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: BUFFALO, OK **COOP ID: 341243**

Climate Division: OK 1 **NWS Call Sign:** **Elevation: 1,795 Feet** **Lat: 36˚51N** **Lon: 99˚38W**

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	49.1	20.9	35.0	87	1986	20	43.9	1986	-14+	1959	4	20.7	1979	929	0	.0	.0	16.7	4.4	27.7	1.1
Feb	56.5	26.0	41.3	92	1962	12	50.7	2000	-13+	1951	1	27.3	1978	672	0	.0	.1	19.3	2.2	20.9	.7
Mar	65.2	34.2	49.7	96	1971	31	55.5	1972	-8	1948	11	43.9	1998	477	3	.0	.5	26.8	.3	14.0	@
Apr	74.7	43.3	59.0	105	1989	23	66.5	1981	15	1975	3	50.6	1983	229	49	.1	2.3	29.4	.0	3.9	.0
May	82.4	53.6	68.0	108	1996	23	75.8	1996	28	1966	13	62.7	1995	64	157	.7	6.4	30.9	.0	@	.0
Jun	92.1	63.2	77.7	111+	1980	27	84.5	1994	42	1998	6	71.0	1982	6	387	5.4	19.2	30.0	.0	.0	.0
Jul	98.0	68.4	83.2	115	1986	29	87.6	1980	45	1990	14	79.6	1975	0	564	13.1	27.7	31.0	.0	.0	.0
Aug	96.6	67.1	81.9	113	1969	12	88.8	2000	45	1988	29	77.1	1992	0	521	11.9	25.3	31.0	.0	.0	.0
Sep	88.2	58.7	73.5	112+	2000	4	79.5	1998	26	1984	30	65.4	1974	17	270	3.5	14.7	30.0	.0	.1	.0
Oct	77.2	45.9	61.6	102	1954	4	67.7	2000	13	1993	31	55.4	1976	151	44	.1	3.7	30.6	@	2.8	.0
Nov	60.9	32.8	46.9	93	1980	8	56.2	1999	5+	1975	26	39.6	1972	546	1	.0	.1	24.1	.4	15.2	.0
Dec	51.3	24.1	37.7	89	1955	24	43.0	1999	-10+	1983	30	23.8	1983	847	0	.0	.0	18.1	2.2	26.0	.7
Ann	74.4	44.9	59.6	115	Jul 1986	29	88.8	Aug 2000	-14+	Jan 1959	4	20.7	Jan 1979	3938	1996	34.8	100.0	317.9	9.5	110.6	2.5

\+ 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	.54	.40	1.23	1949	11	2.45	1980	.00+	2000
Feb	.96	.58	1.95	1960	3	3.51	1985	.00+	1999
Mar	2.14	1.65	2.65	1987	23	9.44	1973	.00	1997
Apr	2.47	1.81	4.00	1980	24	7.71	1976	.30	1996
May	4.26	3.25	4.83	1951	16	10.31	1987	.64	1971
Jun	3.65	3.41	5.45	1987	30	9.98	1987	.05	1976
Jul	2.52	2.19	3.96	1950	18	7.30	1979	.75	1980
Aug	2.74	1.73	6.00	1966	10	11.93	1974	.24	2000
Sep	2.48	2.56	4.11	1969	16	8.14	1973	.00	1992
Oct	1.94	1.21	4.60	1979	30	6.13	1979	.00+	1978
Nov	1.60	1.20	3.05	1971	17	4.76	1981	.00+	1999
Dec	.85	.54	2.10	1973	4	3.27	1984	.00+	1996
Ann	26.15	24.80	6.00	Aug 1966	10	11.93	Aug 1974	.00+	Jan 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.6	1.9	.2	.1
Feb	3.3	2.4	.5	.2
Mar	5.7	4.6	1.2	.7
Apr	6.0	5.0	1.5	.7
May	7.7	6.4	2.7	1.6
Jun	7.0	5.7	2.4	1.1
Jul	5.3	4.7	1.7	.8
Aug	5.8	4.6	1.8	.9
Sep	5.1	3.8	1.6	.8
Oct	4.2	3.4	1.1	.5
Nov	4.0	3.4	.8	.4
Dec	3.4	2.6	.4	.2
Ann	60.1	48.5	15.9	8.0

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	.00	.00	.11	.22	.32	.42	.54	.69	.88	1.18	1.48
Feb	.00	.00	.07	.20	.36	.56	.82	1.15	1.63	2.45	3.29
Mar	.09	.26	.57	.88	1.22	1.60	2.05	2.62	3.40	4.70	5.98
Apr	.33	.54	.89	1.23	1.59	1.99	2.45	3.02	3.78	5.03	6.24
May	.75	1.13	1.75	2.33	2.93	3.57	4.31	5.19	6.38	8.29	10.11
Jun	.44	.72	1.23	1.74	2.28	2.88	3.58	4.45	5.63	7.57	9.45
Jul	.73	.96	1.33	1.64	1.94	2.26	2.62	3.03	3.57	4.41	5.20
Aug	.20	.37	.72	1.10	1.52	2.00	2.59	3.33	4.35	6.09	7.80
Sep	.04	.16	.45	.78	1.17	1.65	2.23	2.99	4.06	5.91	7.77
Oct	.00	.00	.24	.52	.85	1.24	1.72	2.35	3.23	4.76	6.29
Nov	.00	.00	.28	.54	.82	1.13	1.51	1.99	2.64	3.75	4.84
Dec	.00	.04	.16	.29	.43	.59	.79	1.04	1.39	1.99	2.58
Ann	15.08	17.05	19.67	21.72	23.58	25.41	27.34	29.51	32.18	36.15	39.65

\+ 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

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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	1.6	.5	#	0
Feb	5.5	.3	#	0
Mar	2.0	.0	1	0
Apr	.2	.0	0	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	#	.0	#	0
Nov	1.0	.0	#	0
Dec	2.1	.0	#	0
Ann	12.4	.8	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	4.5	1984	17	8.0	1984	3	1972	4	#+	1998
Feb	23.0	1971	21	39.5	1971	36	1971	22	3	1971
Mar	7.0	1998	19	12.0	1998	12	1988	17	12	1988
Apr	3.0	1983	5	3.0	1983	0	0	0	0	0
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	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	.0	0	0	.0	0	0	0	0	0	0
Oct	#	1993	29	#+	1993	#	1993	29	#	1993
Nov	5.0	1996	29	5.0	1996	16	1992	25	1	1992
Dec	12.0	1997	24	13.0	1997	12	1997	24	1	1997
Ann	23.0	Feb 1971	21	39.5	Feb 1971	36	Feb 1971	22	12	Mar 1988

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.7	.6	.2	.0	.0
Feb	1.1	1.1	.7	.3	.1
Mar	.5	.5	.4	.2	.0
Apr	.1	.1	@	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.4	.4	.2	@	.0
Dec	.8	.8	.3	.1	@
Ann	3.6	3.5	1.8	.6	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.2	.1	.0	.0
Feb	.9	.7	.5	.1
Mar	.0	.0	.0	.0
Apr	.0	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.4	.1	.1	.0
Dec	.0	.0	.0	.0
Ann	1.5	.9	.6	.1

+ 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	5/13	5/08	5/05	5/02	4/29	4/26	4/23	4/20	4/15
32	4/26	4/23	4/20	4/18	4/16	4/14	4/12	4/09	4/06
28	4/14	4/10	4/07	4/05	4/03	3/31	3/29	3/26	3/22
24	4/12	4/06	4/02	3/29	3/26	3/22	3/19	3/15	3/09
20	4/03	3/27	3/22	3/18	3/14	3/11	3/06	3/02	2/23
16	3/27	3/19	3/13	3/08	3/03	2/27	2/22	2/16	2/08

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	9/22	9/27	10/01	10/04	10/07	10/10	10/13	10/17	10/22
32	10/02	10/06	10/10	10/13	10/16	10/19	10/21	10/25	10/30
28	10/12	10/17	10/21	10/24	10/28	10/31	11/03	11/07	11/12
24	10/23	10/29	11/02	11/06	11/09	11/13	11/16	11/20	11/26
20	10/30	11/05	11/10	11/14	11/18	11/22	11/26	12/01	12/07
16	11/08	11/15	11/20	11/24	11/28	12/02	12/06	12/11	12/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	180	173	168	164	161	157	153	148	142
32	197	192	188	185	182	179	176	172	167
28	226	219	215	211	207	204	200	195	189
24	248	241	236	232	228	224	219	214	207
20	277	267	260	254	248	242	236	229	219
16	303	291	283	275	269	262	255	246	235

***** 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	929	672	477	229	64	6	0	0	17	151	546	847	3938
60	776	542	335	137	23	0	0	0	3	67	405	692	2980
57	686	466	257	93	10	0	0	0	0	37	326	600	2475
55	628	419	212	69	6	0	0	0	0	23	277	540	2174
50	487	310	120	27	1	0	0	0	0	6	173	398	1522
32	120	63	3	0	0	0	0	0	0	0	9	57	252

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	215	322	552	810	1116	1371	1587	1544	1243	916	455	233	10364
55	9	33	47	189	409	681	874	831	553	226	32	3	3887
57	5	25	31	153	351	621	812	769	493	177	21	1	3459
60	2	16	16	107	271	531	719	676	406	114	10	0	2868
65	0	0	3	49	157	387	564	521	270	44	1	0	1996
70	0	0	0	18	75	254	409	370	158	11	0	0	1295

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	66	160	338	579	874	1137	1344	1306	1013	677	255	81	66	226	564	1143	2017	3154	4498	5804	6817	7494	7749	7830
45	28	86	221	435	719	987	1189	1151	863	525	151	32	28	114	335	770	1489	2476	3665	4816	5679	6204	6355	6387
50	3	38	131	301	564	837	1034	996	714	383	79	10	3	41	172	473	1037	1874	2908	3904	4618	5001	5080	5090
55	0	10	65	186	413	687	879	841	565	250	32	1	0	10	75	261	674	1361	2240	3081	3646	3896	3928	3929
60	0	1	30	99	272	537	724	686	423	144	9	0	0	1	31	130	402	939	1663	2349	2772	2916	2925	2925
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	88	156	261	393	561	731	847	826	648	451	194	92	88	244	505	898	1459	2190	3037	3863	4511	4962	5156	5248

(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