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: GAGE AP, OK **COOP ID: 343407**

Climate Division: OK 1 **NWS Call Sign: GAG** **Elevation: 2,191 Feet** **Lat: 36˚18N** **Lon: 99˚46W**

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	46.5	19.2	32.9	86	1986	20	42.4	1986	-16	1959	4	19.5	1979	997	0	.0	.0	14.0	5.1	28.7	1.4
Feb	52.6	24.3	38.5	90+	1962	11	47.1	1976	-14	1951	1	25.2	1978	743	0	.0	@	17.3	2.9	22.3	.4
Mar	60.9	32.7	46.8	94	1989	10	53.2	1986	-7	1948	11	41.8	1998	565	0	.0	.3	25.6	.7	14.7	.0
Apr	70.6	41.8	56.2	99	1989	23	62.4	1981	15	1994	6	50.7	1983	281	17	.0	1.2	28.8	.0	4.3	.0
May	78.6	52.5	65.6	105+	1996	16	72.6	1996	29	1954	3	60.5	1976	91	108	.3	3.3	30.9	.0	@	.0
Jun	88.0	62.5	75.3	111+	1980	24	80.6	1990	41	1964	1	69.6	1982	10	317	1.4	13.6	30.0	.0	.0	.0
Jul	93.9	67.3	80.6	111	1981	22	86.6	1980	47	1990	14	77.1	1975	0	484	5.6	24.0	31.0	.0	.0	.0
Aug	92.4	66.0	79.2	113+	1964	6	85.2	2000	45	1988	29	73.8	1992	1	442	4.9	22.2	31.0	.0	.0	.0
Sep	84.0	57.1	70.6	108	2000	4	77.1	1998	29+	1984	30	62.2	1974	35	202	.9	9.5	29.9	.0	.3	.0
Oct	73.2	44.3	58.8	99+	1954	4	61.7	1979	10	1993	31	52.0	1976	212	18	.0	1.4	30.2	.1	3.0	.0
Nov	58.6	30.9	44.8	89+	1980	8	52.6	1999	3+	1975	26	38.4	1972	608	0	.0	.0	23.3	.6	17.2	.0
Dec	48.4	21.7	35.1	91	1955	24	40.1	1994	-13+	1983	29	22.1	1983	929	0	.0	.0	15.2	3.5	27.6	.7
Ann	70.6	43.4	57.0	113+	Aug 1964	6	86.6	Jul 1980	-16	Jan 1959	4	19.5	Jan 1979	4472	1588	13.1	75.5	307.2	12.9	118.1	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	.49	.35	.77	2001	28	1.66	1987	.00	1986
Feb	.73	.45	1.39	1948	26	2.66	1987	.00	1991
Mar	1.93	1.69	1.72	1988	2	5.56	2000	.00	1971
Apr	2.09	1.60	2.79	1977	28	6.04	1999	.01	1996
May	3.72	3.25	4.94	1950	7	9.08	1982	.62	1971
Jun	2.89	2.52	3.52	1957	17	6.41	1995	.31	1976
Jul	1.82	1.50	3.98	1950	18	6.72	1996	.01	1974
Aug	2.48	1.56	3.80	1986	15	7.58	1977	.01	1999
Sep	1.97	1.87	3.28	1983	13	5.15	1988	.00	1992
Oct	1.69	1.04	4.09	1953	14	7.89	2000	.04+	1999
Nov	1.10	.87	2.32	1986	4	3.05	1971	.00+	1999
Dec	.88	.54	2.10	1984	15	3.35	1984	.00	1976
Ann	21.79	20.79	4.94	May 1950	7	9.08	May 1982	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.8	1.5	.1	.0
Feb	4.2	2.1	.4	@
Mar	6.5	3.5	1.3	.4
Apr	6.6	3.8	1.4	.4
May	8.5	5.8	2.3	1.0
Jun	7.4	5.3	1.9	.9
Jul	5.3	3.3	1.3	.3
Aug	6.5	3.9	1.6	.7
Sep	5.5	3.4	1.2	.6
Oct	4.5	2.7	.9	.4
Nov	4.4	2.2	.7	.2
Dec	3.9	2.3	.4	.1
Ann	67.1	39.8	13.5	5.0

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	.02	.06	.13	.20	.28	.37	.47	.60	.78	1.09	1.38
Feb	.00	.03	.10	.19	.30	.44	.62	.86	1.21	1.82	2.44
Mar	.09	.26	.55	.83	1.14	1.48	1.88	2.37	3.05	4.17	5.27
Apr	.20	.34	.63	.92	1.23	1.59	2.01	2.54	3.27	4.48	5.67
May	.97	1.32	1.86	2.34	2.80	3.30	3.85	4.50	5.35	6.68	7.94
Jun	.55	.81	1.23	1.63	2.02	2.45	2.93	3.52	4.29	5.54	6.73
Jul	.10	.21	.43	.67	.95	1.28	1.68	2.20	2.92	4.16	5.39
Aug	.11	.24	.52	.85	1.23	1.68	2.25	2.97	4.00	5.77	7.55
Sep	.07	.22	.49	.78	1.09	1.45	1.88	2.42	3.16	4.40	5.63
Oct	.04	.11	.27	.48	.74	1.05	1.46	1.99	2.77	4.12	5.51
Nov	.00	.05	.20	.36	.54	.75	1.02	1.35	1.81	2.61	3.40
Dec	.04	.11	.24	.37	.51	.67	.85	1.08	1.39	1.91	2.42
Ann	15.54	16.75	18.30	19.48	20.53	21.53	22.58	23.73	25.12	27.15	28.90

\+ 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)

Extremes (2)

Mean Number of Days (1)

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	3.5	2.6	#	0	7.0	1988	6	16.0	1987	13	1987	19	2+	1988	2.4	1.5	.4	.1	.0	5.3	1.9	.7	.2
Feb	3.8	2.2	1	0	18.0	1971	21	18.0	1971	25	1971	23	5	1971	2.0	1.4	.5	.2	@	3.6	2.0	1.1	.2
Mar	1.7	.0	#	0	8.1	1994	8	10.8	1988	9	1994	9	1	1988	.8	.6	.2	.1	.0	1.2	.5	.2	.0
Apr	.5	.0	#	0	6.0	1973	8	7.0	1973	6	1973	9	#	1983	.4	.2	@	@	.0	.2	.1	@	.0
May	#	.0	#	0	#	1978	3	#	1978	0	0	0	#	1996	.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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.2	.0	#	0	2.4	1991	31	3.0	1991	1	1991	31	#	1991	.2	.0	.0	.0	.0	@	.0	.0	.0
Nov	1.6	.6	#	0	6.5	1992	24	10.5+	1992	7	1972	21	1	1972	.9	.7	.2	.1	.0	1.0	.3	.1	.0
Dec	3.0	1.7	#	0	5.8	1992	5	12.0	1987	7	1971	3	1+	1992	1.7	1.3	.4	.1	.0	3.8	1.2	.2	.0
Ann	14.3	7.1	N/A	N/A	18.0	Feb 1971	21	18.0	Feb 1971	25	Feb 1971	23	5	Feb 1971	8.4	5.7	1.7	.6	@	15.1	6.0	2.3	.4

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	5/12	5/07	5/03	4/30	4/27	4/24	4/21	4/17	4/12
32	4/28	4/23	4/20	4/17	4/15	4/12	4/09	4/06	4/02
28	4/15	4/11	4/08	4/05	4/03	3/31	3/28	3/25	3/21
24	4/11	4/05	3/31	3/28	3/24	3/21	3/17	3/13	3/07
20	4/06	3/30	3/24	3/19	3/15	3/11	3/06	2/28	2/20
16	3/25	3/17	3/11	3/06	3/01	2/25	2/19	2/12	1/30

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	186	177	171	166	161	156	151	145	137
32	206	198	191	186	181	176	170	164	155
28	231	224	219	215	211	206	202	197	190
24	251	244	238	234	229	225	221	215	208
20	279	269	261	255	249	243	236	229	218
16	>365	294	284	277	271	265	258	251	241

***** 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	997	743	565	281	91	10	0	1	35	212	608	929	4472
60	842	611	414	167	35	1	0	0	9	102	460	774	3415
57	751	533	329	113	17	0	0	0	3	57	376	681	2860
55	690	482	275	83	9	0	0	0	1	37	322	620	2519
50	545	363	162	31	1	0	0	0	0	9	204	474	1789
32	142	81	6	0	0	0	0	0	0	0	11	90	330

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	168	263	464	726	1040	1298	1507	1464	1157	830	393	184	9494
55	3	19	20	119	336	608	794	751	467	153	14	1	3285
57	1	14	12	89	282	548	732	689	410	112	8	0	2897
60	0	8	4	53	207	459	639	596	326	64	2	0	2358
65	0	0	0	17	108	317	484	442	202	18	0	0	1588
70	0	0	0	4	44	193	330	294	108	3	0	0	976

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	51	122	284	522	812	1075	1272	1229	924	606	217	65	51	173	457	979	1791	2866	4138	5367	6291	6897	7114	7179
45	16	61	174	375	657	925	1117	1074	774	455	125	24	16	77	251	626	1283	2208	3325	4399	5173	5628	5753	5777
50	1	24	95	251	505	775	962	919	627	315	61	7	1	25	120	371	876	1651	2613	3532	4159	4474	4535	4542
55	0	6	45	144	356	625	807	764	481	191	25	0	0	6	51	195	551	1176	1983	2747	3228	3419	3444	3444
60	0	0	17	73	217	477	652	609	345	101	5	0	0	0	17	90	307	784	1436	2045	2390	2491	2496	2496
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	66	118	211	338	517	712	832	807	603	395	169	75	66	184	395	733	1250	1962	2794	3601	4204	4599	4768	4843

(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

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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