

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

REPORT FOR:

MONTH

YEAR

February

2010

SIGNATURE

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(Meteorologist-in-Charge)

DATE

March 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.

Active winter weather continued during February 2010 across the region, with southeast OK continuing to receive the highest precipitation amounts. Normal precipitation 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.

Summary of Rain and Snow Events

February 1-14:

Widespread precipitation fell across eastern OK and northwest/west central AR on February 3-4 as an upper-level system approached from the southwest. A large portion of the area received between one tenth and one half inch of rain over the two-day period. Higher amounts of one half to near 1 inch were estimated across far southeast OK and into western AR. With colder temperatures across portions of northeast OK and northwest AR, the rain was mixed with snow and sleet. The highest snowfall report was 2 inches of slushy snow in Osage Co., with lesser accumulations elsewhere (see Fig. 1). A light glaze on elevated surfaces from freezing rain was also reported in Carroll Co. Light precipitation continued on the 5th across northeast OK and northwest AR, with reports of light glaze, light sleet, and light to moderate snow (accumulating on grassy surfaces) during the morning hours and light rain during the afternoon. Fog, freezing fog, and drizzle were also prevalent on the 3rd-5th.



Fig. 1. Observed snow and sleet Feb. 3-4, 2010.

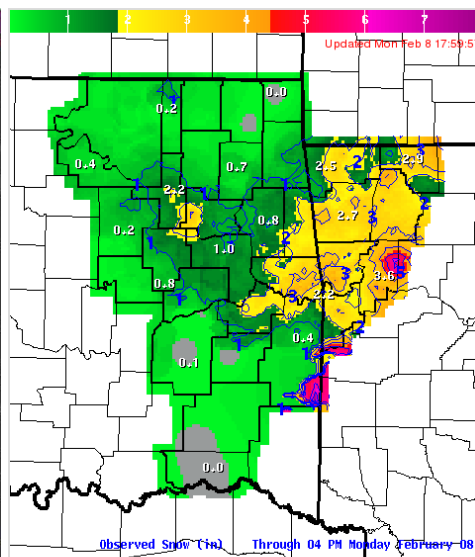


Fig. 2. Observed snow Feb. 7-8, 2010.

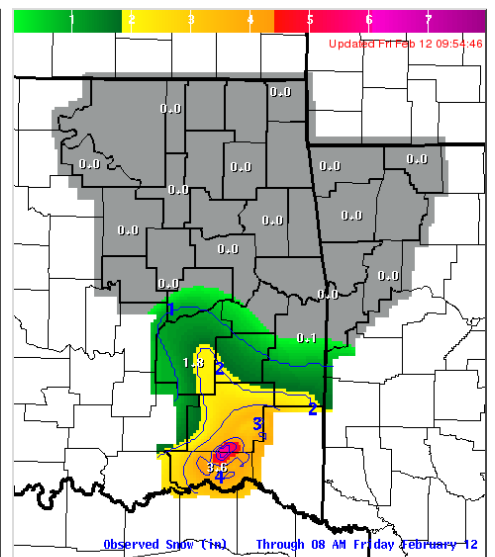


Fig. 3. Observed snow Feb. 11, 2010.

The next round of precipitation occurred Feb. 7-8, bringing snow to much of the HSA. The precipitation began as rain as a mid-level low approached the area. As a cold front moved through the region, the rain transitioned to snow. Observed snowfall totals (fig. 2) were highest across east central OK and western AR, where 2 to over 5 inches were reported. Elsewhere totals were around one inch or less. The two-day liquid precipitation estimates ranged from 0.5-1 inches across northeast OK to over 2 inches across southeast OK.

Another winter storm brought heavy snow to southern OK and northern Texas on the 11th as an upper-level low moved across northern TX. Snowfall remained south on I-40, with totals of 2 to 4 inches in far southeast OK (fig. 3). Liquid equivalent estimates ranged from a few hundredths near I-40 to around 0.75 inches along the Red River. Valentine's Day (Feb. 14) brought additional snowfall to eastern OK and northwest AR as a cold front moved through the HSA. A heavier band of snow initially developed near a Bristow through Tulsa to near Tahlequah line and then moved southeast into east central and southeast OK and northwest and west central AR. Rain, or a mix of rain and snow, affected locations ahead of the snow band. This band of snow brought rapid accumulations of around 1 inch, with some locations receiving around 2 inches of snow. Total rain and liquid equivalent estimates were less than one quarter inch throughout the area.

February 15-28:

A nearly stationary front generally resided near the I-44 corridor on Feb. 20-21. Precipitation developed near the front during the day on the 20th, and the shower and isolated thunderstorm activity increased during the overnight hours as a surface low moved northeast along the boundary. The front eventually moved eastward on the 21st, bringing additional rainfall and colder air into the region. This colder air allowed for a brief period of sleet across northeast OK before the precipitation completely ended, with little to no accumulation. All of the HSA received between half and one and a half inches of rain over the two days, with 2-day totals around 2 inches across portions of Okmulgee, Tulsa, Wagoner, and Rogers Counties.

Precipitation affected east central and southeast OK late on the 25th and through the day on the 26th as an upper-level low moved east near the Red River. Locations southwest of a Tulsa to Fort Smith line received light rainfall totals, while locations south of I-40 and southwest of an Okemah to Wister line received between half and one inch of rain. A few locations saw a brief period of snow early on the 26th, with no accumulation.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 4a.), rainfall totals for February 2010 ranged from 1-2 inches across far northeast OK and far northwest AR to 5-6 inches across far southeast OK. This corresponded to 150-200% of normal February precipitation (see Fig. 4b) for far southeast OK. However, locations along and north of I-40 and east of Hwy 75 received only 50-75% of the normal rainfall for February.

Tulsa, OK (TSA): February, 2010 Monthly Observed Precipitation
Valid at 3/1/2010 1200 UTC- Created 3/1/10 15:43 UTC

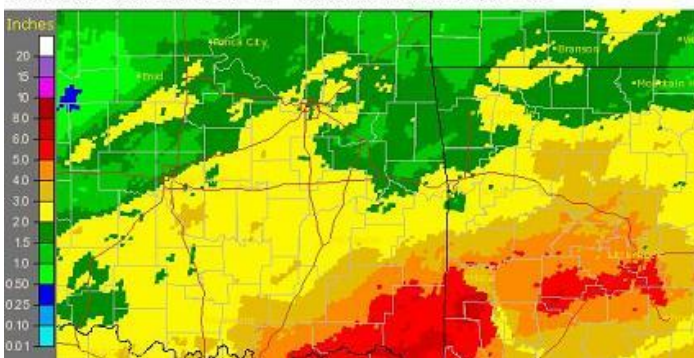


Fig. 4a. Estimated Observed Precip. for Feb. 2010

Tulsa, OK (TSA): February, 2010 Monthly Percent of Normal
Precipitation
Valid at 3/1/2010 1200 UTC- Created 3/1/10 15:48 UTC

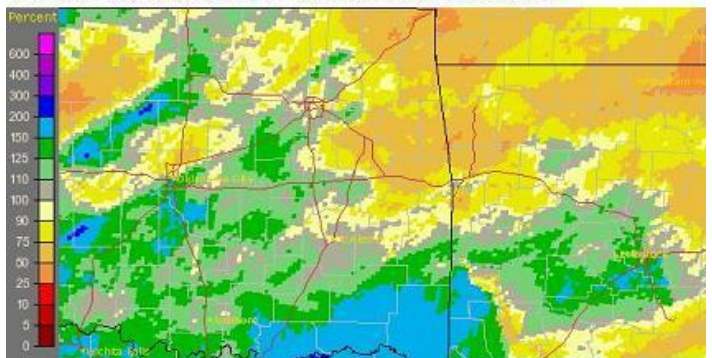


Fig. 4b. Estimated % of Normal Precip. for Feb. 2010

Tulsa, OK recorded 2.4 inches of snow for this month, which makes February 2010 the 35th snowiest February since records began in 1900. This February also ranked as the 13th coldest February (36.2°F, since records began in 1905) and was the 39th wettest February (2.03", since records began in 1888). Fort Smith was the 14th coldest February (37.9°F), was the 48th driest February (1.70"), and was the 21st snowiest February (4.0") since records began in 1883.

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

| | | | | | |
|--------------------|------|---------------------|------|------------------------|------|
| Hugo, OK (meso) | 5.48 | Cloudy, OK (meso) | 5.44 | Antlers, OK (meso) | 4.16 |
| Okema, OK (meso) | 3.84 | Talihina, OK (meso) | 3.48 | Hectorville, OK (meso) | 3.33 |
| Bristow, OK (meso) | 3.30 | Okmulgee, OK (meso) | 3.21 | Oilton, OK (meso) | 3.16 |

Seasonal Summary – Winter (Dec-Jan-Feb) 2009-2010

There was a wide range of precipitation totals from northwest to southeast across the Tulsa HSA this winter. Totals ranged from only 2-4 inches in eastern Kay and western Osage Counties to around 15 inches in far southeast OK (Fig. 5a.). Except for far southeast OK, the Tulsa HSA received near to below average precipitation from December 2009-February 2010 (Fig. 5b). Winter 2009-10 had its fair share of winter weather too, with 10 events bringing measurable snow or ice to the region. The two biggest winter weather events were the Christmas Eve 2009 Winter Storm/Near Blizzard (see Dec. E5 report for details) and the January 28-29, 2010 Winter Storm (see Jan. E5 report for details). The active winter weather was likely due to a combination of effects from a moderate to strong El Niño and strongly negative Arctic and North Atlantic Oscillations. The El Niño shifted the active Pacific Jet Stream further south, which led to a storm track over the Southern Plains. Meanwhile, the Arctic and North Atlantic Oscillations were negative (and very strongly negative at times) during the Dec-Feb period. When these oscillations are in the negative phase, colder than average temperatures occur across the U.S., including the Southern Plains.

Tulsa, OK (TSA): Current 90-Day Observed Precipitation
Valid at 3/1/2010 1200 UTC- Created 3/1/10 16:27 UTC



Tulsa, OK (TSA): Current 90-Day Percent of Normal Precipitation
Valid at 3/1/2010 1200 UTC- Created 3/1/10 16:32 UTC

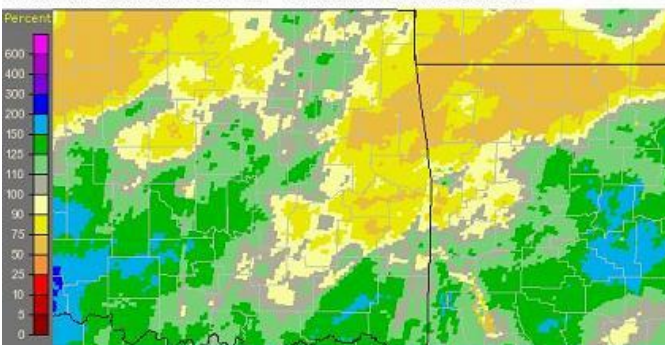


Fig. 5a. Estimated Observed Precip. Winter 2009-10 5b. Estimated % of Normal Precip. Winter 2009-10

Tulsa, OK recorded 17.1 inches of snow this winter, which makes Winter 2009-10 the 5th snowiest winter since records began in 1900. This winter also ranked as the 5th coldest winter (34.8°F, since records began in 1905) and was the 42nd wettest winter (6.27", since records began in 1888). Fort Smith was the 13th coldest winter (37.5°F), was the 57th driest winter (7.49"), and was the 18th snowiest winter (11.0") since records began in 1883.

From the Oklahoma Mesonet Ticker Feb. 24, 2010:

“A casualty of all that cloudiness and precipitation [this winter] is sunshine, and data from the Oklahoma Mesonet exemplifies that once again. The Mesonet’s instruments that measure solar radiation have received a mere 46.2 percent of possible sunshine this winter [across Oklahoma], the second-lowest total since the Mesonet began in 1994. Only the winter of 1997-98, the second wettest on record [for the entire state] and the “super” El Niño winter, was gloomier.”

The impact on Oklahoma’s temperatures has been to suppress the daytime high temperatures much more than the lows. The average high temperature from the Oklahoma Mesonet this winter has been nearly 6 degrees below normal while low temperatures are less than 2 degrees below normal. The cloudiness helps block solar radiation during the day while trapping heat during the overnight hours.”

According to the U.S. Drought Monitor (USDM) from February 23, 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 4% as of March 1, 2010. However, two reservoirs were reporting a higher percentage of storage within the flood pool: Eufaula Lake 13% and Oologah Lake 15%.

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

| Rank since 1921 ("Last XX days" ending Feb. 28, 2010) | Last 30 Days | Year-to- Date 2010 | Winter (Dec.1 – Feb. 28) | Water Year (Oct.1 – Feb. 28) | Cool Growing Season (Sep. 1 – Feb. 28) | Last 365 days (Mar. 1, 2009 – Feb. 28, 2010) |
|---|-----------------------------|-----------------------------|--------------------------------|------------------------------------|--|--|
| Northeast OK | 20 th wettest | 28 th wettest | 42 nd wettest | 25 th wettest | 19 th wettest | 19 th wettest |
| East Central OK | 33 rd wettest | 36 th wettest | 42 nd driest | 23 rd wettest | 13 th wettest | 16 th wettest |
| Southeast OK | 26 th wettest | 20 th wettest | 22 nd wettest | 8 th wettest | 2 nd wettest | 3 rd wettest |

The Climate Prediction Center (CPC) outlook for March 2010 (issued February 28, 2010) indicates an enhanced chance for above median precipitation and an enhanced chance for below average temperatures. For the 3-month period Mar-Apr-May 2010, CPC is forecasting a slightly enhanced chance for below average temperatures and equal chances for above, near, and below median precipitation (outlook issued February 18, 2010). Sea-surface temperatures in the equatorial Pacific indicate that moderate El Niño conditions currently exist. According to CPC, El Niño is expected to continue, though gradually weaken, through the spring. The one-month and three-month outlooks for the Southern Plains are consistent with the general impacts expected during El Niño events, global climate model output, and long-term trends. An El Niño Advisory remains in effect.

Written by:
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WFO Tulsa

Products issued:

- 0 River Flood Warnings (FLW)
- 0 River Flood Statements (FLS)
- 1 River Flood Advisories (FLS) (4 Advisory FLS CON/EXT/CAN)
- 1 River Flood Watches (FFA) (1 Watch FFA CON/EXT/CAN)
- 0 River Statements (RVS)
- 1 Hydrologic Outlooks (ESF)
- 0 Drought Information Statements (DGT)