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: SMITHVILLE, OK **COOP ID: 348285**

Climate Division: OK 9 **NWS Call Sign:** **Elevation: 822 Feet** **Lat: 34˚29N** **Lon: 94˚37W**

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	50.1	24.0	37.1	80	1950	25	43.6	1998	-5	1962	11	27.0	1979	866	0	.0	.0	16.9	1.5	22.1	.1
Feb	55.5	27.5	41.5	84	1996	21	49.6	1976	-22	1951	2	30.6	1978	657	0	.0	.0	20.0	.9	17.2	@
Mar	64.0	36.7	50.4	91	1974	31	55.9	1974	4	1996	9	45.0	1996	454	0	.0	@	28.5	.1	9.3	.0
Apr	71.5	44.2	57.9	92	1987	29	64.3	1981	18	1987	4	52.7	1983	227	12	.0	.1	29.8	.0	3.0	.0
May	78.3	54.3	66.3	96	1962	27	71.7	1987	29	1954	4	61.2	1976	70	112	.0	.5	31.0	.0	@	.0
Jun	85.9	61.8	73.9	105	1953	21	78.3	1998	39	1988	11	69.8	1974	4	270	.2	8.3	30.0	.0	.0	.0
Jul	91.3	65.3	78.3	110+	1986	30	85.6	1998	46	1972	6	75.7	1989	0	412	3.1	20.5	31.0	.0	.0	.0
Aug	91.3	63.8	77.6	110	1986	1	81.9	2000	45	1992	28	72.5	1992	2	391	3.4	20.7	31.0	.0	.0	.0
Sep	84.1	57.2	70.7	107+	1951	2	77.5	1998	29	1989	24	64.5	1974	29	199	.7	8.2	30.0	.0	.1	.0
Oct	74.2	45.6	59.9	100	1953	1	63.4	1998	16	1989	20	53.0	1976	183	25	.0	.8	30.8	.0	3.0	.0
Nov	61.4	35.1	48.3	85+	1980	9	54.6	1999	8	1976	29	41.0	1972	502	0	.0	.0	26.4	@	10.8	.0
Dec	52.4	27.4	39.9	81	1951	31	48.3	1984	-6	1989	22	28.8	1983	778	0	.0	.0	20.8	1.2	19.1	.2
Ann	71.7	45.2	58.5	110+	Aug 1986	1	85.6	Jul 1998	-22	Feb 1951	2	27.0	Jan 1979	3772	1421	7.4	59.1	326.2	3.7	84.6	.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: 1888-2001

(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	3.30	2.89	3.55	1969	30	8.40	1990	.55	1997
Feb	3.34	3.02	5.80	1950	12	6.82	1989	1.10	1996
Mar	5.26	5.03	4.45	1977	28	11.31	1973	1.73	1986
Apr	4.82	4.15	4.16	1974	22	11.97	1991	.38	1987
May	6.73	6.13	6.35	1960	20	22.00	1990	1.50	1998
Jun	4.52	4.00	7.50	1997	30	11.90	1997	1.20	1978
Jul	4.07	3.41	6.08	1991	28	10.38	1973	.00	1993
Aug	2.71	2.53	4.49	1958	10	10.01	1974	.00	2000
Sep	4.55	3.64	6.25	1965	22	12.05	1992	1.22+	1988
Oct	6.22	5.93	10.45	1972	31	16.09	1972	.00+	1995
Nov	5.16	4.65	4.72	1969	18	11.16	2000	.20	1989
Dec	5.03	4.29	8.67	1971	10	15.92	1971	.97	1981
Ann	55.71	52.31	10.45	Oct 1972	31	22.00	May 1990	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	5.4	2.5	.8
Feb	5.5	4.8	2.4	1.1
Mar	7.6	6.3	3.4	2.1
Apr	7.9	6.8	3.3	1.6
May	9.4	8.1	4.4	2.2
Jun	7.1	6.2	3.2	1.3
Jul	6.4	5.4	2.9	1.3
Aug	5.8	4.3	2.0	.8
Sep	7.0	5.7	3.2	1.6
Oct	6.8	5.4	3.3	2.0
Nov	7.0	5.8	3.4	2.0
Dec	6.6	5.7	3.2	2.1
Ann	83.5	69.9	37.2	18.9

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	.77	1.08	1.56	2.00	2.43	2.88	3.39	4.00	4.80	6.07	7.26
Feb	1.09	1.40	1.87	2.27	2.65	3.05	3.48	3.99	4.64	5.66	6.60
Mar	2.12	2.60	3.28	3.85	4.38	4.92	5.51	6.18	7.04	8.35	9.54
Apr	1.46	1.92	2.60	3.19	3.77	4.36	5.02	5.78	6.78	8.33	9.77
May	2.06	2.70	3.66	4.48	5.27	6.09	7.00	8.06	9.43	11.58	13.56
Jun	1.21	1.64	2.29	2.87	3.43	4.02	4.67	5.44	6.46	8.04	9.52
Jul	.28	.69	1.34	1.93	2.56	3.25	4.04	5.02	6.34	8.50	10.58
Aug	.21	.50	.94	1.34	1.75	2.20	2.72	3.35	4.20	5.58	6.91
Sep	.97	1.38	2.05	2.66	3.27	3.92	4.65	5.54	6.70	8.55	10.31
Oct	.00	1.03	2.27	3.26	4.24	5.27	6.44	7.78	9.61	12.54	15.33
Nov	1.07	1.54	2.30	2.99	3.69	4.43	5.27	6.28	7.61	9.74	11.75
Dec	1.40	1.87	2.60	3.23	3.85	4.50	5.22	6.06	7.16	8.89	10.50
Ann	38.67	41.94	46.15	49.35	52.20	54.97	57.83	61.00	64.86	70.46	75.32

\+ 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: 1888-2001
(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	2.0	.0	#	0	7.5	2000	28	10.0	2000	10	2000	28	1	2000	1.0	.7	.2	.1	.0	.5	.2	.1	@
Feb	1.8	.0	#	0	10.0	1979	25	15.0	1979	7	1985	2	4	1982	.7	.6	.2	.1	.1	.3	.1	.0	.0
Mar	#	.0	0	0	#	1998	9	#+	1998	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	#	.0	0	0	#	1997	12	#+	1997	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.1	.0	#	0	2.0	1976	14	2.0	1976	2	1976	14	#+	1995	.1	.1	.0	.0	.0	.1	.0	.0	.0
Dec	.3	.0	#	0	6.0	1975	25	6.0	1975	6	1975	25	#+	2000	.2	.2	@	@	.0	.1	@	@	.0
Ann	4.2	.0	N/A	N/A	10.0	Feb 1979	25	15.0	Feb 1979	10	Jan 2000	28	4	Feb 1982	2.0	1.6	.4	.2	.1	1.0	.3	.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	5/12	5/06	5/01	4/28	4/24	4/21	4/17	4/13	4/07
32	4/26	4/21	4/18	4/15	4/12	4/09	4/07	4/03	3/29
28	4/14	4/09	4/06	4/03	3/31	3/28	3/25	3/22	3/17
24	4/05	3/29	3/24	3/20	3/16	3/13	3/09	3/04	2/25
20	3/27	3/19	3/13	3/08	3/03	2/26	2/21	2/15	2/07
16	3/06	2/27	2/22	2/18	2/13	2/09	2/05	1/31	1/23

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	9/24	9/29	10/02	10/05	10/08	10/10	10/13	10/16	10/21
32	10/03	10/08	10/11	10/14	10/17	10/20	10/23	10/26	10/31
28	10/17	10/23	10/27	10/31	11/03	11/06	11/10	11/14	11/20
24	10/26	11/02	11/08	11/12	11/17	11/21	11/25	12/01	12/08
20	10/30	11/08	11/14	11/19	11/24	11/29	12/05	12/11	12/20
16	11/16	11/26	12/03	12/09	12/14	12/20	12/26	1/02	1/11

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	179	174	170	166	162	157	152	145
32	209	202	196	192	187	183	178	173	165
28	239	231	226	221	216	212	207	202	194
24	278	267	258	251	244	238	230	222	210
20	299	285	277	270	263	256	249	241	230
16	340	323	314	306	300	294	287	279	269

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	866	657	454	227	70	4	0	2	29	183	502	778	3772
60	711	519	307	115	22	0	0	0	7	83	362	624	2750
57	618	441	225	66	9	0	0	0	2	45	283	537	2226
55	560	389	177	42	4	0	0	0	0	28	236	479	1915
50	417	269	86	9	0	0	0	0	0	6	138	342	1267
32	67	28	1	0	0	0	0	0	0	0	5	44	145

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	224	295	569	775	1064	1256	1435	1412	1159	866	493	289	9837
55	4	12	33	126	356	566	722	699	469	180	34	11	3212
57	0	8	19	91	298	506	660	637	411	135	21	7	2793
60	0	2	7	49	218	416	567	544	326	80	10	1	2220
65	0	0	0	12	112	270	412	391	199	25	0	0	1421
70	0	0	0	2	43	142	263	249	103	4	0	0	806

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	103	187	384	588	858	1055	1221	1205	962	658	327	144	103	290	674	1262	2120	3175	4396	5601	6563	7221	7548	7692
45	51	101	257	441	703	905	1066	1050	812	504	209	74	51	152	409	850	1553	2458	3524	4574	5386	5890	6099	6173
50	22	50	149	301	548	755	911	895	663	355	119	36	22	72	221	522	1070	1825	2736	3631	4294	4649	4768	4804
55	4	19	74	181	394	605	756	740	514	223	60	13	4	23	97	278	672	1277	2033	2773	3287	3510	3570	3583
60	0	1	32	88	251	455	601	585	369	117	24	3	0	1	33	121	372	827	1428	2013	2382	2499	2523	2526
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	87	142	263	388	564	720	816	797	639	437	213	108	87	229	492	880	1444	2164	2980	3777	4416	4853	5066	5174

(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