NWS FORM E-5 (11-88) (PRES. by NWS Instruction 10-924)	**U.S. DEPARTMENT OF COMMERCE** NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE	HYDROLOGIC SERVICE AREA (HSA) **Tulsa, Oklahoma (TSA)**
MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS		REPORT FOR: MONTH **June** YEAR **2011**
TO: Hydrometeorological Information Center, W/OH2 NOAA / National Weather Service 1325 East West Highway, Room 7230 Silver Spring, MD 20910-3283		SIGNATURE **Steven F. Piltz** (Meteorologist-in-Charge) DATE **July 1, 2011**

When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Instruction 10-924)

[X] An "X" in the box indicates no flood stages were reached in this Hydrologic Service Area (HSA) during the month above.

June 2011 brought a shift back to well below normal precipitation across eastern OK and northwest AR, in addition to record heat. Normal rainfall in the month of June ranges from 3.9 inches in McIntosh County to 5.9 inches in Wagoner County. The Ozark region of northwest Arkansas averages 5.1 inches for the month.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for June 2011 ranged from around less than 0.10" to isolated areas of 4"-5". This was significantly less than the normal rainfall for June. Most of eastern OK and northwest AR only received 10% to 50% of the normal June rainfall, though some areas of southeast and east central OK received less than 5% (Fig. 1b). The NWS COOP observer in Tuskahoma, OK and the OK Mesonet site in Talihina only measured 0.09" for the month. The OK Mesonet site in Stigler measured only 0.04" this month, while the OK Mesonet sites in Wilburton and Clayton recorded a measly 0.03" for the entire month of June.

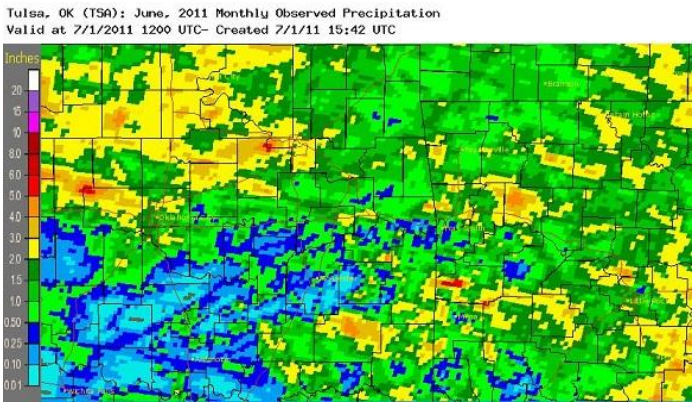
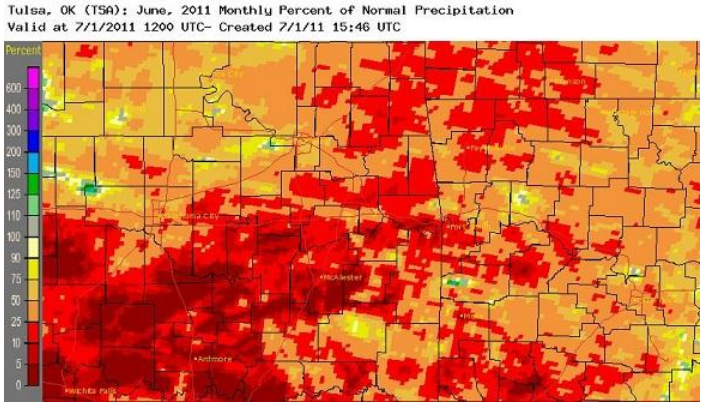


Fig. 1a. Estimated Observed Rainfall for June 2011



1b. Estimated % of Normal Rainfall for June 2011

In Tulsa, OK, June 2011 ranked as the 2nd warmest June (84.4°F; since records began in 1905) and the 10th driest June (1.47", tied with 1983; since records began in 1888). Fort Smith, AR was the warmest June (85.0°F), setting a new record, and the 3rd driest June (0.44") since records began in 1882. A record number of days with temperatures ≥90°F occurred at both Fort Smith and Tulsa in June 2011. Every day in June 2011 in Fort Smith was ≥90°F, setting a new record of 30 days (previous record was 29 days in 1953. Tulsa tied the record of 29 days with temperatures ≥90°F. This record also occurred in 1934 and 1911.

Some of the larger precipitation reports (in inches) for June 2011 included:

Oilton, OK (meso)	3.40	Bixby, OK (meso)	2.59	St. Paul, AR (coop)	2.45
Pawnee, OK (meso)	2.41	Jones Riverside Arpt Jenks, OK (ASOS)	2.31	Foraker, OK (meso)	2.29
Bartlesville, OK (ASOS)	2.28	Burbank, OK (meso)	2.00	Webbers Falls, OK (meso)	1.81

According to the U.S. Drought Monitor (USDM) from June 28, 2011, moderate drought (D1) conditions expanded east across Osage, Washington, Rogers, Tulsa, Creek, Okmulgee, Okfuskee, McIntosh, and western Pittsburg Counties, while abnormally dry (D0) conditions existed across the remainder of eastern OK and western AR (see Figs. 2 & 3). Despite the very wet April and May across eastern OK and western AR, a dry and very hot June has led to short-term dryness across the region.

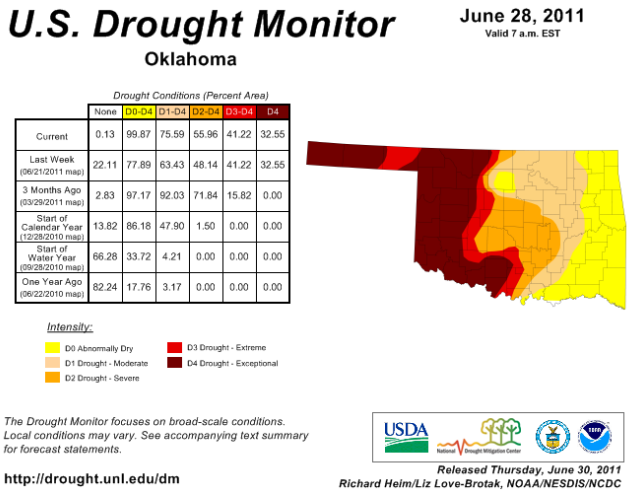


Fig. 2. Drought Monitor for Oklahoma

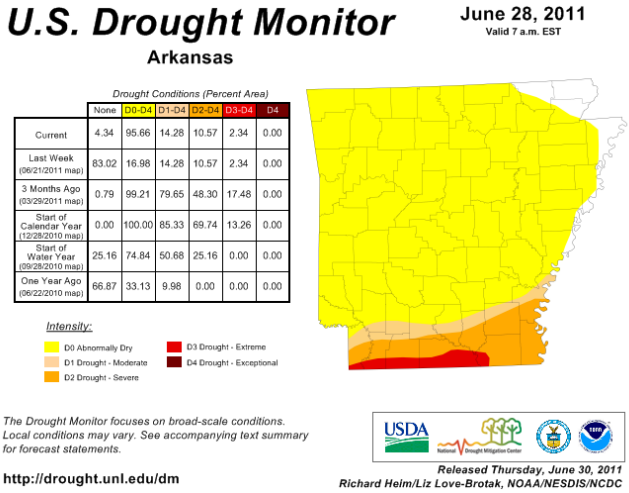


Fig. 3. Drought Monitor for Arkansas

According to statistics from the Oklahoma Climatological Survey (OCS):

Rank since 1921 ("Last XX days" ending June 30, 2011)	June 2011	Warm Growing Season (Mar 1, 2011 – Jun 30, 2011)	Last 60 days (May 2, 2011 – Jun 30, 2011)	Year-to-Date (Jan 1, 2011 – Jun 30, 2011)	Water Year (Oct 1, 2010 – Jun 30, 2011)	Last 365 Days (Jul 1, 2010 – Jun 30, 2011)
Northeast OK	**4th driest**	28th driest	17th driest	27th driest	**14th driest**	29th driest
East Central OK	**3rd driest**	41st wettest	**14th driest**	40th driest	23rd driest	30th driest
Southeast OK	**4th driest**	34th driest	16th driest	21st driest	**15th driest**	**11th driest**
Statewide	**2nd driest**	**7th driest**	**8th driest**	**6th driest**	**3rd driest**	**8th driest**

Most of the major reservoirs in the Tulsa HSA were within ±3% of conservation pool by the end of the June 2011. After a couple of months of having flood control pools in use, several reservoirs were now showing deficits in their conservation pools. Beaver Lake was the only reservoir in excess of its conservation pool, with 71% of flood control storage in use as of June 30. The following reservoirs were reporting conservation pool deficits as of June 30, 2011: Fort Gibson Lake 75%, Skiatook Lake 79%, Birch Lake 89%, Heyburn Lake 91%, Hugo Lake 93%, Kaw Lake 94%, and Keystone Lake 96%. The high temperatures during this June also led to a blue-green algae bloom on Grand Lake by the end of the month, making it unsafe to swim in the lake.

Outlooks

The Climate Prediction Center (CPC) outlook for July 2011 (issued June 30, 2011) indicates an equal chance for above, near, and below average temperatures and precipitation across eastern OK and northwest AR. For the 3-month period Jul-Aug-Sep 2011, CPC is forecasting an equal chance for above, near, and below average temperatures and equal chances for above, near, and below median precipitation across eastern OK and northwest AR (outlook issued June 16, 2011).

According to CPC, ENSO neutral conditions were observed at mid June. While La Niña conditions no longer exist in the Pacific Ocean, residual soil moisture and atmospheric effects from La Niña may continue into July. Current computer models indicate ENSO-neutral conditions will continue through the remainder of 2011.

Summary of Precipitation Events

June 1 – 15:

June was off to a hot start this year, with record high temperatures set or tied at Fayetteville, AR on the 3rd and at Fort Smith, AR on the 4th and 5th. A few isolated showers and thunderstorms induced by the terrain affected Le Flore, northern Sebastian, and far northeast Pushmataha Counties on the 5th. Rain totals of localized 0.10" to 0.50" occurred with this activity. A few storms developed across Kay, Osage, Pawnee, and Creek Counties on the 10th along a slowly moving frontal boundary. Again, only a few hundredths to around a quarter of an inch of rainfall occurred, though an isolated area of around 0.75" fell near Ponca City.

Scattered showers and thunderstorms developed during the afternoon and evening hours as the front continued to sag south into eastern OK and northwest AR and stall near I-40 on the 11th. A large portion of the HSA received 0.10" to around 0.50", though localized higher totals of 1" to 3" affected some areas. An MCS tracked across northern OK during the overnight hours of the 11th and into the early morning of the 12th. This complex brought 1" to 2" of rain to much of Osage, Pawnee, and Kay Counties. Elevated convection brought a few isolated showers to east central OK and northwest AR on the morning of the 12th. While most of this activity remained light, portions of Creek, Okmulgee, McIntosh, and Muskogee Counties received 0.50" to 1.5" of rain.

Elevated showers within a low-level jet axis moved across the area on the morning and into the afternoon of the 14th, bringing only light rain accumulations. A cool front then moved through the region during the late night hours, igniting scattered showers and thunderstorms. These storms developed into a small MCS as they moved across eastern OK and northwest AR. In addition to damaging winds, this activity brought 0.10" to 0.75" of rain to a large portion of the HSA.

June 16 – 30:

Another compact MCS moved across northeast OK and northwest and west central AR during the morning hours of the 16th. This MCS generally affected locations between I-40 and Hwy412. A few isolated damaging wind gusts occurred with this activity, and rainfall amounts were generally 0.25" to 0.50". However, a few localized areas received around 1" of rain. Another larger MCS that traversed KS began to move south into northeast OK and far northwest AR during the afternoon. The highest rainfall totals of around 0.50" to around 1.5" occurred northwest of I-44, with the remainder of the affected area receiving lighter amounts.

Showers and thunderstorms affected locations right along the OK/KS border and across portions of west central AR on the 18th. While most areas received light rain, localized rainfall totals of 0.50" to 1.5" did occur. An isolated supercell moved across northern Osage County and produced a brief tornado that luckily did not do any damage. A few light showers brought a small amount of rain to Creek, southern Tulsa, and northern Okmulgee Counties on the 19th.

Thunderstorms developed along a dryline in north central OK on the evening of the 20th, and as this activity moved east, the storms developed into a line that affected northeast OK and far northwest AR. Rainfall totals from this event ranged from 0.25" to near 1.5". Additional storms across northern TX also affected far southeast OK along the Red River, though less than one tenth of an inch of rain occurred in this area. A cluster of showers and thunderstorms moved across far northeast OK and far northwest AR during the early morning hours of the 24th. This activity generally brought less than one tenth of an inch of rain, though a strip of 0.25" to 0.75" fell along a Vinita to Jay to Prairie Grove to Mountainburg line.

A couple of MCSs affected the area on the 28th. During the early morning hours, the first complex clipped a portion of Craig and Ottawa Counties in far northeast OK, as well as Carroll County in northwest AR. Rainfall with this first system was generally around 0.25" or less, with localized areas near 1" in northeast Craig County. The second MCS moved through the central portion of the HSA during the mid-morning hours, affecting all but far northeast OK and far southeast OK. Rainfall totals with this second MCS ranged from just a few hundredths to around 1.5" in localized areas. Later in the afternoon, thunderstorms developed along a front across southeast Oklahoma. These storms were slow moving and produced heavier rainfall across Pushmataha and Choctaw Counties. Rainfall totals in this area ranged from 0.75" to around 3.5" (see Fig. 4).

On the last day of the month, isolated to scattered thunderstorms developed along the terrain in Carroll County as well as across far southeast OK and west central AR during the heat of the afternoon, generally along and south of I-40. These storms remained nearly stationary and produced from around 0.10" to around 2" of rainfall.

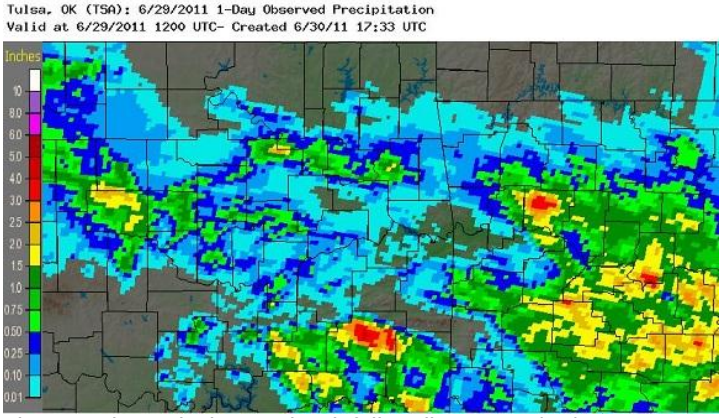


Fig. 4. Estimated Observed Rainfall ending 7am 6/29/2011

Written by:

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Service Hydrologist
WFO Tulsa

Products issued:

- 0 River Flood Warnings (FLW)
- 0 River Flood Statements (FLS)
- 0 River Flood Advisories (FLS) (0 Advisory FLS CON/EXT/CAN)
- 0 River Flood Watches (FFA) (0 Watch FFA CON/EXT/CAN)
- 0 River Statements (RVS)
- 0 Hydrologic Outlooks (ESF)
- 0 Drought Information Statements (DGT)