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: OKMULGEE WATER WORKS, OK **COOP ID: 346670**

Climate Division: OK 6 **NWS Call Sign:** **Elevation: 647 Feet** **Lat: 35˚37N** **Lon: 96˚01W**

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	47.9	23.4	35.7	91	1951	13	43.9	1990	-10	1977	11	24.0	1979	910	0	.0	.0	15.3	3.8	23.9	.4
Feb	54.6	28.2	41.4	91	1996	23	51.5	1999	-8+	1996	4	29.2	1978	664	0	.0	@	19.4	1.9	17.3	.2
Mar	63.0	37.3	50.2	96	1974	31	55.6	1974	-5	1948	12	44.3	1996	461	0	.0	.1	27.1	.3	8.4	.0
Apr	71.8	46.3	59.1	101	1972	12	64.8	1981	21	1957	12	53.1	1983	202	23	@	.4	29.7	.0	1.5	.0
May	78.8	56.5	67.7	95+	1956	8	72.3	1998	34	1981	11	62.2	1976	55	137	.0	1.9	31.0	.0	.0	.0
Jun	86.7	64.9	75.8	102+	1953	20	79.8	1990	43	1976	20	72.3+	1992	2	326	.3	11.7	30.0	.0	.0	.0
Jul	92.7	68.5	80.6	110	1954	14	86.7	1980	47	1972	6	77.2	1976	0	485	4.2	24.0	31.0	.0	.0	.0
Aug	92.7	66.4	79.6	113	1956	16	84.6	1980	39	1967	24	73.8	1992	2	453	5.2	23.2	31.0	.0	.0	.0
Sep	84.5	58.9	71.7	109	1998	5	80.2	1998	33	1981	18	63.8	1974	36	236	1.4	10.6	30.0	.0	.0	.0
Oct	75.1	47.3	61.2	97+	1953	1	64.9	2000	17	1993	31	54.8	1976	164	46	.0	1.5	30.7	.0	2.0	.0
Nov	61.1	36.4	48.8	86	1980	6	57.0	1999	9+	1976	29	42.0	1993	490	3	.0	.0	24.9	.3	10.2	.0
Dec	51.6	27.4	39.5	81	1955	24	45.5	1984	-14	1989	23	25.9	1983	791	0	.0	.0	18.8	1.9	20.9	.2
Ann	71.7	46.8	59.3	113	Aug 1956	16	86.7	Jul 1980	-14	Dec 1989	23	24.0	Jan 1979	3777	1709	11.1	73.4	318.9	8.2	84.2	.8

\+ 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	1.71	1.65	2.20	1982	29	4.81	1990	.00	1986
Feb	2.23	1.77	2.65	1999	6	5.60	1997	.20	1996
Mar	3.77	3.27	3.88	1990	11	9.44	1973	.02	1971
Apr	4.21	4.25	5.20	1967	13	10.40	1990	.40	1989
May	5.76	5.46	5.54	1950	10	10.23	1989	1.91	1988
Jun	4.67	4.37	5.02	1974	8	10.47	1974	1.05	1976
Jul	3.12	2.54	4.57	1988	28	9.47	1981	.00	1993
Aug	2.61	2.51	4.06	1955	29	5.86	1981	.00	2000
Sep	4.55	3.44	6.87	1993	14	11.03	1993	.00	1978
Oct	4.27	2.54	7.58	1983	20	15.11	1985	.95	1975
Nov	3.96	3.58	6.80	1979	21	9.08	1994	.10	1989
Dec	2.63	1.98	3.10	1984	31	8.66	1984	.12+	2000
Ann	43.49	43.99	7.58	Oct 1983	20	15.11	Oct 1985	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	3.4	1.1	.4
Feb	5.2	3.8	1.6	.6
Mar	7.4	5.8	2.9	1.1
Apr	7.2	5.9	2.8	1.4
May	9.2	7.3	4.1	1.9
Jun	7.4	6.2	3.3	1.6
Jul	4.7	3.8	2.1	1.1
Aug	5.6	4.1	1.7	.7
Sep	7.0	5.7	3.0	1.5
Oct	6.0	4.6	2.3	1.2
Nov	6.6	5.3	2.7	1.3
Dec	5.2	4.0	1.8	.9
Ann	76.0	59.9	29.4	13.7

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	.09	.25	.51	.76	1.03	1.32	1.67	2.11	2.69	3.67	4.61
Feb	.30	.48	.80	1.11	1.44	1.79	2.21	2.72	3.41	4.53	5.62
Mar	.61	.93	1.48	2.00	2.53	3.12	3.79	4.61	5.70	7.47	9.17
Apr	.91	1.30	1.92	2.48	3.04	3.64	4.31	5.12	6.18	7.87	9.47
May	2.06	2.60	3.39	4.05	4.67	5.32	6.02	6.84	7.88	9.50	10.98
Jun	1.40	1.84	2.50	3.08	3.63	4.21	4.85	5.60	6.57	8.09	9.50
Jul	.08	.29	.71	1.15	1.65	2.23	2.93	3.81	5.04	7.12	9.19
Aug	.28	.59	1.03	1.41	1.79	2.20	2.66	3.22	3.96	5.15	6.29
Sep	.54	1.11	1.87	2.53	3.18	3.88	4.67	5.62	6.86	8.86	10.76
Oct	.57	.91	1.52	2.11	2.74	3.43	4.23	5.21	6.55	8.73	10.83
Nov	.57	.90	1.47	2.02	2.59	3.22	3.95	4.84	6.04	8.00	9.88
Dec	.18	.34	.68	1.04	1.44	1.91	2.47	3.19	4.19	5.89	7.56
Ann	31.39	33.75	36.76	39.05	41.07	43.02	45.04	47.27	49.96	53.86	57.23

+ 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	1.5	.0	#	0
Feb	1.8	.0	#	0
Mar	1.0	.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
Nov	#	.0	#	0
Dec	.3	.0	#	0
Ann	4.6	.0	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	8.0	1977	9	9.3	1977	12	1988	8	4	1973
Feb	8.0	1993	15	8.0	1993	2	1996	1	#+	1996
Mar	12.0	1989	5	13.0	1989	11	1989	6	1	1989
Apr	.0	0	0	.0	0	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	30	#	1993	0	0	0	0	0
Nov	#	1993	26	#+	1993	#	1991	3	#	1991
Dec	2.0	1983	19	3.0	1987	3	1990	30	#+	1997
Ann	12.0	Mar 1989	5	13.0	Mar 1989	12	Jan 1988	8	4	Jan 1973

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.9	.7	.1	.1	.0
Feb	.5	.4	.2	.1	.0
Mar	.3	.2	.1	.1	.1
Apr	.0	.0	.0	.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	.0	.0	.0	.0	.0
Dec	.2	.1	.0	.0	.0
Ann	1.9	1.4	.4	.3	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	.0	.0	.0	.0
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	.0	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	4/28	4/24	4/21	4/19	4/17	4/14	4/12	4/09	4/05
32	4/17	4/12	4/08	4/05	4/02	3/31	3/27	3/24	3/19
28	4/13	4/06	4/02	3/29	3/25	3/22	3/18	3/13	3/07
24	3/31	3/23	3/18	3/14	3/09	3/05	3/01	2/23	2/16
20	3/16	3/08	3/02	2/25	2/20	2/16	2/11	2/05	1/28
16	3/09	3/01	2/23	2/18	2/13	2/08	2/03	1/28	1/19

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	9/23	9/29	10/04	10/08	10/11	10/15	10/18	10/23	10/29
32	10/09	10/15	10/19	10/23	10/26	10/29	11/02	11/06	11/12
28	10/16	10/22	10/27	10/31	11/04	11/08	11/12	11/17	11/24
24	10/31	11/07	11/13	11/17	11/22	11/26	12/01	12/06	12/14
20	11/06	11/14	11/20	11/25	11/29	12/04	12/09	12/15	12/22
16	11/11	11/23	12/02	12/10	12/17	12/24	1/01	1/10	1/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	199	191	186	181	177	172	167	162	154
32	229	221	216	211	206	201	196	191	183
28	254	243	236	229	223	217	211	203	193
24	290	278	270	263	257	250	243	235	223
20	317	305	296	288	281	274	267	258	245
16	>365	334	320	310	301	293	284	274	261

***** 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	910	664	461	202	55	2	0	2	36	164	490	791	3777
60	757	534	315	101	16	0	0	0	11	76	353	638	2801
57	667	458	234	58	6	0	0	0	5	42	278	551	2299
55	611	409	187	36	3	0	0	0	2	27	233	494	2002
50	468	298	96	8	0	0	0	0	0	6	140	358	1374
32	109	54	2	0	0	0	0	0	0	0	6	54	225

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	222	316	564	811	1105	1314	1508	1474	1190	906	509	287	10206
55	10	27	36	157	395	624	795	761	502	220	46	13	3586
57	5	20	21	119	336	564	733	699	445	173	31	9	3155
60	1	13	9	72	253	474	640	606	361	113	16	3	2561
65	0	0	0	23	137	326	485	453	236	46	3	0	1709
70	0	0	0	5	58	190	330	306	138	13	0	0	1040

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	98	195	397	616	885	1096	1280	1259	979	684	327	136	98	293	690	1306	2191	3287	4567	5826	6805	7489	7816	7952
45	43	110	269	472	730	946	1125	1104	829	531	215	69	43	153	422	894	1624	2570	3695	4799	5628	6159	6374	6443
50	14	60	166	331	575	796	970	949	679	383	128	30	14	74	240	571	1146	1942	2912	3861	4540	4923	5051	5081
55	3	24	87	210	422	646	815	794	530	253	64	11	3	27	114	324	746	1392	2207	3001	3531	3784	3848	3859
60	0	10	40	109	282	496	660	639	390	143	27	1	0	10	50	159	441	937	1597	2236	2626	2769	2796	2797
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	82	148	260	396	587	751	850	824	642	452	217	108	82	230	490	886	1473	2224	3074	3898	4540	4992	5209	5317

(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