

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: **BROKEN BOW 2 W, NE**

1971-2000

COOP ID: 251200

Climate Division: **NE 5**

NWS Call Sign:

Elevation: **2,500 Feet** Lat: **41° 25N**

Lon: **99° 41W**

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	33.6	8.2	20.9	78+	1896	30	32.7	1986	-42	1915	23	5.2	1979	1368	0	.0	.0	5.1	12.0	30.6	7.8
Feb	39.2	13.3	26.3	79	1982	22	35.4	1992	-41	1905	13	12.4	1978	1085	0	.0	.0	9.3	8.9	27.3	4.2
Mar	48.6	21.5	35.1	92	1943	30	42.0	1986	-22+	1960	4	28.2	1996	929	0	.0	.0	16.4	3.7	26.2	.8
Apr	59.4	31.6	45.5	99	1910	28	54.2	1981	-5	1936	3	38.4	1983	585	0	.0	.3	24.4	.3	14.4	.0
May	69.3	44.0	56.7	110	1895	8	63.0	1987	15	1954	3	50.2	1995	277	19	.0	.2	30.3	.0	3.0	.0
Jun	79.8	53.9	66.9	107+	1946	15	73.5	1988	30+	1954	4	61.5	1982	67	123	.3	5.1	29.9	.0	.0	.0
Jul	85.6	59.6	72.6	116	1954	11	78.1	1980	37	1971	30	66.5	1992	11	246	.8	11.5	31.0	.0	.0	.0
Aug	83.5	57.0	70.3	113	1936	17	75.1	2000	33	1950	20	64.9	1992	27	189	.3	9.3	31.0	.0	.0	.0
Sep	75.4	46.0	60.7	106	1895	20	67.6	1998	16	1984	29	55.3	1993	172	43	.1	3.7	29.6	.0	2.3	.0
Oct	64.1	33.4	48.8	97+	1951	1	52.2	1974	-1	1925	28	43.6	1976	504	0	.0	.2	27.6	.3	12.4	.0
Nov	46.3	19.9	33.1	83	1945	5	42.0	1999	-23	1976	28	21.7	1985	957	0	.0	.0	13.4	4.9	26.7	1.4
Dec	36.3	11.3	23.8	80+	1897	25	31.5	1979	-30	1967	31	4.9	1983	1277	0	.0	.0	6.7	10.1	30.5	5.1
Ann	60.1	33.3	46.7	116	Jul 1954	11	78.1	Jul 1980	-42	Jan 1915	23	4.9	Dec 1983	7259	620	1.5	30.3	254.7	40.2	173.4	19.3

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1894-2001

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

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Station: BROKEN BOW 2 W, NE

COOP ID: 251200

Climate Division: NE 5

NWS Call Sign:

Elevation: 2,500 Feet Lat: 41°25N

Lon: 99°41W

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	.43	.33	1.46	1944	27	1.61	1976	.00+	1987	3.5	1.2	.2	.0	.00	.00	.12	.20	.27	.35	.43	.54	.68	.91	1.12
Feb	.48	.31	1.50	1939	28	1.75	1987	.00+	1996	3.8	1.6	.2	@	.00	.02	.09	.16	.24	.33	.44	.58	.78	1.10	1.43
Mar	1.48	1.25	1.85	1987	17	5.82	1987	.02	1994	6.6	3.7	.7	.3	.12	.22	.42	.62	.85	1.11	1.41	1.80	2.34	3.23	4.12
Apr	2.28	2.08	3.74	1905	20	5.49	1984	.19	1989	8.8	5.3	1.4	.4	.45	.65	.99	1.29	1.61	1.94	2.32	2.78	3.38	4.36	5.28
May	3.51	3.37	4.30	1945	27	7.28	1995	1.07	1992	10.4	7.5	2.4	.7	1.22	1.55	2.03	2.44	2.83	3.23	3.67	4.18	4.83	5.84	6.77
Jun	4.01	3.17	4.11	1974	9	10.33	1975	1.00	1997	9.0	6.5	2.7	.9	.91	1.29	1.87	2.40	2.93	3.49	4.11	4.86	5.84	7.41	8.88
Jul	3.62	3.65	3.29	1905	26	9.06	1993	.31	1980	7.9	6.1	2.3	1.0	.87	1.21	1.74	2.21	2.68	3.17	3.73	4.39	5.25	6.63	7.91
Aug	2.43	2.24	4.72	1968	10	7.82	1977	.13	1973	7.4	4.8	1.7	.6	.50	.72	1.07	1.40	1.73	2.08	2.47	2.95	3.58	4.59	5.55
Sep	1.99	1.58	4.10	1942	2	6.01	1973	.25	1975	6.0	3.8	1.2	.4	.23	.38	.65	.93	1.23	1.56	1.94	2.43	3.08	4.16	5.21
Oct	1.44	1.12	4.19	1946	5	3.28	1997	.07	1988	5.3	3.3	.9	.2	.16	.27	.47	.67	.88	1.12	1.40	1.75	2.23	3.02	3.80
Nov	1.01	.97	1.90	2000	1	2.79	2000	.00+	1997	4.8	2.5	.6	@	.00	.06	.21	.36	.53	.72	.96	1.24	1.64	2.32	2.99
Dec	.35	.31	2.41	1913	5	.92	1973	.00+	1995	3.4	1.3	.1	.0	.00	.00	.07	.13	.20	.27	.35	.45	.58	.79	1.00
Ann	23.03	23.03	4.72	Aug 1968	10	10.33	Jun 1975	.00+	Nov 1997	76.9	47.6	14.4	4.5	16.03	17.37	19.10	20.41	21.58	22.71	23.88	25.17	26.75	29.04	31.02

+ 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: 1894-2001

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

Complete documentation available from:

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

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Station: BROKEN BOW 2 W, NE

COOP ID: 251200

Climate Division: NE 5

NWS Call Sign:

Elevation: 2,500 Feet

Lat: 41°25N

Lon: 99°41W

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	4.7	5.0	2	0	9.0	1982	23	12.0	1976	15+	1976	13	10	1976	2.5	1.8	.5	.1	.0	10.2	5.9	4.0	2.0
Feb	4.5	3.0	1	0	12.0	1984	18	19.0	1978	12+	1979	10	9	1979	2.1	1.8	.6	.2	@	4.5	2.4	1.4	.9
Mar	6.0	3.8	#	0	9.0	1987	25	18.5	1971	25	1987	28	3	1978	2.7	2.4	.6	.3	.0	3.2	1.9	1.0	.3
Apr	2.3	.0	#	0	11.0	1984	3	14.0	1994	13	1984	3	1+	1997	1.0	.9	.3	.1	@	1.0	.6	.3	@
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	2000	.0	.0	.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	.1	.0	#	0	2.0	1995	21	2.0	1995	2	1995	21	#	1995	.0	.0	.0	.0	.0	@	.0	.0	.0
Oct	.6	.0	#	0	6.0	1995	24	6.0	1995	6	1995	24	#	1997	.3	.2	.1	@	.0	.2	.1	.1	.0
Nov	5.1	2.0	1	0	12.5	2000	12	19.0	1975	19	1975	30	5	1975	2.0	1.7	.7	.3	.1	3.4	1.8	1.3	.8
Dec	4.8	4.0	1	0	12.0	1982	28	18.0	1973	20+	1982	30	9	1975	2.2	1.8	.6	.2	@	7.4	5.0	3.3	.7
Ann	28.1	17.8	N/A	N/A	12.5	Nov 2000	12	19.0+	Feb 1978	25	Mar 1987	28	10	Jan 1976	12.8	10.6	3.4	1.2	.1	29.9	17.7	11.4	4.7

+ 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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No. 20 1971-2000

Station: BROKEN BOW 2 W, NE

COOP ID: 251200

Climate Division: NE 5

NWS Call Sign:

Elevation: 2,500 Feet

Lat: 41°25N

Lon: 99°41W

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	6/07	6/02	5/29	5/25	5/22	5/19	5/15	5/11	5/06
32	5/25	5/21	5/18	5/15	5/12	5/10	5/07	5/03	4/29
28	5/16	5/11	5/08	5/05	5/02	4/29	4/26	4/23	4/18
24	5/11	5/05	5/01	4/28	4/24	4/21	4/18	4/14	4/08
20	4/29	4/24	4/21	4/18	4/15	4/12	4/09	4/06	4/01
16	4/16	4/10	4/06	4/02	3/30	3/26	3/23	3/18	3/12
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	9/06	9/10	9/13	9/16	9/18	9/21	9/23	9/27	10/01
32	9/13	9/17	9/20	9/23	9/25	9/28	9/30	10/04	10/08
28	9/15	9/21	9/25	9/28	10/01	10/05	10/08	10/12	10/17
24	9/22	9/28	10/02	10/06	10/09	10/13	10/16	10/20	10/26
20	9/30	10/07	10/12	10/16	10/20	10/23	10/28	11/02	11/08
16	10/14	10/20	10/25	10/29	11/02	11/05	11/09	11/14	11/20
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	139	132	127	123	119	115	110	105	98
32	155	148	143	139	135	132	127	122	116
28	171	165	160	156	152	148	144	139	132
24	187	180	175	171	167	163	159	154	147
20	211	203	197	192	187	182	177	171	163
16	242	233	227	221	216	211	206	199	191

* 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:

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Station: BROKEN BOW 2 W, NE

COOP ID: 251200

Climate Division: NE 5 NWS Call Sign: Elevation: 2,500 Feet Lat: 41°25N Lon: 99°41W

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	1368	1085	929	585	277	67	11	27	172	504	957	1277	7259
60	1213	945	774	439	161	22	1	6	83	351	807	1122	5924
57	1120	861	681	355	107	10	0	2	46	263	717	1029	5191
55	1058	808	619	302	78	5	0	1	29	209	657	967	4733
50	908	678	467	186	30	0	0	0	6	100	517	815	3707
32	422	277	78	5	0	0	0	0	0	1	133	338	1254

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	78	116	172	410	764	1046	1258	1186	861	520	166	84	6661
55	0	4	0	17	130	360	545	473	199	15	0	0	1743
57	0	0	0	10	96	305	483	412	157	7	0	0	1470
60	0	0	0	4	57	228	391	323	104	2	0	0	1109
65	0	0	0	0	19	123	246	189	43	0	0	0	620
70	0	0	0	0	4	52	127	89	13	0	0	0	285

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	2	30	96	263	555	847	1042	985	671	348	69	13	2	32	128	391	946	1793	2835	3820	4491	4839	4908	4921
45	0	4	43	163	408	698	887	830	530	225	28	0	0	4	47	210	618	1316	2203	3033	3563	3788	3816	3816
50	0	0	16	92	272	549	732	675	388	123	8	0	0	0	16	108	380	929	1661	2336	2724	2847	2855	2855
55	0	0	3	42	158	400	577	521	263	56	1	0	0	0	3	45	203	603	1180	1701	1964	2020	2021	2021
60	0	0	0	16	72	260	423	371	156	16	0	0	0	0	0	16	88	348	771	1142	1298	1314	1314	1314
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	18	46	101	203	356	541	685	642	441	259	73	25	18	64	165	368	724	1265	1950	2592	3033	3292	3365	3390

(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.

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| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
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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