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: ALTUS IRIG RES STATION, OK **COOP ID: 340179**

Climate Division: OK 7 **NWS Call Sign:** **Elevation: 1,380 Feet** **Lat: 34˚35N** **Lon: 99˚20W**

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	51.1	23.5	37.3	86	1967	22	44.2	1989	-8	1966	23	26.4	1979	859	0	.0	.0	19.3	2.6	24.5	.1
Feb	57.4	28.6	43.0	93+	1962	11	50.1	1976	-7	1986	11	31.1	1978	617	0	.0	.1	21.3	1.5	16.3	.1
Mar	66.0	36.5	51.3	103	1971	27	55.9	1974	7	1960	3	47.1	1996	427	0	.1	.9	28.8	.1	7.4	.0
Apr	75.2	46.4	60.8	105	1972	12	66.2	1981	23+	1971	6	54.4	1997	172	46	.1	2.7	29.7	.0	1.6	.0
May	83.2	57.1	70.2	112	2000	24	77.7	1996	34+	1960	1	65.0	1976	39	198	1.1	9.1	31.0	.0	.0	.0
Jun	92.1	66.3	79.2	115+	1980	27	84.8	1998	48+	1955	11	75.0	1995	1	427	4.5	20.8	30.0	.0	.0	.0
Jul	96.8	70.3	83.6	112+	1954	25	89.2	1998	54	1970	23	79.3	1975	0	574	12.3	28.3	31.0	.0	.0	.0
Aug	95.1	69.0	82.1	112+	1962	5	87.0	1983	54+	1961	24	76.5	1992	0	527	9.7	25.9	31.0	.0	.0	.0
Sep	86.9	61.4	74.2	109	2000	4	81.5	1998	28	1984	30	66.5	1974	16	291	2.4	14.8	30.0	.0	@	.0
Oct	76.7	48.8	62.8	104+	1977	1	66.9	1979	17	1993	31	55.3	1976	123	54	.1	3.3	30.7	@	.8	.0
Nov	62.8	36.4	49.6	91	2001	2	56.7	1999	12+	1976	29	43.5	1972	464	1	.0	.1	26.2	.1	9.0	.0
Dec	52.4	26.5	39.5	88+	1954	4	43.7	1980	-10	1989	23	27.4	1983	792	0	.0	.0	21.2	1.6	21.6	.1
Ann	74.6	47.6	61.1	115+	Jun 1980	27	89.2	Jul 1998	-10	Dec 1989	23	26.4	Jan 1979	3510	2118	30.3	106.0	330.2	5.9	81.2	.3

+ 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	.96	.90	2.05	1973	22	4.13	1973	.00+	1986
Feb	1.19	1.13	3.23	1964	4	4.54	1997	.00	1974
Mar	1.78	1.62	3.22	2000	23	4.87	2000	.00	1971
Apr	2.43	2.28	2.34	1995	17	7.38	1997	.00	1987
May	4.81	4.46	4.60	1980	16	13.34	1980	.31	1984
Jun	4.33	3.86	5.87	1991	2	11.04	1991	.13	1998
Jul	2.00	1.70	3.18	1995	24	7.47	1996	.00	1983
Aug	2.83	1.87	4.44	1979	27	7.38	1974	.01	2000
Sep	3.43	3.23	5.85	1971	5	10.04	1971	.05	1998
Oct	2.69	2.26	7.10	1983	20	11.76	1983	.01	1992
Nov	1.50	1.14	2.98	1994	20	5.27	1992	.00	1989
Dec	1.21	.88	1.78	1984	31	4.86	1984	.00	1977
Ann	29.16	29.69	7.10	Oct 1983	20	13.34	May 1980	.00+	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.8	1.9	.7	.2
Feb	4.8	2.9	.7	.1
Mar	5.3	3.4	1.1	.5
Apr	5.9	3.8	1.5	.7
May	8.5	5.9	3.5	1.9
Jun	7.0	5.5	2.7	1.4
Jul	4.8	3.3	1.5	.5
Aug	6.1	4.1	1.7	.6
Sep	6.3	4.3	2.0	1.1
Oct	5.7	4.0	1.9	.9
Nov	5.1	3.3	1.0	.3
Dec	4.7	2.6	.9	.2
Ann	68.0	45.0	19.2	8.4

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	.02	.12	.24	.40	.59	.83	1.15	1.60	2.40	3.21
Feb	.01	.05	.17	.31	.50	.73	1.02	1.40	1.96	2.94	3.93
Mar	.05	.17	.41	.66	.95	1.27	1.67	2.17	2.86	4.04	5.20
Apr	.12	.34	.71	1.06	1.45	1.87	2.37	2.99	3.84	5.24	6.61
May	.94	1.37	2.08	2.73	3.38	4.09	4.89	5.85	7.13	9.18	11.13
Jun	.78	1.17	1.80	2.39	2.99	3.64	4.38	5.28	6.47	8.39	10.22
Jul	.06	.21	.48	.77	1.09	1.45	1.89	2.45	3.22	4.51	5.79
Aug	.10	.23	.53	.89	1.33	1.85	2.51	3.37	4.60	6.73	8.88
Sep	.18	.37	.78	1.24	1.77	2.40	3.16	4.14	5.52	7.87	10.23
Oct	.09	.21	.49	.83	1.24	1.74	2.37	3.19	4.37	6.42	8.49
Nov	.07	.19	.41	.63	.87	1.14	1.45	1.84	2.38	3.28	4.15
Dec	.02	.09	.24	.41	.60	.83	1.10	1.46	1.97	2.82	3.68
Ann	18.64	20.59	23.14	25.10	26.87	28.59	30.38	32.39	34.84	38.43	41.58

\+ 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	1.7	.0	#	0
Feb	1.0	.0	#	0
Mar	.1	.0	#	0
Apr	.0	.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	.0	.0	#	0
Nov	.3	.0	#	0
Dec	.7	.0	#	0
Ann	3.8	.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	7.0	1973	7	11.0	1973	9	1973	12	3	1973
Feb	3.0	1973	22	6.0	1986	5	1978	9	1	1978
Mar	2.0	1995	2	2.0	1995	2	1995	3	#+	1998
Apr	.0	0	0	.0	0	#	1994	28	#	1994
May	.0	0	0	.0	0	#	1996	14	#	1996
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	.0	0	0	.0	0	#	1993	30	#	1993
Nov	3.0	1976	13	4.0	1976	3	1976	13	#+	2000
Dec	2.0	1972	15	4.2	2000	3	2000	28	1	2000
Ann	7.0	Jan 1973	7	11.0	Jan 1973	9	Jan 1973	12	3	Jan 1973

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.7	.5	.2	@	.0
Feb	.8	.5	.1	.0	.0
Mar	.1	.1	.0	.0	.0
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	.2	.1	@	.0	.0
Dec	.5	.3	.0	.0	.0
Ann	2.3	1.5	.3	@	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	1.3	.8	.3	.0
Feb	.5	.2	.1	.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	.0
Nov	.1	@	.0	.0
Dec	.4	.1	.0	.0
Ann	2.4	1.1	.4	.0

+ 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	4/25	4/21	4/17	4/14	4/12	4/09	4/06	4/03	3/29
32	4/16	4/12	4/09	4/07	4/05	4/03	4/01	3/29	3/26
28	4/12	4/06	4/03	3/30	3/27	3/24	3/21	3/17	3/12
24	3/31	3/24	3/18	3/14	3/10	3/05	3/01	2/24	2/16
20	3/14	3/06	2/28	2/23	2/18	2/13	2/08	2/02	1/24
16	3/10	2/26	2/18	2/10	2/03	1/27	1/20	1/11	12/27

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	10/04	10/09	10/13	10/17	10/20	10/23	10/26	10/30	11/05
32	10/14	10/21	10/26	10/30	11/03	11/06	11/10	11/15	11/22
28	10/17	10/25	10/30	11/04	11/09	11/13	11/18	11/23	12/01
24	11/03	11/10	11/15	11/19	11/23	11/27	12/01	12/06	12/12
20	11/12	11/20	11/25	11/30	12/05	12/09	12/14	12/20	12/28
16	11/20	12/01	12/09	12/16	12/23	12/30	1/06	1/15	1/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	211	204	199	195	190	186	182	177	169
32	233	225	220	215	211	206	202	196	189
28	250	241	235	230	225	221	215	209	201
24	282	273	267	262	257	253	247	241	233
20	326	313	304	296	289	282	274	265	252
16	>365	357	336	324	315	307	298	289	276

***** 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	859	617	427	172	39	1	0	0	16	123	464	792	3510
60	705	486	279	84	11	0	0	0	3	47	324	637	2576
57	614	408	198	47	4	0	0	0	0	22	248	547	2088
55	555	359	152	29	2	0	0	0	0	12	203	489	1801
50	413	249	66	7	0	0	0	0	0	2	113	349	1199
32	67	29	0	0	0	0	0	0	0	0	2	40	138

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	231	336	597	864	1182	1416	1597	1550	1265	953	530	271	10792
55	5	22	35	203	471	726	884	837	575	252	41	7	4058
57	2	15	20	161	411	666	822	775	515	201	26	3	3617
60	0	9	7	108	325	576	729	682	428	133	12	0	3009
65	0	0	0	46	198	427	574	527	291	54	1	0	2118
70	0	0	0	14	101	286	419	376	176	15	0	0	1387

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	118	227	444	669	973	1195	1377	1328	1051	755	349	139	118	345	789	1458	2431	3626	5003	6331	7382	8137	8486	8625
45	54	131	306	521	818	1045	1222	1173	901	603	230	67	54	185	491	1012	1830	2875	4097	5270	6171	6774	7004	7071
50	14	65	189	381	663	895	1067	1018	751	455	132	26	14	79	268	649	1312	2207	3274	4292	5043	5498	5630	5656
55	1	27	99	245	509	745	912	863	604	313	67	2	1	28	127	372	881	1626	2538	3401	4005	4318	4385	4387
60	0	5	44	135	360	595	757	708	460	187	28	0	0	5	49	184	544	1139	1896	2604	3064	3251	3279	3279
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	119	185	303	436	627	782	883	861	687	489	235	122	119	304	607	1043	1670	2452	3335	4196	4883	5372	5607	5729

(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