

# Climatology of the United States

No. 20

1971-2000

Station: BENKELMAN, NE

COOP ID: 250760

Climate Division: NE 7

NWS Call Sign:

Elevation: 3,025 Feet Lat: 40°03N

Lon: 101°33W

## 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	40.5	11.3	25.9	77	1990	11	37.0	1986	-27	1974	4	14.3	1979	1212	0	.0	.0	9.4	8.5	31.0	5.4
Feb	46.8	16.5	31.7	81	1970	18	39.7	1999	-21+	1982	6	20.2	1978	934	0	.0	.0	13.1	5.4	27.7	2.9
Mar	54.8	24.5	39.7	90	1963	29	45.3	1986	-22+	1960	4	34.4	1975	785	0	.0	.0	19.9	2.3	25.2	.6
Apr	65.0	34.0	49.5	97	1989	23	56.7	1981	8	1973	10	43.2	1983	468	3	.0	.6	25.4	.4	12.6	.0
May	74.1	45.3	59.7	103	2000	30	64.6	1994	21	1989	1	53.2	1995	203	39	.1	2.2	30.5	.0	1.8	.0
Jun	85.5	55.6	70.6	110	1954	24	75.9	1988	34	1969	2	64.3	1982	31	197	1.7	11.2	29.9	.0	.0	.0
Jul	91.2	61.4	76.3	114	1954	11	80.1	1980	43+	1990	13	71.6	1972	1	352	4.9	19.0	31.0	.0	.0	.0
Aug	89.4	59.0	74.2	109	1955	25	80.7	1983	39	1976	28	68.8	1974	9	294	2.4	16.5	31.0	.0	.0	.0
Sep	80.9	48.3	64.6	106	1971	8	71.9	1998	21	1985	30	58.1	1974	108	96	.9	8.5	29.5	.0	1.5	.0
Oct	69.2	34.6	51.9	98	1963	2	55.1	1979	8	1997	26	47.0	1976	407	1	.0	1.4	28.4	.2	11.2	.0
Nov	52.4	22.4	37.4	88	1980	7	45.9	1999	-12	1952	28	30.1	1985	828	0	.0	.0	17.4	2.8	26.7	.5
Dec	43.4	14.0	28.7	77+	1980	18	36.1	1999	-34	1989	22	12.0	1983	1126	0	.0	.0	10.6	6.7	30.7	3.3
Ann	66.1	35.6	50.9	114	Jul 1954	11	80.7	Aug 1983	-34	Dec 1989	22	12.0	Dec 1983	6112	982	10.0	59.4	276.1	26.3	168.4	12.7

+ 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](http://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: 1948-2001

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

# 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: BENKELMAN, NE

COOP ID: 250760

Climate Division: NE 7

NWS Call Sign:

Elevation: 3,025 Feet Lat: 40°03N

Lon: 101°33W

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	.59	.43	1.47	1992	1	2.39	1992	.00	1986	3.9	1.6	.3	.1	.03	.08	.17	.25	.35	.45	.57	.72	.93	1.27	1.61
Feb	.52	.32	1.72	1984	18	2.16	1984	.00	1972	4.2	1.4	.2	@	.01	.03	.10	.17	.25	.35	.47	.63	.85	1.24	1.63
Mar	1.41	.97	2.42	1980	29	4.99	1980	.12	1997	6.7	3.5	.7	.2	.11	.20	.38	.57	.79	1.04	1.33	1.71	2.24	3.12	3.99
Apr	1.87	1.50	2.91	1981	20	4.77	1984	.10	1992	7.3	4.1	1.2	.3	.36	.53	.80	1.06	1.31	1.59	1.90	2.28	2.77	3.58	4.34
May	3.21	3.11	4.47	1998	23	7.57	1996	.08	2000	10.7	6.1	1.9	.6	.65	.94	1.41	1.84	2.28	2.75	3.27	3.91	4.75	6.10	7.38
Jun	2.90	2.62	2.84	1974	9	8.24	1992	.50	1998	9.0	5.9	1.8	.6	.72	.99	1.42	1.79	2.16	2.55	2.98	3.50	4.18	5.25	6.25
Jul	3.04	3.08	3.41	1991	23	6.47	1991	.72	1984	8.9	5.5	2.0	.8	1.03	1.31	1.74	2.09	2.43	2.79	3.17	3.62	4.20	5.09	5.92
Aug	2.06	1.62	2.60	1961	13	5.52	1999	.00	1971	7.6	4.2	1.4	.4	.27	.54	.88	1.18	1.47	1.78	2.12	2.54	3.08	3.95	4.77
Sep	1.30	1.08	2.82	1963	21	5.36	1973	.00	1974	5.8	3.0	.8	.3	.06	.18	.38	.57	.77	1.00	1.27	1.60	2.05	2.80	3.53
Oct	1.19	.98	3.13	2000	29	4.39	2000	.00+	1980	4.9	2.6	.7	.2	.00	.07	.24	.42	.62	.85	1.12	1.47	1.95	2.76	3.56
Nov	.82	.67	1.06	1983	27	2.38	1983	.00	1989	4.3	2.2	.5	.1	.04	.12	.24	.36	.49	.63	.80	1.01	1.30	1.77	2.23
Dec	.49	.33	1.13	1982	25	2.14	1982	.00+	1980	3.5	1.5	.2	.1	.00	.00	.10	.18	.26	.36	.47	.61	.80	1.12	1.44
Ann	19.40	19.51	4.47	May 1998	23	8.24	Jun 1992	.00+	Nov 1989	76.8	41.6	11.7	3.7	13.49	14.62	16.08	17.19	18.18	19.14	20.13	21.23	22.56	24.51	26.19

+ 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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**Station: BENKELMAN, NE**

**COOP ID: 250760**

**Climate Division: NE 7**

**NWS Call Sign:**

**Elevation: 3,025 Feet**

**Lat: 40°03N**

**Lon: 101°33W**

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	6.7	4.0	2	1	13.5	1994	27	18.9	1993	13	1994	27	10	1983	3.2	1.9	.8	.2	.1	9.7	5.7	3.7	1.7
Feb	4.6	4.1	1	#	9.3	1993	11	16.3	1993	11	1993	16	8	1993	2.5	1.3	.4	.2	.0	6.7	4.0	2.2	.1
Mar	6.0	2.7	1	#	14.0	1980	28	31.3	1980	24	1980	29	10	1977	2.5	1.6	.6	.3	.1	2.7	1.4	.8	.2
Apr	1.7	.7	#	0	5.0	1988	2	10.2	1995	17	1980	3	3	1980	1.1	.7	.2	@	.0	1.0	.5	.4	.1
May	.0	.0	0	0	.5	1978	7	.5	1978	0	0	0	0	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	.4	.0	#	0	6.0	1995	21	6.0	1995	5	1985	29	#+	2000	.1	.1	.1	.1	.0	.1	.1	@	.0
Oct	1.2	.0	#	0	10.2	1997	26	12.1	1997	9+	1997	26	1+	1997	.4	.3	.1	.1	@	.5	.2	.1	.0
Nov	3.9	2.7	#	#	10.0	1983	27	19.0	1983	18	1983	29	3	1972	2.2	1.4	.5	.2	@	2.4	1.0	.3	.0
Dec	4.7	3.4	1	#	11.0	1972	12	17.3	1982	16	1983	2	11	1983	2.9	1.5	.5	.3	.1	4.3	1.9	.8	.3
Ann	29.2	17.6	N/A	N/A	14.0	Mar 1980	28	31.3	Mar 1980	24	Mar 1980	29	11	Dec 1983	14.9	8.8	3.2	1.4	.3	27.4	14.8	8.3	2.4

+ 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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**NWS Call Sign:**

**Elevation: 3,025 Feet**

**Lat: 40° 03N**

**Lon: 101° 33W**

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	5/26	5/21	5/18	5/16	5/13	5/11	5/08	5/05	5/01
32	5/18	5/13	5/10	5/08	5/05	5/03	4/30	4/27	4/23
28	5/11	5/06	5/02	4/29	4/26	4/23	4/20	4/17	4/12
24	4/27	4/22	4/18	4/15	4/12	4/09	4/06	4/02	3/28
20	4/18	4/12	4/07	4/04	3/31	3/28	3/24	3/19	3/13
16	4/09	4/03	3/30	3/26	3/23	3/20	3/16	3/12	3/07
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	9/13	9/17	9/20	9/23	9/25	9/28	10/01	10/04	10/08
32	9/18	9/23	9/27	9/30	10/04	10/07	10/10	10/14	10/19
28	9/28	10/03	10/06	10/09	10/12	10/15	10/18	10/22	10/27
24	10/05	10/10	10/14	10/17	10/20	10/23	10/27	10/31	11/05
20	10/17	10/22	10/26	10/29	11/01	11/04	11/07	11/11	11/16
16	10/24	10/30	11/03	11/07	11/10	11/13	11/17	11/21	11/27
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	151	145	141	138	134	131	128	123	118
32	171	164	159	154	150	146	142	137	130
28	187	181	176	172	168	164	160	156	149
24	212	205	199	195	191	187	182	177	170
20	239	231	224	219	214	209	204	198	189
16	257	248	242	236	231	226	221	214	205

\* 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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**Climate Division: NE 7      NWS Call Sign:      Elevation: 3,025 Feet    Lat: 40°03N      Lon: 101°33W**

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	1212	934	785	468	203	31	1	9	108	407	828	1126	6112
60	1057	794	630	328	107	8	0	2	45	259	678	971	4879
57	964	710	537	251	66	3	0	0	22	178	588	878	4197
55	902	657	476	206	45	1	0	0	13	131	528	816	3775
50	749	527	329	111	14	0	0	0	2	49	391	668	2840
32	276	161	24	0	0	0	0	0	0	0	65	221	747

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	87	152	262	524	859	1157	1374	1308	978	616	226	117	7660
55	0	4	0	40	192	468	661	595	300	35	0	0	2295
57	0	0	0	26	150	409	599	533	250	20	0	0	1987
60	0	0	0	12	98	324	506	441	182	7	0	0	1570
65	0	0	0	3	39	197	352	294	96	1	0	0	982
70	0	0	0	0	11	100	208	166	41	0	0	0	526

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	11	47	137	326	627	934	1143	1074	756	397	95	20	11	58	195	521	1148	2082	3225	4299	5055	5452	5547	5567
45	0	15	71	213	475	784	988	919	608	269	45	4	0	15	86	299	774	1558	2546	3465	4073	4342	4387	4391
50	0	0	28	124	334	634	833	764	462	159	11	0	0	0	28	152	486	1120	1953	2717	3179	3338	3349	3349
55	0	0	4	57	211	484	678	609	329	71	1	0	0	0	4	61	272	756	1434	2043	2372	2443	2444	2444
60	0	0	0	24	111	342	523	455	209	24	0	0	0	0	0	24	135	477	1000	1455	1664	1688	1688	1688
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	36	75	144	250	395	591	730	685	483	312	116	49	36	111	255	505	900	1491	2221	2906	3389	3701	3817	3866

(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](http://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](http://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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
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## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)