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: KENMARE 1 WSW, ND **COOP ID: 324646**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 1,810 Feet** **Lat: 48˚40N** **Lon: 102˚06W**

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	17.1	-3.7	6.7	51	1987	13	22.1	1992	-39+	1996	19	-11.4	1982	1809	0	.0	.0	@	24.1	30.9	18.3
Feb	24.2	4.1	14.2	63	1992	27	27.2	1998	-40	1996	2	-3.9	1979	1425	0	.0	.0	.8	17.6	27.9	11.5
Mar	35.5	14.9	25.2	75+	1966	31	34.7	1973	-38	1962	1	16.0	1975	1233	0	.0	.0	4.7	11.2	29.9	4.6
Apr	52.5	28.2	40.4	91+	2001	29	48.8	1987	-12	1975	2	29.5	1979	740	0	.0	.1	17.9	1.7	20.6	.3
May	66.1	40.7	53.4	100	1980	23	59.3	1980	11+	1979	4	44.6	1974	380	21	@	.6	28.9	@	5.5	.0
Jun	74.7	50.0	62.4	103	1988	21	74.0	1988	30	1969	12	56.2	1985	153	73	.2	1.9	29.9	.0	.1	.0
Jul	80.2	53.8	67.0	106	1960	21	72.4	1989	36	1967	3	61.1	1993	63	125	.3	4.0	31.0	.0	.0	.0
Aug	79.7	51.1	65.4	108	1958	9	72.0	1983	27	1979	14	56.8	1977	124	136	.4	4.9	31.0	.0	.2	.0
Sep	67.9	40.7	54.3	101+	1978	5	60.5	1998	16	1965	26	47.8	1984	340	19	.1	1.0	28.3	.0	4.2	.0
Oct	54.6	29.6	42.1	93+	1992	2	46.9	1994	-2+	1991	31	34.3	1976	710	0	.0	.1	20.1	1.0	18.3	.1
Nov	34.9	15.2	25.1	76	1990	1	36.0	1999	-27+	1985	28	11.6	1985	1199	0	.0	.0	4.6	11.7	28.7	3.8
Dec	21.9	2.5	12.2	56+	1987	11	26.9	1997	-40	1983	24	-3.4	1983	1637	0	.0	.0	.4	22.1	30.8	13.2
Ann	50.8	27.3	39.0	108	Aug 1958	9	74.0	Jun 1988	-40+	Feb 1996	2	-11.4	Jan 1982	9813	374	1.0	12.6	197.6	89.4	197.1	51.8

\+ 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: 1944-2001

(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	.83	.62	.87	1999	3	2.68	1999	.00	1973
Feb	.63	.43	1.91	1998	25	4.26	1998	.03	1992
Mar	.90	.82	1.17	1996	24	2.67	1997	.00	1977
Apr	1.26	1.05	2.00	1970	28	3.71	1975	.10	1987
May	2.07	1.76	2.84	1985	13	7.89	1999	.08	1980
Jun	2.66	2.54	3.14	1956	19	4.86	1981	.91	1974
Jul	2.67	2.33	3.86	1997	2	7.03	1993	.39	1989
Aug	1.80	1.66	2.40	1950	13	4.43	1974	.11	1988
Sep	1.92	1.62	2.35	1971	5	4.69	1975	.07	1974
Oct	1.19	.72	1.78	1984	7	4.93	1982	.00	1976
Nov	.69	.52	1.44	1998	10	2.56	2000	.00+	1999
Dec	.53	.44	.86	2001	5	1.96	1994	.00+	1987
Ann	17.15	16.86	3.86	Jul 1997	2	7.89	May 1999	.00+	Nov 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.2	2.7	.2	.0
Feb	5.4	1.7	.2	.1
Mar	5.5	2.8	.5	@
Apr	6.3	2.9	.7	.2
May	9.0	4.9	1.1	.2
Jun	11.6	6.5	1.5	.4
Jul	10.3	5.7	1.8	.4
Aug	8.0	3.8	1.1	.3
Sep	7.8	4.0	1.2	.5
Oct	4.9	2.9	.7	.2
Nov	4.5	2.1	.3	.1
Dec	4.7	1.8	.1	.0
Ann	84.2	41.8	9.4	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	.05	.14	.27	.39	.52	.66	.82	1.02	1.29	1.73	2.15
Feb	.02	.05	.12	.20	.30	.41	.56	.75	1.02	1.49	1.96
Mar	.05	.14	.28	.41	.55	.71	.89	1.11	1.41	1.91	2.39
Apr	.16	.27	.44	.62	.81	1.01	1.25	1.54	1.94	2.59	3.22
May	.28	.44	.74	1.03	1.33	1.66	2.05	2.53	3.17	4.23	5.25
Jun	.99	1.24	1.60	1.90	2.18	2.47	2.79	3.15	3.62	4.33	4.99
Jul	.67	.92	1.31	1.65	2.00	2.35	2.76	3.23	3.86	4.84	5.77
Aug	.24	.39	.65	.90	1.16	1.45	1.79	2.20	2.76	3.67	4.55
Sep	.29	.46	.73	1.00	1.27	1.57	1.92	2.34	2.91	3.83	4.71
Oct	.01	.07	.20	.36	.54	.77	1.05	1.42	1.95	2.85	3.77
Nov	.00	.04	.14	.25	.36	.49	.65	.85	1.13	1.59	2.05
Dec	.00	.03	.12	.20	.28	.39	.51	.65	.86	1.21	1.55
Ann	10.53	11.74	13.33	14.56	15.67	16.76	17.90	19.17	20.73	23.04	25.06

\+ 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: 1944-2001
(3) Derived from 1971-2000 serially complete daily data

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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	7.2	6.0	4	3
Feb	6.4	4.0	6	1
Mar	7.2	7.5	2	#
Apr	3.5	1.7	#	0
May	.6	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	1.9	.0	#	0
Nov	5.2	4.0	#	#
Dec	5.1	3.5	2	1
Ann	37.3	26.7	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	5.5	1997	4	19.4	1982	20	1982	31	12	1982
Feb	7.0	1994	24	22.0	1998	30	1989	6	23	1994
Mar	9.0	1996	24	20.8	1975	16	1972	3	14	1972
Apr	14.0	1980	8	15.2	1980	15	1980	8	2	1982
May	4.0	1991	4	5.0	1974	10	1984	1	1	1984
Jun	1.0	1998	1	1.0	1998	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	2.2	1972	26	2.2	1972	2	1972	26	#+	1984
Oct	11.0	1975	14	14.0	1975	10	1975	14	1	1985
Nov	11.5	1998	10	15.8	2000	8	1985	30	3	1986
Dec	6.0	1994	3	20.8	1975	12	1975	31	12	1975
Ann	14.0	Apr 1980	8	22.0	Feb 1998	30	Feb 1989	6	23	Feb 1994

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.8	3.5	.7	.2	.0
Feb	4.9	2.4	.6	.2	.0
Mar	4.1	2.4	.9	.4	.0
Apr	1.7	1.0	.4	.2	@
May	.2	.2	.1	.0	.0
Jun	@	@	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.0	.0	.0
Oct	.9	.6	.3	.1	@
Nov	3.4	1.9	.5	.2	@
Dec	4.4	2.4	.6	.1	.0
Ann	25.5	14.5	4.1	1.4	@

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	1.3	1.0	.6	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	.0	.0	.0
Oct	.8	.4	.2	.1
Nov	6.4	3.5	1.9	.0
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

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

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	8/16	8/22	8/26	8/29	9/02	9/05	9/09	9/13	9/19
32	8/29	9/04	9/08	9/12	9/15	9/18	9/22	9/26	10/02
28	9/05	9/12	9/16	9/20	9/24	9/27	10/01	10/06	10/12
24	9/18	9/23	9/27	10/01	10/04	10/07	10/10	10/14	10/19
20	10/02	10/07	10/11	10/14	10/17	10/20	10/23	10/26	10/31
16	10/05	10/11	10/16	10/19	10/23	10/26	10/30	11/03	11/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	121	111	103	97	91	85	79	71	61
32	141	134	129	124	120	116	112	107	99
28	168	159	152	146	141	135	129	122	113
24	179	172	167	163	159	155	151	146	139
20	203	195	190	185	181	176	172	166	158
16	217	210	205	200	196	192	188	182	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	1809	1425	1233	740	380	153	63	124	340	710	1199	1637	9813
60	1654	1285	1078	595	257	78	18	61	220	555	1049	1482	8332
57	1561	1201	985	510	196	46	8	36	159	463	959	1389	7513
55	1499	1145	923	456	160	31	3	25	124	402	899	1327	6994
50	1344	1012	779	330	87	10	0	8	56	261	755	1172	5814
32	826	559	319	53	1	0	0	0	0	16	304	663	2741

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	40	59	109	303	666	911	1084	1035	669	329	95	49	5349
55	0	0	0	16	111	252	374	347	103	2	0	0	1205
57	0	0	0	10	85	207	317	296	78	1	0	0	994
60	0	0	0	4	53	149	234	228	49	0	0	0	717
65	0	0	0	0	21	73	125	136	19	0	0	0	374
70	0	0	0	0	6	27	50	68	6	0	0	0	157

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	12	138	444	684	844	807	457	165	17	0	0	0	12	150	594	1278	2122	2929	3386	3551	3568	3568
45	0	0	1	77	309	534	689	652	320	88	6	0	0	0	1	78	387	921	1610	2262	2582	2670	2676	2676
50	0	0	0	32	187	388	534	498	198	40	1	0	0	0	0	32	219	607	1141	1639	1837	1877	1878	1878
55	0	0	0	13	103	248	379	348	109	9	0	0	0	0	0	13	116	364	743	1091	1200	1209	1209	1209
60	0	0	0	4	45	134	233	211	48	1	0	0	0	0	0	4	49	183	416	627	675	676	676	676
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	13	110	282	415	536	511	291	130	18	0	0	1	14	124	406	821	1357	1868	2159	2289	2307	2307

(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