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: GATE, OK **COOP ID: 343489**

Climate Division: OK 1 **NWS Call Sign:** **Elevation: 2,250 Feet** **Lat: 36˚51N** **Lon: 100˚03W**

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	46.4	20.7	33.6	85	1986	20	43.9	1986	-25	1984	19	19.3	1979	974	0	.0	.0	14.8	5.7	27.7	1.2
Feb	52.5	25.4	39.0	90	1962	12	48.1	1976	-11	1982	6	26.2	1978	729	0	.0	.0	17.5	3.4	21.1	.7
Mar	60.2	33.5	46.9	95+	1963	28	53.5	1986	1+	1967	8	40.4	1998	564	1	.0	.2	24.7	.8	13.3	.0
Apr	69.5	43.2	56.4	102+	1989	22	63.2	1981	16	1975	3	49.1	1983	289	30	.1	1.4	28.5	.1	3.1	.0
May	77.6	53.6	65.6	105+	1963	9	70.9	1974	30	1966	13	59.3	1995	95	115	.5	4.2	30.8	.0	.1	.0
Jun	88.7	63.3	76.0	113+	1980	27	81.3	1994	41	1964	1	69.6	1982	15	343	3.5	15.8	30.0	.0	.0	.0
Jul	94.9	68.2	81.6	112	1978	18	86.8	1980	50	1990	13	77.8	1989	0	512	9.6	25.3	31.0	.0	.0	.0
Aug	93.4	66.6	80.0	110+	1962	10	85.6	1983	48	1988	29	74.2	1992	2	468	7.5	22.6	31.0	.0	.0	.0
Sep	85.2	58.2	71.7	109	2000	5	77.2	1998	31	1985	29	65.0	1974	24	225	2.1	11.8	29.9	.0	.1	.0
Oct	74.1	45.3	59.7	100	1979	8	65.5	1979	16	1993	30	54.3	1976	189	26	@	2.7	30.2	.1	1.9	.0
Nov	58.9	32.2	45.6	90	1990	2	54.0	1999	5	1976	28	38.8	1972	584	0	.0	@	22.2	.7	14.6	.0
Dec	48.6	23.2	35.9	77	1980	17	40.5	1994	-12	1989	22	22.4	1983	902	0	.0	.0	15.9	3.7	26.8	.8
Ann	70.8	44.5	57.7	113+	Jun 1980	27	86.8	Jul 1980	-25	Jan 1984	19	19.3	Jan 1979	4367	1720	23.3	84.0	306.5	14.5	108.7	2.7

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1959-2001

(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	.71	.52	1.94	2001	28	2.72	1999	.00+	1996
Feb	.76	.44	1.85	1964	4	2.98	1987	.00+	1999
Mar	2.07	1.42	2.70	1987	22	8.25	1973	.00	1997
Apr	1.91	1.37	3.06	1985	12	5.69	1976	.02	1996
May	3.23	2.89	4.81	1989	16	7.16	1989	.72	1973
Jun	2.93	2.69	2.86	1987	29	6.57	1989	.41	1976
Jul	2.68	2.49	3.19	1989	13	7.87	1998	.56	1999
Aug	2.76	1.99	4.60	1981	13	9.76	1981	.08	1976
Sep	2.04	1.99	3.08	1969	1	6.24	1973	.00	1992
Oct	1.71	1.25	4.20	1968	16	10.56	2000	.00+	1978
Nov	1.28	.83	3.07	1971	17	4.76	1971	.00+	1999
Dec	.90	.65	1.76	1984	14	3.09	1997	.00	1976
Ann	22.98	22.09	4.81	May 1989	16	10.56	Oct 2000	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.7	2.0	.3	.1
Feb	3.7	2.1	.4	.1
Mar	6.1	3.8	1.4	.5
Apr	5.7	3.7	1.3	.4
May	7.8	5.6	2.2	.8
Jun	7.4	5.2	2.0	.7
Jul	5.6	4.3	1.8	.7
Aug	6.6	4.3	1.7	.6
Sep	5.6	3.6	1.5	.6
Oct	4.4	2.8	.9	.4
Nov	4.1	2.6	.9	.2
Dec	4.1	2.1	.5	.1
Ann	64.8	42.1	14.9	5.2

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	.06	.18	.29	.41	.54	.69	.88	1.14	1.56	1.98
Feb	.00	.00	.00	.17	.33	.50	.71	.96	1.31	1.91	2.48
Mar	.08	.24	.54	.84	1.17	1.54	1.99	2.54	3.31	4.60	5.86
Apr	.12	.24	.48	.74	1.03	1.37	1.79	2.31	3.05	4.30	5.54
May	.88	1.18	1.65	2.06	2.46	2.87	3.34	3.89	4.61	5.73	6.78
Jun	.51	.77	1.20	1.60	2.01	2.45	2.96	3.57	4.39	5.71	6.97
Jul	.64	.89	1.28	1.63	1.98	2.34	2.75	3.24	3.89	4.90	5.86
Aug	.24	.42	.79	1.17	1.59	2.07	2.64	3.36	4.35	6.00	7.63
Sep	.05	.19	.46	.74	1.07	1.45	1.90	2.48	3.29	4.66	6.01
Oct	.00	.00	.28	.55	.85	1.19	1.60	2.13	2.84	4.04	5.24
Nov	.00	.00	.16	.35	.57	.83	1.15	1.56	2.13	3.12	4.11
Dec	.03	.10	.22	.35	.49	.66	.86	1.10	1.45	2.03	2.60
Ann	15.60	17.00	18.81	20.20	21.43	22.63	23.87	25.25	26.93	29.38	31.51

\+ 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: 1959-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	3.9	3.0	1	#
Feb	3.0	.2	1	#
Mar	4.2	1.0	#	#
Apr	.7	.0	#	0
May	.1	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	#	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.2	.0	#	0
Nov	1.3	.0	#	0
Dec	2.8	.2	1	#
Ann	16.2	4.4	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	7.0	1993	9	13.5	1973	10	1988	7	4	1974
Feb	12.0	1971	22	21.3	1971	20	1971	23	5	1993
Mar	11.0	1991	3	20.0	1988	10	1999	14	4	1983
Apr	6.0	1983	4	8.2	1983	4	1973	8	#+	1997
May	2.0	1978	3	3.0	1978	2	1978	3	#	1978
Jun	.0	0	0	.0	0	#	1999	19	#	1999
Jul	.0	0	0	.0	0	#	1993	12	#	1993
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1995	22	#	1995	0	0	0	0	0
Oct	2.0	1991	30	4.0	1991	4	1991	31	#+	2000
Nov	21.0	1992	25	21.0	1992	22	1992	25	5	1992
Dec	13.0	1997	24	13.0	1997	14	1992	6	5	1992
Ann	21.0	Nov 1992	25	21.3	Feb 1971	22	Nov 1992	25	5+	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.2	1.8	.2	.1	.0
Feb	1.6	1.2	.3	.2	@
Mar	1.4	1.2	.6	.3	@
Apr	.3	.2	.1	@	.0
May	.1	.1	.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	.1	.1	.0	.0	.0
Nov	.8	.7	.3	.1	@
Dec	1.4	1.3	.5	.2	.1
Ann	7.9	6.6	2.0	.9	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	5.1	1.7	.9	.0
Feb	2.7	1.4	.7	.3
Mar	1.8	1.0	.6	.1
Apr	.1	@	.0	.0
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.1	@	.0	.0
Nov	1.1	.6	.4	.2
Dec	3.7	2.3	1.4	.6
Ann	14.6	7.0	4.0	1.2

+ 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	5/09	5/04	5/01	4/28	4/25	4/22	4/19	4/15	4/11
32	4/27	4/22	4/18	4/15	4/12	4/09	4/06	4/03	3/29
28	4/12	4/08	4/05	4/03	3/31	3/29	3/27	3/24	3/20
24	4/08	4/03	3/30	3/28	3/25	3/22	3/19	3/16	3/11
20	3/29	3/23	3/19	3/15	3/12	3/08	3/04	2/28	2/22
16	3/24	3/16	3/11	3/06	3/01	2/25	2/20	2/15	2/07

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	191	185	180	176	172	168	164	159	152
32	213	206	201	197	193	189	185	180	173
28	236	230	225	221	217	213	209	204	197
24	256	249	244	239	235	231	227	222	215
20	281	272	266	261	256	252	246	240	232
16	307	296	289	282	276	270	263	256	245

***** 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	974	729	564	289	95	15	0	2	24	189	584	902	4367
60	820	599	416	183	38	4	0	0	5	89	441	747	3342
57	730	521	331	131	19	1	0	0	1	51	360	654	2799
55	670	470	279	102	11	0	0	0	0	33	309	594	2468
50	528	353	169	46	2	0	0	0	0	9	199	451	1757
32	143	78	7	0	0	0	0	0	0	0	14	85	327

Cooling Degree Days (1)

Base													
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	192	274	467	731	1043	1319	1535	1489	1191	860	420	206	9727
55	6	22	26	143	341	629	822	776	501	180	25	3	3474
57	3	16	16	112	287	569	760	714	442	135	16	1	3071
60	1	10	8	73	213	482	667	621	356	81	7	0	2519
65	0	0	1	30	115	343	512	468	225	26	0	0	1720
70	0	0	0	10	50	221	358	321	123	4	0	0	1087

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	64	137	301	530	830	1099	1306	1257	960	639	238	79	64	201	502	1032	1862	2961	4267	5524	6484	7123	7361	7440
45	25	72	188	391	676	949	1151	1102	810	488	146	33	25	97	285	676	1352	2301	3452	4554	5364	5852	5998	6031
50	2	29	110	263	524	799	996	947	662	342	78	10	2	31	141	404	928	1727	2723	3670	4332	4674	4752	4762
55	0	8	58	159	375	649	841	792	518	223	30	0	0	8	66	225	600	1249	2090	2882	3400	3623	3653	3653
60	0	0	20	82	239	499	686	637	378	122	8	0	0	0	20	102	341	840	1526	2163	2541	2663	2671	2671
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	70	122	220	346	526	713	843	809	615	407	177	83	70	192	412	758	1284	1997	2840	3649	4264	4671	4848	4931

(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:
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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