

**CHAPTER THREE
SECTION 3.5
HAZARD PROFILE-EXTREME HEAT**

AFFECTED JURISDICTIONS

COMMUNITIES

Unincorporated Pottawatomie County
Town of Asher
Town of Bethel Acres
Town of Brooksville
Town of Earlsboro
Town of Johnson
City of Maud
Town of Macomb
City of McLoud
Town of Pink
City of Shawnee
Town of St. Louis
City of Tecumseh
Town of Tribbey
Town of Wanette

PUBLIC SCHOOL DISTRICTS

Asher Public Schools
Bethel Public Schools
Dale Public Schools
Earlsboro Public Schools
Grove School
Macomb Public Schools
Maud Public Schools
Macomb Public Schools
McLoud Public Schools
North Rock Creek School
Shawnee Public Schools
South Rock Creek School
Tecumseh Public Schools

TECHNOLOGY CENTERS

Gordon Cooper Technology Center

This page intentionally left blank

EXTREME HEAT

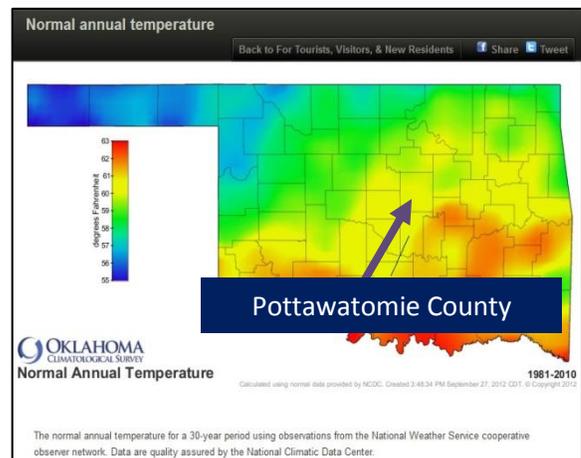


Oklahoma, as part of the Southern Great Plains, is prone to wide swings of temperature. Summertime temperatures routinely climb above the 100-degree mark. **Extreme heat** is defined as temperatures that hover 10 degrees or more above the average high for the area, and last for several weeks. Humid or muggy conditions, which add to the discomfort or high temperatures, occur when a “dome” of high atmospheric pressure traps hazy, damp air near the ground.

The hottest period of the Oklahoma summer extends from mid-July through mid-August. Overall, August (the third and final month of the Climatological summer) is Oklahoma’s second hottest, fifth driest, and least windy month. The mean annual temperature over the state ranges from 62 degrees F along the Red River to about 58 degrees F along the northern border. In Pottawatomie County temperatures average near 61 degrees, with a slight increase from north to south.

LOCATION

Oklahoma and all participating jurisdictions, school districts and Gordon Cooper Technology Center and the unincorporated area of Pottawatomie County (Refer to Table 1-1) are at risk for extreme heat, although temperatures experienced in Pottawatomie County do not compare with western Oklahoma that experience 35 – 40 days of temperatures over 100 degrees. Pottawatomie County experiences



10-20 days of temperatures greater than 100 degrees annually according to the Oklahoma Climatological Survey. In Pottawatomie County, however, during parts of the summer, the humidity can be higher because of its location in relation to the Gulf of Mexico, which causes temperatures to be more uncomfortable.

TEMPERATURE

- Average Annual: 61 degrees
- Average Maximum: 73 degrees
- Average Minimum: 50 degrees
- Highest: 116 degrees (Shawnee, August 10, 1936)

EXTENT

It is often extremely hot and humid during the summer in Oklahoma, including Pottawatomie

County. When prolonged

higher than normal

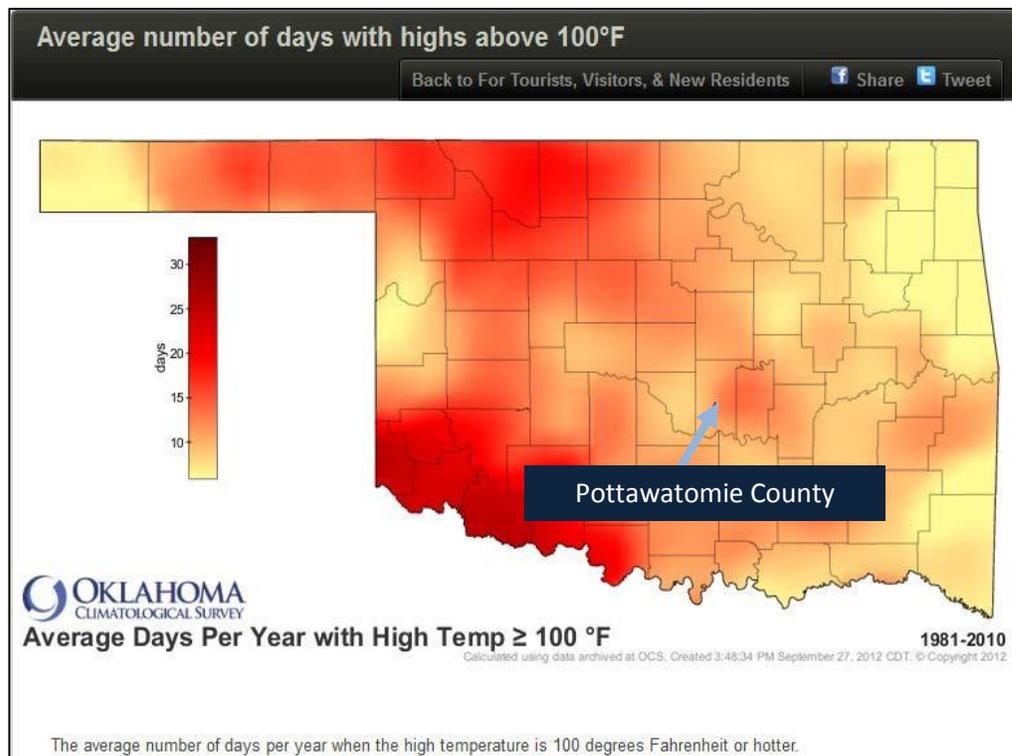
temperatures

occur, the heat can become a hazard to life and to livestock.

Pottawatomie

County's highest temperature on record occurred

on August 10,



1936 when the temperature reached 116 degrees Fahrenheit in Shawnee.

The **Heat Index** is how the heat and humidity in the air combine to make individuals feel. High humidity plus higher temperatures often combine to make us feel a superficial temperature that is higher than the actual air temperature.

Pottawatomie County officials along with the officials of all participating jurisdictions, school districts and Gordon Cooper Technology Center consider any extended period with temperatures above 90 degrees or with a daytime heat indices of 105 degrees Fahrenheit or greater to be a major and cause for concern with periodic checks on the elderly and other at risk populations.

Table 3-16 HEAT INDEX CHART

Heat Index Chart																	
		% Relative Humidity															
		15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
T e m p e r a t u r e	110	108	112	117	123	130											
	105	102	105	108	113	117	122	130									
	100	97	98	102	104	107	110	115	120	126	132						
	95	91	93	95	96	98	100	104	106	109	113	119	124	130			
	90	86	87	88	90	91	92	95	97	98	100	103	106	110	114	117	121
	85	81	82	83	84	85	86	87	88	89	90	92	94	96	97	100	102
	80	76	77	78	78	79	79	80	81	82	83	84	85	86	87	88	89
Legend																	
80-89 degrees		Fatigue is possible with prolonged exposure and/or physical activity.															
90-104 degrees		Sunstroke, heat cramps and heat exhaustion are possible with prolonged exposure and/or physical activity.															
105-129 degrees		Sunstroke, heat cramps and heat exhaustion are likely. Heat stroke is possible with prolonged exposure and/or physical activity.															
130+ degrees		Heatstroke/sunstroke is highly likely with continued exposure.															

PREVIOUS OCCURRENCES

Pottawatomie County has experienced extreme heat events over the last five years with excessively high temperatures causing significant problems for citizens, including:

Table 3-17 SIGNIFICANT POTTAWATOMIE COUNTY EXTREME HEAT HISTORY 2009-2012 Data provided by the Oklahoma Climatological				
Year	Days above 90 degrees	Days above 100 degrees	Pottawatomie County	
			Fatalities	Injuries
2012	93	34	None known	Unknown
2011	109	63	None known	Unknown

**NOTE: NCDC website was checked for data but information available was inadequate.
NWS Norman was also checked for temperature data but usable data was not found.**

Average High for July: 93.1 degrees
Average Number of Days above 90 degrees: 76

PROBABILITY OF FUTURE EVENTS

While extreme heat is a hazard for Oklahomans, efforts are being made throughout the state to mitigate the effects of the extreme heat hazard. The National Weather Service – Norman is now issuing extreme heat warnings by county through the NOAA Weather Radio. They are issued when the combined effect of high temperatures and high humidity result in daytime heat indices greater than or equal to 105 degrees Fahrenheit and nighttime ambient temperatures greater than or equal to 80 degrees Fahrenheit, persisting for two days or longer.

The entire state of Oklahoma is at risk for extreme heat. Based on history and public input, the probability of a future extreme heat event in Pottawatomie County including all participating jurisdictions, school districts and Gordon Cooper Technology Center is “**LIKELY**”.



VULNERABILITY AND IMPACT

Pottawatomie County has an extreme heat hazard due to its location and climate. Summers are hot and usually dry, with daytime highs in the upper 80s to the mid-90s and generally less than three inches of rain in July and August.



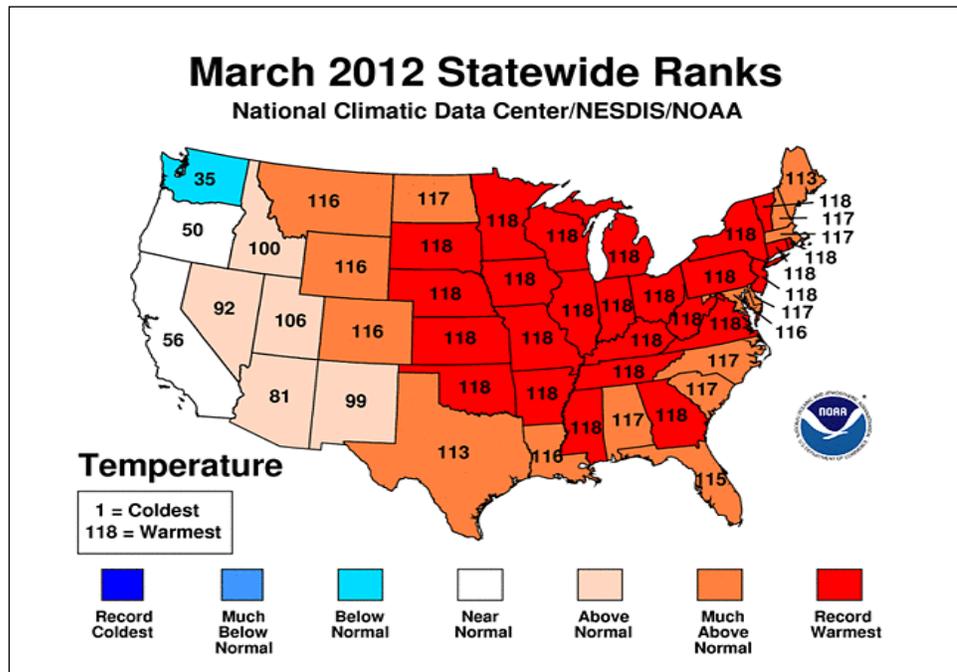
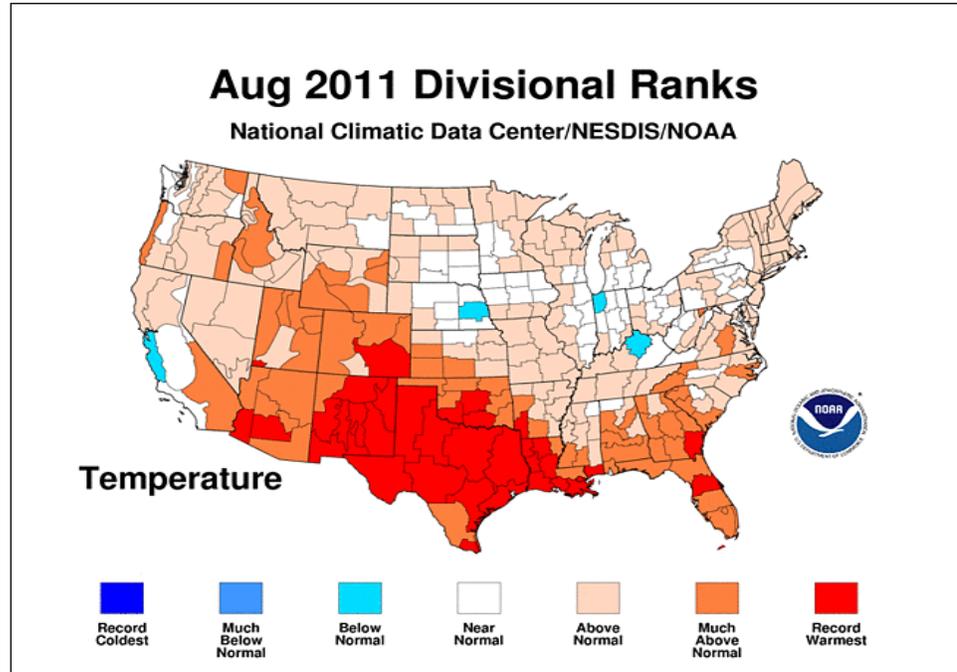
Power supplies throughout the county are often affected due to high use of air conditioners by the population potentially causing power “brownouts” or outages. Also a problem is that some elderly or handicapped citizens either do not have air conditioners or fans that work or do not use them because of electric cost concerns; some become victims of the severe temperatures. Extreme heat deaths are usually from that group of citizens, although handicapped and very young can sometimes be victims of extreme heat also.

Although schools are generally not in session during the hottest months of the summer, some athlete activities begin practice in August or run practices into the summer months. In those instances, school officials encourage additional liquids and rest periods for their athletes and keep a vigilant watch for symptoms of heat exhaustion during hot periods.

In Pottawatomie County, various groups will volunteer fans and air conditioners free of charge for people who can't afford

them, but not everyone takes advantage of their generosity. People working outside are also vulnerable to extreme temperatures and need to know how to take care of themselves and should know the signs of heat

exhaustion and heat stroke. Public education programs can help tremendously to save people from the effects of the heat and humidity.





Roads are often affected by extreme heat. Some older asphalt roads tend to “melt” or get soft with continued heat. Many of these roads are used by school buses and mail carriers.

Concrete roads “explode” and crack due to the heat leading to higher maintenance costs. The damaged roads often cause the citizens to find alternate transportation routes.

Agriculture is an important industry in Pottawatomie County, especially cattle and horse ranching. Extreme heat can be extremely damaging to various crops during the summer months. Livestock and livestock products make up the majority of Pottawatomie County’s annual revenue; however, the industry suffers when grass dries up and ranchers are unable to properly feed their livestock. Large economic losses are likely when farmers and ranchers are unable to continue operating their business in Pottawatomie County. Beef producers particularly will be more concerned with the lack of moisture, short forage supplies, the distance they had to go to find hay, and the price they had to pay when they found it. They are concerned about the impact the high daily temperature and humidity have on their cattle. Cattle have an upper critical temperature that is 20 degrees cooler than humans. At 82 degrees and 75% humidity some humans may start to feel a little uncomfortable, but most cattle will be in the danger zone

for heat stress. At 90 degrees and 65% humidity cattle are at extreme risk for heat stress. The humidity makes it difficult for cattle to dissipate body heat at these temperatures.

CONCLUSION

Although all jurisdictions in Pottawatomie County are susceptible to Extreme Heat, during which occasional injury or deaths may occur, most heat-related fatalities involve elderly citizens who are unable or unwilling to use their air conditioners or fans. The Oklahoma Climatological Survey indicates the Pottawatomie County area averages 10-20 days over 100 degrees during the summer. The school districts in the



county are less affected by summertime extreme heat events because they are generally not active. The exception would be during late spring or in August when athletics begin practice, at which time school personnel take extra steps to detect effects of the heat on the athletes and to take appropriate action.

The American Red Cross, Salvation Army, along with private organizations, and others, are making efforts to ensure that those in need receive fans or air conditioners and periodic visits to verify their welfare.

SOURCES

(NWS) National Weather Service – Norman

www.srh.noaa.gov/oun/

(OCS) Oklahoma Climatological Survey

www.climate.mesonet.org/

This page intentionally left blank