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 **2012**
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 2, 2012**

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.

A few isolated heavy rain event occurred this month, but by the end of June 2012, conditions across eastern OK and northwest AR were hot and dry and drought was beginning to intensify. 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 2012 ranged from around a meager 0.50" in isolated areas to near 7" in a few spots. Most of the HSA received 1"-3". A large portion of the area received less than half of the normal June rainfall this month and locations across far northeast OK, southeast OK, northwest AR, and the Arkansas River Valley received only 10%-50% of normal (Fig. 1b). Only a few places in eastern OK received between 110%-150% of the normal June rain.

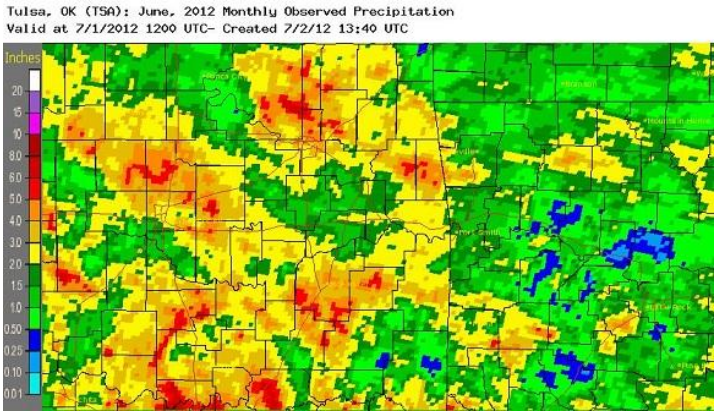

Fig. 1a. Estimated Observed Rainfall for June 2012

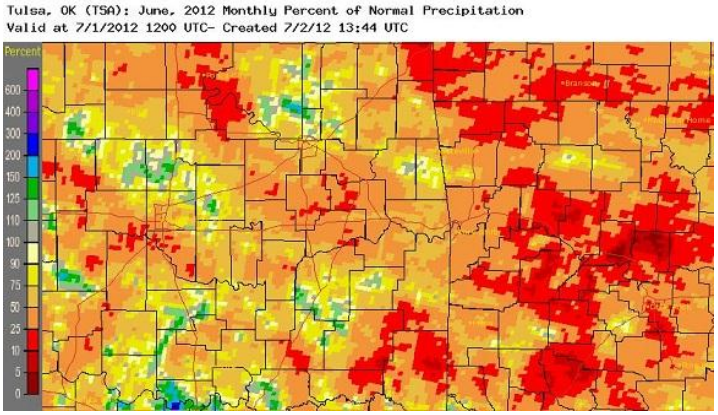

Fig. 1b. Estimated % of Normal Rainfall for June 2012

In Tulsa, OK, June 2012 ranked as the 18th warmest June (80.7°F; since records began in 1905) and the 61st driest June (4.29"; since records began in 1888). Fort Smith, AR, was the 8th warmest June (82.6°F, tied with 1952) and the 19th driest June (1.57", tied with 1931) since records began in 1882. Fort Smith, AR, Fayetteville, AR, and Muskogee, OK all tied their respective records for hottest daily high temperature in June this month.

Some of the larger precipitation reports (in inches) for June 2012 included:

Skiatook, OK (meso)	6.86	Wilburton, OK (meso)	5.46	Claremore, OK (meso)	5.09
Wynona, OK (meso)	4.90	Bartlesville, OK (ASOS)	4.85	Jay, OK (meso)	4.69
Tulsa, OK (ASOS)	4.29	Tahlequah, OK (meso)	4.23	Vinita, OK (meso)	4.11

Some of the lowest precipitation reports (in inches) for June 2012 included:

Ralston, OK (coop)	0.45	Cloudy, OK (meso)	0.45	Pawnee, OK (meso)	0.53
Miami, OK (meso)	0.69	Burbank, OK (meso)	0.83	Okmulgee, OK (meso)	0.96
Porter, OK (meso)	1.06	Ozark, AR (coop)	1.15	Berryville 5NW, AR (coop)	1.19

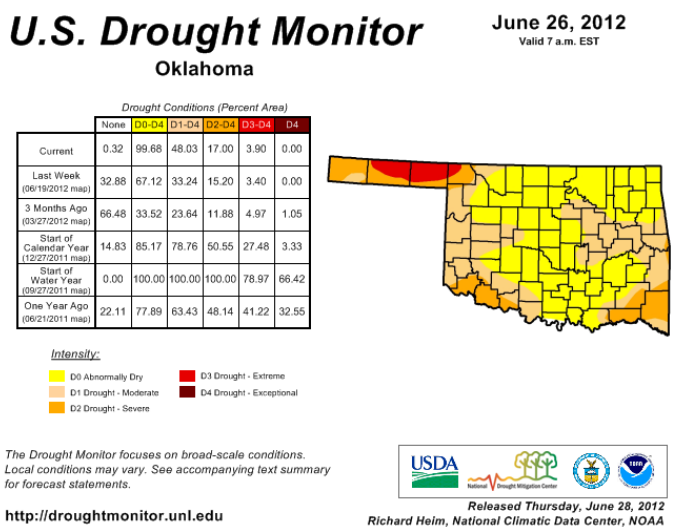

Fig. 2. Drought Monitor for Oklahoma

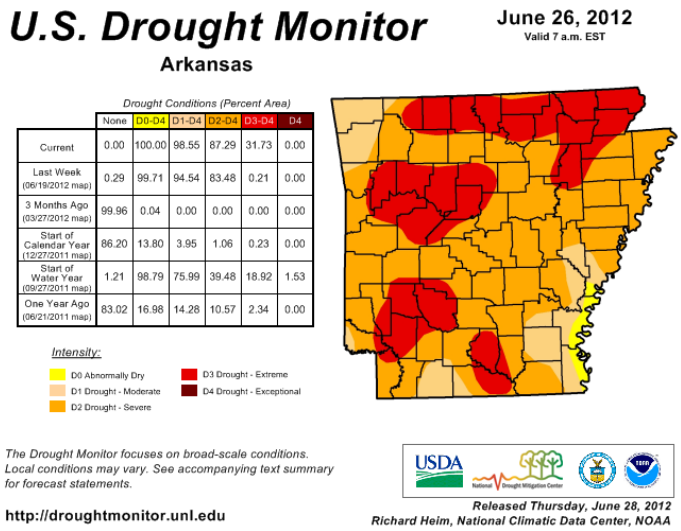

Fig. 3. Drought Monitor for Arkansas

According to the U.S. Drought Monitor (USDM) from June 26, 2012 (Figs 2, 3), all of eastern OK and northwest AR were in dry/drought conditions. Extreme drought (D3) was affecting Franklin and Carroll Counties. Severe (D2) drought was present across Choctaw, southeast Pushmataha, far southern Le Flore, Sebastian, Crawford, Madison, and Carroll Counties. Moderate (D1) drought was occurring across portions of Pawnee, Creek, Okfuskee, Okmulgee, McIntosh, Muskogee, southern Cherokee, Adair, Sequoyah, Haskell, Le Flore, Pushmataha, Benton, and Washington (AR) Counties. Abnormally dry (D0) conditions existed across the remainder of the area.

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

Rank since 1921	Last 31 Days (June 1 – July 1)	Warm Growing Season (Mar 1 – Jul 1)	Year-to-Date (Jan 1 – Jul 1)	Water Year (Oct 1, 2011 – Jul 1, 2012)	Last 60 Days (May 3 – Jul 1)	Last 90 Days (Apr 3 – Jul 1)	Last 365 days (Jul 3, 2011– Jul 1, 2012)
Northeast OK	22nd driest	38th wettest	44th driest	41st wettest	**5th driest**	20th driest	42nd driest
East Central OK	17th driest	**12th driest**	**15th driest**	36th driest	**4th driest**	**3rd driest**	23rd driest
Southeast OK	16th driest	16th driest	24th driest	43rd wettest	**5th driest**	**2nd driest**	22nd driest
Statewide	17th driest	24th driest	33rd driest	42nd wettest	**3rd driest**	**9th driest**	27th driest

Most of the major reservoirs in the Tulsa HSA were operating within ±5% of the top of their conservation pools as of June 29, 2012. However, several reservoirs were reporting conservation pool deficits as of June 29, 2012: Hugo Lake 73%, Heyburn Lake 81%, Beaver Lake 84%, Skiatook Lake 85%, Eufaula Lake 92%, and Ft. Gibson Lake 93%.

Outlooks

The Climate Prediction Center (CPC) outlook for July 2012 (issued June 30, 2012) indicates an enhanced chance for above normal temperatures. This outlook also denotes a slightly enhanced chance for below median rainfall across far northeast OK and far northwest AR and equal chances for above, near, and below median precipitation for the rest of the area. This outlook was based primarily on short-term dynamic computer models, which are indicating the persistent ridge pattern will remain over the central U.S. for the first part of July.

For the 3-month period Jul-Aug-Sep 2012, CPC is forecasting an enhanced chance for above average temperatures and equal chances for above, near, and below median precipitation across the region (outlook issued June 21, 2012). This outlook is based on dynamic computer model output and long term trends.

According to CPC, ENSO neutral conditions are ongoing and expected to continue through the summer. There is at 50% chance for El Niño conditions by the end of the year.

Summary of Precipitation Events

June 1 – 15

After a hot and dry May, June began with record low morning temperatures and showers lasting much of the day. The majority of rain, between 0.10" and 0.50", fell along and south of a Ponca City, to Tulsa, to Fort Smith line, with lighter amounts elsewhere. Isolated showers and thunderstorms developed during the overnight hours in east central OK and west central AR, bringing only a little additional rainfall due to their quick movement. A warm front moved north through the HSA on the 2nd and 3rd, with a few nocturnal thunderstorms developing along it north of I-40. The highest rainfall of 1"-2" occurred over southern Delaware and western Benton Counties.

Isolated thunderstorms, some of which produced severe hail, developed in the very unstable warm sector during the afternoon of the 3rd and affected primarily far northeast OK and northwest AR. This activity resulted in locally heavy rainfall. Storms developed over northeast OK during the early morning hours of the 4th. These storms became nearly stationary for a time along a line from near Pawhuska, to Claremore, to Tahlequah and into southern Washington County (AR). Rainfall totals in this area were 3" to 6", with the highest total of 6.32" measured at the Oklahoma Mesonet site in Skiatook. Radar estimates indicated as much as 6"-8" fell near to just south of Claremore in southern Rogers County (see Figs. 4, 5). Flash flooding occurred across this region, with numerous reports of street closures, including St Hwy 20 in Skiatook at Bird Creek. Water entered homes and residential rescues were needed in Skiatook near Oak and Haney Streets at around 2:30 am CDT. Water was also reported in homes southwest of Claremore. Tulsa International Airport measured 2.10" of rain in one hour (1-2am CDT), with a storm total of 3.32" (a new daily rainfall record). This is almost triple the rainfall Tulsa received during the entire month of May 2012. Skiatook Lake rose approximately 2 feet in response to this event. In addition to the heavy rain, strong winds knocked down trees and power lines. Once these storms began to push south, the remainder of eastern OK and northwest AR received XX" of rain (see Fig. 6).

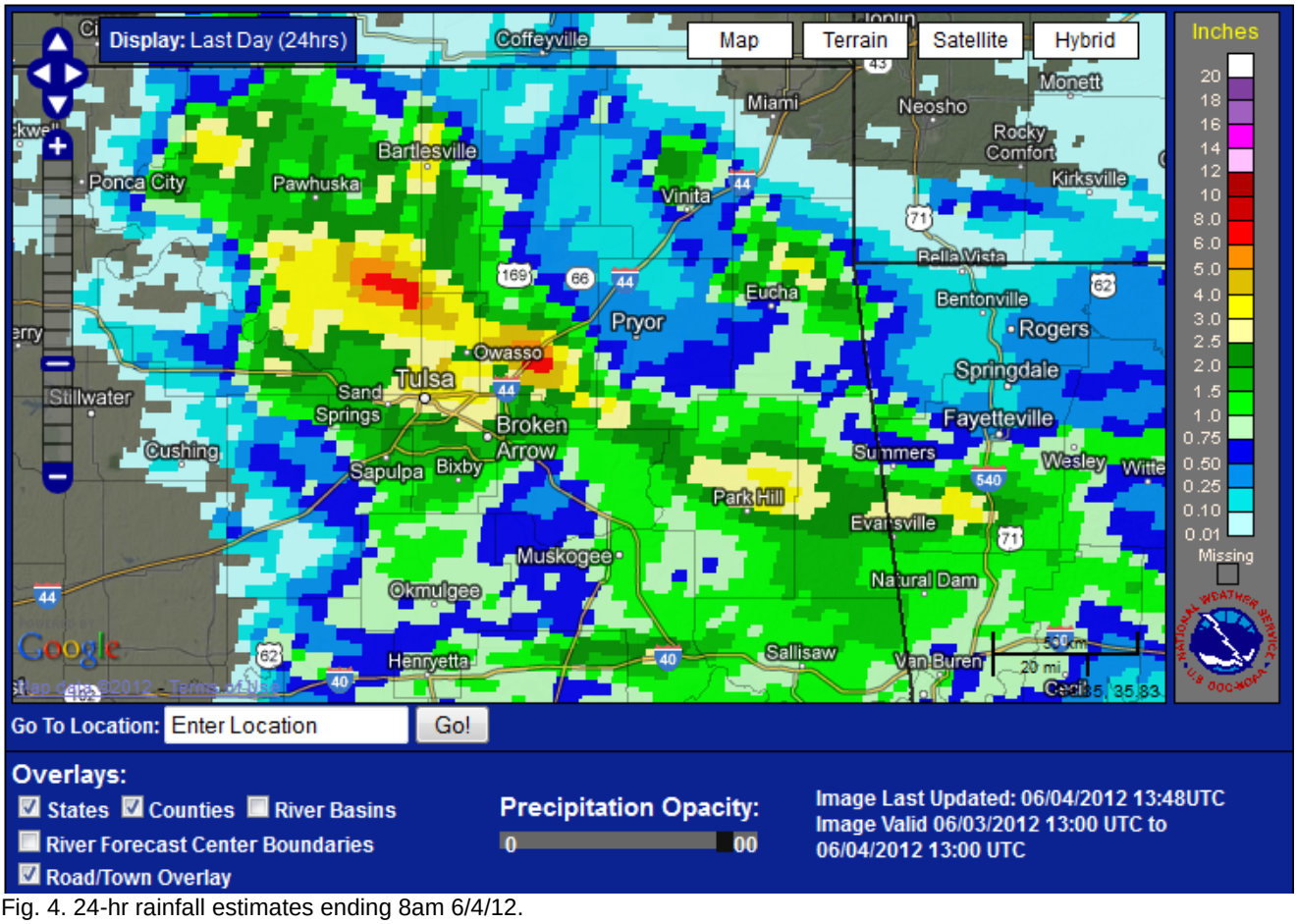

Fig. 4. 24-hr rainfall estimates ending 8am 6/4/12.

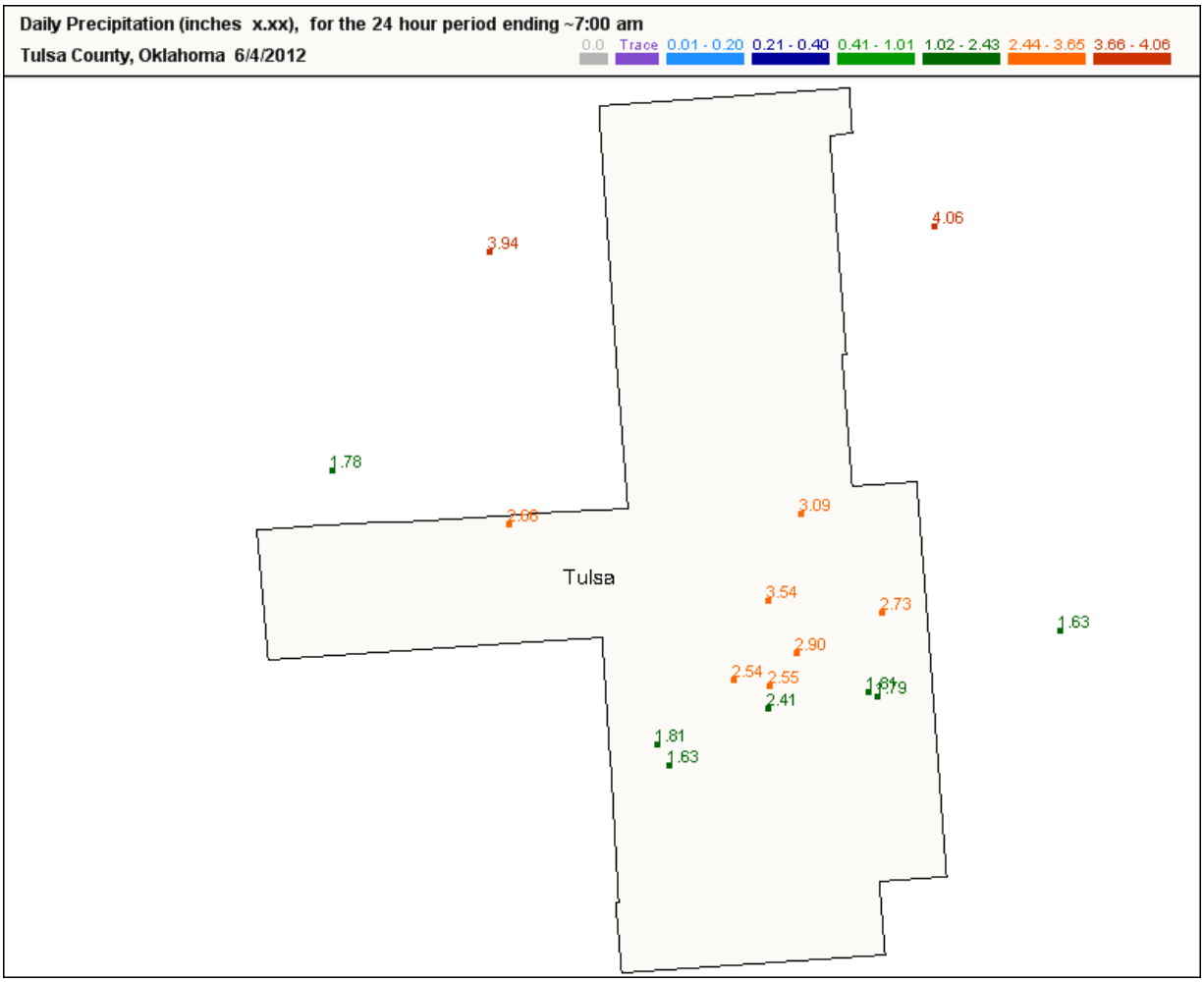

Fig. 5. 24-hr rainfall CoCoRaHS reports from Tulsa and surrounding Counties ending 7am 6/4/12.

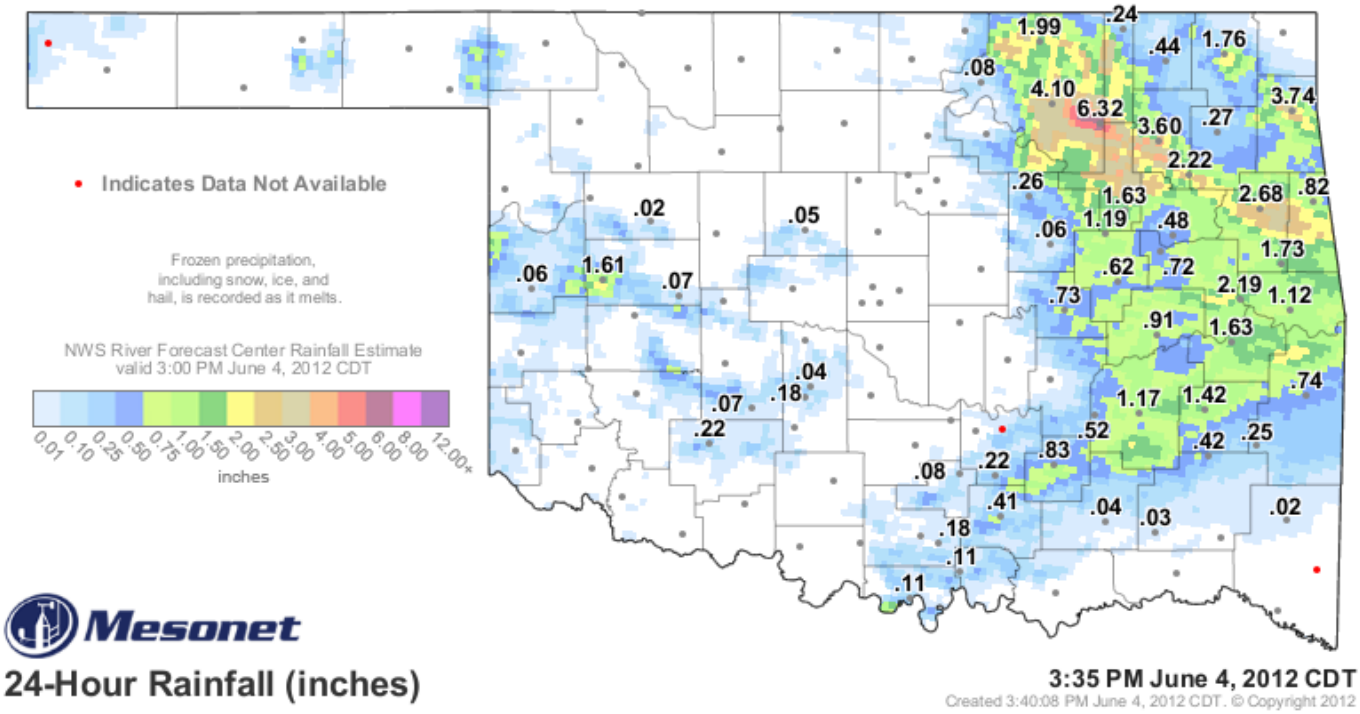

Fig. 6. 24-hr rainfall Mesonet measurements and radar estimates ending 3:35pm CDT 6/4/12.

Bands of showers and thunderstorms affected western and central OK on the 6th due to an upper-level circulation over the TX panhandle/far western OK. The eastern periphery of this activity reached portions of Creek, Okfuskee, Pittsburg, Pushmataha, and Choctaw Counties in eastern OK during the afternoon and evening, where rainfall ranged from a tenth to near one inch.

A thunderstorm complex moved out of southwest MO on the morning of the 11th and brought around 0.5" to around one inch of rain to Carroll County. Later, during the evening and overnight hours on the 11th, a complex of efficient rain producing thunderstorms developed near a frontal boundary and affected southeastern OK and west central AR south of I-40. Portions of Pittsburg and Pushmataha Counties received 2"-4" of rain, while most locations received 0.25"-1.5" of rainfall (Fig. 7).

A linear complex of thunderstorms moved into northeast OK during the very early hours of the 15th and moved south, affecting much of the HSA, through the morning before dissipating by noon. Most of the affected area received 0.25"-1" of rain from these storms, with isolated totals of 1"-2.5". Isolated showers and thunderstorms redeveloped during the afternoon/evening along outflow boundaries across far southeast OK and west central AR. Very localized 1.5"-3" of rain occurred in Le Flore County from these storms, with much lower totals elsewhere.

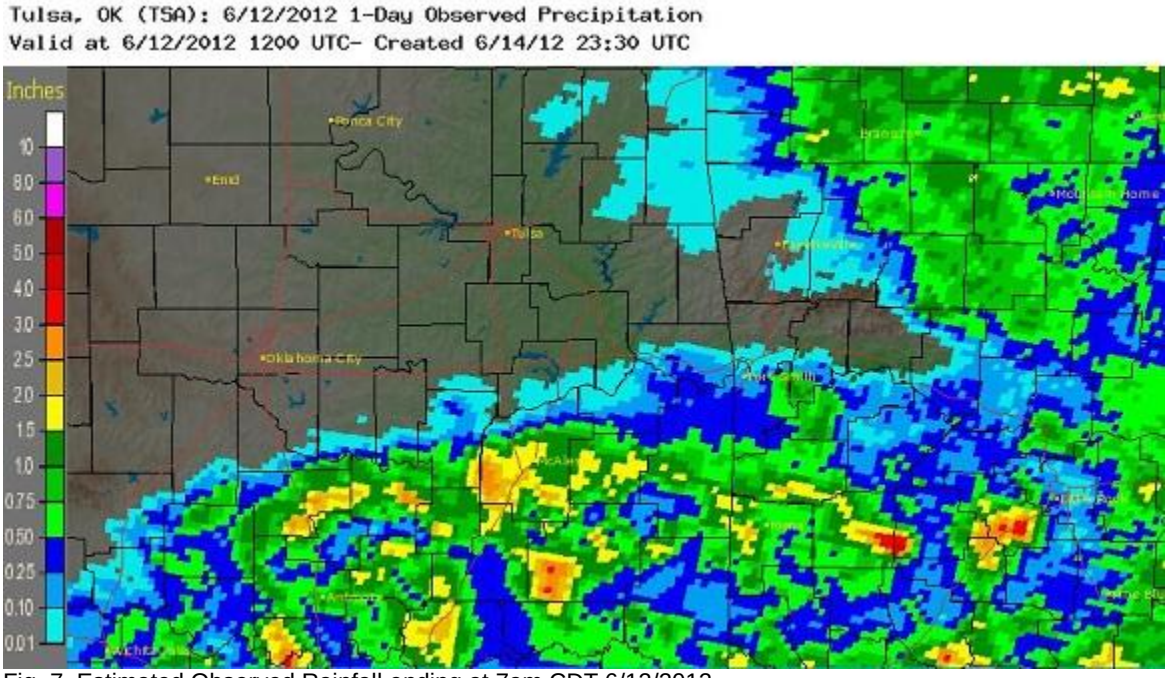

Fig. 7. Estimated Observed Rainfall ending at 7am CDT 6/12/2012

June 16 – 30

A nearly stationary MCV lead to nearly stationary thunderstorms over far western Pushmataha and western Choctaw Counties on the morning of the 16th. Much of western Choctaw County received 1.5"-4" of rain due to these storms (Fig. 8).

Showers and thunderstorms that developed along a cold front in KS moved south into northeast OK and northwest AR north of a Ponca City to Tulsa to Fort Smith line during the morning hours of the 21st. The highest rainfall totals occurred over northeast OK, where 1.5" to just over 2" fell. The remainder of the affected area received around three quarters of an inch or less. A few additional storms developed over the HSA as the front moved south during the afternoon with localized 0.5"-1" rainfall.

High pressure over the central U.S. led to hot and dry conditions through the remainder of the month. Temperatures soared over 100°F across most of the HSA from the 24th-30th (and continuing into July), with temperatures topping out at 107°F in the HSA.

Fig. 8. Estimated Observed Rainfall ending at 7am CDT 6/17/2012

Written by:

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Service Hydrologist
WFO Tulsa

Products issued in June 2012:

7 Flash Flood Warnings (FFW)
9 Flash Flood Statements (FFS)
1 Flash/Areal Flood Watches (FFA) (1 Watch FFA CON/EXT/CAN)
8 Urban and Small Stream Advisories (FLS) (0 Advisory FLS CON/EXT/CAN)
1 Areal Flood Warnings (FLW)
0 Areal Flood Statements (FLS)
3 River Flood Warnings (FLW)
5 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)
1 Drought Information Statements (DGT)

<u>Preliminary Hydrographs:</u>

No river flooding occurred this month.