Oklahoma Monthly Climate Summary

AUGUST 2013

OKLAHOMA CLIMATOLOGICAL SURVEY

The unusually mild and wet conditions of July continued into August for a couple of weeks, but summer returned with a vengeance to finish out the month. The rains disappeared after week two, and then a summer-like heat wave arrived during the final week. Despite that late heat, the month still managed to finish a tad on the cool side overall. According to preliminary data from the Oklahoma Mesonet, the statewide average temperature was 80.1 degrees. 0.3 degrees below normal and the 49th coolest August since records began in 1895. The abundant rainfall during the first two weeks of the month, mainly across the northern two-thirds of Oklahoma, pushed the statewide average into the surplus territory at 3.04 inches, about a quarter-inch above normal. That ranks the month as the 51st wettest August on record. The southern third of the state missed out on the bountiful moisture and finished from 20-80 percent of normal for the month. Hugo and Newport finished with less than a quarter-inch of rainfall for the month, and many other locations across southern Oklahoma saw less than an inch. The northern two-thirds of the state recorded more generous totals with numerous amounts between 5-7 inches.

August 2013 Statewide Extremes

Description	Extreme	Station	Day
High Temperature	108°F	Several	6
Low Temperature	54°F	Several	17
High Precipitation	6.98 in.	Okmulgee	--
Low Precipitation	0.17 in.	Hugo	--

The climatological summer (June-August) had two distinct rainy periods that vaulted it up the wet side of the rankings – the first half of June and then mid-July through mid-August. The statewide average for the summer finished at 12.50 inches, 2.73 inches above normal to rank as the 24th wettest on record. Oklahoma City's official measurement site at Will Rogers recorded 18.15 inches of rain from June through August to finish with its sixth wettest summer season on record. Oklahoma City records date back to 1891. Its January-August total of 45.19 inches ranks as the wettest in the city's history. In contrast, the Mesonet site at Altus recorded a paltry 4.7 inches of rain during the summer and an equally depressing 11.5 inches for the first nine months of the year. Only the Mesonet stations in the western Panhandle recorded less from January through August.

The return to a more summer-like rainfall pattern the last two weeks of the month put the brakes on any continued drought relief, and actually reversed it across parts of the state. The U.S. Drought Monitor report released on August 28 indicated that 38 percent of the state was suffering from at least moderate drought, up from 33 percent the previous week. Most of that increase came from southern Oklahoma. It is still a vastly different story than one year ago in late August when 100 percent of the state was entrenched in drought, including 90 percent in the extreme to exceptional categories, the two worst possible on the Monitor's intensity scale. Still, the summer rains allowed for great strides. As much as 59 percent of the state was experiencing drought at the end of May. The Drought Monitor's worst two categories, severe and exceptional, dropped from 27 percent at the end of May to 10 percent at the end of August.

August 2013 Statewide Statistics

Temperature

	Average	Depart.	Rank (1895-2013)
Month (August)	80.1°F	-0.3°F	49th Coolest
Season-to-Date (Jun-Aug)	79.3°F	-0.2°F	50th Coolest
Year-to-Date (Jan-Aug)	61.1°F	-0.7°F	37th Coolest

Precipitation

	Average	Depart.	Rank (1895-2013)
Month (August)	3.04 in.	.27 in.	51st Wettest
Season-to-Date (Jun-Aug)	12.50 in.	2.73 in.	24th Wettest
Year-to-Date (Jan-Aug)	28.21 in.	3.55 in.	18th Wettest

Depart. = departure from 30-year normal

AUGUST 2013 DAILY HIGHLIGHTS

AUGUST 1: You couldn't see much of a shift in temperatures when the end of July transitioned into August. Maximum temperatures were still reaching 100 degrees on the 1st in Mangum and Hollis with most other areas in the 90s. Minimum temperatures ranged between 62 in Boise City and 76 in

south-central and southeast Oklahoma. Skies were mostly sunny to sunny and rainfall was negligible. Despite average wind speeds just under 15mph in the panhandle, most of the state had average wind speeds around 5mph.

AUGUST 2-5: Scattered showers and thunderstorms passed through northern Oklahoma between August 2nd and 5th, slightly increasing in intensity as the days passed. Although less than one inch was common in most areas, 1.18 inches (Vinita) and 2.23 inches (Miami) fell on the 4th and 1.01 inches (Miami) fell on the 5th. A warm-up of roughly 6 degrees occurred during this period with maximum temperatures reaching 107, 106, and 104 degrees in the southwest. The lowest maximum temperatures had a spread between 76 in Miami on the 4th and 92 in Miami on the 5th. Minimum temperatures fell between 63 degrees in the rain-cooled panhandle and 78 degrees in the southwest. By Monday, a heat advisory was issued for the region. Average wind speeds were generally less than 15mph and gusts of 45mph were reported in Hobart on the 2nd and Alva on the 5th.

AUGUST 6-9: The 6th kicked off a period of strong-severe thunderstorms that continued through the 9th with multiple wind, flood, and hail reports. Storms started in the northwest and pushed northeast on Tuesday and Wednesday. Although storms lingered in northern and central OK on Thursday, additional severe storms formed in the southwest and continued into south-central OK on Friday. Maximum daily rainfall amounts were 1.04 inches in Woodward, followed by .42 inches in Burbank on the 6th; 2.26 inches in Hooker and 2.82 inches in Beaver on the 7th; 3.66 inches at the Oklahoma City North Mesonet station and 4.11 inches in Jay on the 8th; and 2.70 inches in Okmulgee and 3.11 inches in Chandler on the 9th. Flooding was reported in the tri-county panhandle, as well as 2.75 inch hail reports in Cimarron County on the 7th. Furthermore, flooding was reported in Ottawa, Craig, and Delaware Counties on the 8th and severe wind gusts as high as 72mph were measured in Wister on the 9th. Maximum temperatures continued to bolster as the highest temps for the month were recorded in Altus, Hollis, Grady, and Mangum at 108 degrees on Tuesday. The lowest daily maximum temperatures, however, drastically declined as the days progressed, falling from 91 in the northeast to 70 in the panhandle. The range for minimum temperatures declined as well, varying between 64-80 on the 6th and 59-76 on the 9th. The coolest temperatures were observed in the panhandle each day. Average daily wind speeds were 5-15mph on Tuesday, 5-13mph on Wednesday, and 5-10mph on Thursday and Friday.

AUGUST 10-12: Maximum temperatures were a few degrees cooler than the previous week. Although highs averaged in the mid-80s on the 10th, the warmest temperatures were in the mid-upper 90s in the southeast for that day. The following two days had maximum highs in the upper 90s and even reached 100 in Grady, Tipton, and Madill on the 12th. The coolest maximum temperature was 80 degrees in the panhandle on the 10th and 11th and 82 in the northeast on the 12th. Minimum temperatures were between 55 (Boise City) and 75 (Shawnee). Rain fell in east-central Oklahoma on Saturday, but soon moved eastward out of the state. Thunderstorms occurred in the southeast the entire weekend, leaving the rain fed areas of the state with as much as .95 inches in Webbers Falls and 1.79 inches in Mangum. Storms continued on the 12th, but frequented areas in the north, central, and southwest portions of the state. The maximum rainfall for that day occurred in Pawnee (1.78 inches) and Stuart (1.49 inches). Flooding was reported in Murray County. Average wind speeds were generally less than 10mph each day.

AUGUST 13-17: This period was marked by unseasonably cool temperatures, showers, and thunderstorms. A drastic cool down from a passing cold front decreased the highest maximum temperatures to 91 degrees on every day except the 15th, which had a max high of 93 in Hollis and Altus. The warmest temperatures occurred in southwest and south-central Oklahoma on the 13th, 14th, and 15th, but occurred in the panhandle on the 16th and 17th. The lowest highs were around 78 degrees and minimum temperatures ranged from 54 in Jay to 74 in Durant. Apart from the southeast, rainfall visited almost every portion of the state during this period. The hardest rain hit areas were east-central OK on the 13th (~2 to 3 inches), the panhandle on the 14th (~.5 to 1 inch), north-central and northeast OK on the 15th (~1 inch), southeast OK on the 16th (~1 to 1.25 inches), and the northwest/panhandle region on the 17th. Most areas on the 17th received less than a tenth of an inch, however, an isolated shower brought 1.29 inches to Beaver on that day. Multiple severe weather reports took place during this time, such as flooding in McIntosh and Washington County on the 13th, wind gusts of 70mph in Comanche County on the 15th, and hail with a diameter of 2.25 inches in Beckham County on the 16th. Despite the stormy weather, daily average wind speeds were less than 10mph for the majority of the state. Peak wind gusts were in the 40s and 50s on the 13th through the 16th.

AUGUST 18-22: A high pressure ridge sitting over the Southern Plains made for some dry weather throughout the state. High temperatures started out cooler than the beginning of the month, but slowly warmed as the days progressed. The highest maximum temperature was 94 degrees in Kenton on the 18th and then gradually climbed to 100 in Grady by the 22nd. The lowest maximums recorded were in the 80s, except for on the 22nd when the northeast hit 90. Most areas had highs in the mid-80s on the 18th and 19th, and the low 90s on the 20th, 21st, and 22nd. Minimum temperatures ranged from 56 in Antlers to 75 in Tulsa. McAlester broke a daily low temperature record at 59 degrees on the 18th. Daily average wind speeds were less than 13mph on the 18th and 22nd, with light winds in most regions. The days in between were a little gustier with maximum daily wind speeds around 15mph on the 19th and 20th, and 17mph on the 21st.

AUGUST 23: Isolated showers and thunderstorms passed over east-central and southeast Oklahoma, leaving behind a quarter inch to .71 inches (Cookson) of rain before moving out. Maximum temperatures varied between 87 in Hectorville and Okemah and 101 in Tipton, Grady, and Altus. The lowest minimum temperature was 62 in the panhandle and the warmest minimum was 75 in central OK. Although the highest daily wind speed average was 13.4mph in Weatherford, most daily wind speeds were less than 10mph.

AUGUST 24-28: Despite some light, widespread showers on the 24th and 25th, precipitation amounts didn't accumulate to anything. Thus, the period from the 24th to the 28th was relatively dry. Skies were fair and warm/muggy conditions were a common trend. The warmest maximum temperatures hit the triple digits on the 24th and 25th (101 in Tipton and Altus; 100 in Hollis and Grady), but generally stayed in the upper 90s the following days. The lowest maximums were in the upper 80s and low 90s in the east-central and northeast portions of the state. The lowest temperatures fluctuated every other day between 62 and 63 degrees and the highest minimum was 75 every day except the 27th when it dropped to 72. Average daily wind speeds were roughly between 4 and 15mph on the 24th to the 27th, and between 3 and 13mph on the 28th.

AUGUST 29-31: The end of August continued the trend of muggy and warm conditions, with highs reaching the triple digits in some areas. The warmest temperatures were 102 in the southeast on the 29th, 105 in Tipton on the 30th, and 107 in Grady on the 31st. The lowest maximum temperatures were fairly warm as well, measuring in the mid-90s in the northeast. Minimum temperatures averaged in the upper 60s and low 70s. The lowest and highest minimums reported during this period, however, were 61 degrees in Kenton and 81 degrees in Tulsa. Apart from an isolated shower that brought .22 inches to Antlers, .18 inches to Cloudy, and .13 inches to Mt. Herman on the 31st, rainfall was negligible. Average wind speeds were less than 13mph and the highest gust was 46mph in Hooker on the 31st.

AUGUST 2013 SEVERE WEATHER

Wind Gusts (70 mph or greater)

Speed (m.p.h)	Location	County	Day
72	Wister	Le Flore	9
70	1 NNW Sterling	Comanche	15

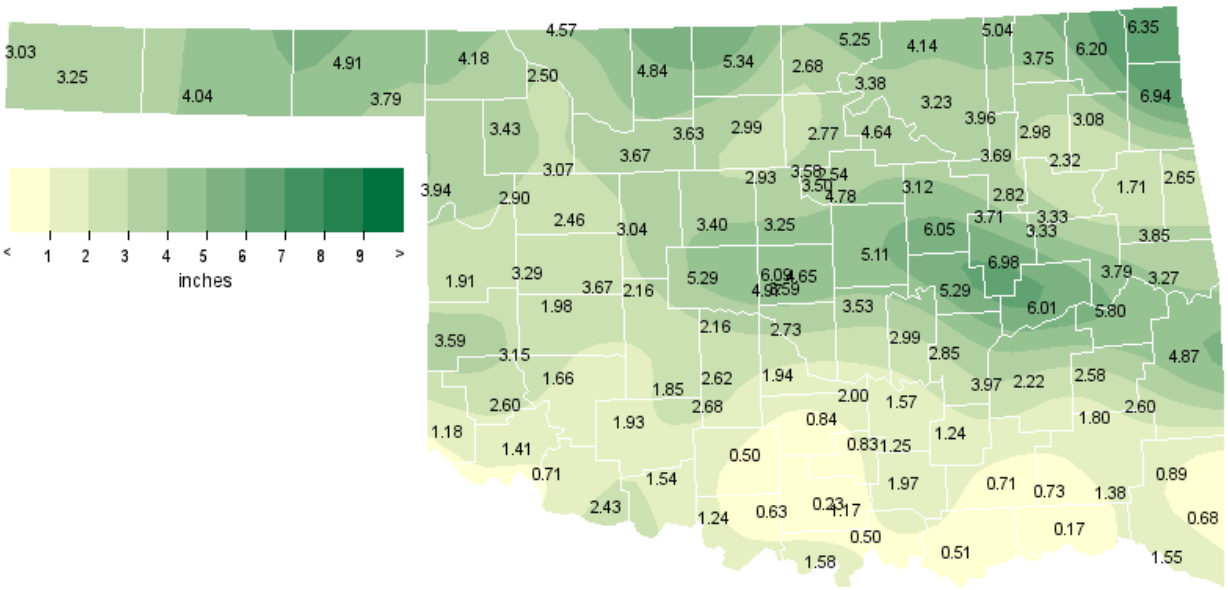
Flooding

Location	County	Day
Guymon	Texas	7
13 S Turpin	Beaver	7
Beaver	Beaver	7
Keyes	Cimarron	7
5 N Jay	Delaware	8
Fairland	Ottawa	8
2 SW Big Cabin	Craig	8
1 ENE Miami	Ottawa	8
5 W Sulphur	Murray	12
Checotah	McIntosh	13
Bartlesville	Washington	13

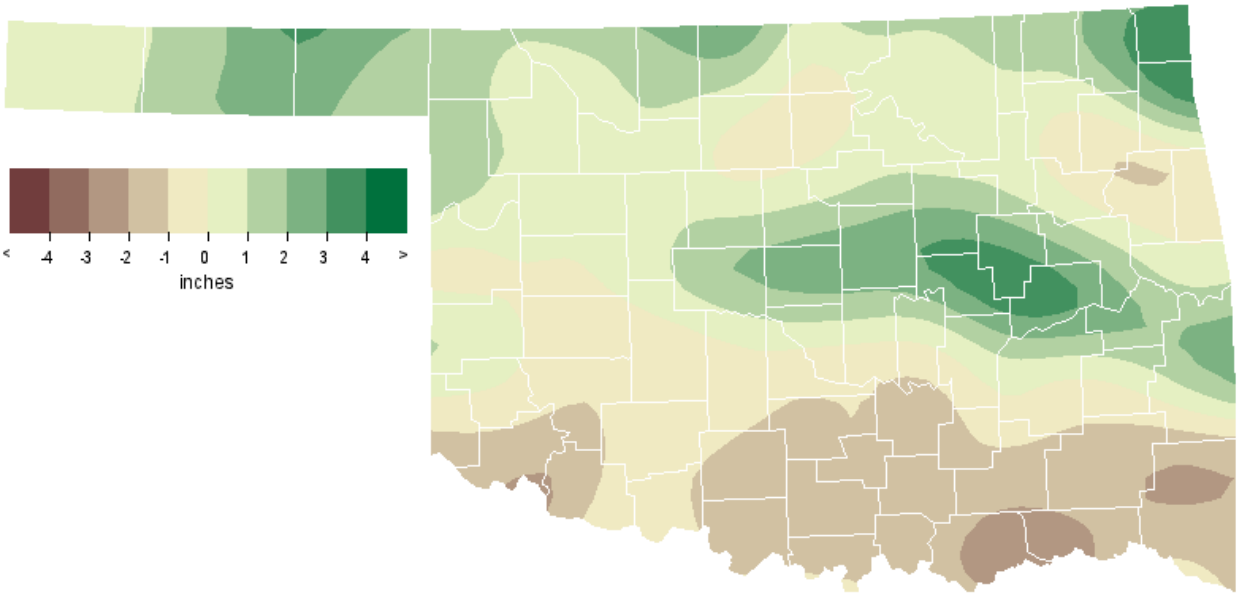
Hail (2 inches in diameter or greater)

Size (in.)	Location	County	Day
2.75	4 NNW Boise City	Cimarron	7
2.75	Keys	Cimarron	7
2.25	4 W Sweetwater	Beckham	16

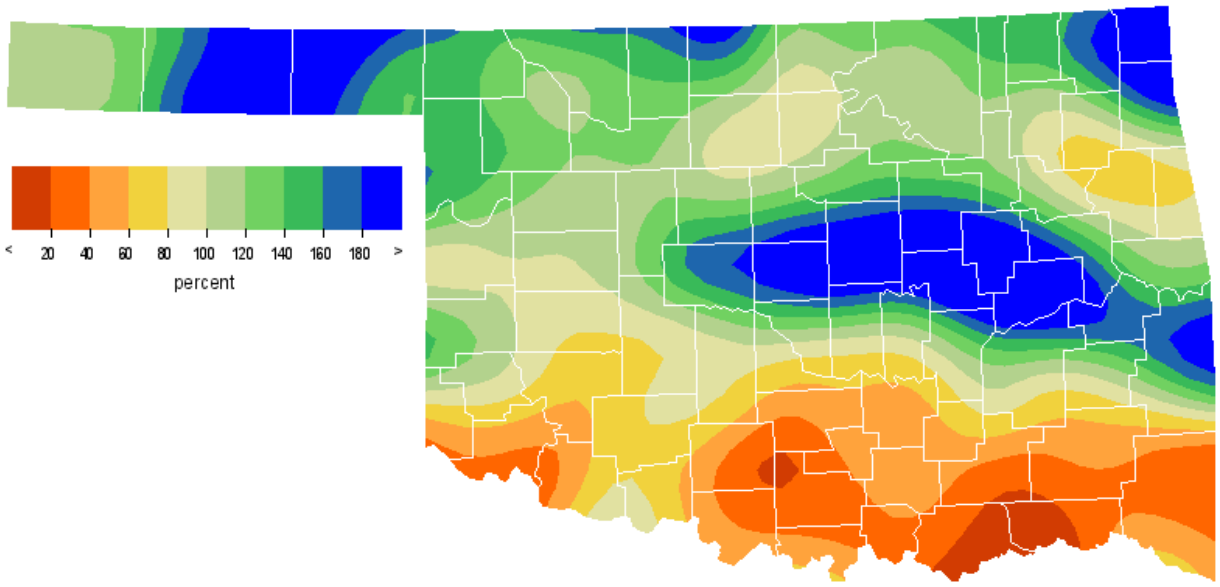
AUGUST 2013 OBSERVED PRECIPITATION



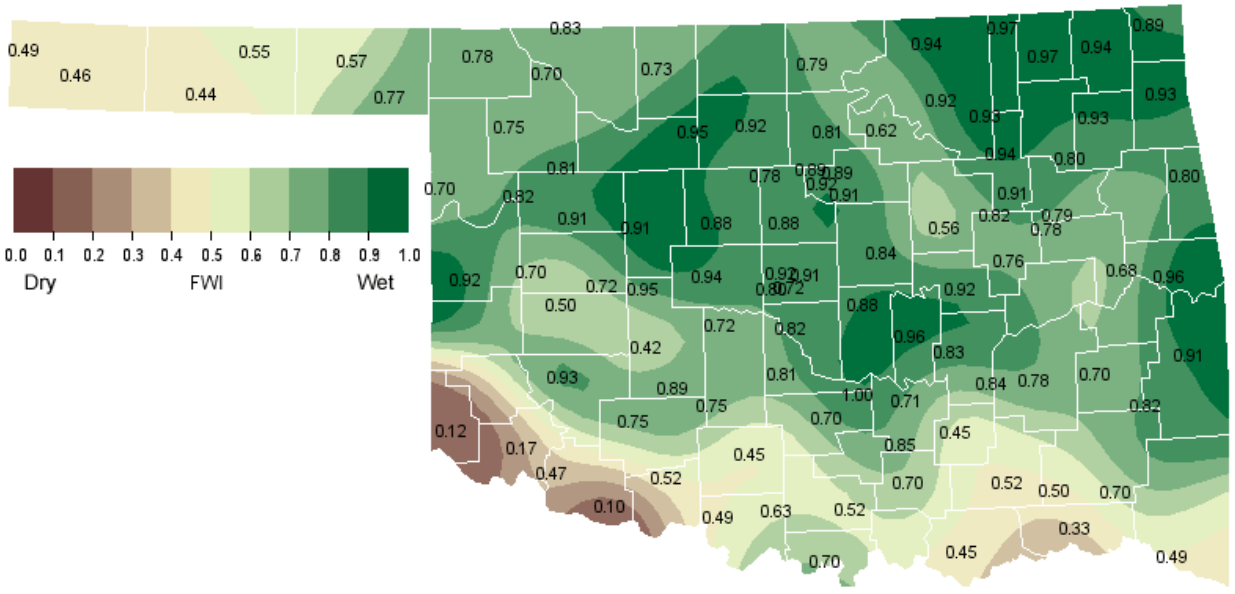
AUGUST 2013 DEPARTURE FROM NORMAL PRECIPITATION



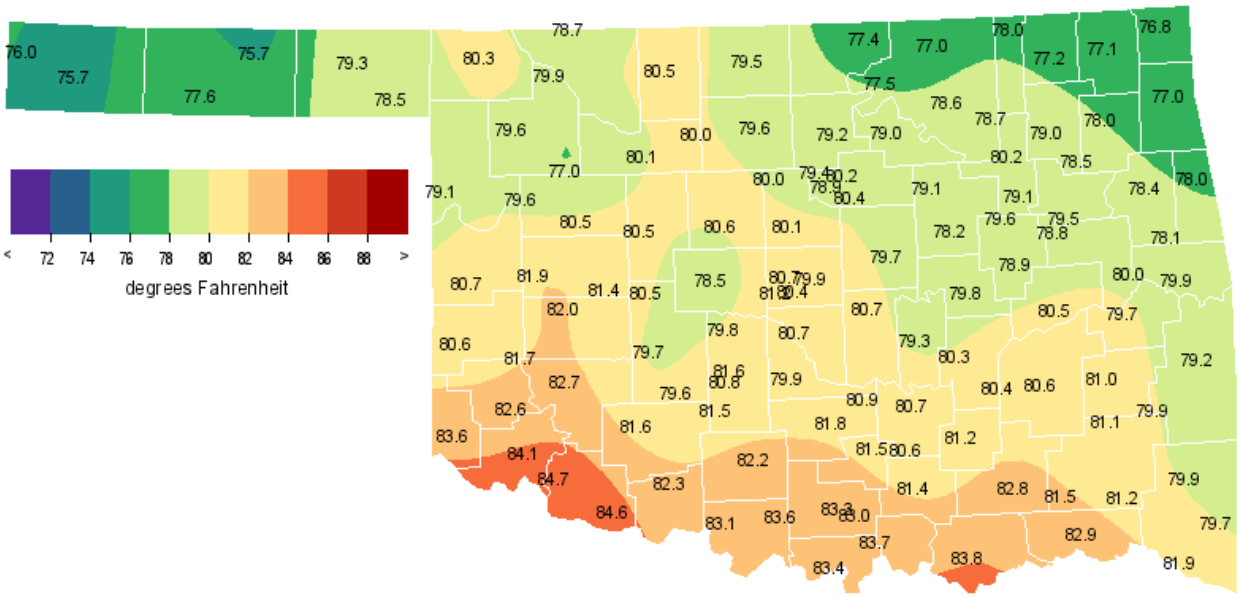
AUGUST 2013 PERCENT OF NORMAL PRECIPITATION



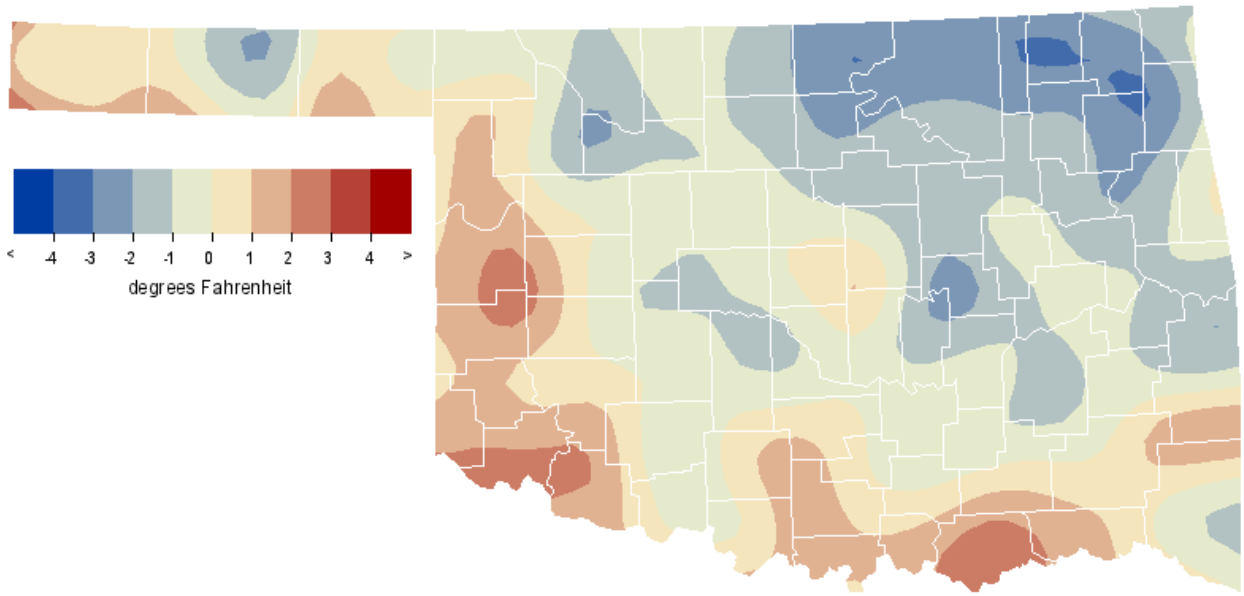
AUGUST 2013 AVERAGE SOIL MOISTURE AT 25CM



AUGUST 2013 AVERAGE TEMPERATURE



AUGUST 2013 DEPARTURE FROM NORMAL TEMPERATURE

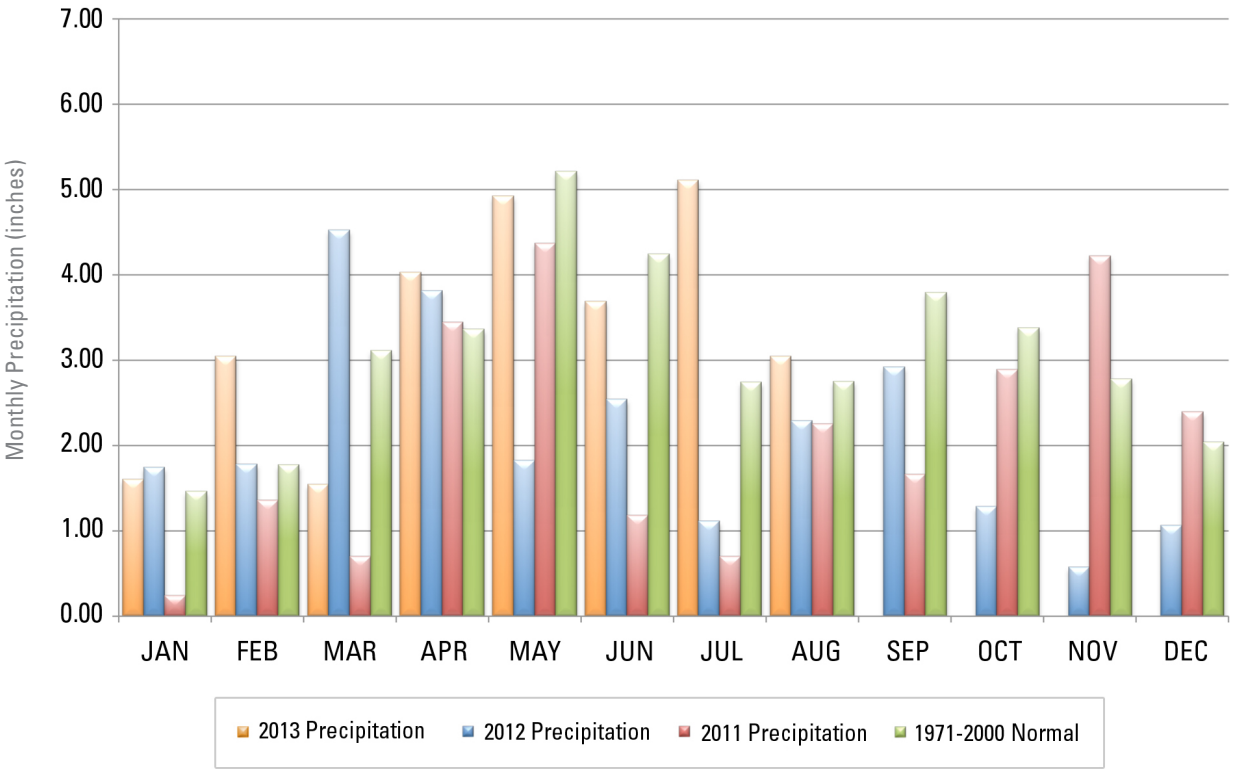


MESONET MONTHLY SUMMARY FOR AUGUST 2013

NAME	MEAN TEMP	HIGH TEMP	HIGH DAY	LOW TEMP	LOW DAY	HDD	CDD	TOT PPT	HIGH 24-HR	HIGH DAY
PANHANDLE										
Arnett	79.1	104	6	63	22	0	437	3.94	1.04	7
Beaver	79.4	105	5	59	15	0	445	4.91	2.82	7
Boise City	75.6	100	31	55	10	0	330	3.25	1.58	8
Buffalo	80.4	105	2	63	15	0	477	4.18	1.39	7
NORTH CENTRAL										
Alva	*****	***	***	***	***	****	****	*****	*****	***
Blackwell	*****	***	***	***	***	****	****	2.68	.76	12
Breckinridge	79.5	103	31	61	16	0	451	2.99	.97	8
Cherokee	80.5	104	31	63	16	0	481	4.84	3.22	8
Fairview	80.0	105	31	63	16	0	466	3.67	1.77	8
Freedom	79.8	105	31	61	16	0	460	2.50	1.38	8
Lahoma	80.0	104	31	62	16	0	465	3.63	1.45	8
NORTHEAST										
Bixby	79.2	99	6	60	18	0	440	2.82	.91	13
Burbank	77.5	98	31	59	18	0	386	3.38	1.01	15
Claremore	78.9	100	31	60	18	0	431	2.98	1.29	9
Copan	78.0	97	31	59	18	0	403	5.04	1.19	8
Foraker	77.0	97	31	58	18	0	373	4.14	.92	13
Inola	78.5	100	31	60	17	0	418	2.32	.72	9
Jay	77.0	95	31	54	17	0	372	6.94	4.11	8
Miami	76.8	95	31	57	17	0	365	6.35	2.23	4
WEST CENTRAL										
Bessie	82.0	106	6	64	19	0	526	1.98	.85	8
Butler	81.8	107	6	64	22	0	521	3.29	1.43	8
Camargo	79.7	104	6	60	22	0	455	2.90	2.18	8
Cheyenne	80.7	104	6	64	9	0	487	1.91	.69	8
Erick	80.6	107	6	61	22	0	484	3.59	1.33	8
CENTRAL										
Acme	81.4	104	31	62	17	0	507	2.68	1.00	13
Bowlegs	79.3	99	31	59	18	0	445	2.99	1.08	13
Bristow	78.2	97	31	57	18	0	408	6.05	2.21	13
Lake Carl Blac	79.4	103	31	60	18	0	446	3.58	1.32	9
Chandler	79.7	99	31	62	18	0	455	5.11	3.11	9
Chickasha	81.6	106	31	63	17	0	515	*****	*****	***
El Reno	78.5	99	31	61	17	0	420	5.29	2.39	13
Guthrie	80.0	104	31	62	16	0	466	3.25	1.24	8
Kingfisher	80.7	106	31	63	16	0	486	3.40	2.55	8
Marena	78.9	100	31	61	16	0	431	3.50	1.09	9
Minco	79.8	102	31	62	16	0	457	2.16	.96	13
Marshall	80.0	103	31	62	16	0	464	2.93	1.48	8
EAST CENTRAL										
Cookson	78.0	97	31	54	17	0	403	3.85	1.15	13
Eufaula	80.5	99	31	62	18	0	480	6.01	2.11	13
Haskell	78.9	98	31	60	18	0	430	3.33	1.21	9
Hectorville	79.7	98	31	61	18	0	455	3.71	.96	9
Holdenville	80.3	100	31	61	18	0	474	2.85	1.39	13
McAlester	80.6	102	31	59	17	0	485	2.22	.73	13
Okmulgee	78.9	99	6	58	18	0	430	6.98	3.15	13
SOUTHWEST										
Altus	84.1	108	6	65	16	0	593	1.41	.44	11
Apache	79.7	101	31	61	17	0	455	1.85	.61	13
Fort Cobb	79.7	101	2	63	17	0	455	*****	*****	***
Grandfield	84.6	108	6	64	21	0	608	2.43	.93	16
Hinton	80.4	105	31	63	17	0	478	2.16	.99	8
Hobart	82.7	105	31	64	19	0	549	1.66	.81	11
SOUTH CENTRAL										
Ada	80.7	102	31	58	18	0	486	1.57	.79	16
Ardmore	83.0	103	31	61	17	0	558	1.17	.73	12
Burneyville	83.4	106	31	59	17	0	570	1.58	.47	16
Byars	80.8	101	31	60	17	0	491	2.00	.58	9
Centrahoma	81.2	104	31	59	17	0	502	1.24	.54	16
Durant	83.8	103	31	60	17	0	583	.51	.38	12
Fittstown	80.6	101	31	59	17	0	484	1.25	.46	8
Ketchum Ranch	82.2	104	31	62	17	0	533	.50	.43	8
Lane	82.8	104	31	58	18	0	552	.71	.63	8
SOUTHEAST										
Antlers	81.5	104	31	55	17	0	512	.73	.41	8
Antlers	*****	***	***	***	***	****	****	*****	*****	***
Broken Bow	79.7	98	29	55	17	0	455	.68	.58	12
Clayton	81.1	103	31	57	17	0	500	1.80	1.07	8
Cloudy	81.2	102	31	58	17	0	503	1.38	.57	12
Hugo	82.9	102	31	60	17	0	555	.17	.13	12

NAME	MEAN TEMP	HIGH TEMP	HIGH DAY	LOW TEMP	LOW DAY	HDD	CDD	TOT PPT	HIGH 24-HR	HIGH DAY
Goodwell	77.6	102	2	58	10	0	390	4.04	1.36	12
Hooker	78.5	105	31	58	10	0	419	2.89	2.26	7
Kenton	75.9	99	31	57	10	0	337	3.03	2.22	7
Slapout	78.5	105	2	61	22	0	420	3.79	1.50	7
May Ranch	78.7	103	31	61	10	0	425	4.57	2.13	8
Medford	79.5	104	31	62	16	0	448	5.34	1.90	9
Newkirk	77.4	98	31	60	18	0	385	5.25	1.14	15
Red Rock	79.2	102	31	60	18	0	439	2.77	.85	15
Seiling	79.8	104	31	62	22	0	459	3.07	2.32	8
Woodward	79.6	103	31	62	16	0	453	3.43	1.54	8
Nowata	77.2	97	31	58	18	0	379	3.75	.96	8
Pawnee	79.0	100	31	60	18	0	433	4.64	1.78	12
Porter	79.5	99	31	61	17	0	450	3.33	1.47	13
Pryor	78.1	97	31	59	17	0	405	3.08	.96	9
Skiatook	78.7	98	31	61	15	0	425	3.96	1.44	13
Vinita	77.1	95	31	57	17	0	376	6.20	2.32	8
Wynona	78.6	101	31	61	18	0	421	3.23	1.07	15
Putnam	80.4	103	6	62	16	0	478	2.46	1.35	8
Retrop	81.8	105	6	64	17	0	520	3.15	1.17	11
Watonga	80.6	104	31	62	16	0	482	3.04	1.43	8
Weatherford	81.4	106	6	63	16	0	508	3.67	1.85	8
Ninnekah	80.8	103	31	62	17	0	491	2.62	1.17	13
Norman	80.7	101	31	63	16	0	488	2.73	.99	13
Oilton	79.1	100	31	58	18	0	438	3.12	1.20	9
OKC East	80.4	101	31	62	17	0	477	3.59	1.77	8
OKC North	80.7	101	31	63	16	0	488	6.09	3.66	8
OKC West	81.2	100	31	63	16	0	501	4.97	2.12	8
Okemah	79.8	99	31	61	18	0	458	5.29	1.94	9
Perkins	80.4	103	31	62	16	0	478	4.78	1.19	8
Shawnee	80.6	101	31	61	18	0	485	3.53	.97	13
Spencer	79.9	100	31	61	18	0	462	4.65	1.72	13
Stillwater	80.2	101	31	61	18	0	470	2.54	.87	15
Washington	80.0	103	31	61	17	0	465	1.94	.88	13
Sallisaw	79.9	99	31	58	17	0	460	3.27	1.26	9
Stigler	79.7	99	31	59	17	0	457	5.80	2.56	13
Stuart	80.4	100	31	59	18	0	479	3.97	1.49	12
Tahlequah	78.4	99	31	57	17	0	414	1.71	.68	9
Webbers Falls	80.0	99	6	60	17	0	465	3.79	1.41	13
Westville	77.9	96	31	57	17	0	400	2.65	.94	8
Hollis	83.6	108	6	64	16	0	576	1.18	.39	16
Mangum	82.6	108	6	62	27	0	546	2.60	1.79	11
Medicine Park	81.6	102	31	63	16	0	514	1.93	.73	16
Tipton	84.7	107	6	66	21	0	612	.71	.18	8
Walters	*****	***	***	***	***	****	****	*****	*****	***
Madill	83.6	105	31	61	17	0	578	.50	.15	9
Newport	83.3	106	31	61	17	0	566	.23	.08	16
Pauls Valley	81.8	105	31	62	18	0	520	.84	.43	16
Ringling	83.6	105	31	61	17	0	577	.63	.31	12
Sulphur	81.5	103	31	60	17	0	510	.83	.57	16
Tishomingo	81.4	103	31	60	17	0	509	1.97	1.09	8
Vanoss	*****	***	***	***	***	****	****	*****	*****	***
Waurika	83.1	106	31	62	17	0	560	1.24	.75	12
Idabel	81.9	101	7	57	17	0	525	1.55	1.50	11
Mt Herman	79.9	99	30	54	17	0	463	.89	.67	12
Talihina	79.9	101	31	55	17	0	461	2.60	1.08	12
Wilburton	81.0	103	31	58	17	0	497	2.58	1.09	13
Wister	79.2	98	31	58	17	0	439	4.87	2.03	13

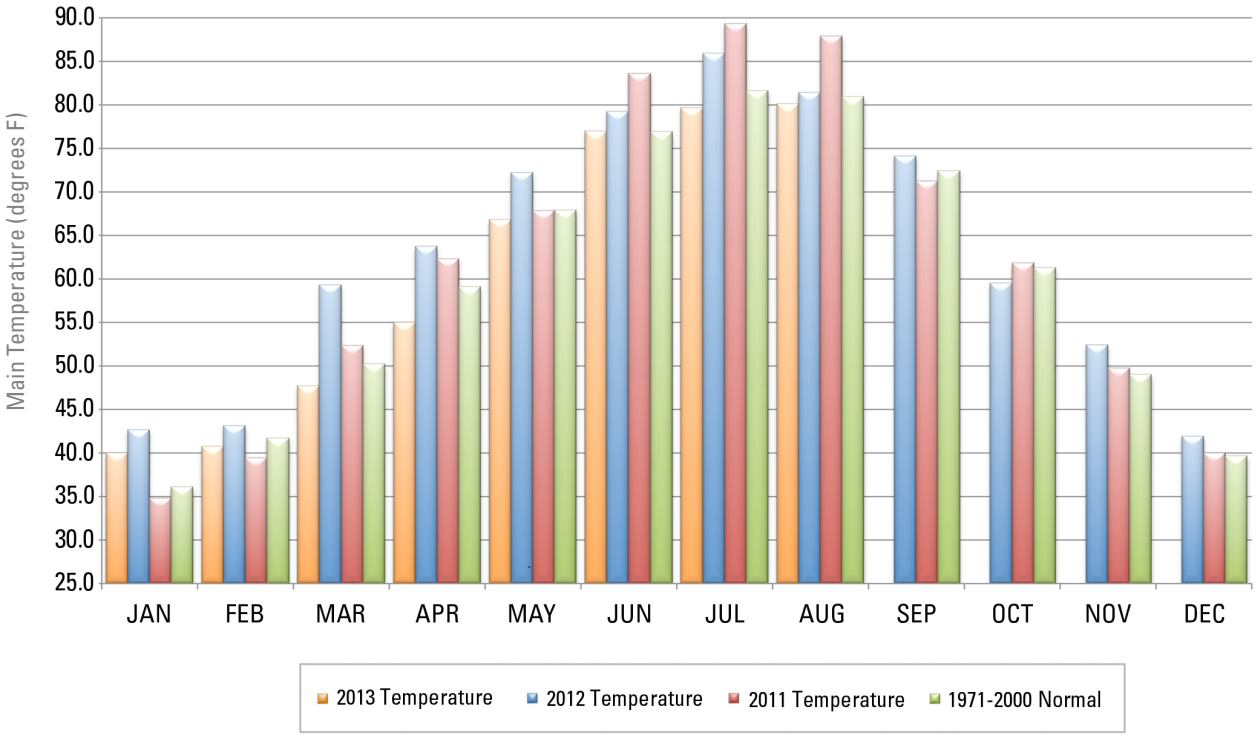
2011, 2012 AND 2013 STATEWIDE PRECIPITATION MONTHLY TOTALS VS. NORMAL



August 2013 Mesonet Precipitation Comparison

Climate Division	Precipitation (inches)	Departure from Normal (inches)	Rank since 1895	Wettest on Record (Year)	Driest on Record (Year)	Aug-12
Panhandle	3.88	1.37	20th Wettest	5.68 (1977)	0.47 (1913)	1.65
North Central	3.73	0.68	36th Wettest	7.69 (1974)	0.09 (1913)	1.81
Northeast	4.12	0.94	38th Wettest	8.03 (1964)	0.02 (2000)	2.32
West Central	2.89	0.17	43rd Wettest	7.25 (2005)	0.05 (1913)	1.63
Central	3.77	1.14	32nd Wettest	7.21 (1906)	0.03 (2000)	2.94
East Central	3.86	0.99	39th Wettest	6.89 (1915)	0.00 (2000)	3.18
Southwest	1.75	-0.94	49th Driest	8.01 (1996)	0.00 (1913)	1.57
South Central	1.05	-1.49	17th Driest	8.46 (1915)	0.01 (2000)	2.50
Southeast	1.73	-0.98	24th Driest	8.73 (1915)	0.19 (1943)	3.25
Statewide	3.04	0.27	51st Wettest	6.54 (1906)	0.14 (2000)	2.34

2011, 2012 AND 2013 STATEWIDE TEMPERATURE MONTHLY TOTALS VS. NORMAL



August 2013 Mesonet Temperature Comparison

Climate Division	Average Temp (F)	Departure from Normal (F)	Rank since 1895	Hottest on Record (Year)	Coldest on Record (Year)	Aug-12 (F)
Panhandle	77.8	0.0	50th Coolest	85.1 (2011)	71.3 (1915)	78.3
North Central	79.2	-1.5	36th Coolest	88.9 (1936)	72.3 (1915)	80.0
Northeast	78.2	-1.6	33rd Coolest	88.4 (1936)	71.7 (1915)	81.0
West Central	81.0	0.8	56th Warmest	88.1 (2011)	72.9 (1915)	81.8
Central	80.1	-0.9	43rd Coolest	88.7 (2011)	73.1 (1915)	82.4
East Central	79.5	-0.9	42nd Coolest	88.0 (1936)	73.0 (1915)	83.3
Southwest	82.4	0.6	59th Warmest	91.2 (2011)	75.4 (1915)	84.4
South Central	82.3	0.5	57th Warmest	90.6 (2011)	75.5 (1915)	82.5
Southeast	80.8	0.5	59th Warmest	87.4 (2011)	74.5 (1915)	80.3
Statewide	80.1	-0.3	49th Coolest	87.9 (2011)	73.2 (1915)	81.5

RECORD EVENT REPORTS

Description	Day	Location	Record	Previous Record	Year
Daily Low Temperature	18	McAlester	59	61	1999

MESONET EXTREMES FOR AUGUST 2013

Climate Division	High Temp (F)	Day	Station	Low Temp (F)	Day	Station	High Monthly Rainfall (inches)	Station	High Daily Rainfall (inches)	Day	Station
Panhandle	105	5th	Beaver	55	10th	Boise City	4.91	Beaver	2.82	7th	Beaver
North Central	105	31st	Freedom	60	18th	Red Rock	5.34	Medford	3.22	8th	Cherokee
Northeast	101	31st	Wynona	54	17th	Jay	6.94	Jay	4.11	8th	Jay
West Central	107	6th	Erick	60	22nd	Camargo	3.67	Weatherford	2.18	8th	Camargo
Central	106	31st	Kingfisher	57	18th	Bristow	6.09	Oklahoma City North	3.66	8th	Oklahoma City North
East Central	102	31st	McAlester	54	17th	Cookson	6.98	Okmulgee	3.15	13th	Okmulgee
Southwest	108	6th	Altus	61	17th	Apache	2.60	Mangum	1.79	11th	Mangum
South Central	106	31st	Burneyville	58	18th	Lane	2.00	Byars	1.09	8th	Tishomingo
Southeast	104	31st	Antlers	54	17th	Mt Herman	4.87	Wister	2.03	13th	Wister
Statewide	108	6th	Altus	54	17th	Jay	6.98	Okmulgee	4.11	8th	Jay

SEPTEMBER OUTLOOK

Summer's heat fades as precipitation increases across most of Oklahoma during September. The statewide-averaged normal temperature for the month, 73.0 degrees, makes September the fourth warmest month of the year. As such, climatologists consider it the first month of the autumn transitional season. Monthly precipitation decreases in extreme northwestern portions of the state, even as the rest of the state enjoys a second rainy season. Normal monthly precipitation, averaged statewide, is 3.80 inches, an increase of more than one inch over either of the two previous months. An increasing frequency of fronts, bringing cooler air from the northern plains, leads to the lower temperatures, an effect that often isn't apparent before the middle of the month.

Temperature

Mean	73.0 degrees
Hottest September	1931, 79.8 degrees
Coolest September	1974, 64.7 degrees
Hottest location	Waurika, 76.8 degrees
Coolest location	Boise City, 68.0 degrees
Hottest recorded	115 degrees, Alva, September 3, 1939 and 1947
Coldest recorded	25 degrees, Boise City, September 30, 1985

Freezes are uncommon in September, but stations in the extreme northwest experience a freeze before the end of September in about 10 percent of years. The earliest reported freeze is September 15, in 1993 at Freedom (28 degrees), Gage (30 degrees), and Hammon (30 degrees), and in 1947 at Kenton (31 degrees). Hot weather is most evident in the southwest. Chattanooga averages 16 days in September with a high temperature of 90 degrees or more, including four days in which the temperature reaches 100 degrees or more. Conversely, Kansas and Stilwell each average only six September days with the high temperature in the 90s. Triple digit temperatures occur only about once every third year at Miami, Kenton, and Boise City.

Statewide-averaged precipitation has varied between 0.27 inch in 1956 and 7.86 inches in 1945. Wyandotte recorded 16.82 inches in September 1945 to hold the monthly state record. The record daily precipitation at a regular reporting station is the 10.42 inches reported at Barnsdall on September 29, 1986. Snow is rare in September, But Boise City reported 4 inches for the month in 1984 and Kenton recorded 3 inches on September 17, 1971, the earliest snowfall in the state since at least 1910.

Precipitation

Mean	3.80 inches
Wettest September	1945, 7.86 inches
Driest September	1956, 0.27 inches
Wettest location	Kansas, 5.56 inches
Driest location	Regnier, 1.44 inches
Most recorded	16.82 inches, Wyandotte, 1945

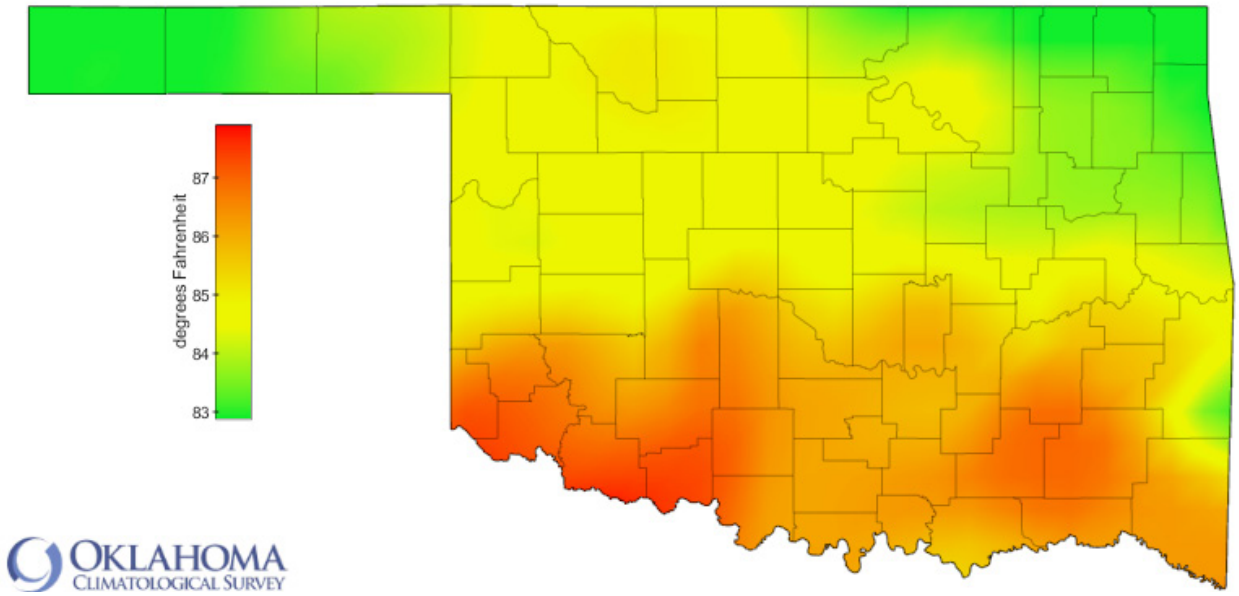
Tornadoes

Average September Tornadoes	2
Most	16 (1992)

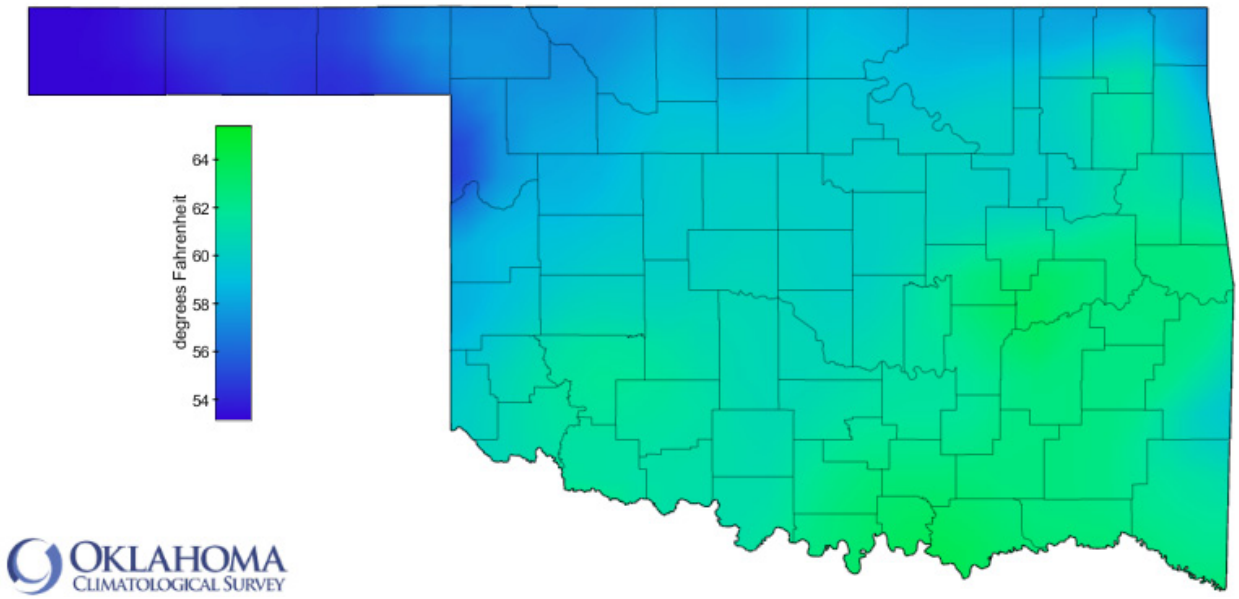
Tornadoes are slightly more frequent in September, averaging 2.1 each year, than they are during the previous two months. The most tornadoes reported in the state during September is 16 in 1992. No tornadoes were reported in the state during September in 18 of 52 years from 1950 through 2001 (the period of comprehensive records). Two people killed in Pottawattomie County on September 14, 1957 are the only tornado-related deaths recorded in September during that period.

Floods present a more common weather hazard than tornadoes in September. Residual moisture from tropical disturbances, usually from the Gulf of Mexico but occasionally from the Pacific Ocean, interacts with slow moving frontal systems in the state from time-to-time during the autumn months. Widespread heavy downpours are the typical result, frequently leading to flooding on larger rivers and streams. On other occasions, a frontal system will stall within the state and successive thunderstorms will form along the frontal boundary and follow each other along a narrow path, thereby producing intense rain over a limited area and causing dangerous flash flooding.

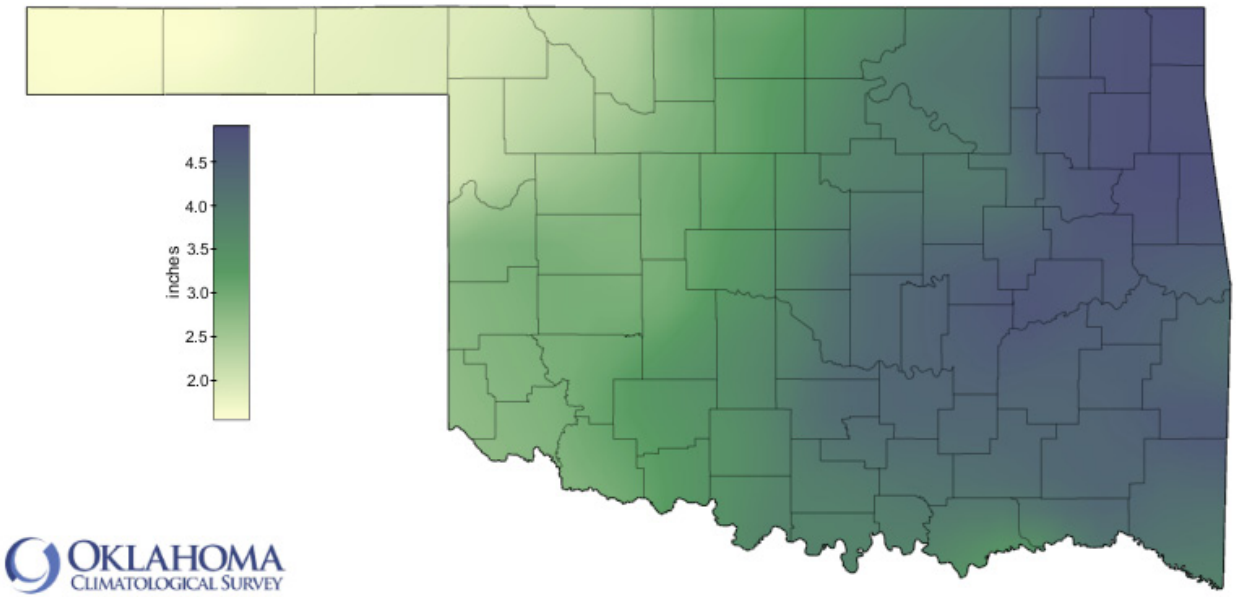
SEPTEMBER NORMAL DAILY MAXIMUM TEMPERATURE (1981-2010)



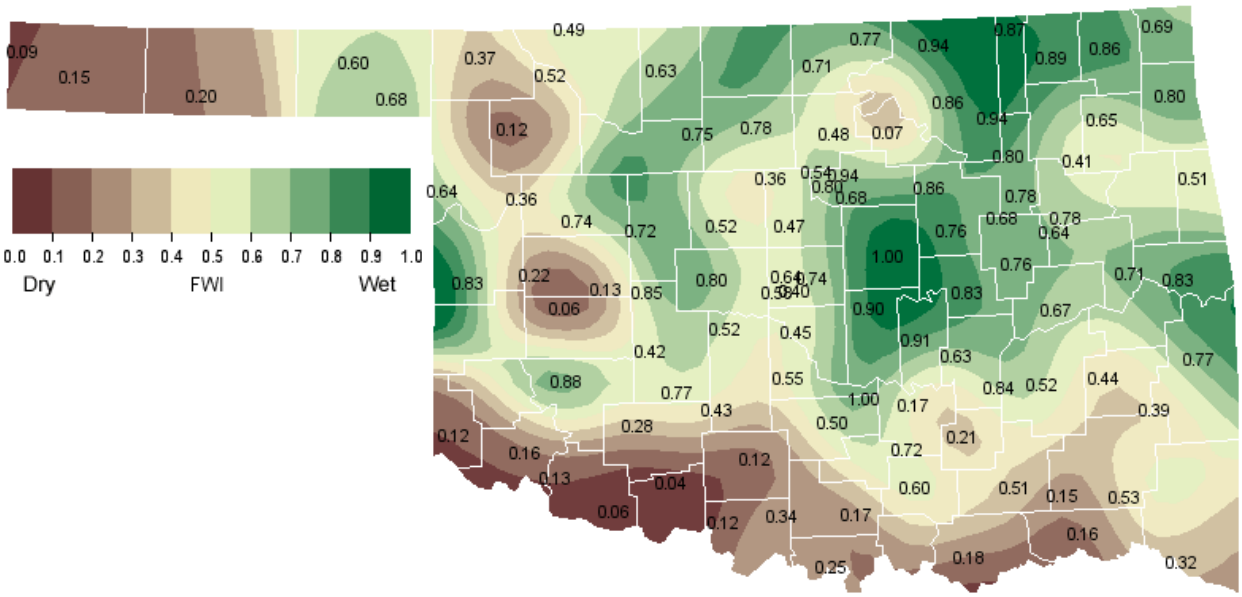
SEPTEMBER NORMAL DAILY MINIMUM TEMPERATURE (1981-2010)



SEPTEMEBER NORMAL PRECIPITATION (1981-2010)



SEPTEMEBER 1, 2013 SOIL MOISTURE CONDITIONS AT 25CM



SEPTEMBER 2013 DROUGHT INDICES

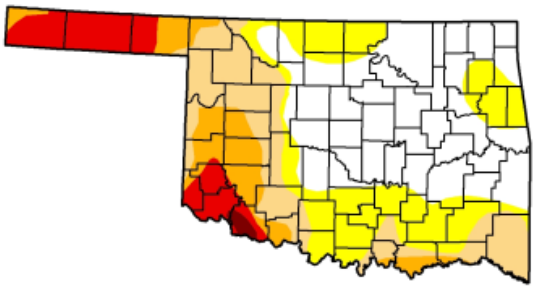
U.S. Drought Monitor

August 27, 2013
Valid 7 a.m. EST

Oklahoma

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	39.80	60.20	38.01	19.44	9.89	0.54
Last Week (08/20/2013 map)	53.91	46.09	32.82	22.26	9.89	0.54
3 Months Ago (05/28/2013 map)	31.88	68.12	58.80	48.33	26.51	11.34
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	100.00	94.89	37.06
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	99.98	95.33	42.09
One Year Ago (08/21/2012 map)	0.00	100.00	100.00	99.62	90.11	48.10



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu

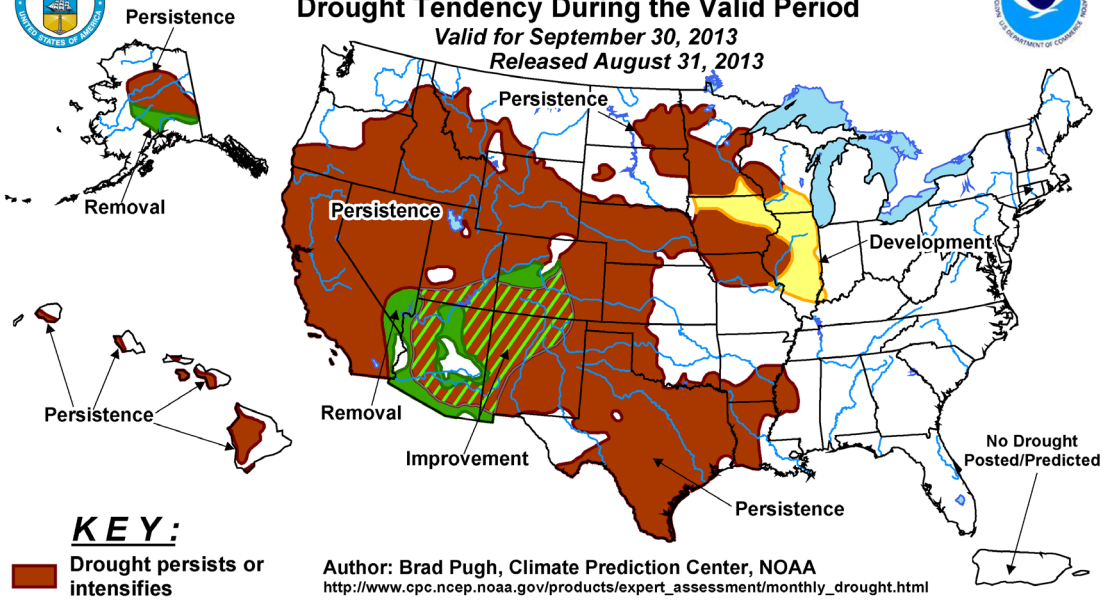
USDA | National Drought Mitigation Center

Released Thursday, August 29, 2013
Anthony Artusa, NOAA/NWS/NCEP/CPC

U.S. Monthly Drought Outlook

Drought Tendency During the Valid Period

Valid for September 30, 2013
Released August 31, 2013



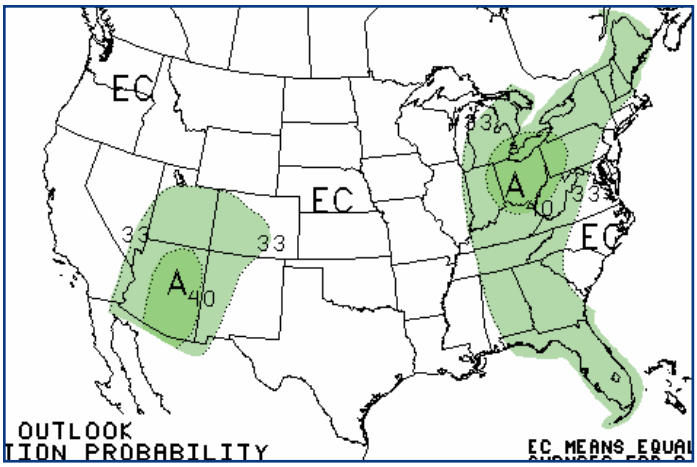
KEY:

- **Drought persists or intensifies**
- **Drought remains but improves**
- **Drought removal likely**
- **Drought development likely**

Author: Brad Pugh, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/monthly_drought.html

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.
NOTE: The Green and Brown hatched areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The Green areas imply drought removal by the end of the period (D0 or none)

SEPTEMBER 2013 U.S. PRECIPITATION FORECAST



Percent Likelihood of Above or Below Average Precipitation*

- 5% - 10%
- 0% - 5%

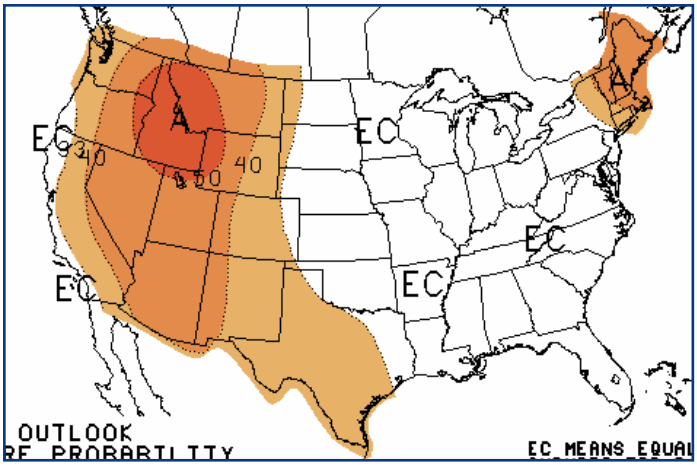
A = Above

- 0% - 5%
- 5% - 10%

B = Below

*EC indicates no forecasted anomalies due to lack of model skill.

SEPTEMBER 2013 U.S. TEMPERATURE FORECAST



Percent Likelihood of Above or Below Average Temperatures*

- 10% - 20%
- 5% - 10%
- 0% - 5%

A = Above

- 0% - 5%
- 5% - 10%

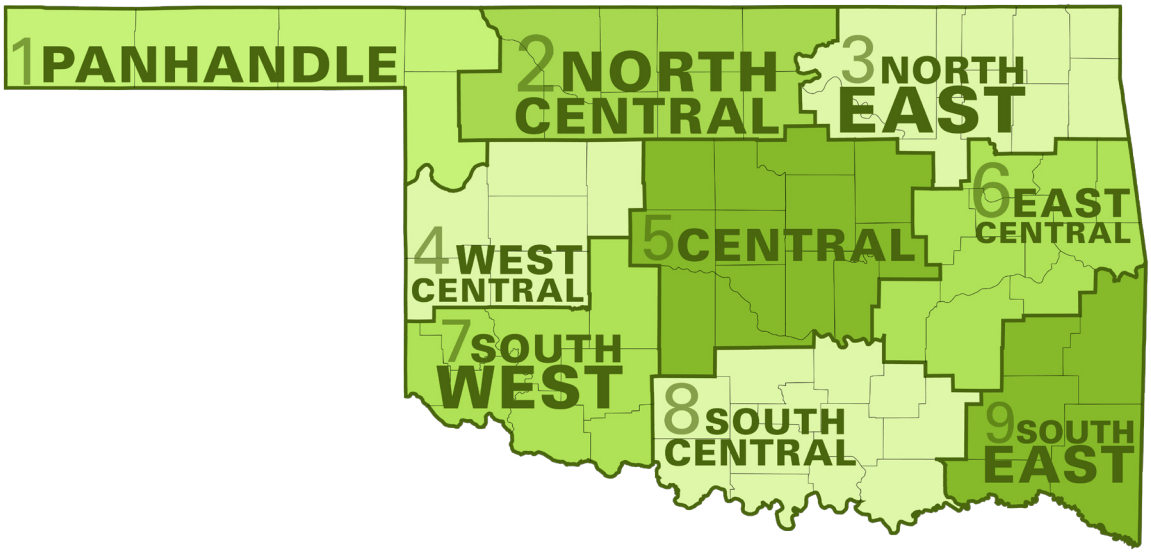
B = Below

*EC indicates no forecasted anomalies due to lack of model skill.

SEPTEMBER CLIMATE NORMALS

Climate Division	Max. Temperature (°F)	Min. Temperature (°F)	Avg. Temperature (°F)	Precipitation (inches)
1	84.5	55.6	70.1	1.86
2	84.8	59.2	72	3.13
3	84.1	60.5	72.3	4.83
4	84.7	59.5	72.1	2.95
5	84.8	61.0	72.9	4.03
6	84.5	61.3	72.9	4.88
7	86.4	61.0	73.7	3.34
8	86.2	62.3	74.3	4.27
9	85.9	60.9	73.4	4.52
Statewide	85.1	60.3	72.7	3.9

Oklahoma Climate Divisions



INTERPRETATION INFORMATION

MEAN DAILY TEMPERATURE: Calculated from an average of the daily maximum and minimum temperatures. Daily averages are summed for each day, and then divided by the number of valid data points – typically the number of days in the month. Although this June differ from the "true" daily average, it is consistent with historical methods of observation and comparable to the normals and extremes for stations and regions of the state.

DEGREE DAYS: Degree Days are calculated each day of the month for which there is a temperature report and the mean temperature for the day is less than (Heating Degree Days) or greater than (Cooling Degree Days) 65 degrees. Daily values are summed to arrive at a monthly total. HDD/CDD are qualitative measures of how much heating/cooling was required to maintain a comfortable indoor temperature. Missing observations June result in an artificially high or low value.

SEVERE WEATHER REPORTS: Only the most significant events are listed. Tornadoes of F2 or greater strength (on the 0-5 Fujita scale), hail of two inches diameter or greater, and wind speeds of 70 miles per hour or above are listed. National Weather Service defines storms as severe when they produce a tornado, hail of three-quarters inch or greater, or wind speeds above 57 miles per hour (50 knots). For additional reports, contact the Oklahoma Climatological Survey, Storm Prediction Center, or your local National Weather Service forecast office.

SOIL MOISTURE: The soil moisture variable displayed is the Fractional Water Index (FWI), measured at a depth of 25 cm. This unitless value ranges from very dry soil having a value of 0, to saturated soils having a value of 1.

ADDITIONAL RESOURCES

SUNRISE / SUNSET TABLES
U.S. Naval Observatory: http://aa.usno.navy.mil/data

SEVERE STORM REPORTS
Storm Prediction Center: http://spc.noaa.gov/climo/

National Climatic Data Center (more than about 4-5 months old):
http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

SEASONAL OUTLOOKS
Climate Prediction Center:
http://www.cpc.ncep.noaa.gov/products/OUTLOOKS_index.html

CLIMATE CALENDARS AND OTHER LOCAL WEATHER AND CLIMATE INFORMATION
Oklahoma Climatological Survey:
http://climate.mesonet.org or http://climate.ok.gov/

OKLAHOMA CLIMATOLOGICAL SURVEY

Oklahoma Climatological Survey is the State Climate Office for Oklahoma

Dr. Kevin Kloesel Director
Dr. Renee McPherson State Climatologist

EDITOR
Gary D. McManus Associate State Climatologist

CONTRIBUTORS
Gary D. McManus Associate State Climatologist
Dr. Mark A. Shafer Director of Climate Services
Howard Johnson Associate State Climatologist (Ret.)
Monica Deming Service Climatologist

DESIGN
Ada Shih Graphic Designer

For more information, contact:
Oklahoma Climatological Survey
The University of Oklahoma
120 David L. Boren Blvd., Suite 2900
Norman, OK 73072-7305

TEL: 405-325-2541
FAX: 405-325-2550
E-MAIL: ocs@ou.edu
WEBSITE: http://climate.ok.gov