

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR:  
MONTH **November** YEAR **2010**

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  
**December 2, 2010**

*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)*

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

November 2010 was another dry month across eastern Oklahoma and northwest Arkansas, with many locations receiving only 25% - 50% of the normal November rainfall. Normal precipitation for November ranges from 2.6 inches in Pawnee County to 4.4 inches in Haskell County. Normal precipitation for the Ozark region of northwest Arkansas averages 4.2 inches.

**Monthly Summary**

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a.), rainfall totals for November 2010 ranged from 0.5" to near 5" across the HSA, with most of the area receiving between 1" and 3". The entire HSA received below normal rainfall this month, with the exception of small portions of Craig and Ottawa Counties (Fig. 1b). Most of the HSA recorded less than 75% of the normal November rainfall, with a large portion of the area only receiving 25% - 50% of the monthly normal.

In Tulsa, OK, November 2010 ranked as the 32<sup>nd</sup> warmest November (51.8°F, tied with 1944 & 1942; since records began in 1905) and was the 60<sup>th</sup> driest November (1.96", tied with 2008; since records began in 1888). Fort Smith, AR was the 25<sup>th</sup> warmest November (54.0°F, tied with 2004) and was the 61<sup>st</sup> driest November (2.47") since records began in 1882.

Tulsa, OK (TSA): November, 2010 Monthly Observed Precipitation  
Valid at 12/1/2010 1200 UTC- Created 12/1/10 15:44 UTC

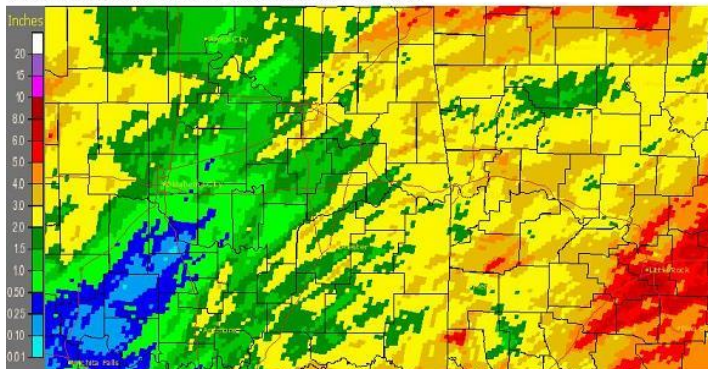


Fig. 1a. Estimated Observed Rainfall for November 2010

Tulsa, OK (TSA): November, 2010 Monthly Percent of Normal Precipitation  
Valid at 12/1/2010 1200 UTC- Created 12/1/10 15:51 UTC

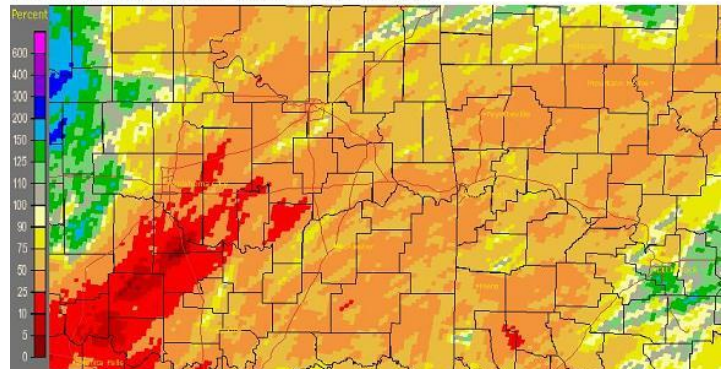


Fig. 1b. Estimated % of Normal Rainfall for November 2010

Some of the larger precipitation reports (in inches) for November 2010 included:

Miami, OK (meso)	4.31	Vinita, OK (meso)	4.17	Gravette, AR (coop)	4.12
Mountainburg, AR 2NE (coop)	3.89	St Paul, AR (coop)	3.75	Eureka Springs, AR 3WNW (coop)	3.47
Pryor, OK (meso)	3.37	Miami, OK (coop)	3.35	Spavinaw, OK (coop)	3.32
Bristow, OK (meso)	3.32				

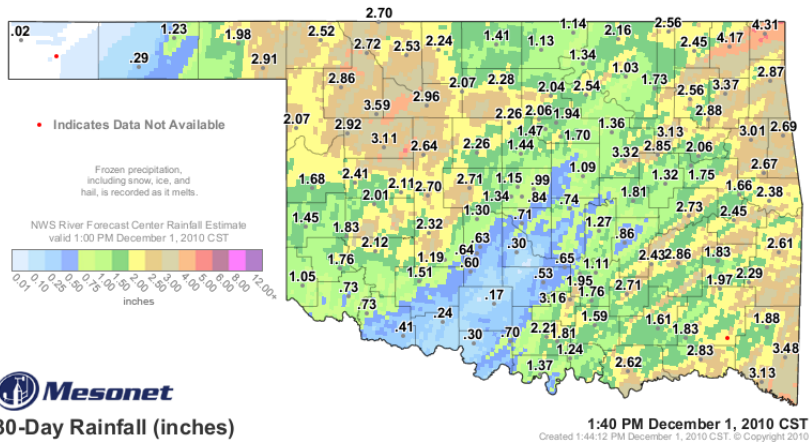


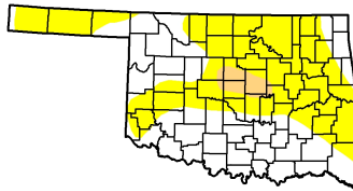
Fig. 1c. 30-Day rainfall totals from the Oklahoma Mesonet with RFC rainfall estimate overlay image.

According to the [U.S. Drought Monitor](#) (USDM) from November 30, 2010, abnormally dry conditions (D0) extended across much of eastern OK and into Sebastian Co. in west central AR (see Figs. 2 & 3). This expansion of abnormally dry conditions was due to the overall below normal precipitation received this November.

### U.S. Drought Monitor Oklahoma

November 30, 2010  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	46.3	53.7	3.1	0.0	0.0	0.0
Last Week (11/23/2010 map)	47.5	52.5	3.1	0.0	0.0	0.0
3 Months Ago (09/07/2010 map)	42.3	57.7	35.8	0.0	0.0	0.0
Start of Calendar Year (01/05/2010 map)	100.0	0.0	0.0	0.0	0.0	0.0
Start of Water Year (10/05/2010 map)	66.3	33.7	4.2	0.0	0.0	0.0
One Year Ago (12/01/2009 map)	100.0	0.0	0.0	0.0	0.0	0.0



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

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

<http://drought.unl.edu/dm>

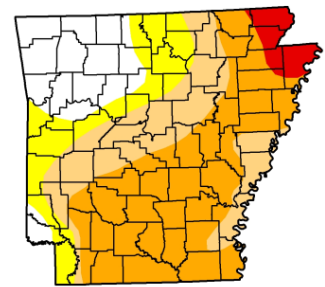


Released Thursday, December 2, 2010  
Author: R. Tinker, CPC/NOAA

### U.S. Drought Monitor Arkansas

November 30, 2010  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	17.4	82.6	67.7	45.5	4.1	0.0
Last Week (11/23/2010 map)	17.4	82.6	67.7	50.2	8.0	0.0
3 Months Ago (09/07/2010 map)	0.0	100.0	58.1	1.9	0.0	0.0
Start of Calendar Year (01/05/2010 map)	100.0	0.0	0.0	0.0	0.0	0.0
Start of Water Year (10/05/2010 map)	25.3	74.7	50.7	25.2	0.0	0.0
One Year Ago (12/01/2009 map)	100.0	0.0	0.0	0.0	0.0	0.0



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

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

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Fig. 2. Drought Monitor for Oklahoma

Fig. 3. Drought Monitor for Arkansas

Most of the major reservoirs in the Tulsa HSA were reporting below 90% of their normal conservation pools as of December 1, 2010, though a few reported pools that were 90% - 100% full and Lake Hudson was actually reporting 7% of flood control storage. Conservation pool deficits: Hugo Lake 53%, Heyburn Lake 75%, Wister Lake 83%, Keystone Lake 86%, Ft. Gibson 86%, Eufaula Lake 86%, Skiatook Lake 88%, Birch Lake 88%, Tenkiller Lake 88%, Hulah Lake 88%, and Copan Lake 89%.

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

Rank since 1921 ("Last XX days" ending November 30, 2010)	November 2010	Water Year (Oct 1, 2010 – Nov 30, 2010)	Autumn-to-Date (Sep 1 – Nov 30)	Last 120 Days (Aug 3 – Nov 30)	Last 365 Days (Dec 1, 2009 – Nov 30, 2010)	Year-to-Date 2010
Northeast OK	39 <sup>th</sup> wettest	19 <sup>th</sup> driest	36 <sup>th</sup> driest	36 <sup>th</sup> driest	41 <sup>st</sup> driest	43 <sup>rd</sup> wettest
East Central OK	34 <sup>th</sup> driest	17 <sup>th</sup> driest	41 <sup>st</sup> wettest	36 <sup>th</sup> driest	25 <sup>th</sup> driest	31 <sup>st</sup> driest
Southeast OK	34 <sup>th</sup> driest	16 <sup>th</sup> driest	22 <sup>nd</sup> driest	12 <sup>th</sup> driest	10 <sup>th</sup> driest	9 <sup>th</sup> driest

The [Climate Prediction Center](#) (CPC) outlook for December 2010 (issued November 30, 2010) indicates an equal chance for above, near, and below average temperatures as well as an equal chance for above, near, and below median precipitation. Short-term computer models indicated that an enhanced chance for cooler than normal temperatures due to a negative phase of the Arctic Oscillation and North Atlantic Oscillation will offset the enhanced chance for warmer than normal temperatures due to La Niña effects. Therefore, the December outlook indicates equal chances for temperature across the region. For the 3-month period Dec-Jan-Feb 2010-11, CPC is forecasting an enhanced chance for above average temperatures and equal chances for above, near, and below median precipitation (outlook issued November 18, 2010). The enhanced chance for above average temperatures for the 3-month winter outlook is consistent with La Niña impacts across the southern Plains. However, the precipitation signal across the HSA for La Niña is not strong. This means that during some La Niñas, eastern OK and northwest AR experience wetter than median precipitation, while for others it is drier than the median.

According to CPC, borderline strong La Niña conditions were observed at the end of November. La Niña events typically peak in December, and current computer models indicate that La Niña borderline moderate to strong conditions will occur this December. La Niña conditions are still expected to continue through winter 2010-11, and very likely into spring 2011. A La Niña Advisory continues, meaning La Niña conditions have been observed and are expected to continue.

## **Summary of Rain Events**

### **November 1 - 15:**

A low pressure system over northeast TX led to scattered showers and isolated thunderstorms across portions of east central and southeast OK, as well as northwest AR, starting late on November 1<sup>st</sup> and continuing through the 2<sup>nd</sup>. Most locations affected by the rain received around 0.5" or less of total rainfall, though higher totals of 0.5" to near 1" occurred across portions of Le Flore and Pushmataha Counties. Choctaw County had the highest totals, with most of the county receiving 1" to 1.5" and areas along the Red River getting 1.5" to 2".

Scattered showers and thunderstorms developed ahead of a cold front during the evening of November 11 and continued through the morning of the 12<sup>th</sup>. Most locations received around 0.10" to around 0.75" of rain from the prefrontal activity, with a narrow band of 1" to 1.5" from northern Pawnee through northern Washington Counties in northeast OK. Widespread rainfall accompanied the front as it moved across eastern OK during the afternoon and evening hours on the 12<sup>th</sup>. The showers became more scattered during the evening as the front moved into western AR. Rainfall totals from this event (see Fig. 4) ranged from a few hundredths in eastern Carroll County to around 2" in portions of Osage and Washington Counties. The OK Mesonet location at Copan measured 2.11" from this system. Most of eastern OK north of I-40 received storm total amounts of 0.5" to 1.5" of much needed rain.

Widespread light rain developed across the HSA during the afternoon of the 15<sup>th</sup> and continuing into the morning of the 16<sup>th</sup> as an upper-level trough moved through the Plains. Most locations received 0.25" or less of precipitation, with slightly higher amounts of 0.25" to 0.75" occurring northwest of I-44. The highest totals occurred across southern Le Flore County, where around 0.75" to around 1.5" fell.

Tulsa, OK (TSA): Current 7-Day Observed Precipitation  
Valid at 11/15/2010 1200 UTC - Created 11/15/10 16:06 UTC

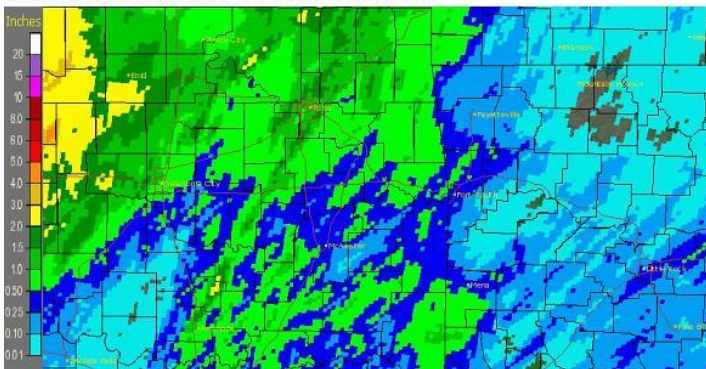


Fig. 4. Estimated Observed Rainfall for November 12-13, 2010

## November 16 - 30:

As a strong surface low moved across northern OK on the 17<sup>th</sup>, light rain fell from along Hwy 412 and north. Rainfall amounts were generally around 0.10" or less, though higher totals of around 0.25" occurred closer to the KS/OK state line as well as the AR/MO state line.

A cold front moved across the region on the 22<sup>nd</sup>, bringing widespread rainfall to western AR and portions of southeast OK, with widely scattered activity across far eastern OK. Rainfall totals primarily ranged from 0.10" to 0.75". However, some areas of Pittsburg, Haskell, Sequoyah, Le Flore, and Franklin Counties saw 1" to 1.5" from this event. The front stalled near the Red River before returning north as a warm front on the 23<sup>rd</sup> and 24<sup>th</sup>. Warm air advection led to additional widespread light rain, with totals of 0.5" or less across most of the area.

Another strong cold front then swept through the region on the evening of the 24<sup>th</sup> and into the morning of the 25<sup>th</sup>. Showers and thunderstorms, some severe, developed along and ahead of the front, with training of storms leading to flash flooding across far northeast OK. A large portion of eastern OK and northwest AR received over 1" of total precipitation, with over 3" of rain falling across portions of Craig and Ottawa Counties (see Figs. 5 and 6). The Mesonet site in Miami measured 2.72", with 2.44" measured at the Mesonet site in Vinita on the 24<sup>th</sup>. Portions of Pittsburg and western Latimer Counties also received higher totals of 1.5" – 2.5" of rain. As sub-freezing air filtered in behind the front, there was a brief period of post frontal freezing rain and sleet, though little to no accumulation was reported. Unfortunately, Osage, Pawnee, and Washington Counties and most of Nowata County did not receive any rainfall from this event.

The final rain event of the month occurred on November 29<sup>th</sup> as a pre-frontal trough traversed the area. Light rain occurred along and ahead of the trough during the morning and early afternoon hours. Most of the region received less than 0.25" of rain, though portions of far southeast OK and west central AR received between 0.5" and 0.75" of precipitation.

Tulsa, OK (TSA): 11/25/2010 1-Day Observed Precipitation  
Valid at 11/25/2010 1200 UTC- Created 11/27/10 23:32 UTC

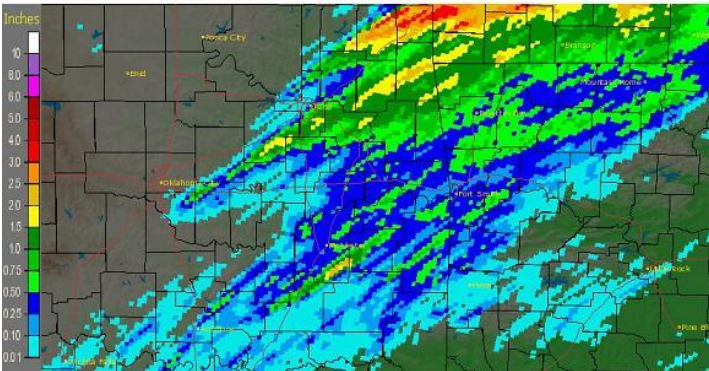


Fig. 5. Estimated Observed Rainfall for November 24, 2010

Tulsa, OK (TSA): 11/26/2010 1-Day Observed Precipitation  
Valid at 11/26/2010 1200 UTC- Created 11/28/10 23:31 UTC

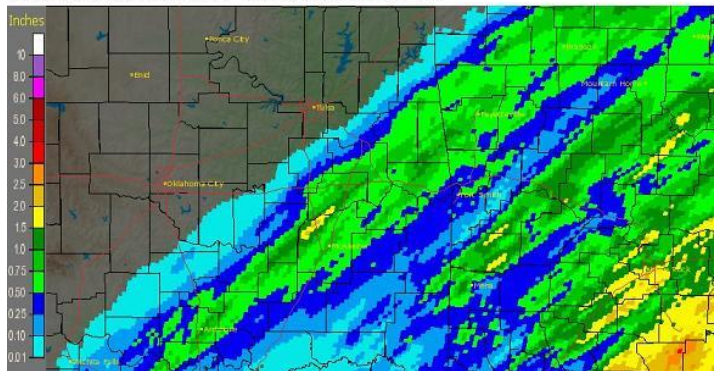


Fig. 6. Estimated Observed Rainfall for November 25, 2010

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)