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 **2009**
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, 2009**

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)

June 2009 saw below normal precipitation across most of northeast OK and northwest AR. 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.

Summary of Rain Events

June 1-8:

A slow moving cold front moved into northeast OK on June 2, resulting in rainfall totals of one half to around 2 inches of rain northwest of Interstate 44 (see Fig. 1). As the front moved south through the remainder of the area, scattered showers and thunderstorms brought generally less than one half inch of rainfall. Overnight on the 2nd and into the early morning hours of the 3rd, an MCS moved into southeast OK. Widespread 1.5 to 3 inch rainfall totals were estimated across all of Pittsburg County, as well as a large part of Latimer and western Pushmataha Counties. Isolated areas of around 5 inches of rain affected Pittsburg County, leading to some flash flooding. The MCS then diminished rapidly, with just some remaining light showers across eastern OK and northwest AR during the first part of the June 3rd. Light showers and a few thunderstorms affected the area on June 7th and 8th, with mostly locations receiving less than one tenth of an inch of rain. A few locations across northeast OK received one quarter to around one half inch.

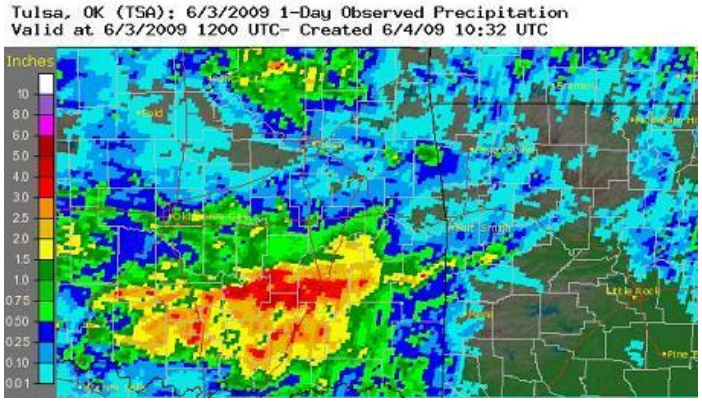


Fig. 1. Rainfall totals from 7am June 2 to 7am June 3, 2009.

June 9-17:

A more typical June pattern of afternoon thunderstorms and nocturnal MSCs affected the region during the middle of the month. The first round of storms on June 9th brought 0.5 to 1.5 inches of rain to far northeast OK and northwest AR, with portions of Ottawa Co. getting around 3 inches of rain. This heavy rain eventually led to minor flooding along the Neosho River near Commerce (see E3 report for details). Areas of 1.5 to over 2 inches also occurred in portions of Craig, Benton, Washington AR, and Madison Counties. It rained across the entire HSA on the 10th, with the heaviest band of 0.5 to around 1.5 inches of rainfall affecting east central OK into west central AR. An EF0 tornado occurred in Haskell Co. with this system.

An MCS moved out of Kansas on the morning of the 12th and moved through the entire HSA during the day and into the early morning hours of the 13th. Very large hail and damaging straight-line winds were associated with a bow echo that moved across the HSA (measured gust of 85 mph at the Oklahoma Mesonet site in Inola!). The MCS also produced widespread one half to around two inches of rain primarily north of I-40. Another severe MCS, which affected the area on the 13th and into the morning of the 14th, brought widespread one quarter to around one inch rainfall totals to locations along and south of a McIntosh County to Benton County

line, though isolated 1.5 to 3 inch amounts were also estimated in Haskell County. Additional light rainfall occurred along the Kansas/Oklahoma border on the 13th. The MCS left a boundary near I-40, which provided a focus for thunderstorm development associated with the low-level jet. Rainfall totals of one half inch or less were widespread north of I-40, with areas in the central portion of the HSA receiving 0.5 to around 1.5 inches of rain.

Supercells developed during the evening on June 15th near a stationary boundary that was located just north of the Oklahoma/Kansas state line. The storms then congealed into an MCS that moved southeast across far northeast OK and northwest AR on the 16th. Rainfall totals from the complex ranged generally from 0.10 inch to near 1.5 inches, with a few isolated amounts from 1.5 to 2 inches. The rainfall across Kansas and into northeast OK from this system led to minor river flooding along the Neosho River near Commerce June 17th-19th (see E3 report for details).

June 18-30:

After a couple of quiet days, a cold front stalled just west of the HSA on the 19th and 20th with showers and thunderstorms only affecting Osage, Pawnee, and Kay Counties. The heaviest rainfall of 0.5 to 1 inch fell across Kay and northwest Osage Counties. Temperatures then soared as high pressure developed over the region, with many locations reaching 100 degrees Fahrenheit or more for several days. The hot and humid conditions allowed for typical summer-time afternoon and evening isolated thunderstorms on the 23-28. Due to the generally short lifetime of these types of storms, localized rainfall amounts were generally a half inch or less, though some of the larger storms produced higher rainfall totals and strong wind gusts. Another cold front moved into northeast OK on the evening of the 27th and into the morning of the 28th, bringing some additional rainfall to locations primarily northwest of I-44. Rainfall totals were around 1 inch or less. On the last day of the month, a nearly stationary front resided along a line from near Okemah, OK to near Fayetteville, AR. Isolated thunderstorms developed along the front, bringing severe winds and around 0.25 to 1 inch of rain.

Monthly Summary

Using the radar-derived observed precipitation from the RFCs (Fig. 2a.), a large portion of eastern OK, northwest, and west central AR received between 2 and 5 inches of rain during June 2009. Overall, much of the region received 50% to 90% of the normal June rainfall (Fig. 2b.), with a few locations receiving 110% to 150% of normal June rain. Isolated locations in Okfuskee, Creek, and Le Flore Counties only received between 10% and 25% of the normal June precipitation.

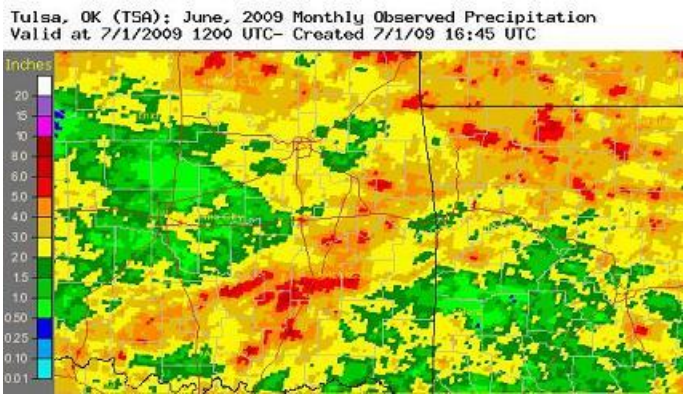
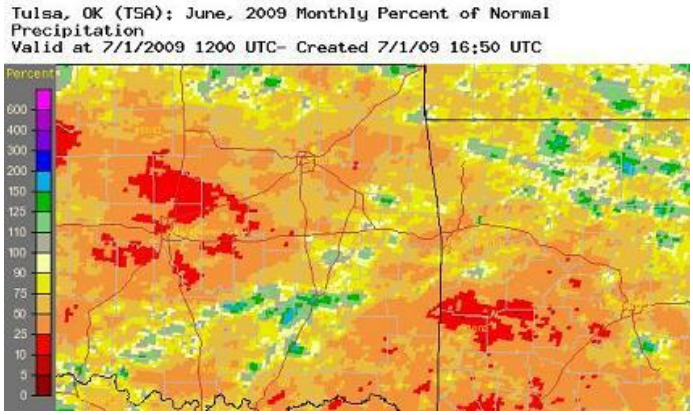


Fig. 2a. Observed Precipitation for June 2009



2b. Percent of Normal Precipitation for June 2009

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

Jay, OK (meso)	6.58	Foraker, OK (meso)	5.49	Northwest Arkansas Reg. Aprt. (ASOS)	5.17
Wilburton, OK (meso)	4.92	Eufaula, OK (meso)	4.61	McAlester, OK (ASOS)	4.49
Nowata, OK (meso)	4.31	Bartlesville, OK (ASOS)	4.27	Cookson, OK (meso)	4.23

According to statistics from the Oklahoma Climatological Survey (OCS), northeast OK ranked as the 25th driest June since records began in 1921, receiving 70% of its normal rainfall. The past 365 days (July 1, 2008-June 30, 2009) rank as the 44th wettest for northeast OK, while ranking as the 43rd wettest year-to-date so far in 2009. East central OK was the 29th driest June on record, ending the month with 72% of normal rain. East

central OK also ranked as the 30th driest for the past 12 months and the 41st driest so far this year. Finally, southeast OK was the 20th driest June, receiving 53% of normal rainfall. This area was also the 39th driest for the past 12 month period, and for the year-to-date, southeast OK ranks as the 33rd wettest.

According to the U.S. Drought Monitor (USDM), abnormally dry (D0) and moderate drought (D1) conditions have existed across portions of northeast OK throughout June 2009. As shown in Figure 3, the U.S. Drought Monitor valid June 30th indicates D1 conditions across Pawnee, Creek, and Okfuskee Counties, with D0 conditions elsewhere across northeast OK.

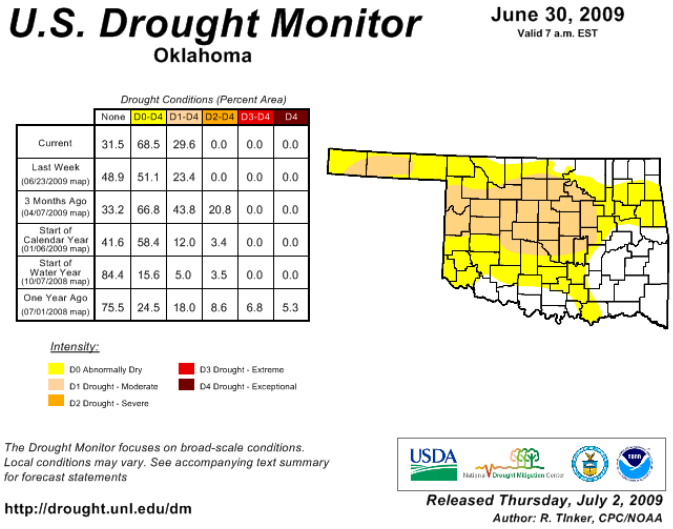


Fig. 3. U.S. Drought Monitor valid June 30, 2009

The major reservoirs in the Tulsa HSA were at 100% of their conservation pools by July 1, 2009, with a few reservoirs reporting levels within 7% of their flood control pools.

The Climate Prediction Center (CPC) outlook for July 2009 (issued June 30, 2009) indicates a slightly enhanced chance of above normal temperatures for all but northeast OK and far northwest AR, where there is an equal chance for above, near, and below normal temperatures. This outlook also suggests a slightly enhanced chance for above normal precipitation for northeast OK and far northwest AR, while there is an equal chance for above, near, and below normal rainfall for the remainder of the area. For the 3-month period Jul-Aug-Sep 2009, CPC is forecasting a slightly enhanced chance of below normal temperatures, with around a 40% chance of below normal temperatures (33% chance for normal and 27% chance for above normal) in northwest AR. The outlook calls for an equal chance for above, near, and below normal precipitation for the Jul-Aug-Sep period (outlook issued June 18, 2009). Sea-surface temperatures in the equatorial Pacific indicate that ENSO-neutral conditions currently exist and are expected to transition to more El Niño like conditions during July. An El Niño Watch has been issued, indicating that El Niño conditions are possible by the end of the summer. With the fairly rapid transition from La Niña to El Niño conditions this year, it is possible that a moderate El Niño will develop later this fall and winter.

Written by:
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Products issued:

3	River Flood Warnings
14	River Flood Statements
0	River Flood Advisories
0	River Flood Watches
0	River Statements
0	Hydrologic Outlooks
0	Drought Information Statements