Oklahoma Monthly Climate Summary

MAY 2013

OKLAHOMA CLIMATOLOGICAL SURVEY

In a state so accustomed to highly variable and often tumultuous weather, May 2013 will be long remembered as one of its most notorious. The month began with some of the coldest late-spring weather in the state's history and finished with a flourish of violent weather, including one of Oklahoma's worst tornado disasters on record. Stirring the echoes of May 3, 1999, for many central Oklahoma residents, a massive and violent tornado churned its path of destruction from near Newcastle through south Oklahoma City and Moore before dissipating near Stanley Draper Lake. The tornado reached EF5 level, the strongest category on the Enhanced Fujita Scale. The tornado had winds estimated at over 200 mph and reached a maximum damage width of 1.3 miles. State officials confirmed 24 fatalities due to the twister. The storm injured over 300 others with preliminary damage estimates totaling over $2 billion along its 17 mile, 40 minute path. The twister destroyed two Moore elementary schools, killing seven schoolchildren at Plaza Towers elementary and injuring many others. One day previous to that event, a violent twister traveled from east Norman to near McLoud causing two fatalities. That tornado was rated as an EF4. While numbers are still preliminary, the National Weather Service counted at least 19 tornadoes between the two days. Officials from the Oklahoma Department of Emergency Management estimated that the two-day barrage impacted 2937 homes, businesses and non-residential buildings. The severe weather was far from over, unfortunately. May's final three days saw a flurry of dangerous weather, culminating on its final day. A large tornadic supercell spawned several tornadoes from El Reno to Moore to southeast Oklahoma City. A preliminary count of nine fatalities from those tornadoes, including two children, brought the year's tally to at least 35. That ties 2013 with 1960 as Oklahoma's second deadliest tornado year since 1950, bested only by 1999's 42 fatalities. The stationary supercell produced prolific rainfall amounts across Oklahoma City and resulted in widespread flash flooding. At least two deaths were blamed on flash flooding from the event, with more possible as searches continued.

May saw a continuation of the cool weather and drought relief the state has experienced since mid-February, although western Oklahoma and the Panhandle remained parched. According to preliminary data from the Oklahoma Mesonet, the statewide average temperature finished at 66.8 degrees, more than a degree below normal. May was the fourth consecutive month to finish with below normal temperatures, a feat not seen in Oklahoma since the four month period between December 2009 and February 2010. The below normal finish was mainly due to a cool first half of the month, particularly during the first week. A freeze occurred across western and northern Oklahoma as late as May 3, with temperatures dropping into the 20s as far south as the Red River. Up to 2 inches of snow fell across northeastern Oklahoma on that day, the latest snowfall on record for many locations. Tulsa recorded its first ever May snowfall with a trace on May 2. Numerous records were broken for lowest minimum and lowest maximum temperatures during those first few days of the month. The climatological spring season of March-May finished with a statewide average temperature of 56.2 degrees, nearly 3 degrees below normal, to rank as the 11th coolest on record.

May 2013 Statewide Extremes

Description	Extreme	Station	Day
High Temperature	106°F	Altus, Tipton	31
Low Temperature	22°F	Boise City, Hooker, Kenton	3
High Precipitation	12.35 in.	Oklahoma City East	--
Low Precipitation	0.08 in.	Hooker	--

May 2013 Statewide Statistics

Temperature

	Average	Depart.	Rank (1895-2013)
Month (May)	66.8°F	-1.1°F	37th Coolest
Season-to-Date (Mar-May)	56.3°F	-2.8°F	11th Coolest
Year-to-Date (Jan-May)	50.0°F	-1.1°F	37th Coolest

Precipitation

	Average	Depart.	Rank (1895-2013)
Month (May)	4.92 in.	-0.29 in.	54th Wettest
Season-to-Date (Mar-May)	10.65 in.	-1.03 in.	53rd Wettest
Year-to-Date (Jan-May)	15.55 in.	0.66 in.	36th Wettest

Depart. = departure from 30-year normal

The precipitation totals across the state only added to the month's tarnished legacy. The Mesonet site at Hooker in Texas County recorded a measly 0.08 inches of rain for the month, the second lowest May total for that Panhandle town since records began in 1906, just 0.04 inches behind 1916's 0.04 inches. On the other end of the scale, Oklahoma City experienced its wettest May on record with a whopping 14.52 inches of rain at Will Rogers Airport. That total becomes Oklahoma City's second wettest month on record, eclipsed only by June 1989's 14.66 inches. Combined with March and April, Oklahoma City's spring total balloons to 23.18 inches, besting the previous wettest spring mark of 20.31 inches from 1947.

According to data from the Oklahoma Mesonet, the statewide average rainfall total for May was 4.9 inches, about 0.3 inches below normal. That ranks the month as the 54th wettest since 1895. A band from south central through central and northeastern Oklahoma recorded from 9 to 11 inches of rainfall. Most of the western third of the state recorded less than 2 inches, however, with much of the Panhandle seeing less than a quarter of an inch. Although the spring season had a rather unremarkable statewide average at 10.65 inches, about an inch below normal, the stark contrast between western Oklahoma and the rest of the state was evident in the details. The Panhandle experienced its fourth driest spring on record while central Oklahoma had its 15th wettest.

The exaggerated moisture difference produced obvious changes to the U.S. Drought Monitor by month's end. Extreme and exceptional drought increased through the western third of the state while drought was eliminated across much of central and eastern Oklahoma. May's final Drought Monitor map showed about 41 percent of the state being drought free, but 27 percent under the extreme-exceptional categories.

The June outlooks from the Climate Prediction Center (CPC) indicate increased odds of below normal precipitation and above normal temperature across western Oklahoma, particularly in the Panhandle. The outlooks are inconclusive across the rest of the state. The outlooks for the summer season call for increased odds of below normal rainfall across the western half of the state and above normal temperatures over all of Oklahoma. CPC's latest U.S. Seasonal Drought outlook predicts improving drought conditions across most of Oklahoma through August with the exception of the extreme western third of the state and the Panhandle. Drought is expected to persist or intensify in those areas.

MAY DAILY HIGHLIGHTS

MAY 1-2: A cold front pushed into the state, stretching from western north Texas to north-central Oklahoma. This produced a wide range of maximum temperatures ahead of and behind the front. Highs ranged from 59 in Boise City to 88 in Grady on the 1st, and 43 in Newkirk to 67 in Idabel on the 2nd. Although minimum temperatures reached into the low 60s on Wednesday and fell as cool as 24 in Boise City on Thursday, they averaged in the 30s for much of the state. Daily records for coldest maximum temperature (48 degrees) and lowest minimum temperature (37 degrees) were broken by Oklahoma City on the 2nd. On that same day, Tulsa broke its daily lowest mean temperature record (45) and McAlester tied its daily minimum temperature record (37). While a mix of rain and snow fell in the northwest, scattered showers and thunderstorms formed ahead of the front in central and north-central OK. A trace amount of snow fell in Tulsa, breaking a daily snowfall and latest snow date record. Other liquid precipitation amounts reached .85 inches in Medford (May 1st), .71 inches in Hobart (May 2nd), and .56 inches in Pawnee (May 2nd). Most areas, however, received less than a quarter inch. Wind speeds were gusty, peaking at 58 in Goodwell on the 1st and 64 in Medicine Park on the 2nd. Average wind speeds were on the high end as well, falling between 5 and 30mph.

MAY 3-6: With the cold front past, a gradual warm trend ensued from the 3rd through the 6th. The highest maximum temperatures increased from 72 in Hollis to 78 in Burneyville. Low maximum temperatures started at 50 degrees in Miami on the 3rd, but got to 60 degrees in Jay by the 6th. Following a similar trend and increasing by roughly 10 degrees in this 4-day period, the highest minimum temperatures jumped from 38 in Idabel to 49 in Medicine Park; the lowest minimum temperatures increased from a chilly 22 degrees in Boise City to 33 degrees in Kenton. McAlester broke two daily records on the 4th: lowest maximum temperature of 53 degrees and lowest mean temperature of 44 degrees. Despite some lingering light rain in eastern OK and some patchy fog in northwest, north-central, and central OK on the 6th, skies were fairly clear. Precipitation that fell in the northeast measured as much as .29 inches in Westville on the 3rd, followed by .46 inches in Jay and .35 inches in Westville on the 4th. Average wind speeds tended to stay below 15mph on the 3rd and 4th, and 10mph on the 5th and 6th.

MAY 7-11: This period was rather wet with multiple showers and thunderstorms pushing through the region. Warm front induced thunderstorms started in the northwest and increased in strength as they moved through northwest, north-central, and central Oklahoma. Intense lightning and hail reports of greater than 2 inches in diameter were reported in Dewey, Custer, Major, Caddo, Canadian, and Cleveland Counties on the 8th. The largest hailstone reported was 3 inches near Orion in Major County. As a cold front moved in from the west on the 9th, southern portions of the state got their turn at receiving generous amounts of rainfall. Mesonet sites that measured the highest amount of precipitation on each succeeding day were El Reno (1.57 in. on the 8th), Inola (2.38 in. on the 9th), Sallisaw (1.25 in. on the 10th), and Okemah (.36 in. on the 11th). Areas that received precipitation on the 7th generally had less than a tenth of an inch. Although central and south-central OK had patchy to dense fog on the morning of the 10th, it returned to the area in a much lighter form the following day. The highest maximum temperatures observed in the state were relatively

warm, climbing into the 80s on most days. Beaver, however, got as high as 91 degrees on the 8th. The lowest maximum temperatures started in the mid-70s, but dropped down to the mid-60s by the end of this period. Minimum temperatures were on the warmer side as well, averaging in the 40s and 50s. Average wind speeds were generally less than 15mph on the 7th and 8th, and less than 10mph on the 9th, 10th, and 11th. Some peak wind gusts were as high as 68mph on the 7th (Seiling) and 57mph on the 8th (Minco and Medford).

MAY 12-14: Lingering showers in the north quickly dissipated and made way for clear, sunny conditions for much of the state. Temperatures were above seasonal norms with the highest maximum temperatures in the 90s and the lowest maximum temperatures increasing from the mid-60s to low 80s from the 12th to the 14th. Minimum temperatures averaged in the 40s on the 12th, 50s on the 13th, and 60s on the 14th. Even with the trending warm temperatures, however, Bartlesville and Tulsa still managed to break their daily lowest temperature records on the 12th measuring minimums of 36 and 40 degrees, respectively. Average wind speeds were a little gusty, ranging from 5-10mph on the 12th, 5-15mph on the 13th, and 5-20mph on the 14th.

MAY 15-16: Showers formed in central Oklahoma on Wednesday and then spread into the eastern and southern portions of the state. Rainfall and a few thunderstorms continued on Thursday in the same areas. 1-2 inches of precipitation were common in eastern OK, with the highest amounts measured in Antlers (2.63 inches) and Bowlegs (2.47inches) on the 15th, and Idabel (1.64 inches) and Lane (1.58 inches) on the 16th. Maximum temperatures ranged from the mid-60s and low 70s to the low 90s. Minimum temperatures were generally in the upper 50s and low 60s. Average wind speeds were 5-15mph on the 15th and 5-10mph on the 16th.

MAY 17: Although Friday was rain free, skies were overcast for the majority of Oklahoma. Maximum temperatures ranged widely from 71 degrees in May Ranch to 97 degrees in Grady. Minimum temperatures fell between 52 in Breckinridge to 66 in Grady. Average wind speeds were less than 15mph, with the northwest being the windiest.

MAY 18-21: A slew of severe weather events, including hail, flooding, tornadoes, and severe wind gusts from passing showers and thunderstorms occurred during this period. Isolated storms formed in the southwest and moved northward on the 18th. On the 19th, intense thunderstorms continued to move across north-central Oklahoma to the east and northeast. Failing to keep away, severe weather passed through central and eastern Oklahoma on the 20th and then covered the western two-thirds of Oklahoma moving eastward by the 21st. On the 19th, three significant tornadoes (EF-2 or greater) occurred: an EF-2 (Pottawatomie/Lincoln County), an EF-3 (Lincoln County), and an EF-4 (Cleveland/Pottawatomie County). Two more significant tornadoes formed on the 20th: an EF-2 (Ottawa County) and an EF-5 (Grady/McClain/Cleveland County).

Hail greater than two inches was reported on the 18th (southwest and north-central OK), 19th (central OK), and 20th (central, south-central, and northwest OK). The largest hail reports were 4.25 inches in Osage County (20th), 3.25 inches in Canadian County (20th), and 3 inches in Cleveland County (19th). Wind gusts of 70mph were reported in Major County on the 18th, 80mph in Johnston County on the 20th, and 77mph in Caddo County on the 21st. Flooding was observed in the southeast and east-central portions of the state. Rainfall amounts were as high as 2.18 inches in Hobart (18th), 2.93 inches in Foraker (19th), 2.87 inches in Tishomingo (20th), and 4.46 inches in Centrahoma (21st). Oklahoma City and McAlester broke their daily maximum rainfall records at 2.82 inches and 3.81 inches on the 20th and 21st, respectively.
Maximum temperatures were well above normal for this time of year, reaching above 100 degrees in portions of the eastern half of the state on the 18th and 19th. The highest maximums only got to 99 and 79 on the following days. The lowest maximums were 83 in Copan on the 18th, 76 and 72 in Kenton on the 19th and 20th, and 64 in Ada on the 21st. Minimum temperatures ranged from the 40s and 50s in Boise City to the 60s and low 70s in the south. Despite thunderstorm wind gusts, average wind speeds were roughly 5-18mph, 10-20mph, 5-15mph, and 5-13mph on each consecutive day.

MAY 22: There was a little bit of relief on the 22nd with the majority of the state under sunny skies. Maximum temperatures ranged from 73 in Jay to 91 in Hollis, Altus, and Grady. Minimum temperatures varied between 40 in Kenton and 58 in Mt. Herman and Cloudy. Wind speeds averaged below 10mph.

MAY 23-25: Showers and thunderstorms returned to the state. The most severe storms during this three-day period occurred on the 23rd with hail measuring 2.5 inches in Murray County and flooding in Oklahoma, Canadian, and Cleveland Counties. Rain and storms impacted areas in the northwest and central one-third of Oklahoma on the 23rd, south-central and western Oklahoma on the 24th, and predominantly southern portions of the state on the 25th. Even with precipitation amounts ranging from a tenth of an inch in south-central Oklahoma to 2.5 inches at the Oklahoma City West Mesonet site on the 23rd, most areas received less than an inch on the 24th and 25th. Maximum temperatures ranged from the low 60s on Thursday and mid-70s on Friday and Saturday to the low 90s. Minimum temperatures averaged in the 50s and 60s. Average wind speeds were calm-18mph on the 23rd and 5-20mph on the 24th and 25th.

MAY 26: Despite a few weak showers in the southeast, rainfall was negligible on the 26th. Maximum temperatures ranged from 79 in Cloudy and Hugo to 100 in Hooker and Beaver. Minimum temperatures ranged from 53 in Boise City to 70 in Burneyville. Average wind speeds were between 5 and 20mph with a few gusts over 40mph in the panhandle.

MAY 27-31: The last week in May ended with another string of severe weather events. Showers and thunderstorms passed through areas in the northern half of the state on the 27th and 28th with wind gusts over 70mph in west-central counties on Monday. On the following three days, thunderstorms intensified in the north with many forming in central OK and moving east by the 31st. Hail over 2 inches was reported on the 29th, 30th, and 31st. The largest stone reported was 4.25 inches in Stephens County, followed by 4 inches in Garvin County on the 30th. Although many central and east-central counties had wind gusts over 70mph, Oklahoma County measured the highest gust at 87mph on the 31st. Multiple tornadoes occurred during this period, but the most significant were an EF-2 in Tulsa/Wagoner County on the 30th, and an EF-5 and EF-2 in Canadian County on the 31st.

In the areas that received rainfall, Mesonet amounts were generally between a tenth of an inch and .35 inches (Bessie) on the 27th, less than a tenth of an inch (except for .47 inches in Buffalo) on the 28th, 1 to 4.2 (Lake Carl Blackwell and Marshall) inches on the 29th, half an inch to 4.21 (Skiatook) inches on the 30th, and a quarter of an inch to 5.41 (Oklahoma City North) inches on the 31st. Daily maximum rainfall records were broken in McAlester at 2.46 inches on the 29th and in Oklahoma City at 5.64 inches on the 31st. Needless to say, flooding was reported in central, northeast, and southeast Oklahoma on Thursday and Friday. Maximum temperatures ranged from the upper 70s and low 80s to the 90s and low 100s. It got as toasty as 104 in Beaver on the 27th and 106 in Tipton and Altus on the 31st. Minimum temperatures fell between the 50s and the 70s. Daily average wind speeds were pretty brisk, maxing out near 25mph on the 27th and 29th, and 20mph on the 28th, 30th, and 31st.

MAY 2013 SEVERE WEATHER

Wind Gusts (70 mph or greater)

Speed (m.p.h)	Location	County	Day
70	1 WSW Lahoma	Major	18
80	2 WNW Wapanucka	Johnston	20
77	2 W Cyril	Caddo	21
70	7 N Reed	Greer	27
70	4 ENE Clinton	Custer	27
78	2 NE Clinton	Custer	27
70	1 W Burns Flat	Washita	27
70	Altus Air Force Base	Jackson	29
71	Altus	Jackson	29
79	4 NW Walters	Cotton	29
70	3 NW Walters	Cotton	29
70	Fort Supply	Woodward	29
70	4 E Lawton	Comanche	29
70	Midwest City	Oklahoma	29
70	3 WSW Lake Carl Blackwell	Payne	31
73	4 W Oklahoma City	Oklahoma	31
87	Tinker Air Force Base	Oklahoma	31
71	Will Rogers Airport	Oklahoma	31
70	2 N Eufaula	McIntosh	31

Flooding

Location	County	Day
Atoka	Atoka	21
7 NE Coalgate	Coal	21
Hodgen	Le Flore	21
Gans	Sequoyah	21
6 SW Oklahoma City	Oklahoma	23
9 WSW Oklahoma City	Oklahoma	23
3 NE Mustang	Canadian	23
4 NNW Norman	Cleveland	23
3 SSE Moore	Cleveland	23
4 SE Norman	Cleveland	23
3 N Mustang	Canadian	23
4 SE Yukon	Canadian	23
5 ESE Cyril	Caddo	30
Skiatook	Tulsa	30
4 WSW Oklahoma City	Oklahoma	31
Oklahoma City	Oklahoma	31
Newcastle	McClain	31
Del City	Oklahoma	31
3 NE Moore	Cleveland	31
3 N The Village	Oklahoma	31
1 S Heavener	Le Flore	31

Significant Tornadoes (EF2 or greater)

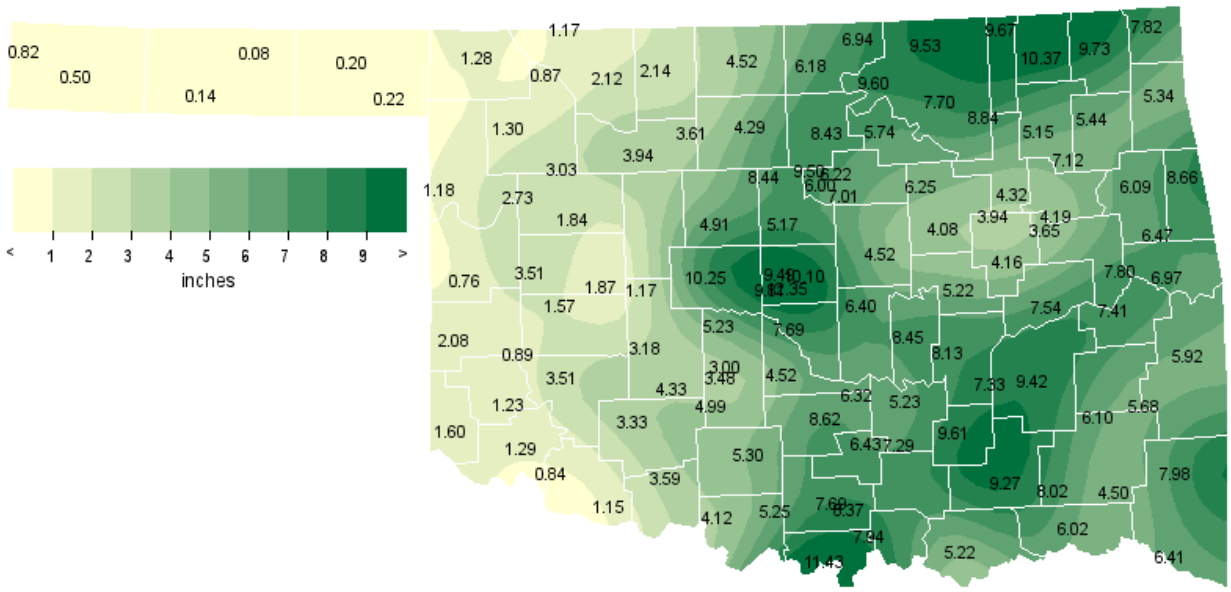
EF-rating	County	Day
3	Lincoln	19
4	Cleveland/Pottawatomie	19
2	Pottawatomie/Lincoln	19
5	Grady/McClain/Cleveland	20
2	Ottawa	20
2	Tulsa/Wagoner	30
5	Canadian	31
2	Canadian	31

MAY 2013 SEVERE WEATHER (CONT.)

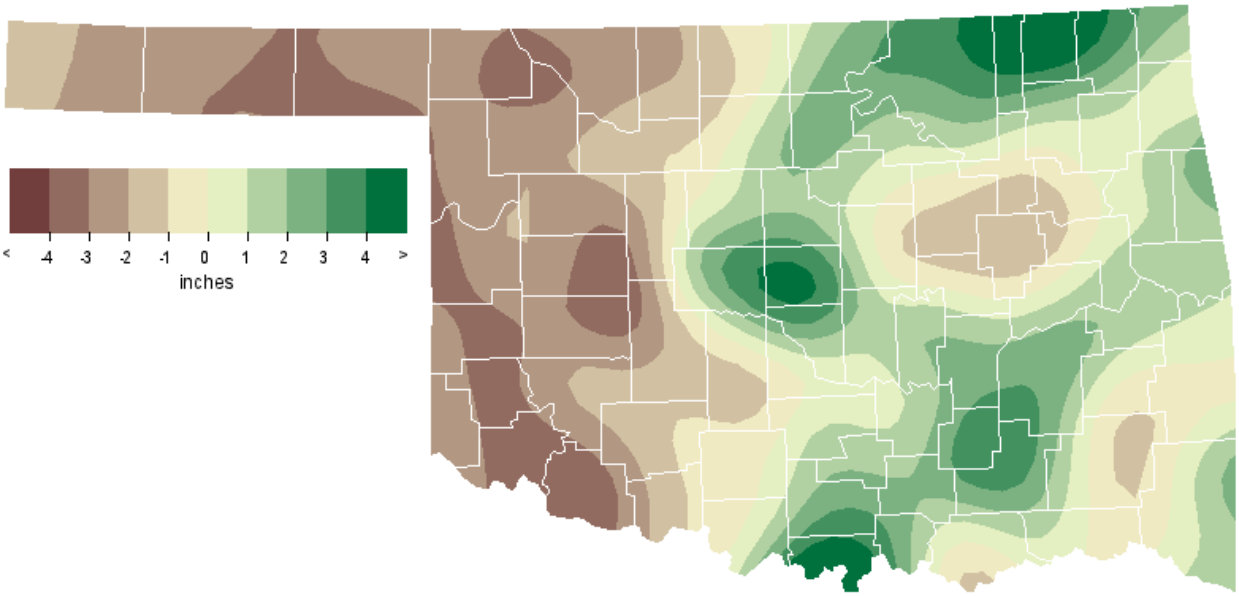
Hail (2 inches in diameter or greater)

Size (in.)	Location	County	Day
2.00	2 SSW Leedey	Dewey	8
2.00	2 WNW Thomas	Custer	8
2.00	1 S Chester	Major	8
2.75	4 E Chester	Major	8
3.00	3 W Orion	Major	8
2.50	1 S Chester	Major	8
2.00	3 NW Anadarko	Caddo	8
2.75	1 S Gracemont	Caddo	8
2.60	11 WSW El Reno	Canadian	8
2.25	3 W Moore	Cleveland	8
2.00	8 ESE Hinton	Canadian	8
2.50	3 W Seiling	Dewey	8
2.75	E Friendship	Jackson	18
2.75	Warren	Jackson	18
2.50	Warren	Jackson	18
2.50	Gould	Harmon	18
2.50	4 W Duke	Jackson	18
2.50	6 W Elk City	Beckham	18
2.00	3 E Blair	Jackson	18
2.00	Vance Air Force Base	Garfield	18
2.60	5 WNW Arcadia	Oklahoma	19
2.75	3 N Luther	Oklahoma	19
2.00	2 WSW Blanchard	Grady	19
2.50	NW Norman	Cleveland	19
3.00	N Norman	Cleveland	19
2.00	4 NE Norman	Cleveland	19
3.25	Yukon	Canadian	20
2.50	3 NNW Moore	Oklahoma	20
2.00	Will Rogers Airport	Oklahoma	20
2.50	Cornish	Jefferson	20
2.75	4 S Little City	Marshall	20
4.25	9 N Bigheart	Osage	20
2.75	Avant	Osage	20
2.50	Davis	Murray	23
2.90	7 SSW Erick	Beckham	29
2.75	8 NW Vinson	Harmon	29
2.00	14 S Erick	Greer	29
2.00	9 N Vinson	Beckham	29
2.50	14 S Erick	Greer	29
4.25	3 E Bray	Stephens	30
4.00	Wynnewood	Garvin	30
2.00	N Broken Arrow	Tulsa	30
2.50	6 ESE Lawton	Comanche	31
2.50	1 E Asher	Pottawatomie	31

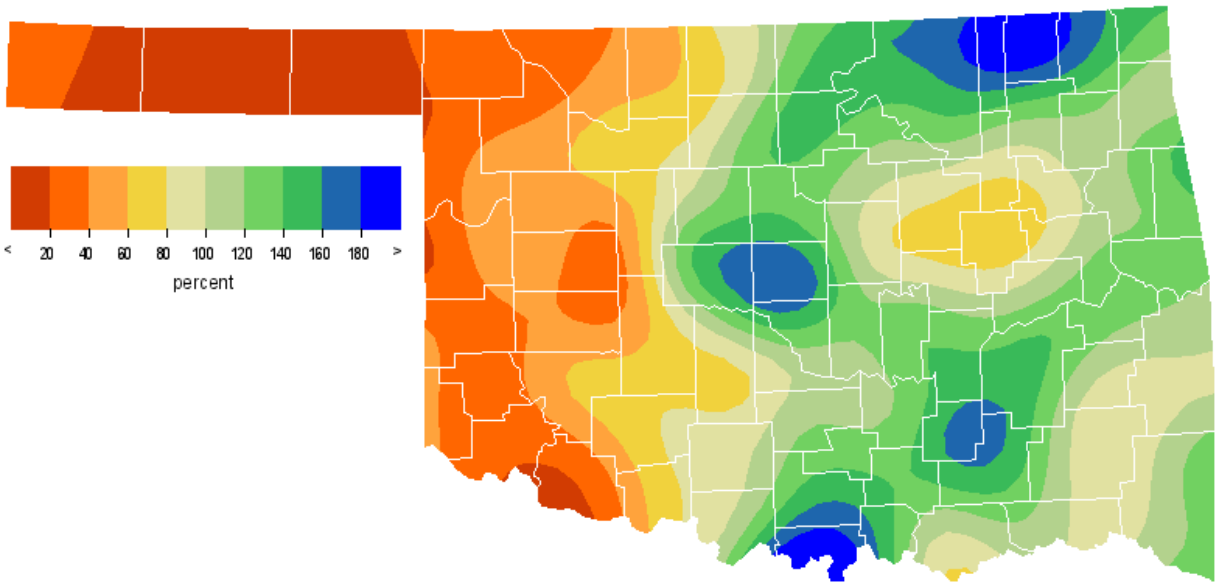
MAY 2013 OBSERVED PRECIPITATION



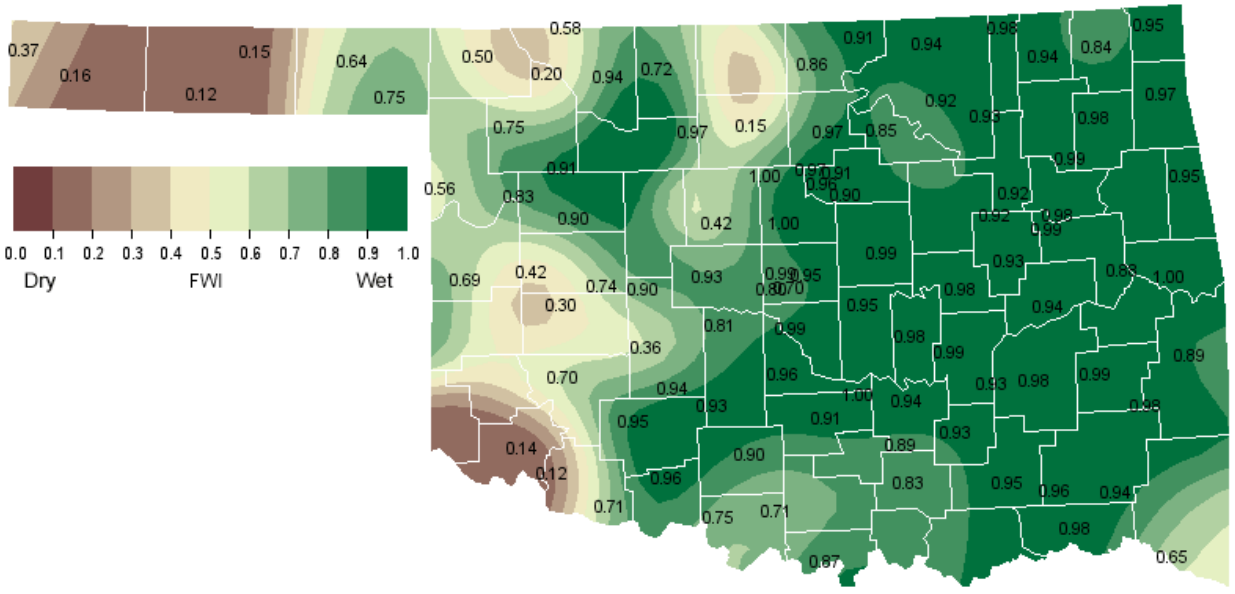
MAY 2013 DEPARTURE FROM NORMAL PRECIPITATION



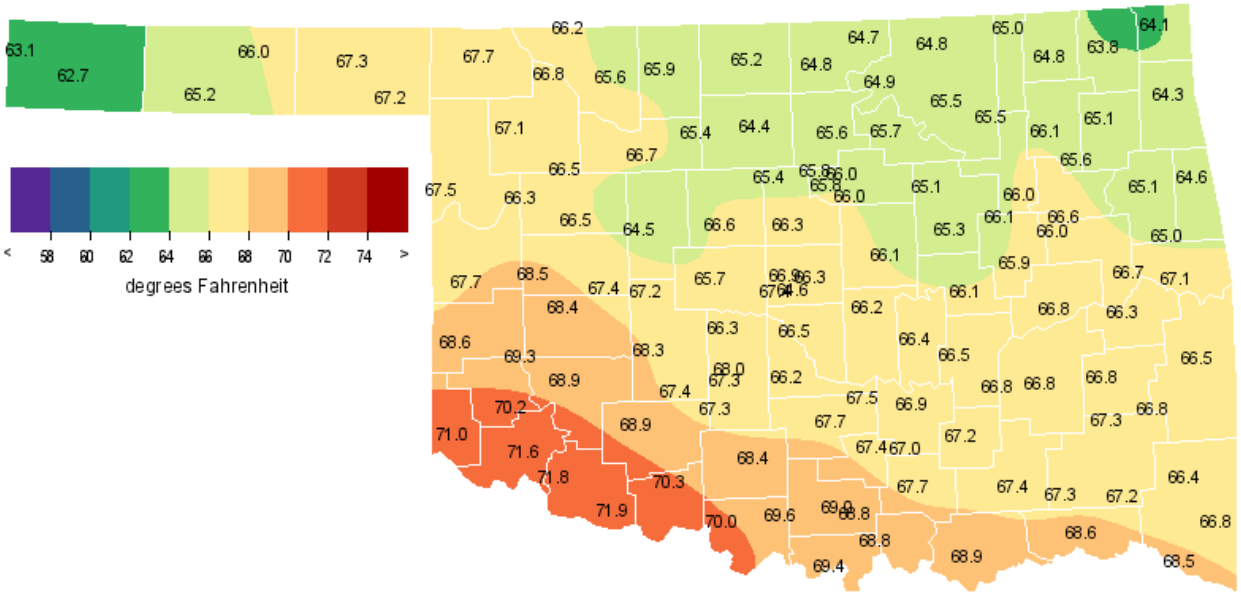
MAY 2013 PERCENT OF NORMAL PRECIPITATION



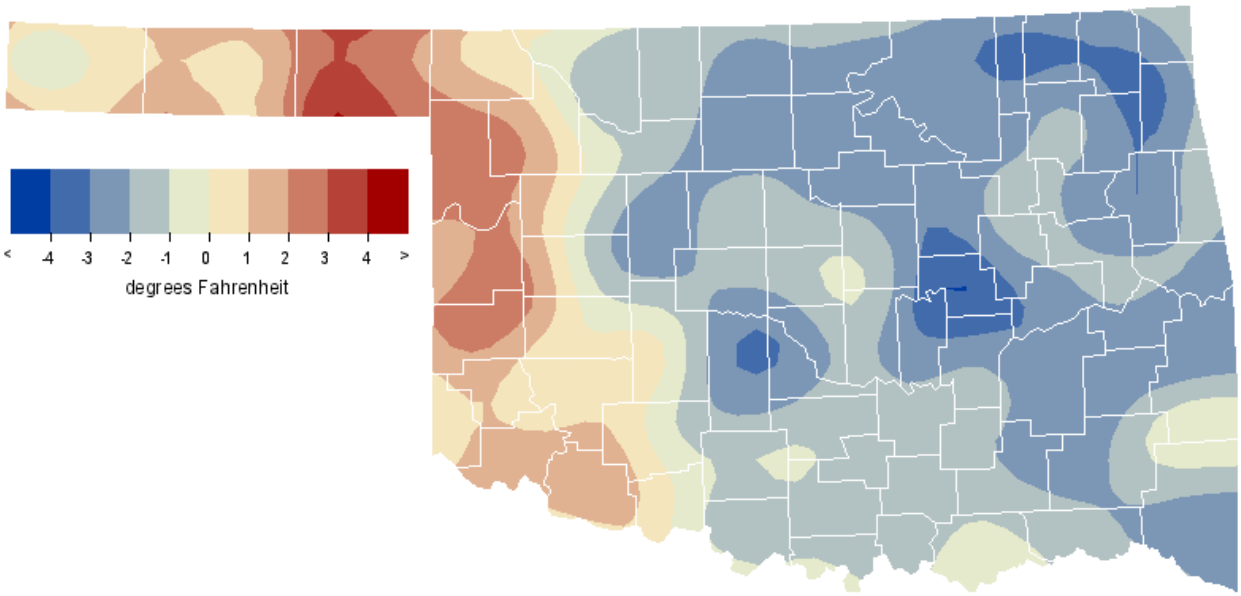
MAY 2013 AVERAGE SOIL MOISTURE AT 25CM



MAY 2013 AVERAGE TEMPERATURE



MAY 2013 DEPARTURE FROM NORMAL TEMPERATURE

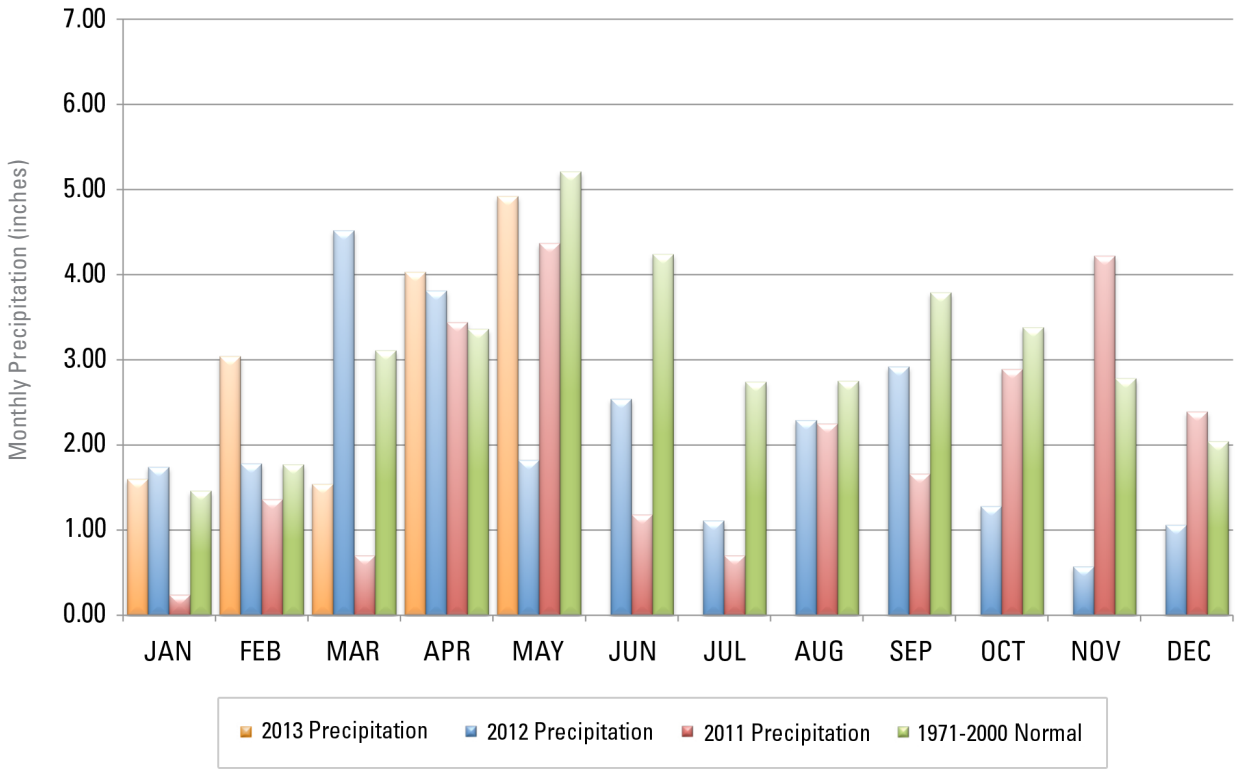


MESONET MONTHLY SUMMARY FOR MAY 2013

NAME	MEAN TEMP	HIGH TEMP	HIGH DAY	LOW TEMP	LOW DAY	HDD	CDD	TOT PPT	HIGH 24-HR	HIGH DAY
PANHANDLE										
Arnett	67.5	97	18	32	3	91	169	1.18	.71	29
Beaver	67.3	104	18	23	3	112	182	.20	.12	31
Boise City	62.7	96	26	22	3	174	104	.50	.26	9
Buffalo	67.7	102	27	30	3	97	180	1.28	.47	28
NORTH CENTRAL										
Alva	65.5	93	18	30	3	116	131	2.12	1.18	8
Blackwell	64.9	88	14	33	3	121	117	6.18	1.66	9
Breckinridge	64.5	91	18	31	2	132	115	4.29	1.31	29
Cherokee	65.9	92	18	31	3	110	139	2.14	1.18	8
Fairview	66.7	94	18	34	3	96	150	3.94	1.77	19
Freedom	66.8	97	18	29	3	106	162	.87	.26	2
Lahoma	65.5	92	18	33	3	110	125	3.61	1.53	29
NORTHEAST										
Bixby	66.0	87	31	36	3	105	137	4.32	.86	15
Burbank	64.9	88	14	32	3	122	119	9.60	2.39	19
Claremore	66.0	89	14	35	2	106	138	5.15	2.06	30
Copan	65.0	89	14	35	2	119	117	9.67	3.43	30
Foraker	64.8	90	14	33	3	121	115	9.53	2.93	19
Inola	65.7	87	14	34	2	111	131	7.12	2.38	9
Jay	64.3	86	14	31	5	142	119	5.34	1.63	30
Miami	64.1	85	18	33	2	138	111	7.82	2.43	30
WEST CENTRAL										
Bessie	68.5	97	31	34	3	79	186	1.57	.37	29
Butler	68.5	98	18	30	3	88	196	3.51	3.21	29
Camargo	66.3	96	18	29	3	105	145	2.73	1.36	8
Cheyenne	67.8	97	18	33	3	87	172	.76	.40	24
Erick	68.6	99	18	29	3	90	200	2.08	1.64	29
CENTRAL										
Acme	67.3	91	19	30	4	95	168	4.99	1.69	30
Bowlegs	66.3	88	13	33	3	97	138	8.45	3.33	21
Bristow	65.3	87	18	33	3	116	126	4.08	.65	21
Lake Carl Blac	65.8	91	18	31	3	113	137	9.50	4.20	29
Chandler	66.1	89	18	31	3	102	135	4.52	.68	20
Chickasha	68.0	93	18	34	4	82	176	3.00	.70	21
El Reno	65.7	91	19	30	3	107	130	10.25	4.76	31
Guthrie	66.3	90	18	32	3	102	141	5.17	1.62	29
Kingfisher	66.6	95	19	32	4	101	150	4.91	2.27	29
Marena	65.8	90	18	34	3	104	128	6.00	1.52	30
Minco	66.3	91	19	34	3	91	131	5.23	2.38	31
Marshall	65.4	90	18	32	3	119	130	8.44	4.20	29
EAST CENTRAL										
Cookson	65.1	86	19	31	5	120	123	6.47	1.96	21
Eufaula	66.8	87	18	35	3	92	147	7.54	2.73	21
Haskell	66.0	88	18	35	3	102	134	3.65	1.07	21
Hectorville	66.2	87	18	35	3	99	136	3.94	.85	15
Holdenville	66.4	88	13	34	3	88	132	8.13	3.94	21
McAlester	66.8	87	18	33	4	94	151	9.42	3.69	21
Okmulgee	65.8	88	18	35	3	107	132	4.16	.97	21
SOUTHWEST										
Altus	71.6	106	31	28	3	69	274	1.29	.90	10
Apache	67.4	93	19	30	3	86	159	4.33	1.42	18
Fort Cobb	68.4	95	31	31	3	79	184	3.18	1.59	29
Grandfield	71.9	104	31	31	3	65	279	1.15	.77	29
Hinton	67.2	95	19	31	3	95	164	1.17	.72	29
Hobart	68.9	102	31	29	3	87	207	3.51	2.18	18
SOUTH CENTRAL										
Ada	66.8	90	13	33	3	92	148	5.23	2.81	21
Ardmore	68.8	91	13	34	3	67	185	8.37	2.80	29
Burneyville	69.4	92	18	28	3	76	213	11.43	3.50	29
Byars	67.4	89	13	32	3	85	159	6.32	2.13	15
Centrahoma	67.2	87	13	33	4	84	154	9.61	4.46	21
Durant	68.9	88	31	35	3	66	187	5.22	2.14	15
Fittstown	67.0	90	13	33	3	86	147	7.29	4.28	21
Ketchum Ranch	68.3	91	13	34	3	76	179	5.30	1.85	15
Lane	67.4	88	31	34	4	80	155	9.27	2.97	21
SOUTHEAST										
Antlers	67.3	88	31	34	4	80	153	8.02	3.49	21
Antlers	*****	***	***	***	***	****	****	*****	*****	***
Broken Bow	66.8	90	31	31	4	84	138	*****	*****	***
Clayton	67.3	88	31	35	4	89	160	6.10	2.88	21
Cloudy	67.2	88	31	36	3	77	145	4.50	1.79	21
Hugo	68.5	88	31	38	3	69	179	6.02	2.23	15

NAME	MEAN TEMP	HIGH TEMP	HIGH DAY	LOW TEMP	LOW DAY	HDD	CDD	TOT PPT	HIGH 24-HR	HIGH DAY
Goodwell	65.2	98	28	24	3	133	139	.14	.09	9
Hooker	66.0	100	28	22	3	119	151	.08	.04	2
Kenton	63.2	95	17	22	3	174	117	.82	.47	9
Slapout	67.3	102	27	30	3	100	170	.22	.11	2
May Ranch	66.3	95	27	33	2	103	143	1.17	.48	8
Medford	65.2	90	18	32	3	119	126	4.52	1.11	9
Newkirk	64.8	89	14	31	3	125	117	6.94	2.12	9
Red Rock	65.5	89	18	33	3	110	127	8.43	3.17	29
Seiling	66.5	95	18	33	3	99	146	3.03	1.27	18
Woodward	67.1	96	18	31	3	98	163	1.30	.52	29
Nowata	64.8	90	14	34	2	122	116	10.37	3.07	30
Pawnee	65.7	90	14	34	3	111	133	5.74	2.41	29
Porter	66.6	87	18	35	2	96	145	4.19	1.02	21
Pryor	65.1	86	14	33	2	122	125	5.44	2.89	30
Skiatook	65.5	89	14	35	3	106	121	8.84	4.21	30
Vinita	63.7	86	14	33	2	138	98	9.73	2.41	30
Wynona	65.5	90	14	35	3	111	125	7.70	2.71	30
Putnam	66.4	93	18	30	3	99	144	1.84	.76	29
Retrop	69.3	100	18	31	3	80	212	.89	.26	27
Watonga	32.3	93	19	***	16	100	148	*****	*****	***
Weatherford	67.5	96	31	30	3	90	166	1.87	1.11	29
Ninnekah	67.3	91	13	32	4	86	159	3.48	1.23	21
Norman	66.5	88	18	32	3	94	141	7.69	2.07	31
Oilton	65.1	87	18	34	3	121	124	6.25	2.69	30
OKC East	66.7	89	18	37	3	****	****	12.35	5.04	31
OKC North	67.0	89	18	35	3	89	150	9.49	5.41	31
OKC West	67.4	89	18	37	3	83	159	9.81	3.79	31
Okemah	66.0	88	31	35	3	97	128	5.22	1.21	15
Perkins	65.9	90	18	32	3	109	138	7.01	2.77	30
Shawnee	66.3	87	31	33	3	98	137	6.40	1.83	31
Spencer	66.3	89	18	33	3	102	143	10.10	4.23	31
Stillwater	66.0	91	18	33	3	111	142	6.22	1.52	30
Washington	66.3	89	13	34	3	89	129	4.52	1.69	21
Sallisaw	67.1	89	19	35	3	90	156	6.97	2.36	21
Stigler	66.3	88	18	35	2	100	139	7.41	2.75	21
Stuart	66.7	86	31	35	3	83	137	7.33	4.06	21
Tahlequah	65.0	85	18	33	2	118	120	6.09	1.19	21
Webbers Falls	66.7	88	14	37	2	94	147	7.80	1.77	21
Westville	64.7	85	19	32	3	124	114	8.66	2.09	9
Hollis	70.9	104	31	30	3	69	253	1.60	.40	10
Mangum	70.2	104	31	30	3	76	238	1.23	.60	18
Medicine Park	68.9	95	18	37	3	65	186	3.33	1.25	18
Tipton	71.8	106	31	27	3	70	280	.84	.26	21
Walters	*****	***	***	***	***	****	****	*****	*****	***
Madill	68.7	90	18	32	3	70	185	7.94	1.91	29
Newport	68.9	92	13	31	3	69	191	7.69	2.02	21
Pauls Valley	67.7	91	13	33	3	82	167	8.62	2.89	30
Ringling	69.6	93	13	31	3	71	215	5.25	1.80	21
Sulphur	67.4	90	13	29	4	94	168	6.43	3.23	21
Tishomingo	67.7	89	13	34	3	77	161	*****	*****	***
Vanoss	*****	***	***	***	***	****	****	*****	*****	***
Waurika	70.0	94	18	33	3	67	221	4.12	1.71	20
Idabel	68.5	90	31	35	4	72	179	6.41	2.47	21
Mt Herman	66.4	86	31	33	4	89	133	7.98	3.55	30
Talihina	66.8	88	31	34	3	96	152	5.68	3.25	21
Wilburton	66.8	87	31	35	3	97	152	7.81	3.52	21
Wister	66.5	89	18	35	3	95	143	5.92	2.91	21

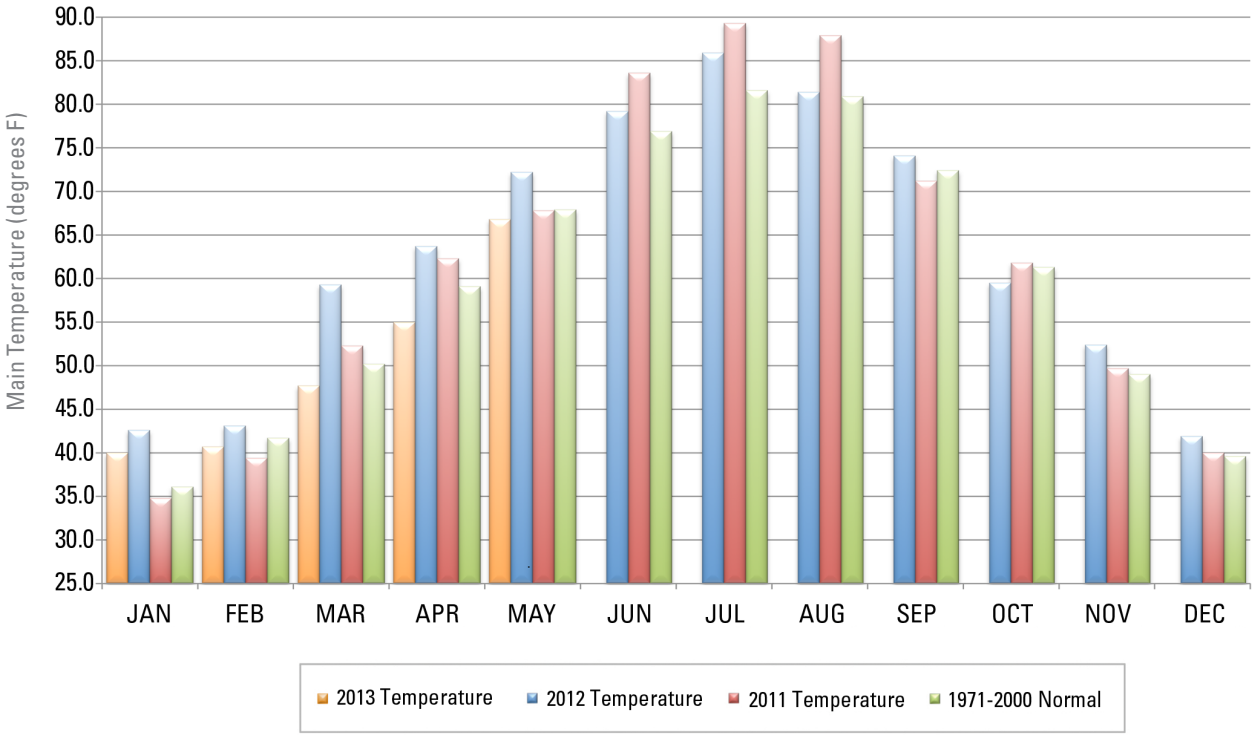
2011, 2012 AND 2013 STATEWIDE PRECIPITATION MONTHLY TOTALS VS. NORMAL



May 2013 Mesonet Precipitation Comparison

Climate Division	Precipitation (inches)	Departure from Normal (inches)	Rank since 1895	Wettest on Record (Year)	Driest on Record (Year)	May-12
Panhandle	0.55	-2.82	6th Driest	6.37 (1951)	0.00 (1927)	0.68
North Central	3.73	-0.99	59th Driest	11.70 (1957)	0.25 (1924)	1.57
Northeast	7.37	1.89	23rd Wettest	19.10 (1943)	1.38 (1917)	1.94
West Central	1.91	-2.99	21st Driest	12.40 (1982)	0.00 (1924)	1.72
Central	6.80	1.17	29th Wettest	12.53 (1902)	0.96 (1988)	2.49
East Central	6.74	0.85	41st Wettest	14.72 (1943)	1.25 (1941)	2.78
Southwest	2.29	-2.68	22nd Driest	11.96 (1902)	0.38 (1984)	2.45
South Central	7.21	1.61	30th Wettest	12.66 (1982)	0.46 (1988)	2.85
Southeast	6.33	-0.03	53rd Wettest	14.36 (1990)	1.24 (1963)	2.64
Statewide	4.92	-0.29	54th Wettest	10.68 (1957)	1.30 (1988)	2.12

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



May 2013 Mesonet Temperature Comparison

Climate Division	Average Temp (F)	Departure from Normal (F)	Rank since 1895	Hottest on Record (Year)	Coldest on Record (Year)	May-12 (F)
Panhandle	65.8	1.4	35th Warmest	72.0 (1896)	56.8 (1917)	70.9
North Central	65.8	-1.3	35th Coolest	75.2 (1896)	60.7 (1907)	72.4
Northeast	65.2	-2.0	24th Coolest	74.1 (1962)	61.2 (1907)	72.5
West Central	67.5	0.3	57th Coolest	75.6 (1896)	60.9 (1907)	72.9
Central	66.2	-2.3	25th Coolest	75.5 (1896)	62.0 (1907)	72.7
East Central	66.1	-2.2	15th Coolest	74.8 (1896)	62.2 (1907)	72.6
Southwest	69.8	0.2	58th Warmest	77.8 (1896)	62.8 (1907)	74.5
South Central	68.2	-1.5	25th Coolest	76.0 (1896)	63.6 (1907)	73.1
Southeast	67.2	-1.6	27th Coolest	75.3 (1896)	62.8 (1907)	72.5
Statewide	66.8	-1.1	37th Coolest	75.0 (1896)	61.5 (1907)	72.6

RECORD EVENT REPORTS

Description	Day	Location	Record	Previous Record	Year
Daily coldest max temp	2	Oklahoma City	48	51	1994
Daily low temp	2	Oklahoma City	37	38	2004
Daily low mean temp	2	Tulsa	45	47	2011
Daily snowfall & latest date of snow	2	Tulsa	Trace	--	--
Daily low temp	2	McAlester	37	37	2011
Daily low max temp	4	McAlester	53	56	1990
Daily low mean temp	4	McAlester	44	50	1990
Daily low temp	12	Bartlesville	36	38	2008
Daily low temp	12	Tulsa	40	40	1960
Daily max rainfall	20	Oklahoma City	2.82	2.74	1979
Daily max rainfall	21	McAlester	3.81	1.04	1983
Daily max rainfall	29	McAlester	2.46	2.01	1981
Daily max rainfall	31	Oklahoma City	5.64	2.14	1892

MESONET EXTREMES FOR MAY 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	104	18th	Beaver	22	3rd	Boise City	1.28	Buffalo	0.71	29th	Arnett
North Central	97	18th	Freedom	29	3rd	Freedom	8.43	Red Rock	3.17	29th	Red Rock
Northeast	90	14th	Pawnee	31	5th	Jay	10.37	Nowata	4.21	30th	Skiatook
West Central	100	18th	Retrop	29	3rd	Erick	3.51	Butler	3.21	29th	Butler
Central	95	19th	Kingfisher	30	3rd	El Reno	12.35	Oklahoma City East	5.41	31st	Oklahoma City North
East Central	89	19th	Sallisaw	31	5th	Cookson	9.42	McAlester	4.06	21st	Stuart
Southwest	106	31st	Tipton	27	3rd	Tipton	4.33	Apache	2.18	18th	Hobart
South Central	94	18th	Waurika	28	3rd	Burneyville	11.43	Burneyville	4.46	21st	Centrahoma
Southeast	90	31st	Idabel	31	4th	Broken Bow	8.02	Antlers	3.55	30th	Mt Herman
Statewide	106	31st	Tipton	22	3rd	Boise City	12.35	Oklahoma City East	5.41	31st	Oklahoma City North

JUNE OUTLOOK

June marks a transition from spring into summer, and is considered the first of the "climatological summer" months. About the middle of the month, weather patterns change from mild and wet to dry and hot. The transition is especially apparent across Western Oklahoma, where the wheat harvest replaces vegetation with exposed soil. Sunlight heats the bare ground more quickly, pushing temperatures higher. Buffalo and Mangum each average more than five days with temperatures at or above 100 degrees.

Temperature

Mean	76.9 degrees
Warmest June	1953, 85.1 degrees
Coldest June	1903, 70.3 degrees
Hottest location	Waurika, 80.3 degrees
Coolest location	Boise City, 72.6 degrees
Hottest recorded	117 degrees, Hollis, June 24, 1953 Mangum, June 24, 1980; June 27-28, 1980
Coldest recorded	34 degrees, Kenton, June 13, 1919

Rainfall across the state generally decreases from its springtime peak, but the Panhandle has its wettest months ahead of it. While most of the state follows the patterns of the Great Plains, weather patterns in far western Oklahoma are more controlled by the Rocky Mountains to the west, which typically develop late afternoon thunderstorms. Even with its peak rainfall occurring in June, most Panhandle locations are still drier than the rest of the state. Rainfall totals over an inch are rare, even in their rainy season. The Panhandle is also notable for dust storms during the dry years, especially during the 1930s and 1950s. In 1937, Goodwell reported 11 days with visibility less than one mile due to dust storms, and a dust storm near Hooker in 1957 led to a 12-car pile-up. A "black blizzard" was reported at Kenton in 1939, when rain washed thick dust from the air.

Flooding is a major hazard during June. Flooding can occur from localized heavy rainfall, or from persistent rains in a river basin. As much as twenty inches may have fallen near Hydro within a 14-hour period one June 22, 1948, although official reports showed 11.25 inches. Resulting flash floods killed 11 people who found themselves trapped along Route 66. Basin flooding in 1923 was described as "unusually disastrous" on the North Canadian, Arkansas, Cimarron, and Neosho rivers from June 7-11. The Washita River flooded Pauls Valley in 1941, contributing to an extensive development effort to control the river through a series of small dams upstream. In 1957, waters first topped the spillway at Lake Texoma, and the Red River remained in flood stage downstream of the dam for the entire month. Waurika, Guthrie, and areas north and east of the Arkansas River have frequently dealt with flooding in past Junes.

Precipitation

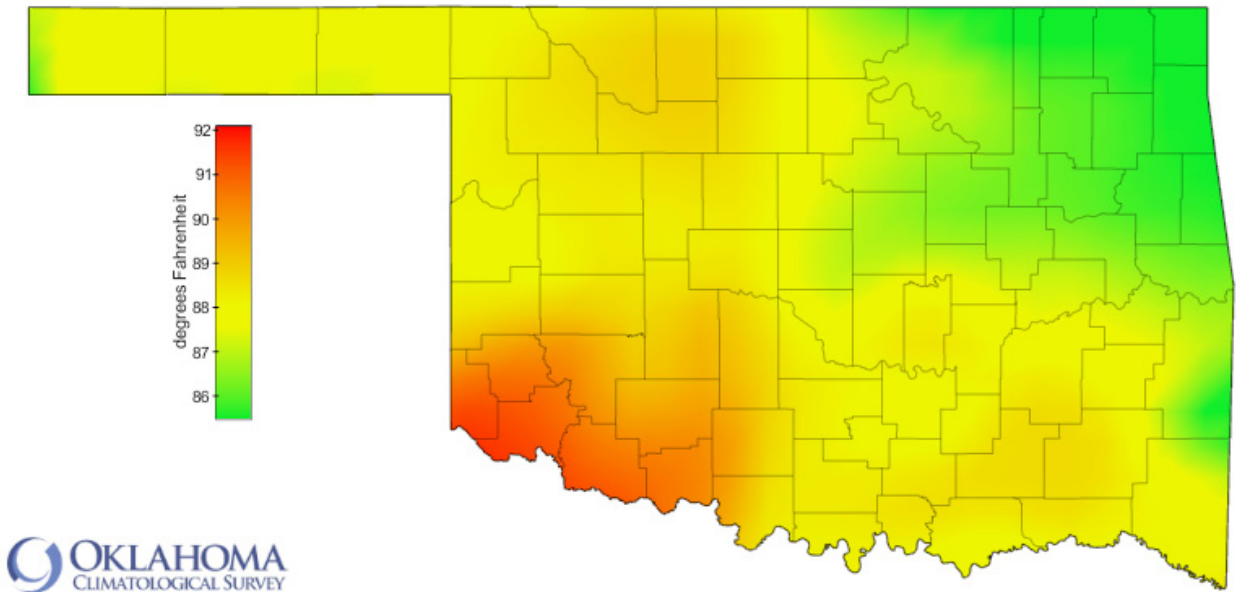
Mean	4.24 inches
Wettest June	2007, 9.10 inches
Driest June	1933, 0.46 inches
Wettest location	Durant, 5.49 inches
Driest location	Kenton, 2.18 inches
Most recorded	18.87 inches, Meeker, 1932

Tornadoes

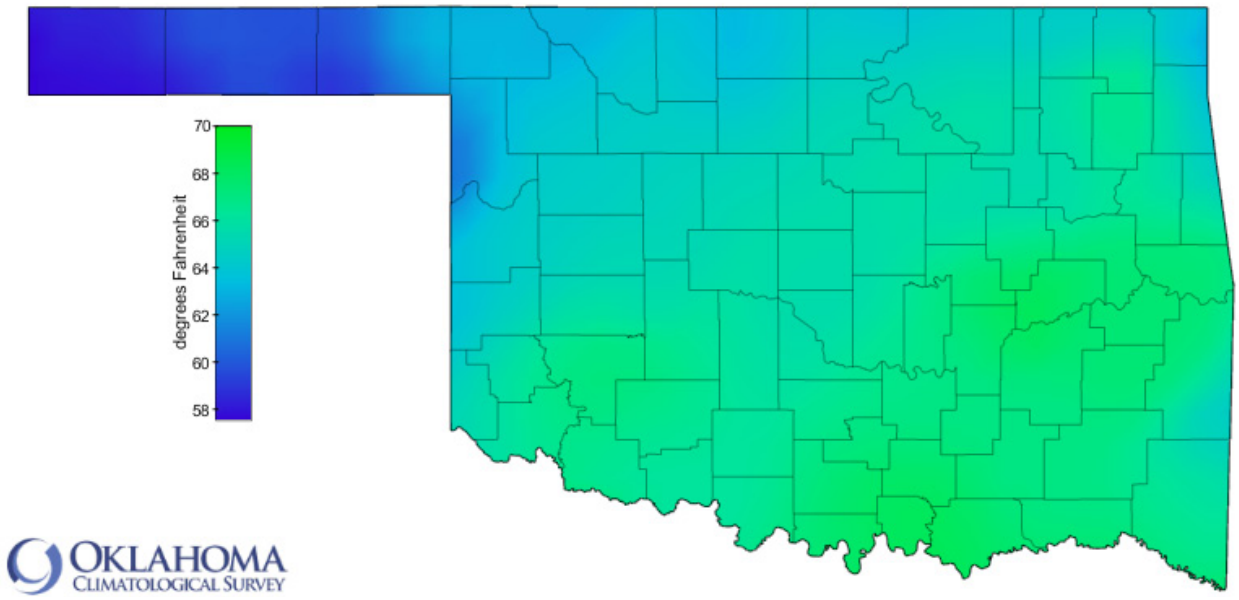
Average June Tornadoes	8.0
Most	28 (1995)

Springtime severe weather patterns are common in early June. The state averages nine tornadoes per year, with as many as 28 occurring in 1995 and as few as none in 1987. Especially violent tornadoes include one on June 1, 1917 that killed 14 people in Coalgate, one that left 35 dead in southwest Oklahoma City on June 12, 1942, and a June 8, 1974 tornado that killed 14 in Drumright. Hail also plagues the state. Farmers have lost wheat crops to hailstorms just before the fields were ready for harvest. One hailstorm cut a 25-mile by 10-mile swath west of Gage on June 14, 1938. In 1993, hailstorms from Tyrone to Grove caused more than $70 million in damage to the wheat crop alone. Hail up to six inches in diameter was reported in Enid from the storm, and extensive property damage occurred in Blackwell. A nearly-stationary storm dropped hailstones on Woodward for one hour in 1957, causing extensive damage to property. Straight-line winds from thunderstorms have been recorded as high as 110 miles per hour, leaving many customers without power.

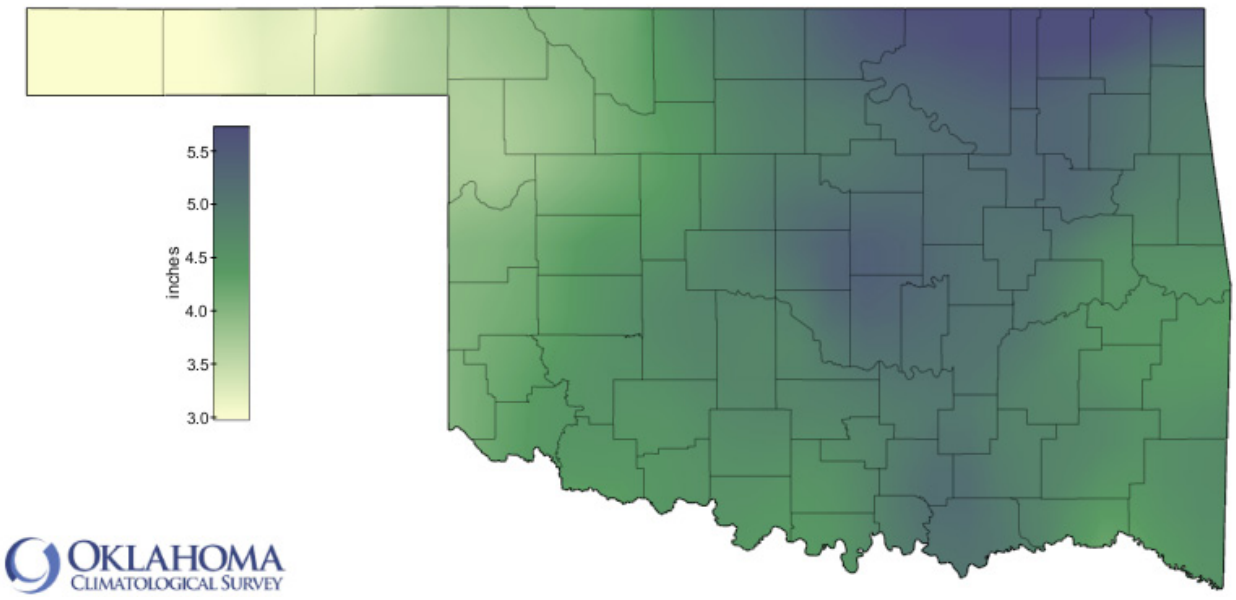
JUNE NORMAL DAILY MAXIMUM TEMPERATURE (1981-2010)



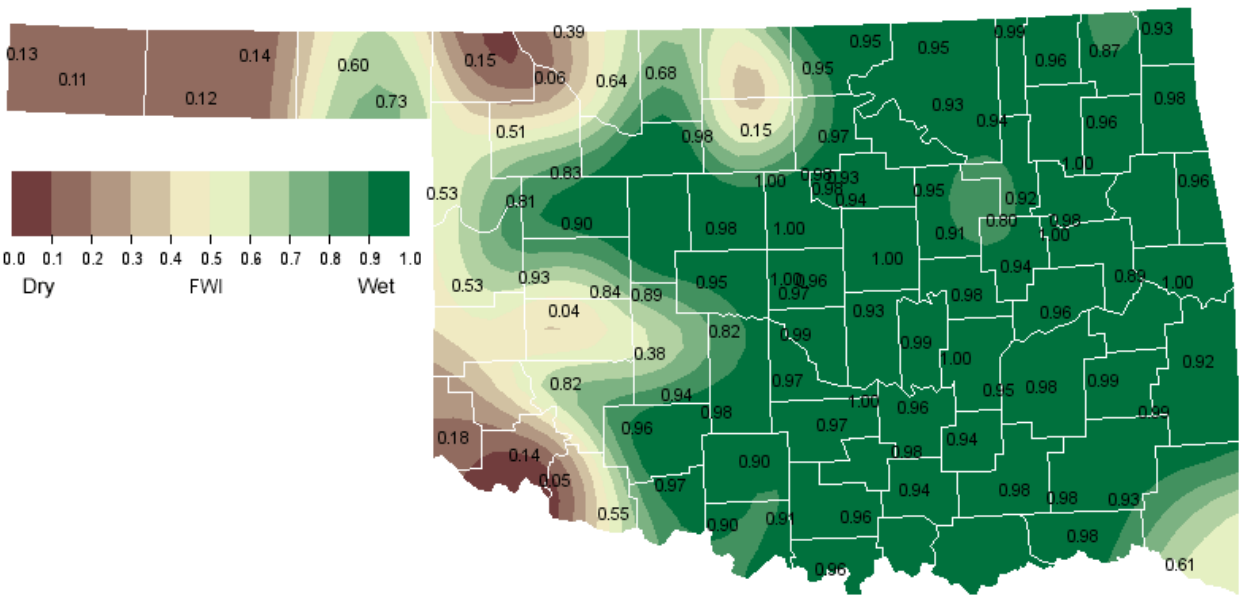
JUNE NORMAL DAILY MINIMUM TEMPERATURE (1981-2010)



JUNE NORMAL PRECIPITATION (1981-2010)



JUNE 1, 2013 SOIL MOISTURE CONDITIONS AT 25CM



JUNE 2013 DROUGHT INDICES

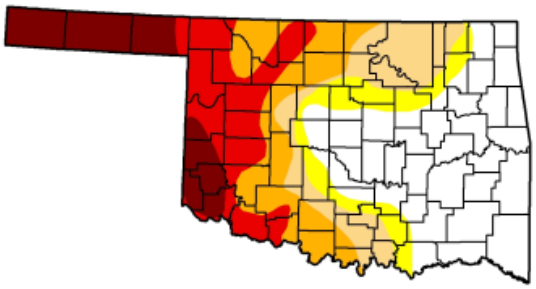
U.S. Drought Monitor

June 4, 2013
Valid 7 a.m. EST

Oklahoma

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	38.02	61.98	53.45	40.99	26.36	11.34
Last Week (05/28/2013 map)	31.88	68.12	58.80	48.33	26.51	11.34
3 Months Ago (03/05/2013 map)	0.00	100.00	100.00	100.00	61.65	9.54
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 (05/29/2012 map)	27.30	72.70	16.50	11.14	3.26	0.00



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

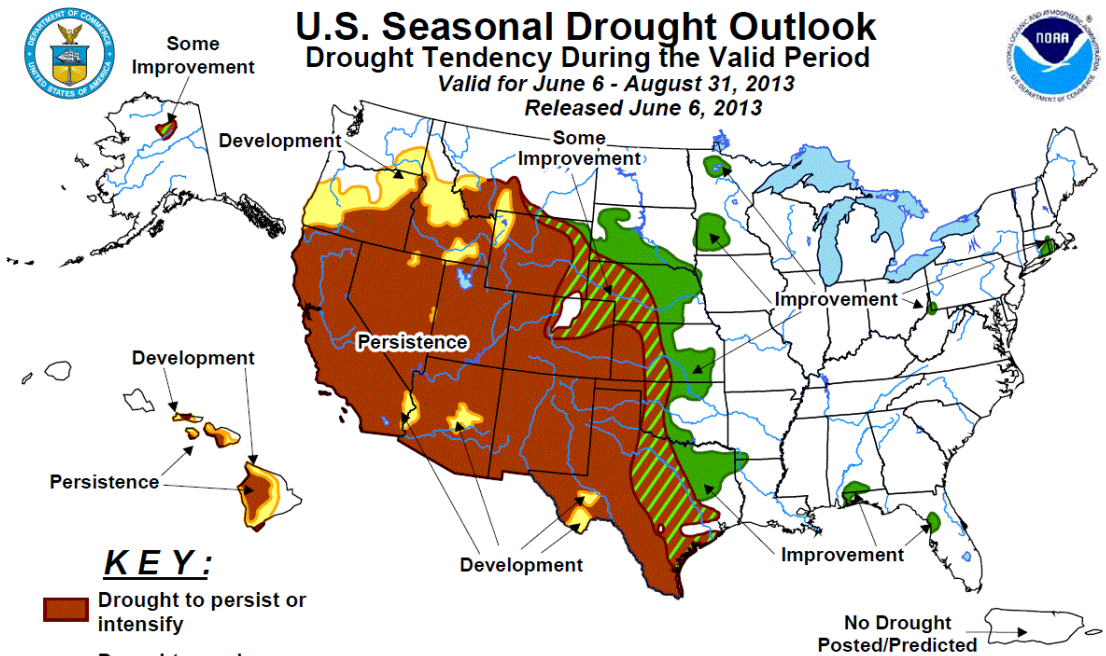
USDA National Drought Mitigation Center

Released Thursday, June 6, 2013
David Simeral, Western Regional Climate Center

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 6 - August 31, 2013
Released June 6, 2013

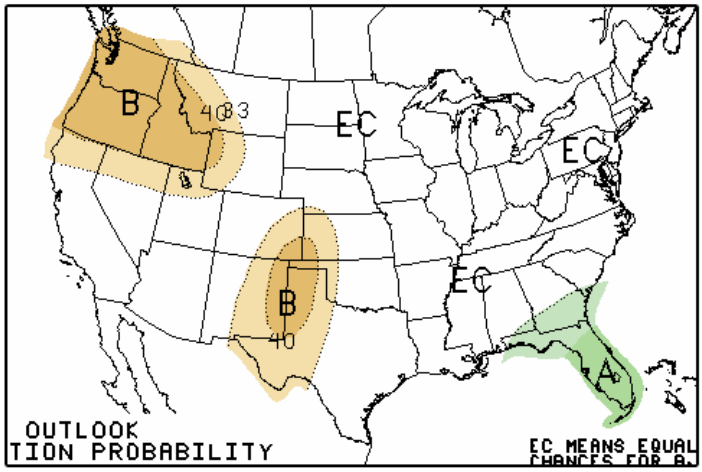


KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

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 improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

JUNE 2013 U.S. PRECIPITATION FORECAST



Percent Likelihood of Above or Below Average Precipitation*

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

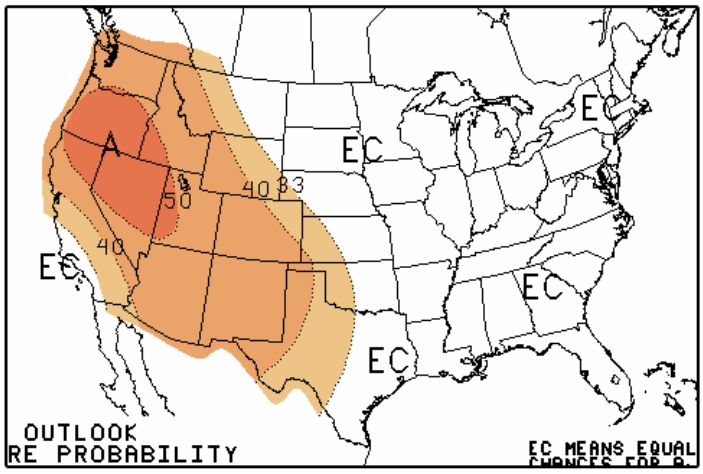
A = Above

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

B = Below

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

JUNE 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%

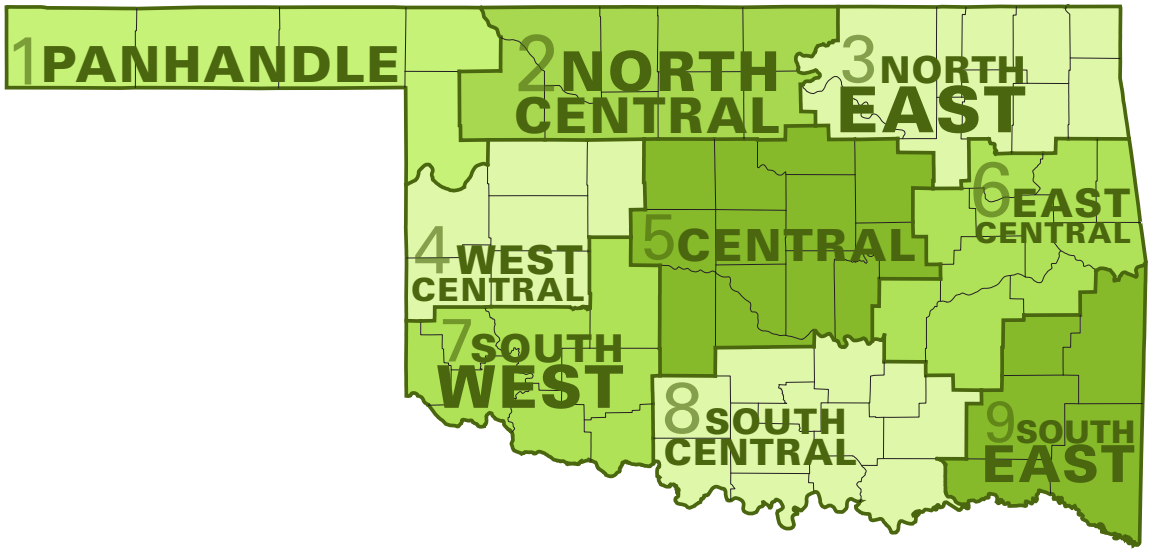
B = Below

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

JUNE CLIMATE NORMALS

Climate Division	Max. Temperature (°F)	Min. Temperature (°F)	Avg. Temperature (°F)	Precipitation (inches)
1	88.9	60.6	74.8	2.90
2	88.9	64.5	76.7	3.92
3	86.8	65.3	76.1	4.59
4	88.6	64.7	76.6	3.78
5	87.7	66.0	76.8	4.45
6	86.8	65.9	76.3	4.70
7	90.5	65.9	78.3	4.01
8	88.5	66.9	77.7	4.56
9	87.9	65.2	76.6	4.63
Statewide	88.2	65.1	76.7	4.26

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

DESIGN
Ada Shih Graphic Designer
Lacie Webb Graphic Designer Student Assistant

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