	#	1971	10	#	1971
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	4.0	1972	26	7.0	1972	1	1972	25	#+	1995
Oct	11.5	1991	30	12.0	1991	9	1985	8	1	1985
Nov	15.0	1998	10	26.2	1998	12	1985	20	12	1985
Dec	6.0	1974	22	17.0	1977	10	1974	31	5	1985
Ann	21.5	Apr 1997	6	26.2	Nov 1998	31	Jan 1989	11	18	Jan 1989

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.4	2.7	.6	.2	.0
Feb	3.2	2.2	.6	.1	.0
Mar	2.7	2.2	.8	.3	.1
Apr	.6	.6	.4	.2	.1
May	@	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.1	.0	.0
Oct	.9	.6	.4	.2	@
Nov	2.3	1.7	.8	.3	.1
Dec	3.2	2.1	.6	.2	.0
Ann	16.4	12.2	4.3	1.5	.3

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	-9.9	-9.9	-9.9	-9.9
Apr	.5	.1	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.0	.0	.0
Oct	.6	.4	.1	.0
Nov	-9.9	-9.9	-9.9	-9.9
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

Complete documentation available from:
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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	6/10	6/05	6/01	5/29	5/25	5/22	5/19	5/15	5/10
32	5/29	5/24	5/21	5/19	5/16	5/13	5/11	5/08	5/03
28	5/19	5/14	5/11	5/08	5/05	5/02	4/29	4/26	4/21
24	5/11	5/06	5/03	4/30	4/27	4/24	4/21	4/17	4/12
20	4/30	4/25	4/22	4/19	4/17	4/14	4/11	4/08	4/03
16	4/20	4/15	4/12	4/09	4/06	4/03	4/01	3/28	3/24

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	8/25	8/30	9/03	9/06	9/09	9/12	9/15	9/19	9/24
32	9/05	9/10	9/14	9/17	9/20	9/23	9/26	9/29	10/05
28	9/19	9/23	9/26	9/28	10/01	10/03	10/05	10/08	10/12
24	9/27	10/01	10/04	10/07	10/10	10/13	10/15	10/19	10/23
20	10/05	10/09	10/13	10/16	10/19	10/21	10/24	10/28	11/02
16	10/08	10/15	10/19	10/23	10/27	10/30	11/03	11/08	11/14

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	128	121	115	110	106	101	97	91	83
32	147	140	134	130	126	122	118	112	105
28	168	161	156	152	148	144	140	135	128
24	185	178	173	169	165	161	157	152	146
20	206	199	193	189	184	180	176	170	163
16	228	219	213	208	203	198	193	186	178

***** 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	1797	1411	1202	707	314	114	47	83	288	664	1181	1625	9433
60	1642	1271	1047	564	196	49	14	32	174	509	1031	1470	7999
57	1549	1187	954	481	140	25	6	16	118	418	941	1377	7212
55	1487	1131	892	429	108	16	1	10	87	358	881	1315	6715
50	1332	991	743	308	50	3	0	2	33	224	733	1160	5579
32	808	541	286	49	0	0	0	0	0	12	281	641	2618

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	34	54	107	333	729	970	1148	1083	723	371	90	39	5681
55	0	0	0	23	124	295	437	379	120	4	0	0	1382
57	0	0	0	15	93	245	380	324	91	2	0	0	1150
60	0	0	0	8	57	179	294	247	56	0	0	0	841
65	0	0	0	1	20	94	173	142	21	0	0	0	451
70	0	0	0	0	4	37	87	68	6	0	0	0	202

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	1	18	179	518	765	928	878	526	216	21	0	0	1	19	198	716	1481	2409	3287	3813	4029	4050	4050
45	0	0	4	101	378	615	773	723	382	120	8	0	0	0	4	105	483	1098	1871	2594	2976	3096	3104	3104
50	0	0	0	51	251	465	618	569	254	55	2	0	0	0	0	51	302	767	1385	1954	2208	2263	2265	2265
55	0	0	0	21	144	324	464	415	147	14	0	0	0	0	0	21	165	489	953	1368	1515	1529	1529	1529
60	0	0	0	9	74	194	314	271	72	3	0	0	0	0	0	9	83	277	591	862	934	937	937	937
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	20	142	334	480	596	560	331	156	21	0	0	0	20	162	496	976	1572	2132	2463	2619	2640	2640

(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