

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR:

MONTH **January** YEAR **2010**

SIGNATURE

**Steven F. Piltz**  
 (Meteorologist-in-Charge)

DATE

**February 1, 2010**

TO: Hydrometeorological Information Center, W/OH2  
 NOAA / National Weather Service  
 1325 East West Highway, Room 7230  
 Silver Spring, MD 20910-3283

*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 HSA during the month above.

January 2010 started off with record breaking cold and ended with a significant winter storm. January is climatologically the driest month of the year. Normal precipitation for January ranges from 1.2 inches in Pawnee County to 2.2 inches in Haskell County. In the Ozark region of northwest Arkansas, precipitation averages 2.2 inches for the month.

**Summary of Rain and Snow Events**

January 1-15:

Despite being weak, a fast moving disturbance brought bands of light to moderate snow to eastern OK and northwest AR from late January 2 into the afternoon on the 3<sup>rd</sup>. As seen in Fig. 1, 1 to 3 inches of snow affected locations across northeast OK and northwest AR.

A strong cold front moved through the area on the evening of the 6<sup>th</sup>, bringing frigid temperatures, strong winds, and wintry precipitation. Lows on the morning of the 7<sup>th</sup> ranged from 6°F to 18°F north to south, and with wind gusts of 20-30 mph, wind chill values dropped to as low as 11 degrees below zero.

Additionally, a dusting of snow and light freezing rain up to one tenth of an inch affected northeast OK and northwest AR. The extremely cold temperatures continued on the 8<sup>th</sup>, with lows falling to -2°F in far northeast OK to 10°F in southeast OK. Wind chills were as cold as -19°F across portions of northeast OK and northwest AR as winds gusted to 15 to 25 mph. On the 9<sup>th</sup>, a passing upper wave brought snow flurries to Tulsa, Rogers, and Muskogee Counties, creating a dusting of snow.

Temperatures finally warmed up during the week of the 11<sup>th</sup>, with a large amount of snowmelt on the 13<sup>th</sup> and 14<sup>th</sup>. This led to only very minor rises on area rivers. A mid-level short wave moved through the region on the 14<sup>th</sup>, bringing light rain, around one tenth of an inch or less, to east central and southeast OK, and portions of northwest AR. A 4.0 earthquake on the Richter Scale, which was weakly felt in the Tulsa area, occurred near Jones in central OK on the 15<sup>th</sup>. Dense fog, heavy drizzle, and light rain brought up to one tenth of an inch of rain to the HSA on the 15<sup>th</sup>.

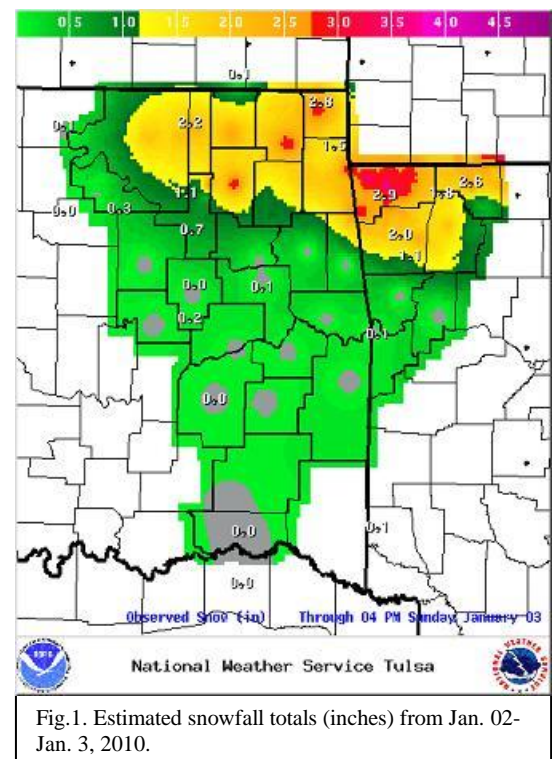


Fig. 1. Estimated snowfall totals (inches) from Jan. 02-Jan. 3, 2010.

## January 16-27:

As an upper-level wave moved along the Red River on the 16<sup>th</sup>, scattered showers brought light to briefly moderate rainfall to primarily southeast OK and west central AR, with heavy drizzle affecting the remainder of the area. Locations south of an Okmulgee to Poteau to Ozark line received from one tenth to around one inch of rainfall from this activity. Another passing upper wave sparked light showers on the 19<sup>th</sup>. While most of eastern OK received only a trace to few hundredths of an inch of precipitation, far eastern OK and western AR saw up to around half an inch of rain due to isolated thunderstorms that developed during the evening hours.

The atmosphere became moderately unstable during the late afternoon and evening hours on the 20<sup>th</sup>. Showers and thunderstorms developed along and ahead of a frontal boundary that was draped across southeast OK and west central AR. As a strong low pressure system moved into the region, thunderstorms developed across southern OK and northern TX and moved northeast. A severe thunderstorm brought 1" hail to Choctaw County and damaging winds affected Fort Smith, AR. These storms merged into a line of storms as they continued to the northeast across southeast OK into northwest AR. A second line of storms developed and moved from south central OK into northeast OK and northwest AR. All of this activity led to widespread rainfall across the HSA. Many locations received between 0.5 and 1 inch of rain, with several COOP observers and mesonet sites reporting over one inch of rain. The Cloudy, OK mesonet station recorded over 2 inches of rain from this event. Area rivers experienced minor rises from this rainfall, though no flooding occurred. As the storm system departed the area, wrap-around light rain and drizzle on the 21<sup>st</sup> brought a trace to a several hundredths of an inch of precipitation to northeast OK and far northwest AR.

Light rain fell ahead of a cold front on the late on the 22<sup>nd</sup> and through 23<sup>rd</sup>. Along and northwest of I-44, rainfall totals were less than one tenth of an inch. The remainder of eastern OK received from 0.10" to 0.50" of rain, with isolated areas in east central OK getting around 0.75". Heavier rainfall occurred across western AR, where totals ranged from 0.25" to near 1" from west to east. Franklin and far eastern Madison Counties had totals closer to 1.5". Franklin County reported a landslide along portion of State Highway 23 between Ozark and the Madison County line due to all of the recent rainfall.

## January 28-31 (Significant Winter Storm):

A significant winter storm affected eastern OK and northwest AR on the 28<sup>th</sup> - 29<sup>th</sup>. An upper-level low pressure system moved out of the southwest U.S. across OK and AR resulting in various types of wintry precipitation across eastern OK and northwest AR. At the surface, a cold front moved south through the area overnight on the 27<sup>th</sup>, dropping temperatures below freezing across northeast OK and northwest AR. Weak surface low pressure developed along the front to our south in Texas and moved east into Louisiana on the 29<sup>th</sup>. The north to northeast surface winds to the north of the low pressure center eventually drew enough cold air into southeast OK and west central AR to drop temperatures below freezing.

Precipitation ahead of the upper-level low began spreading into eastern OK on the morning of the 28<sup>th</sup> and into northwest AR during the afternoon. To the north of Highway 412, the precipitation was mostly a mixture of sleet and snow, with some light freezing rain. To the south of Highway 412, freezing rain was most common, with some sleet mixed in at times. Along and south of a McAlester to Fort Smith line, temperatures were above freezing, so rain was the precipitation type through the day and night on the 28<sup>th</sup>. Snow and sleet accumulations by the morning of the 29<sup>th</sup> ranged from 1 to 2 inches north of Highway 412, with ice accumulations of one quarter to one half inch common in the freezing rain area along and south of Highway 412.

On the 29<sup>th</sup>, as the upper-level low moved into OK bringing colder air both at the surface and aloft into the area, the precipitation changed to snow across all of eastern OK and northwest AR. Moderate to heavy snow fell at times during the afternoon of the 29<sup>th</sup> across all but far southeast OK, with the longest duration of snow being in northeast OK and northwest AR. Snowfall totals of 5 to 8 inches were common across northeast OK and northwest AR, with 2 to 4 inches across much of southeast OK and west central AR. In far southeast OK near the Red River, snow accumulations were under an inch. Snow and ice accumulations are shown in Fig. 2. The official Tulsa, OK sleet and snowfall two-day total was 7.0 inches and the official Fort Smith, AR total was 4.0 inches. Liquid equivalent estimates for this entire storm ranged from one half inch across the north to 2 to 3 inches across Pushmataha and Choctaw Counties (see Fig.3).

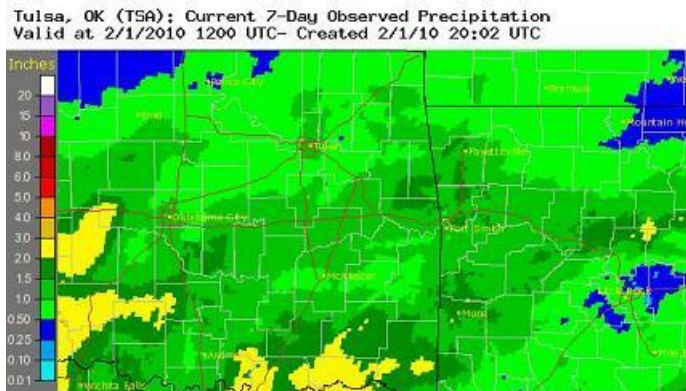
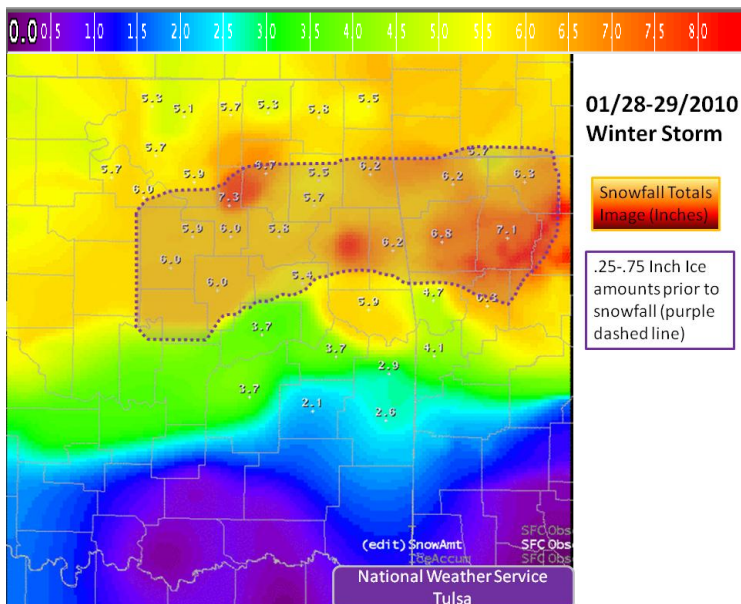


Fig. 2. Storm total snow and ice accumulation Jan. 28-29. Fig. 3. Storm total liquid equivalent Jan. 28-29.

## Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 4a.), rainfall totals for January 2010 ranged from around 1/2 inch around Ponca City to over 5 inches in the eastern portions of Pushmataha and Choctaw Counties. Most of the HSA received between 1.5 and 3 inches of rainfall. This corresponded to most of the region getting  $\pm 50\%$  of normal January precipitation (see Fig. 4b), though some areas were both well above and well below normal for the month.

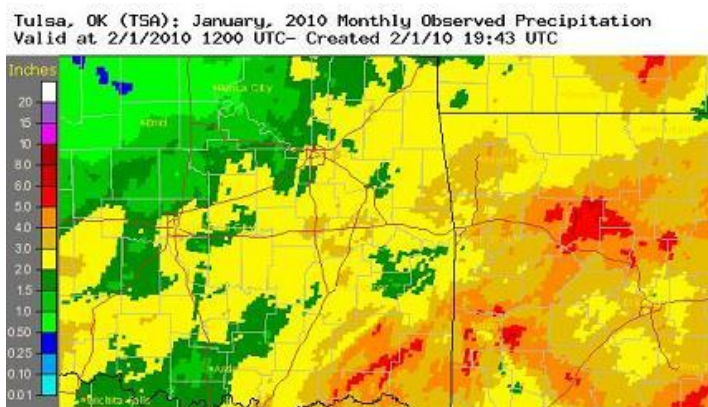
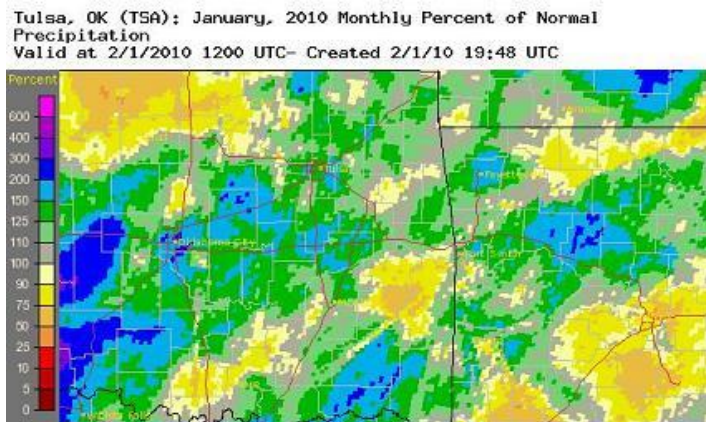


Fig. 4a. Estimated Observed Precip. for Jan. 2010



4b. Estimated % of Normal Precip. for Jan. 2010

Tulsa, OK recorded 7.3 inches of snow for this month, which makes January 2010 the 14<sup>th</sup> snowiest January since records began in 1900. This January also ranked as the 19<sup>th</sup> coldest January (33.7°F, since records began in 1905) and ties with 2004 as the 26<sup>th</sup> wettest January (2.36", since records began in 1888). Fort Smith tied with 1976 as the 33<sup>rd</sup> coldest January (36.9°F), was the 42<sup>nd</sup> wettest January (2.92"), and was the 25<sup>th</sup> snowiest January (4.0") since records began in 1883.

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

Cloudy, OK (meso)	5.45	Hugo, OK (meso)	4.99	Antlers, OK (meso)	4.33
Eureka Springs 3WNW, AR (coop)	3.29	Natural Dam, AR (coop)	3.29	Muskogee, OK (coop)	3.27
Odell, AR 2N (coop)	3.25	Ozark, AR (coop)	3.23	Fayetteville, AR (ASOS)	3.19

According to the U.S. Drought Monitor (USDM) from January 26, 2010, drought conditions did not exist across northeast OK and northwest AR.

The major reservoirs in the Tulsa HSA reported full conservation pools and flood control pool levels within 6% as of February 1, 2010. The exception was Kaw Lake, which was at 92% of its conservation pool. Additionally, the following reservoirs were reporting a higher percentage of storage within the flood pool: Pensacola Lake 15%; Eufaula Lake 14%; Oologah Lake 13%; Ft. Gibson Lake 12%, and Wister 7%.

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

Rank since 1921 ("Last XX days" ending Jan. 31, 2010)	January 2010	Dec. 1 – Jan. 31	Water Year (Oct. 1 – Jan. 31)	Last 90 Days (Nov. 3 – Jan. 31)	Last 180 days (Aug. 5–Jan. 31)	Last 365 days (Feb. 1- Jan. 31)
Northeast OK	42 <sup>nd</sup> driest	36 <sup>th</sup> driest	26 <sup>th</sup> wettest	21 <sup>st</sup> driest	18 <sup>th</sup> wettest	21 <sup>st</sup> wettest
East Central OK	44 <sup>th</sup> driest	38 <sup>th</sup> driest	21 <sup>st</sup> wettest	19 <sup>th</sup> driest	11 <sup>th</sup> <b>wettest</b>	19 <sup>th</sup> wettest
Southeast OK	28 <sup>th</sup> wettest	33 <sup>rd</sup> wettest	13 <sup>th</sup> <b>wettest</b>	31 <sup>st</sup> driest	4 <sup>th</sup> <b>wettest</b>	6 <sup>th</sup> <b>wettest</b>

The Climate Prediction Center (CPC) outlook for February 2010 (issued January 31, 2010) indicates a slightly enhanced chance for above normal precipitation and equal chances for above, near, and below normal temperatures. For the 3-month period Feb-Mar-Apr 2010, CPC is forecasting a slightly enhanced chance for below normal temperatures and equal chances for above, near, and below normal precipitation (outlook issued January 21, 2010). Sea-surface temperatures in the equatorial Pacific indicate that strong El Niño conditions currently exist. According to CPC, El Niño is expected to continue, though gradually weaken, through the spring, and the one-month and three-month outlooks are based on the general impacts expected during El Niño events. An El Niño Advisory remains in effect.

Written by:  
Nicole M<sup>c</sup>Gavock,  
Service Hydrologist  
WFO Tulsa

Products issued:

- 0 River Flood Warnings (FLW)
- 0 River Flood Statements (FLS)
- 0 River Flood Advisories (FLS)
- 0 River Flood Watches (FFA)
- 0 River Statements (RVS)
- 0 Hydrologic Outlooks (ESF)
- 0 Drought Information Statements (DGT)