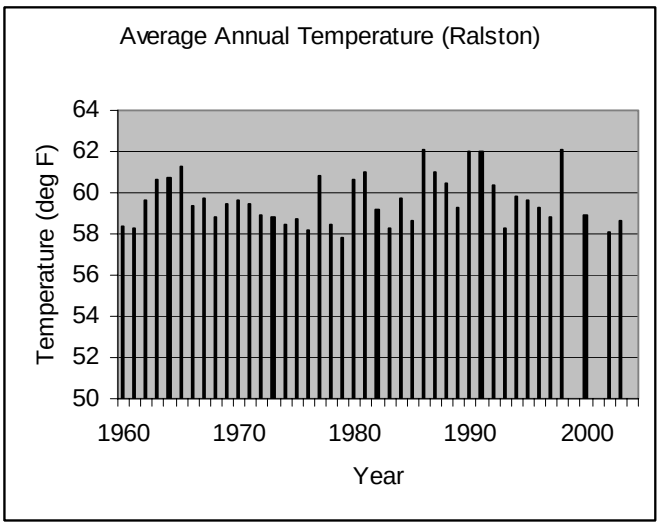
The Climate of Pawnee County

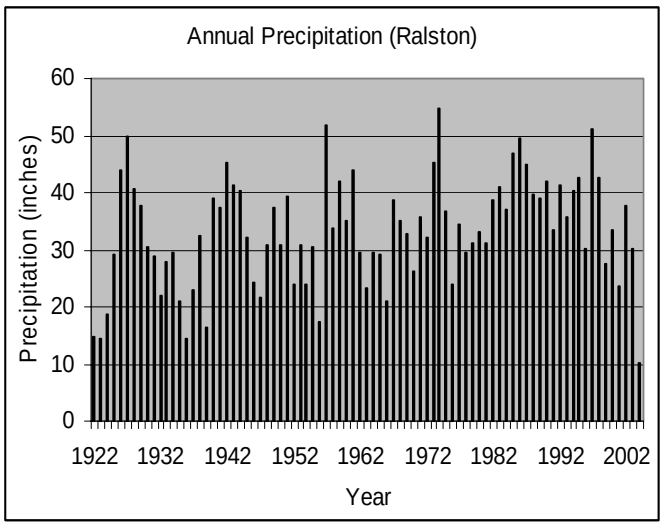
Pawnee County is in a region of Oklahoma known as the cross-timbers, populated largely by blackjack and post oak trees. Annual precipitation averages nearly 39 inches in the county. May is the wettest months, but all spring and fall months typically have abundant rainfall. About nine out of ten winters has at least one inch of snow, with nearly half having ten or more inches.

Temperatures average between 59 and 60 degrees, with a slight increase from northwest to southeast. Temperatures range from an average daytime high of 94 degrees in July to an average low of 24 degrees in January. Pawnee County averages a growing season of 197 days, but plants that can withstand short periods of colder temperatures may have an additional six weeks.

Winds from the south to southeast are quite dominant, averaging nearly nine miles-per-hour. Relative humidity, on average, ranges from 45% to 90% during the day. During the year, humidity is highest in late spring and lowest in late winter to early spring. Winter months tend to be cloudier than summer months. The percentage of possible sunshine ranges from an average of about 50% in winter to nearly 80% in summer.

Thunderstorms occur on about 51 days each year, predominantly in the spring and summer. During the period 1950 - 2003, Pawnee County recorded 23 tornadoes, although neighboring counties had substantially more. The most recent significant tornado (F2 intensity or greater) occurred on April 26, 1991. Pawnee County may not be struck often, but many of the significant tornadoes in its history are long-track, F3 or F4 tornadoes. Typically, there are about 2-3 events each year of hail exceeding one inch in diameter. As information collection improves, both the number of reported tornadoes and the number of severe hail events have increased.





Temperature (deg Fahrenheit)

	AVERAGES (1971-2000)			EXTREMES (1959-2003)				AVG # DAYS PER MONTH (1971-2000)				
	Daily Max	Daily Min	Daily Avg	Record High		Record Low		Max>100	Max>90	Max<32	Min<32	Min<0
Jan	47.3	23.6	35.4	80	(7th, 1965)	-11	(10th, 1977)			4	25	1
Feb	54.0	28.6	41.3	92	(22nd, 1996)	-15	(4th, 1996)		*	2	18	*
Mar	63.4	37.8	50.6	93	(31st, 1974)	-1	(8th, 1967)		*	*	10	
Apr	73.3	46.9	60.1	100	(12th, 1972)	18	(3rd, 1975)	*	1		2	
May	80.4	56.6	68.5	97	(17th, 1972)	29	(1st, 1960)		3			
Jun	88.1	65.3	76.7	105	(26th, 1980)	44	(1st, 1983)	1	13			
Jul	94.0	69.3	81.7	112	(6th, 1996)	49	(31st, 1971)	5	26			
Aug	93.6	67.7	80.6	110	(4th, 1964)	43	(29th, 1988)	6	23			
Sep	85.4	59.9	72.6	109	(2nd, 2000)	30	(30th, 1984)	1	11		*	
Oct	75.0	47.9	61.4	98	(8th, 1979)	13	(31st, 1993)		1		2	
Nov	60.5	36.3	48.4	88	(11th, 1989)	6	(29th, 1976)			*	11	
Dec	49.8	26.7	38.2	80	(7th, 1966)	-13	(23rd, 1989)			3	22	1
Annual	72.2	47.3	59.7	112	(Jul 6, 1996)	-15	(Feb 4, 1996)	12	78	10	91	2

Precipitation (inches)

	AVERAGE	EXTREMES (1922-2003)			AVG # DAYS PER MONTH (1971-2000)					
	1971-2000	Monthly Max	Daily Max		any	meas	0.10"+	0.25"+	0.50"+	1.00"+
Jan	1.30"	5.55" (1949)	1.75"	(30th, 1999)	7	5	3	2	1	*
Feb	1.76"	5.41" (1985)	2.50"	(23rd, 1985)	7	5	4	2	1	*
Mar	3.44"	8.24" (1973)	3.50"	(11th, 1974)	9	7	6	4	3	1
Apr	3.66"	11.02" (1942)	4.50"	(10th, 1944)	9	7	6	4	2	1
May	5.47"	19.82" (1943)	5.98"	(17th, 1943)	11	9	7	5	4	2
Jun	4.36"	15.55" (1957)	3.62"	(10th, 1940)	9	8	6	5	3	1
Jul	3.14"	13.83" (1997)	7.15"	(18th, 1997)	7	6	5	3	2	1
Aug	3.54"	11.34" (1974)	6.95"	(10th, 1974)	7	6	5	3	2	1
Sep	4.33"	13.37" (1945)	7.75"	(30th, 1986)	8	7	5	4	3	1
Oct	3.18"	10.44" (1941)	4.85"	(5th, 1998)	7	6	5	3	2	1
Nov	2.72"	8.39" (1931)	3.82"	(17th, 1928)	8	6	4	3	2	1
Dec	1.86"	5.36" (1984)	2.36"	(20th, 1991)	7	5	3	2	1	1
Annual	38.77"	19.82" (May 1943)	7.75"	(Sep 30, 1986)	93	76	59	42	26	12

Snow and Sleet (inches)

	AVERAGE	EXTREMES (1922-2003)					AVG # DAYS PER MONTH (1971-2000)				
	1971-2000	Monthly Max	Daily Max		Greatest Depth		any	meas	0.50"+	1.00"+	Pot. Glazing
Jan	3.1"	15.0" (1987)	6.0"	(18th, 1987)	10.0"	(19th, 1987)	4	2	2	1	4
Feb	3.2"	12.5" (1980)	12.0"	(8th, 1980)	10.0"	(8th, 1929)	3	2	1	1	2
Mar	1.5"	13.5" (1970)	11.0"	(8th, 1994)	11.0"	(8th, 1994)	2	1	1	0	1
Apr	0.1"	6.0" (1938)	6.0"	(8th, 1938)	6.0"	(8th, 1938)	*	*	*	*	
May											
Jun											
Jul											
Aug		0.0" (1929)	0.0"	(10th, 1929)							
Sep		1.4" (1947)	1.4"	(20th, 1947)							
Oct	0.0"	0.0" (1925)	0.0"	(29th, 1925)	0.1"	(29th, 1925)	*				
Nov	0.6"	7.5" (1972)	5.0"	(19th, 1972)	10.0"	(30th, 1975)	1	*	*	*	*
Dec	1.9"	11.0" (1987)	10.0"	(23rd, 1966)	8.0"	(23rd, 1966)	3	1	1	1	2
Annual	10.3"	15.0" (Jan 1987)	12.0"	(Feb 8, 1980)	11.0"	(Mar 8, 1994)	13	6	5	4	9

TEMPERATURE AND PRECIPITATION

From Ralston Cooperative Observer Station (347390); October 1922 – June 2003
Latitude: 3630N Longitude: 09644W Elevation: 824 ft

Exceedence values (2 in 10 years)				
Month:	Maximum Temperature Higher Than:	Minimum Temperature Lower Than:	Precipitation Less Than:	Precipitation More Than:
January	74	-3	0.30	2.00
February	80	-1	0.58	2.06
March	87	12	0.95	3.63
April	92	25	1.55	5.25
May	94	36	2.75	7.58
June	99	48	2.43	6.05
July	106	55	0.94	4.88
August	105	53	1.40	5.20
September	102	37	1.62	6.37
October	93	27	1.12	4.27
November	83	13	0.59	4.31
December	75	-1	0.53	2.32
Annual	**108**	**-6**	**28.97**	**42.05**

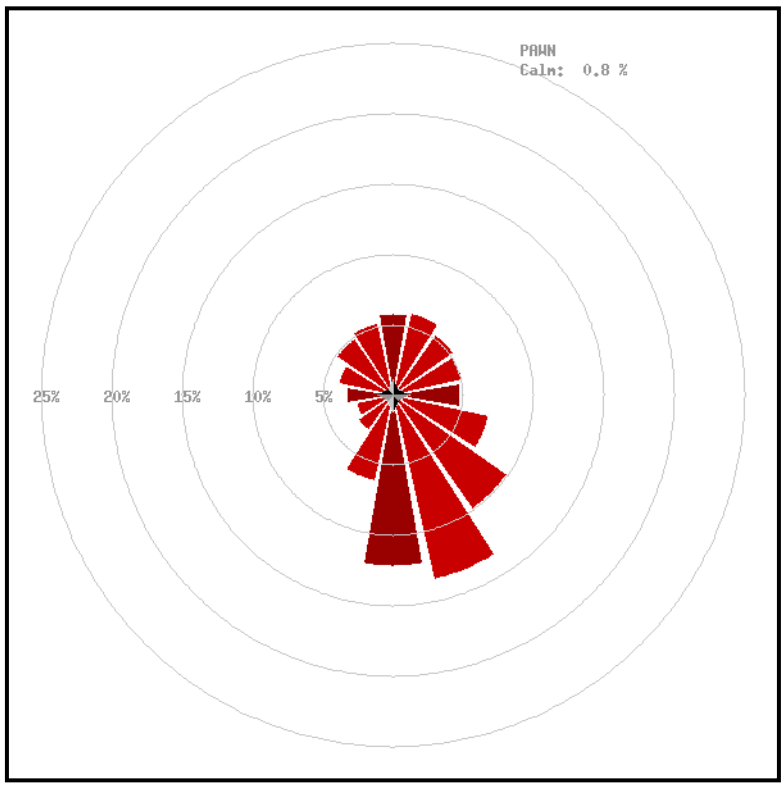
First Freezing Temperature in Fall			
Probability	24 F or Lower	28 F or Lower	32 F or Lower
1 Year in 10 Earlier Than –	October 31	October 19	October 8
2 Years in 10 Earlier Than –	November 4	October 22	October 12
5 Years in 10 Earlier Than –	November 12	November 4	October 21
Last Freezing Temperature in Spring			
Probability	24 F or Lower	28 F or Lower	32 F or Lower
1 Year in 10 Later Than –	April 5	April 15	April 22
2 Years in 10 Later Than –	April 2	April 11	April 15
5 Years in 10 Later Than –	March 22	April 2	April 6

Number of Days in Growing Season			
Probability	Higher than 24 F	Higher than 28 F	Higher than 32 F
9 Years in 10	220	198	177
8 Years in 10	223	203	182
5 Years in 10	238	215	197
2 Years in 10	256	234	208
1 Year in 10	270	238	223

WINDS

From Pawnee Mesonet Site (PAWN); Jan 1994 – Dec 2001

Latitude: 3622N Longitude: 09646W Elevation: 928 ft



Wind Roses show the prevailing direction from which the wind is blowing. North is up in the image. The circles show the percentage of time from which the wind is blowing in that direction. For example, Pawnee records a south-southeasterly wind about 13 percent of the time, with northerly winds just under 6 percent of the time.

The table below shows the percentage of time the wind is blowing from each of the 16-point compass headings, and the percent of time the prevailing wind is recorded in each speed bin.

Maximum Gust: 80.2 mph
Maximum Sustained: 44.0 mph
Overall Average Speed: 8.8 mph

PAWN	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
Calm																	0.8%
1- 5 mph	0.6	0.8	1.3	1.3	1.6	2.4	2.8	1.9	1.2	0.8	0.7	1.0	1.3	1.1	1.0	0.8	20.4%
6-10 mph	2.3	2.5	2.7	2.7	2.5	3.7	4.7	4.7	3.3	2.1	1.3	1.1	1.5	1.6	2.0	2.2	40.9%
11-15 mph	1.8	1.8	1.1	1.0	0.7	0.8	1.9	4.3	3.8	1.8	0.7	0.4	0.4	0.8	1.2	1.4	23.8%
16-20 mph	0.8	0.7	0.2	0.2	0.1	0.1	0.4	1.9	2.5	1.0	0.3	0.1	0.1	0.4	0.6	0.7	10.2%
21-25 mph	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.5	1.1	0.4	0.1	0.0	0.1	0.1	0.1	0.2	3.1%
26-30 mph	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6%
31-35 mph	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1%
35+ mph	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0%
Totals	5.8	6.0	5.3	5.1	4.8	7.0	9.9	13.4	12.2	6.3	3.1	2.7	3.4	4.0	4.9	5.2	100.0%

PAWN	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Max Gust	49	56	62	66	45	67	44	61	79	54	52	65	62	78	74	80
Max 5 Min	35	44	43	42	33	34	35	43	36	38	37	35	34	37	42	44
Avg Speed	10.2	9.5	7.3	7.1	6.3	6.1	7.1	10.1	12.0	10.8	8.5	6.8	6.5	8.2	8.9	9.6

Due to rounding, column and row totals may not sum to exactly 100.0%.

HUMIDITY

From Pawnee Mesonet Site (PAWN); Jan 1994 – Dec 2003
Latitude: 3622N Longitude: 09646W Elevation: 928 ft

Mean Monthly Humidity and Moisture					
	Daily Maximum Relative Humidity	Daily Minimum Relative Humidity	Daily Average Relative Humidity	Daily Average Dewpoint (^{o}F)	Daily Average Vapor Deficit
January	89	46	69	26	3.0
February	87	42	65	30	4.3
March	87	41	64	35	5.5
April	88	40	63	45	7.9
May	94	51	74	59	7.6
June	94	52	74	66	9.4
July	92	48	71	70	13.1
August	90	43	68	68	14.4
September	92	46	71	60	9.9
October	91	44	69	49	7.0
November	90	44	68	38	4.6
December	90	48	71	29	3.0
Annual	**90**	**45**	**69**	**48**	**7.5**

Vapor pressure is given in millibars.

SOIL TEMPERATURES

From Pawnee Mesonet Site (PAWN); Jan 1994 – Dec 2003
Latitude: 3622N Longitude: 09646W Elevation: 928 ft

Soil Temperatures at 10 cm (4-inch) depth				
	Average Temperature beneath sod	Average Temperature beneath bare soil	Average Daily Max Temperature	Average Daily Min Temperature
January	40	40	43	38
February	43	44	48	41
March	48	50	54	46
April	58	60	66	55
May	67	70	76	65
June	74	79	86	74
July	79	85	92	80
August	79	85	91	79
September	73	77	83	72
October	63	65	70	61
November	52	52	56	49
December	44	43	46	40
Annual	**60**	**63**	**67**	**58**

Average daily maximum and minimum temperatures based on bare soil.

TORNADOES

Significant Tornadoes (F2 intensity or greater) affecting Pawnee County, 1880 – 2003. Source: *Significant Tornadoes, 1880-1989: Volume I* and National Weather Service, Norman office.

Date	Path	Deaths	Injuries	Rating	Counties Affected
April 20, 1912	30 miles	3	12	F4	Noble, Pawnee
November 4, 1922	25 miles	11	40	F4	Creek, Pawnee
May 2, 1942	85 miles	3	28	F4	Noble, Pawnee, Osage, Washington
May 21, 1949	5 miles	0	1	F3	Pawnee, Osage
May 1, 1954	25 miles	0	7	F3	Payne, Pawnee, Osage
April 2, 1956	10 miles	0	1	F3	Pawnee, Osage
March 31, 1959	5 miles	0	0	F3	Creek, Pawnee
April 26, 1984	22 miles	3	37	F4	Creek, Pawnee, Osage
April 29, 1984	27 miles	1	60	F4	Creek, Pawnee, Osage
April 26, 1991	24 miles	1	24	F4	Pawnee, Osage

About the Data:

The temperature and precipitation data from Ralston are from the National Weather Service Cooperative Observer station, which records daily maximum and minimum temperatures, precipitation, and snowfall. The station has been in operation since 1922 for measuring precipitation and since 1959 for temperature observations, yielding an 81-year series of data for precipitation and a 44-year series for temperature. The cooperative observer station at Pawnee, which has been operational since 1943, only records precipitation; therefore the records were not complete enough for this climatology and Ralston was the next-best selection. Extremes, frost and freeze data, and growing season lengths were determined using the entire 81- or 44-year series. The means for temperature, precipitation, and snowfall were determined using a subset of the series, from 1971-2000, corresponding with official national standards set by the National Climatic Data Center.

Wind and humidity data are compiled from the Oklahoma Mesonet station at Pawnee (3 miles east-southeast of town), which has been operational since 1994. The Oklahoma Mesonet is a cooperative project between Oklahoma State University and The University of Oklahoma. Data are collected and archived at the Oklahoma Climatological Survey. The Mesonet records a variety of weather information at 5-minute intervals throughout the day, with at least one reporting station in every county in Oklahoma. For more information on the Mesonet, see http://www.mesonet.org/.

Solar radiation (sunshine) data were obtained from the *Climatic Atlas of the United States,* U.S. Department of Commerce, 1968. Severe storm information is available from the National Climatic Data Center, http://www.ncdc.noaa.gov/, under Weather/Climate Events: Climatology & Extreme Events, U.S. Storm Events Database. The best site for online county tornado information for Oklahoma is through the National Weather Service, Norman Office, http://www.srh.noaa.gov/oun/tornadodata/.

The tables and summary were prepared by the Oklahoma Climatological Survey. For more information, please contact OCS at 405-325-2541. Many climate summary products are available on the worldwide web at http://www.ocs.ou.edu/.

Need Additional Information?

If you cannot find what you need here, or want some help interpreting what this means for your particular needs, please contact:

The Oklahoma Climatological Survey
100 E. Boyd Street, Suite 1210
Norman, OK 73019-1012
Phone: 405-325-2541
E-mail: ocs@ou.edu

In addition to maintaining records of all weather and climate information for Oklahoma, OCS has a staff of climatologists who specialize in tailoring information for particular needs. Whether you want to know how dry it has been or are planning a construction project, OCS can help.