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 **February** YEAR **2014**
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 **March 4, 2014**

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.

Franklin County, AR was officially transferred to the NWS Tulsa Hydrologic Service Area (HSA) on February 5, 2014. NWS Tulsa is now responsible for watches/warnings/advisories for two additional daily forecast points: Mulberry River near Mulberry (MLBA4) and Arkansas River at Ozark Lock and Dam (OZGA4). It was another very dry month across eastern OK and northwest AR. In fact, Tulsa, OK ranked as the driest January – February period on record this year with only 0.45" of rain from Jan. 1-Feb. 28, 2014 (Fort Smith, AR ranked as the 11th driest and Fayetteville, AR was the 9th driest). Normal precipitation across the Hydrologic Service Area (HSA) in February ranges from 1.8 inches in Osage County to 3.2 inches in Choctaw County. In the Ozark region of northwest Arkansas, the normal monthly precipitation is 2.9 inches.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for February 2014 ranged from 0.10" in portions of eastern OK to around a measly 1" in portions of northwest AR. This resulted in well below normal precipitation for the entire area for February. A large portion of the HSA received less than 25% of the normal February rainfall (Fig. 1b), with portions of Nowata and Okfuskee Counties receiving only between 5% and 10% of the normal rainfall this month. The remainder of eastern OK and northwest AR received 25%-50% of the normal rainfall this month.

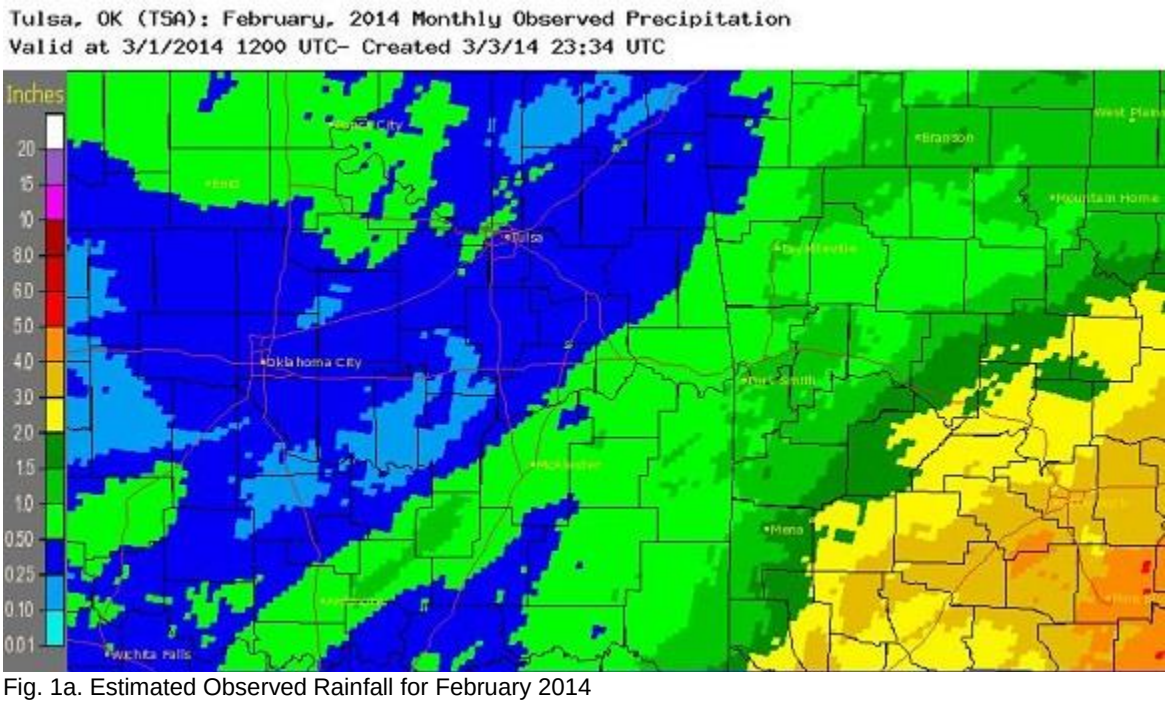

Fig. 1a. Estimated Observed Rainfall for February 2014

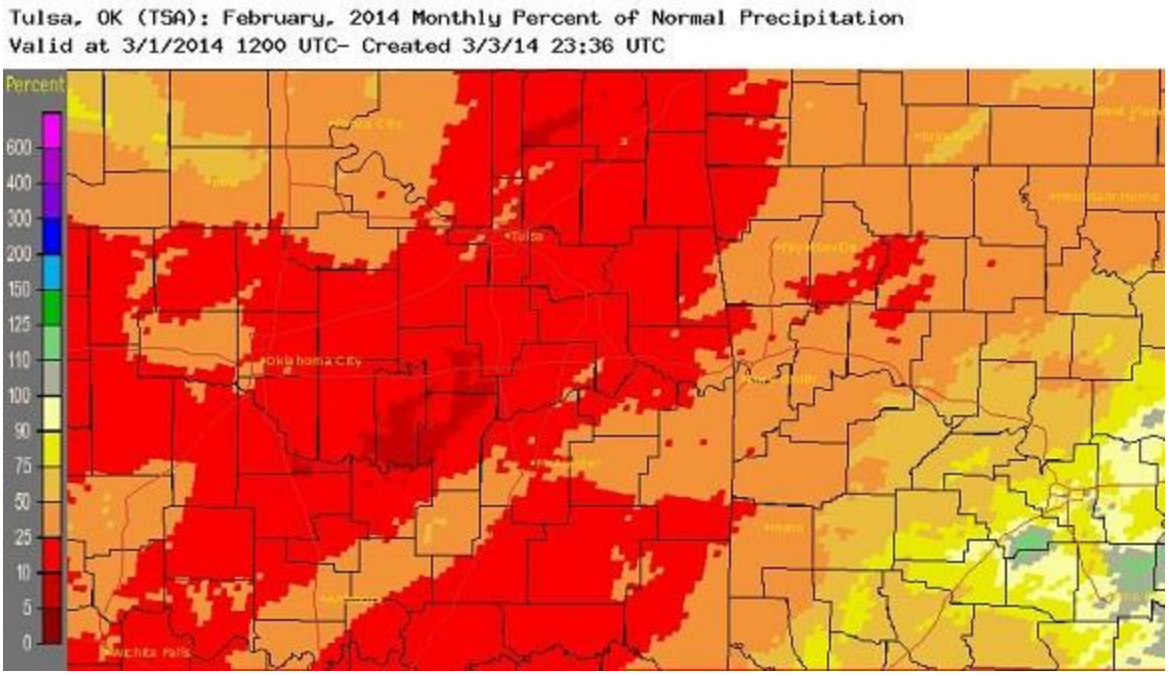

Fig. 1b. Estimated % of Normal Rainfall for February 2014

In Tulsa, OK, February 2014 ranked as the 14th coldest February (36.5°F, tied 1947; since records began in 1905), the 11th driest February (0.32"; since records began in 1888), and the 26th snowiest February (3.9"; since records began in 1900). Fort Smith, AR was the 25th coldest February (39.8°F, tied 2003, 1975; since records began in 1883), the 23rd driest February (0.98"; since records began in 1883), and the 17th snowiest February (5.2"; since records began in 1884). Fayetteville, AR was the 6th coldest (33.8°F, tied 1985), the 4th driest (0.84"), and the 14th snowiest (5.2") February since records began in 1950.

Some of the larger precipitation reports (in inches) for February 2014 included:

Cloudy, OK (meso)	1.29	Ozark, AR (coop)	1.20	Clayton, OK (meso)	1.12
Winslow 7NE, AR (coop)	1.07	Talihinia, OK (meso)	1.06	Wister, OK (meso)	1.05
Hugo, OK (meso)	1.05	Bengal, AR (coop)	1.00	Fort Smith, AR (ASOS)	0.98

Some of the lowest precipitation reports (in inches) for February 2014 included:

Miami, OK (meso)	0.13	Nowata, OK (meso)	0.16	Pryor, OK (meso)	0.16
Bartlesville, OK (ASOS)	0.21	Wynona, OK (meso)	0.23	Jenks Riverside Arpt, OK (ASOS)	0.26
Vinita, OK (meso)	0.26	Tulsa, OK (meso)	0.27	Copan, OK (meso)	0.27

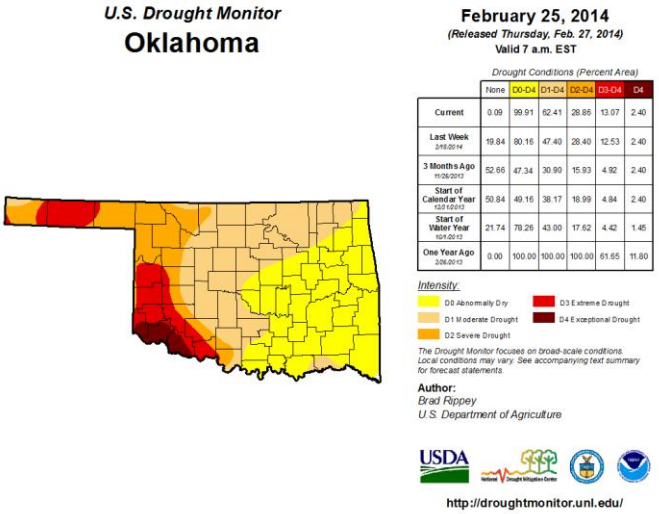

Fig. 2. Drought Monitor for Oklahoma

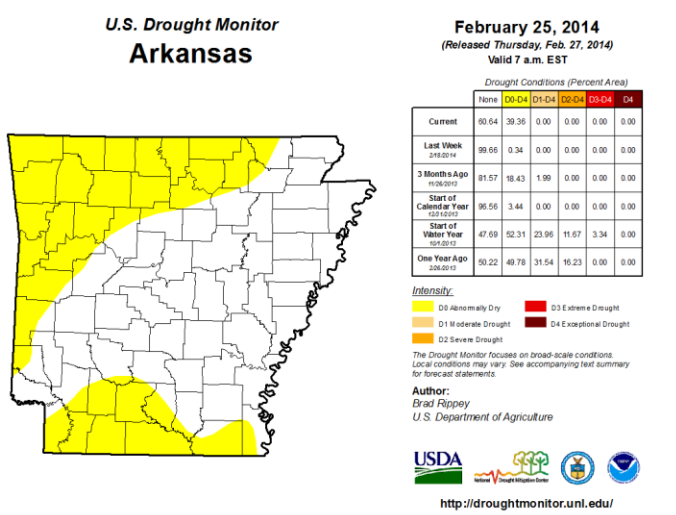

Fig. 3. Drought Monitor for Arkansas

According to the U.S. Drought Monitor (USDM) from February 25, 2014 (Figs 2, 3), Moderate Drought (D1) conditions pushed eastward into northeast OK, affecting Osage, Pawnee, Washington, Nowata, Craig, western

Ottawa, northern Rogers, northern Tulsa, and northern Creek counties. D1 also redeveloped in Choctaw County. Abnormally Dry (D0), but not experiencing drought, conditions also expanded across all of eastern OK and northwest AR.

According to the USACE, most of the major reservoirs in the HSA were operating within ±3% of the top of their conservation pools as of 2/28/2014. However, a few lakes were below normal: Skiatook Lake 72%, Heyburn Lake 76%, Birch Lake 92%, Eufaula Lake 93%, and Tenkiller Lake 95%.

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

Rank since 1921	Last 30 Days (Jan 30-Feb 28)	Year-to-Date (Jan 1 – Feb 28)	Winter-to-Date (Dec 1 – Feb 28)	Last 120 Days (Nov 1 – Feb 28)	Water Year-to-Date (Oct 1 – Feb 28)	Cool Growing Season (Sep 1 – Feb 28)	Last 365 Days (Mar 1, 2013 – Feb 28, 2014)
Northeast OK	**4th driest**	**1st driest**	**3rd driest**	**7th driest**	**15th driest**	17th driest	40th driest
East Central OK	**6th driest**	**6th driest**	**12th driest**	**13th driest**	32nd driest	21st driest	37th driest
Southeast OK	**7th driest**	**7th driest**	**7th driest**	17th driest	36th driest	27th driest	41st driest
Statewide	**9th driest**	**4th driest**	**6th driest**	**9th driest**	17th driest	**15th driest**	34th driest

Winter 2013-14

In Tulsa, OK, Winter 2013-14 ranked as the 12th coldest Winter (35.8°F; since records began in 1905-06) and the 6th driest Winter (2.23"; since records began in 1888-89). Fort Smith, AR was the 23rd coldest Winter (38.6°F, tied 1892-93; since records began in 1882-83) and the 32nd driest Winter (5.87"; since records began in 1882-83). Fayetteville, AR was the 5th coldest (33.2°F) and the 20th driest (6.58", tied 1991-92) Winter since records began in 1949-50.

Outlooks

The Climate Prediction Center (CPC) outlook for March 2014 (issued February 28, 2013) indicates a slightly enhanced chance for below normal temperatures across far northeast OK and far northwest AR, with equal chances for above, near, and below temperatures elsewhere across the area. This outlook also indicates equal chances for above, near, and below median precipitation across all of eastern OK and northwest AR. This outlook is based on short-, medium-, and extended-range forecasts of expected weather conditions during the month. The enhanced chance for below normal temperatures is primarily due to a period of much below normal temperatures favored for the first week of March for much of the central and eastern US, a continuation of favored below normal temperatures in the extended-range model guidance until at least mid-march, and a tendency for below normal temperatures across parts of the central and eastern US associated with strengthening and forecast MJO activity over the next few weeks.

For the 3-month period Mar-Apr-May 2014, CPC is forecasting equal chances for above, near, and below normal temperatures and rainfall across all of eastern OK and northwest AR (outlook issued February 20, 2014). According to CPC, ENSO neutral conditions remained through February. ENSO neutral conditions are expected to continue through Spring 2014, with an increasing chance for development of El Niño conditions into Summer 2014. Therefore, this outlook is based on both statistical and dynamical forecast tools.

Summary of Precipitation Events

February 1-14

Light rain/drizzle/freezing rain developed across northeast OK and northwest AR behind a cold front during the early hours of the 1st. The precipitation remained very light across most of the affected area, though northwest

AR received 0.10” to around 0.25”.

An upper-level disturbance moved into the area from the southwest on Groundhog Day, Feb. 2, resulting in wintry precipitation across eastern OK and northwest AR. The snow moved into the area quickly during the morning, resulting in treacherous driving conditions and numerous accidents. Snow fell across most of the area, except along and north of a Pawnee to Nowata line, where it remained dry. Far southeast OK saw mostly freezing rain and sleet, with a brief changeover to snow at the end of the event. The heaviest snow fell from south of Okemah through Checotah to near Fayetteville, where 5”-7” was common (Fig. 4a). 0.10”-0.20” of ice accumulation occurred in far southeast OK (Fig. 4b), and a narrow band of heavy sleet just to the north of the icing area resulted in 1.5” of sleet accumulation at Clayton in northern Pushmataha County. Liquid equivalent/rainfall totals ranged from around 0.10” near the I-44 corridor to near 0.75” in east central OK and west central AR. Most of the affected area received 0.10” to around 0.50”. More information about this winter storm can be found at: http://www.srh.noaa.gov/tsa/?n=weather-event_2014feb2

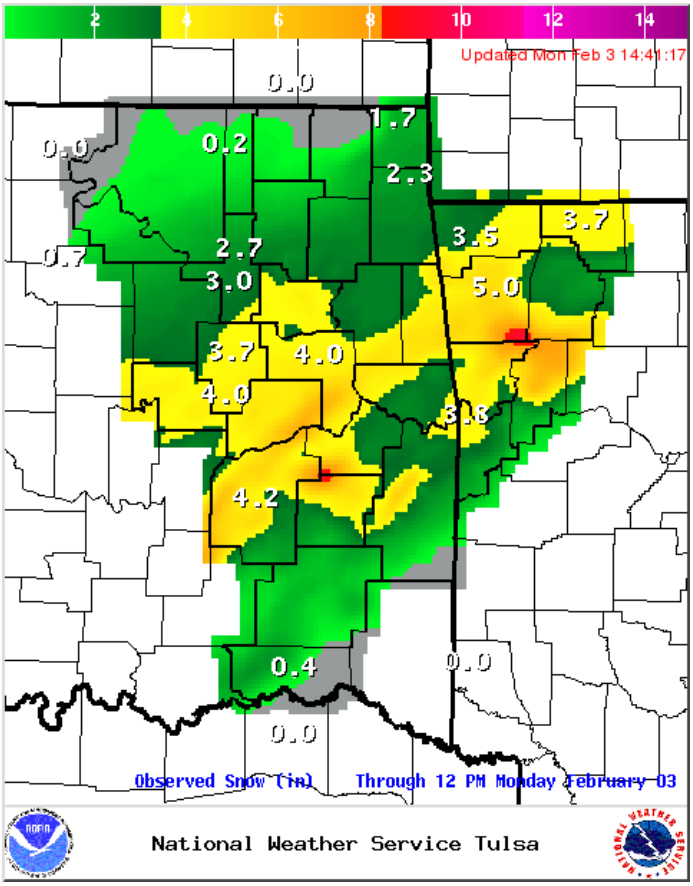

Fig. 4a. Snowfall estimate for Feb. 2, 2014.

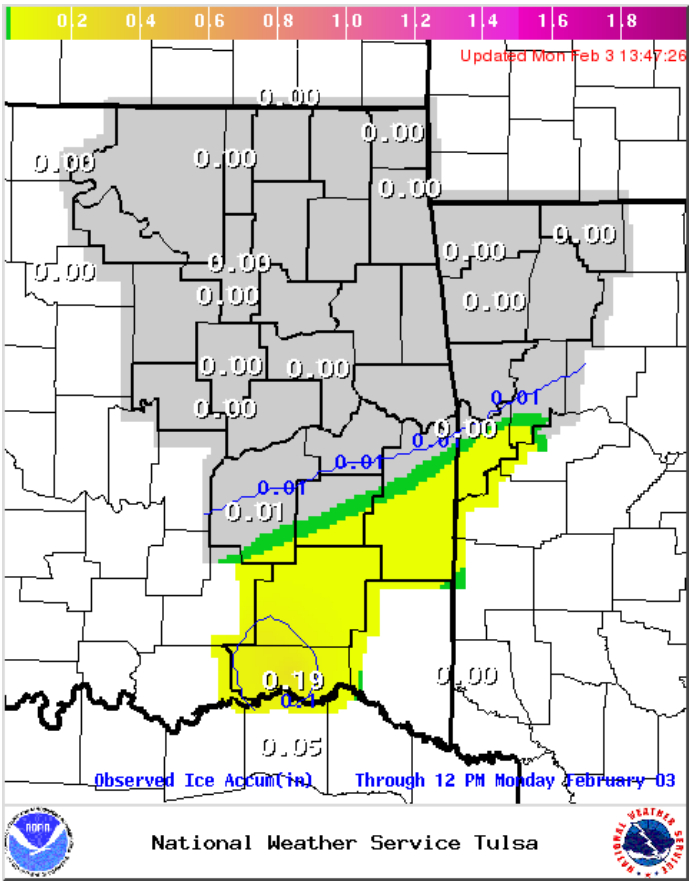

Fig. 4b. Ice accumulation estimate for Feb. 2, 2014.

Another winter weather system affected most of the HSA on the 4th. Warm air advection in the lower layers of the atmosphere, in advance of the main upper-level system, combined with sub-freezing surface conditions caused the initial precipitation to be freezing rain and sleet. As the upper-level system got closer, the precipitation changed over to snow, mainly north of I-40. The highest snowfall totals were 1”-3” across portions of northeast OK and northwest AR, with lesser amounts further south as the dry slot moved in (Fig. 5a). Ice accumulations ranged from a glaze to around 0.10” (Fig. 5b). Rainfall and liquid equivalent totals from this system ranged from around 0.10” to around 0.50”.

An unseasonable cold airmass moved in to the region on the 5th. A fast moving upper-level wave moved into the region late on the 5th, bringing primarily light snow to all but far northeast OK on the 6th. While most locations received less than 0.50” of snow, portions of Okmulgee, Muskogee, Okfuskee, Creek, Latimer, and McIntosh Counties received 1”-2” (Fig. 6). The highest report was 3” in Henryetta (Okmulgee Co.). This was a very fluffy, dry snow, with little liquid water equivalent.

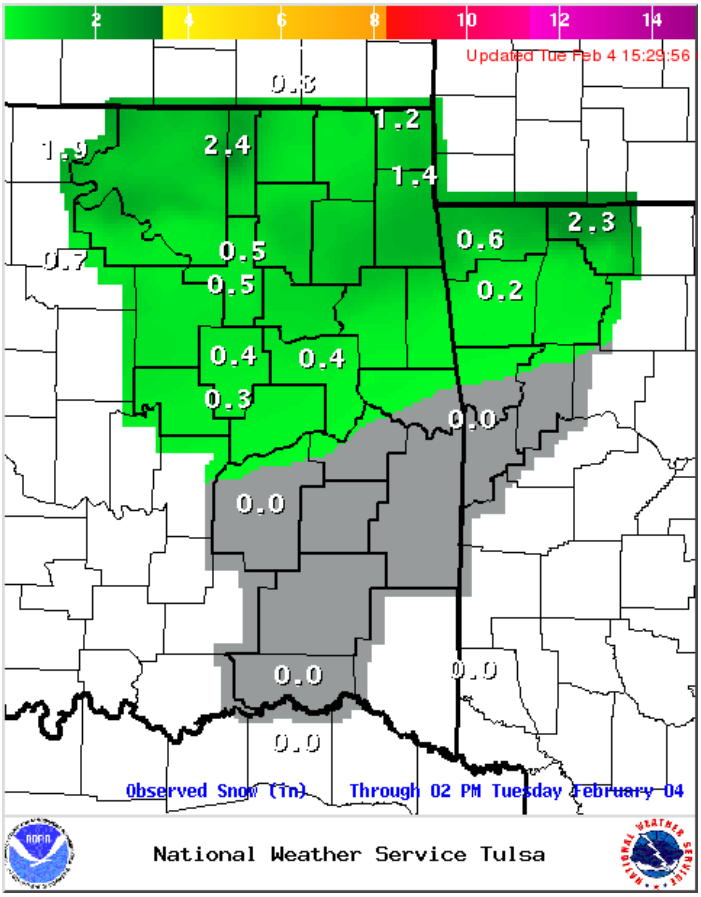

Fig. 5a. Snowfall estimate for Feb. 4, 2014.

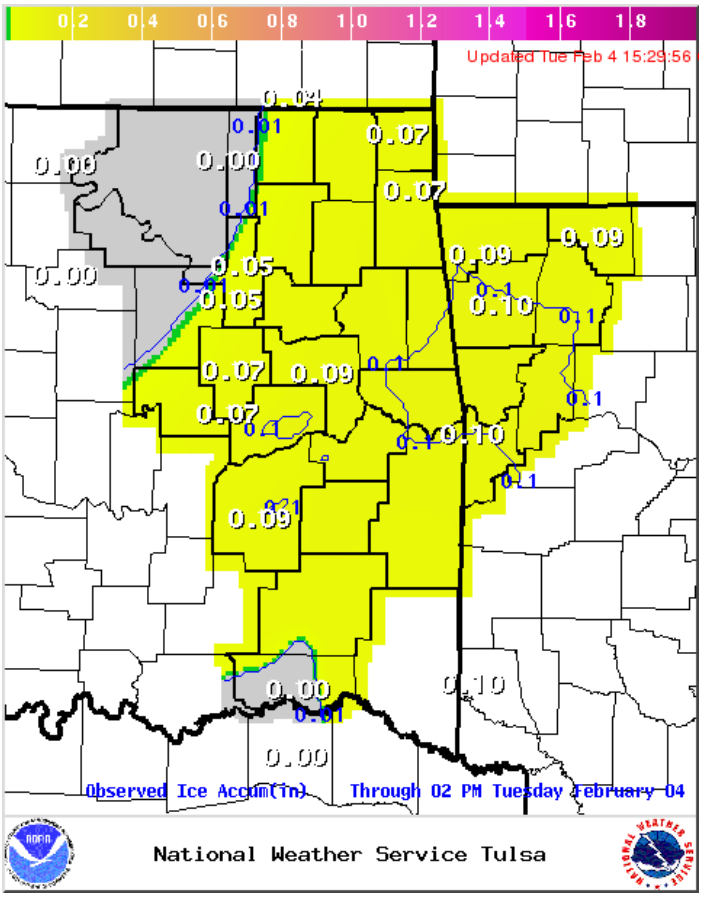

Fig. 5b. Ice accumulation estimate for Feb. 4, 2014.

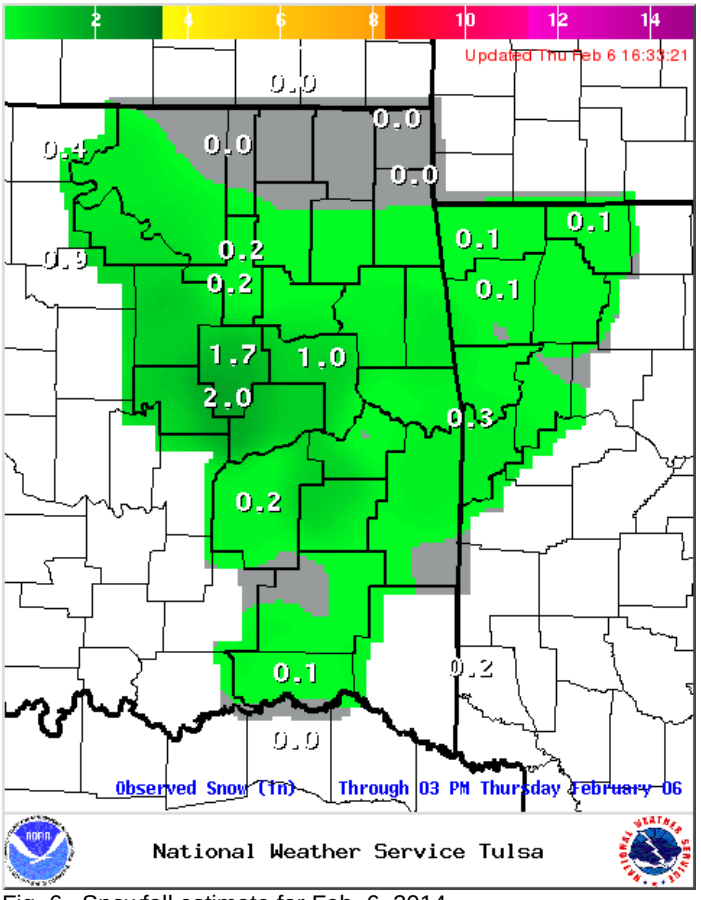

Fig. 6. Snowfall estimate for Feb. 6, 2014.

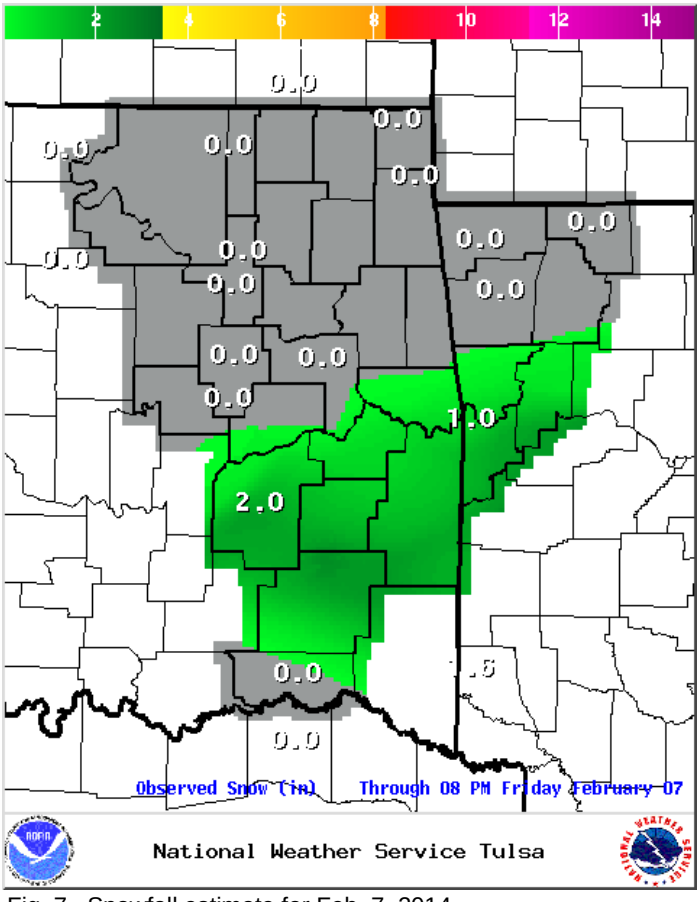

Fig. 7. Snowfall estimate for Feb. 7, 2014.

Another shortwave trough approached from the west on the 7th, bringing snow to southeast OK and west central AR, generally along and south of I-40, during the afternoon and evening hours. 1.5”-2.5” of snow were reported in Pushmataha, Pittsburg, Le Flore, and Latimer Counties in OK and Sebastian and Franklin Counties in AR, with less than 1” reported elsewhere (Fig. 7). The highest report was 3” of snow in Poteau (Le Flore Co.). Rainfall/liquid equivalent totals were around 0.10” or less.

An intense but narrow band of snow affected primarily Osage, Pawnee, Tulsa, and Creek Counties during the evening and into the overnight hours of the 10th-11th. However, drier air at the lower levels lessened the snowfall extent as the system moved east. Snowfall totals ranged from 3” in Pawnee (Pawnee Co.) to around half an inch in Bixby (southern Tulsa Co.) (Fig. 8). Liquid equivalent was around 0.10” in western Pawnee County, with less than 0.10” elsewhere.

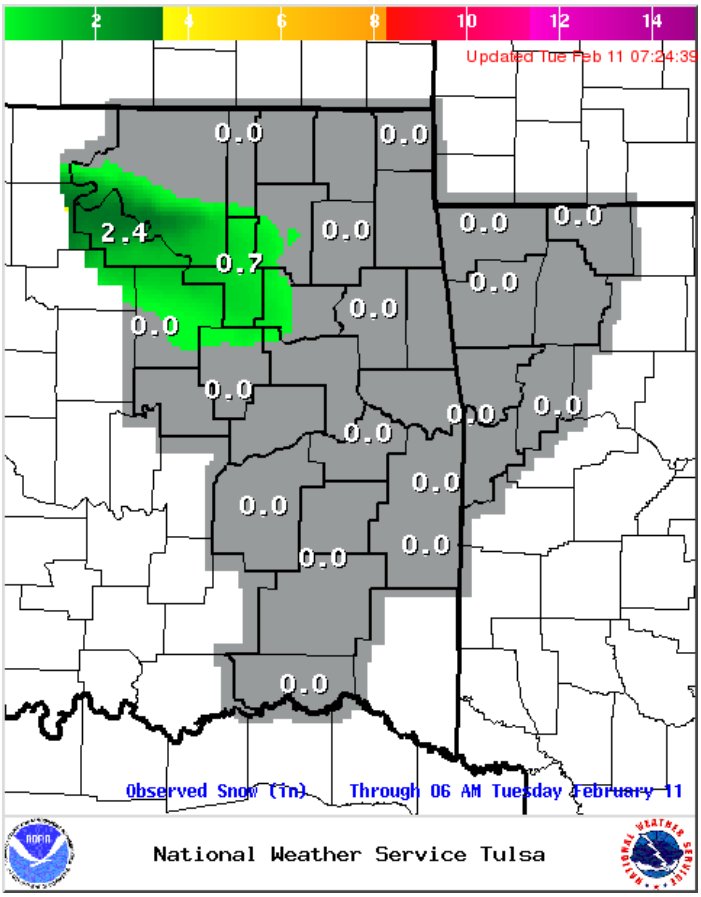

Fig. 8. Ice accumulation estimate for Feb. 10-11, 2014.

February 15-28

A warm front lifted north across the HSA on the 19th, with a few isolated showers and thunderstorms developing during the evening and late night hours across northeast OK. Most affected locations received only a few hundredths of an inch of rain, with isolated spots of around 0.25”.

An upper-level wave brought some light rainfall to northeast OK and northwest AR, along and north of I-40, during the morning and afternoon hours of the 28th. Rainfall totals were generally around 0.10” or less north of I-40; however, slightly higher totals of 0.10” to near 0.50” occurred in portions of eastern Kay, Osage, Pawnee, Creek, and western Tulsa Counties.

Written by:

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WFO Tulsa

Products issued in February 2014:

***MLBA4 and OZGA4 transferred to NWS Tulsa HSA February 5, 2014**

*Mixed case River Flood products began July 31, 2013

0 Flash Flood Warnings (FFW)
0 Flash Flood Statements (FFS)
0 Flash/Areal Flood Watches (FFA) (0 Watch FFA CON/EXT/CAN)
0 Urban and Small Stream Advisories (FLS)
0 Areal Flood Warnings (FLW)
0 Areal Flood Statements (FLS)
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)

Preliminary Hydrographs:

None