

Climatography of the United States No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: BOTTINEAU, ND

1971-2000

COOP ID: 320941

Climate Division: ND 2

NWS Call Sign:

Elevation: 1,640 Feet Lat: 48° 50N

Lon: 100° 26W

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	13.8	-7.8	3.0	50	1944	20	17.7	1990	-47	1916	13	-12.5	1982	1924	0	.0	.0	.0	28.0	31.0	20.1
Feb	21.1	-.1	10.5	63	1988	28	24.4	1998	-49	1936	12	-5.2	1979	1528	0	.0	.0	.2	21.8	28.2	13.6
Mar	32.9	12.8	22.9	79	1910	23	34.5	1973	-37	1972	2	13.2	1980	1306	0	.0	.0	2.5	13.7	29.9	6.2
Apr	51.7	27.6	39.7	95	1980	22	47.7	1987	-16	1975	2	28.0	1979	760	0	.0	.1	16.9	2.3	20.1	.4
May	66.9	40.6	53.8	110	1925	30	62.6	1977	10	1918	12	45.4	1979	370	22	.0	.7	28.8	.0	5.2	.0
Jun	74.8	49.9	62.4	108	1936	25	73.8	1988	25	1917	1	55.5	1985	151	71	@	1.5	29.9	.0	.1	.0
Jul	79.4	54.0	66.7	111	1936	12	72.0	1989	30	1912	15	60.3	1993	66	118	.2	2.7	31.0	.0	.0	.0
Aug	78.9	52.0	65.5	104+	1949	8	71.3	1983	28	1910	26	57.7	1977	111	124	.1	3.6	31.0	.0	.0	.0
Sep	67.3	41.5	54.4	102	1931	8	60.5	1998	15+	1942	28	49.1	1972	333	15	@	.8	28.3	@	3.4	.0
Oct	53.7	29.1	41.4	91	1920	7	46.4	1973	-6	1991	30	36.1	1991	732	0	.0	.0	19.1	1.2	19.5	.1
Nov	32.8	13.6	23.2	73+	1999	1	34.8	1999	-28+	1985	29	10.5	1985	1254	0	.0	.0	3.1	14.7	28.9	4.7
Dec	18.7	-1.7	8.5	63	1939	6	22.0	1997	-44	1934	26	-5.3	1983	1753	0	.0	.0	.0	26.5	31.0	15.9
Ann	49.3	26.0	37.7	111	Jul 1936	12	73.8	Jun 1988	-49	Feb 1936	12	-12.5	Jan 1982	10288	350	.3	9.4	190.8	108.2	197.3	61.0

+ 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

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1898-2001

(3) Derived from 1971-2000 serially complete daily data

007-A

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Climate Division: ND 2

NWS Call Sign:

Elevation: 1,640 Feet Lat: 48°50N

Lon: 100°26W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.49	.46	.42	1972	6	1.11	1980	.00	1973	6.4	1.6	.0	.0	.13	.20	.27	.34	.39	.45	.52	.59	.68	.83	.96
Feb	.46	.30	1.25	2000	26	2.31	1976	.00	1971	4.6	1.6	@	@	.02	.05	.11	.18	.25	.33	.43	.56	.73	1.02	1.31
Mar	.79	.65	1.35	1945	26	1.85	1975	.00	1977	4.9	2.6	.3	@	.06	.15	.27	.39	.51	.64	.79	.97	1.22	1.61	2.00
Apr	1.22	.86	2.80	1975	27	7.30	1975	.00	1977	6.3	3.1	.6	.1	.02	.10	.25	.42	.62	.84	1.12	1.48	1.98	2.84	3.69
May	2.16	1.94	2.41	1960	26	6.58	1999	.47	1997	9.5	5.5	1.2	.2	.53	.73	1.05	1.33	1.61	1.90	2.23	2.61	3.12	3.93	4.68
Jun	3.29	3.10	3.45	1923	23	7.66	1971	.78	1974	11.8	7.5	2.0	.5	1.13	1.44	1.89	2.28	2.64	3.02	3.43	3.91	4.53	5.49	6.37
Jul	3.04	2.84	3.38	1955	7	6.96	1987	.19	1985	10.6	6.0	1.9	.7	.69	.97	1.42	1.82	2.22	2.65	3.12	3.69	4.44	5.64	6.76
Aug	2.62	2.19	4.18	1998	3	7.92	1998	.76	1971	8.5	5.2	1.3	.7	.65	.90	1.28	1.62	1.96	2.31	2.70	3.17	3.78	4.75	5.66
Sep	1.94	1.71	5.03	1973	2	8.34	1973	.10	1976	8.4	4.4	.9	.3	.28	.44	.72	.99	1.27	1.58	1.93	2.37	2.96	3.92	4.84
Oct	1.27	.92	2.25	1898	3	4.61	1971	.11	1990	6.8	3.0	.8	.2	.09	.17	.34	.51	.70	.93	1.20	1.54	2.02	2.82	3.61
Nov	.66	.65	1.17	1906	16	2.14	2000	.05	1976	6.0	2.3	.2	.0	.08	.14	.23	.32	.42	.53	.65	.81	1.02	1.36	1.70
Dec	.51	.45	1.02	1977	17	1.35	1977	.06	1986	5.1	1.6	.1	@	.07	.12	.19	.26	.33	.41	.51	.62	.78	1.03	1.27
Ann	18.45	17.13	5.03	Sep 1973	2	8.34	Sep 1973	.00+	Apr 1977	88.9	44.4	9.3	2.7	11.23	12.54	14.27	15.61	16.83	18.02	19.26	20.65	22.36	24.89	27.11

+ 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: 1898-2001

(3) Derived from 1971-2000 serially complete daily data

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1971-2000

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Station: BOTTINEAU, ND

COOP ID: 320941

Climate Division: ND 2

NWS Call Sign:

Elevation: 1,640 Feet

Lat: 48° 50N

Lon: 100° 26W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	7.6	7.0	10	9	6.0	1989	7	17.5	1994	29	1989	16	21	1989	5.7	4.3	.7	.1	.0	30.2	25.7	21.6	11.1
Feb	6.1	5.3	9	9	8.0	1998	26	24.0	1976	23	1976	29	19	1989	4.0	3.2	.5	.1	.0	26.0	24.0	20.4	11.3
Mar	6.9	5.5	7	6	9.0	1995	23	20.5	1975	33	1976	13	24	1976	3.3	2.9	.9	.4	.0	18.8	14.3	11.1	6.3
Apr	3.3	2.2	1	#	9.0	1984	28	17.0	1984	17	1984	29	7	1979	1.6	1.3	.4	.1	.0	4.1	2.1	1.5	1.2
May	.4	.0	#	0	4.0	1991	4	5.0	1991	5	1984	2	#+	2000	.3	.2	@	.0	.0	.2	.1	.1	.0
Jun	#	.0	#	0	#	1998	3	#	1998	#	1998	3	#	1998	.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	.2	.0	#	0	2.5	1995	21	2.5	1995	2	1972	26	#+	1995	.1	.1	.0	.0	.0	.1	.0	.0	.0
Oct	1.8	.0	#	#	6.0	1985	8	12.5	1991	8	1991	31	1	1991	.9	.8	.2	@	.0	1.4	.3	.1	.0
Nov	6.7	7.8	2	2	7.0	1998	10	16.0	1985	13	1985	30	6	1986	4.3	3.4	.8	.3	.0	13.4	7.8	4.9	1.0
Dec	7.9	8.0	6	4	8.0	1977	17	16.0	1996	21	1996	31	14	1996	4.7	3.8	.7	.3	.0	26.9	20.9	16.1	6.4
Ann	40.9	35.8	N/A	N/A	9.0+	Mar 1995	23	24.0	Feb 1976	33	Mar 1976	13	24	Mar 1976	24.9	20.0	4.2	1.3	.0	121.1	95.2	75.8	37.3

+ 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:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

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No. 20 1971-2000

Station: BOTTINEAU, ND

COOP ID: 320941

Climate Division: ND 2

NWS Call Sign:

Elevation: 1,640 Feet

Lat: 48° 50N

Lon: 100° 26W

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	6/13	6/07	6/03	5/30	5/27	5/23	5/20	5/16	5/10
32	5/29	5/24	5/22	5/19	5/17	5/14	5/12	5/09	5/05
28	5/17	5/13	5/09	5/07	5/04	5/02	4/29	4/26	4/22
24	5/11	5/06	5/03	4/30	4/28	4/25	4/22	4/19	4/15
20	5/04	4/29	4/25	4/22	4/19	4/15	4/12	4/08	4/03
16	4/19	4/14	4/11	4/09	4/06	4/04	4/01	3/29	3/25
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	8/30	9/03	9/06	9/09	9/11	9/14	9/17	9/20	9/24
32	9/11	9/14	9/17	9/19	9/21	9/23	9/25	9/27	10/01
28	9/15	9/19	9/22	9/25	9/27	9/30	10/02	10/05	10/09
24	9/25	9/29	10/02	10/04	10/07	10/09	10/11	10/14	10/18
20	10/02	10/07	10/11	10/14	10/16	10/19	10/22	10/26	10/31
16	10/10	10/15	10/19	10/22	10/25	10/28	11/01	11/04	11/10
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	111	107	103	98	93	86
32	141	136	133	129	127	124	120	117	112
28	163	157	153	149	145	141	137	133	127
24	177	172	168	165	161	158	155	151	145
20	203	195	189	185	180	176	171	165	157
16	222	215	210	205	201	197	193	188	180

* 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

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

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No. 20
1971-2000**

Station: BOTTINEAU, ND

COOP ID: 320941

Climate Division: ND 2

NWS Call Sign:

Elevation: 1,640 Feet Lat: 48° 50N Lon: 100° 26W

Degree Days to Selected Base Temperatures (°F)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1924	1528	1306	760	370	151	66	111	333	732	1254	1753	10288
60	1769	1388	1151	615	249	76	18	49	211	577	1104	1598	8805
57	1676	1304	1058	532	189	44	8	27	150	484	1014	1505	7991
55	1614	1248	996	478	154	29	3	18	114	423	954	1443	7474
50	1459	1108	850	352	83	9	0	5	48	277	804	1288	6283
32	923	637	381	68	2	0	0	0	0	19	338	753	3121

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	21	33	98	298	677	910	1075	1036	672	310	74	23	5227
55	0	0	1	18	116	249	365	341	96	1	0	0	1187
57	0	0	0	12	89	204	308	288	71	0	0	0	972
60	0	0	0	5	56	146	226	218	43	0	0	0	694
65	0	0	0	0	22	71	118	124	15	0	0	0	350
70	0	0	0	0	7	25	45	57	4	0	0	0	138

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	6	134	460	697	852	810	454	154	11	0	0	0	6	140	600	1297	2149	2959	3413	3567	3578	3578
45	0	0	0	75	324	548	697	655	318	78	2	0	0	0	0	75	399	947	1644	2299	2617	2695	2697	2697
50	0	0	0	34	209	399	542	500	198	35	0	0	0	0	0	34	243	642	1184	1684	1882	1917	1917	1917
55	0	0	0	14	115	261	388	352	108	9	0	0	0	0	0	14	129	390	778	1130	1238	1247	1247	1247
60	0	0	0	4	50	143	241	213	49	3	0	0	0	0	0	4	54	197	438	651	700	703	703	703
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	7	98	285	425	537	510	281	114	10	0	0	0	7	105	390	815	1352	1862	2143	2257	2267	2267

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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