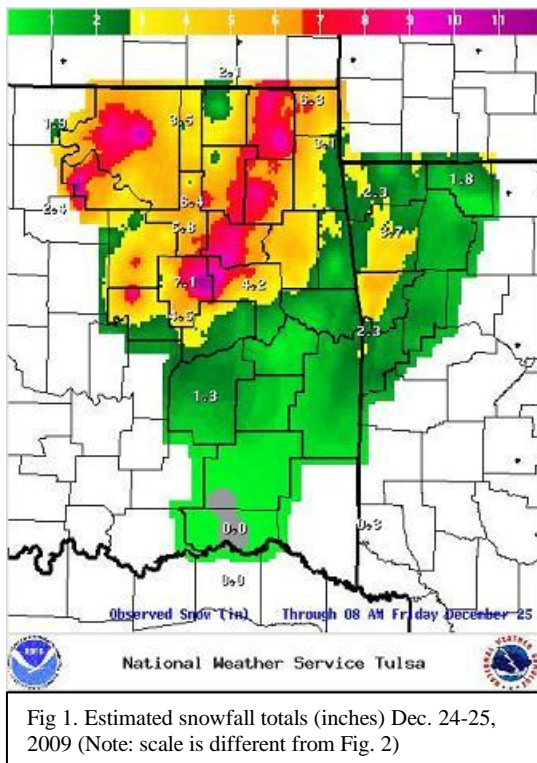


to 4 inches across much of the remainder of eastern Oklahoma and northwest Arkansas (see Fig. 1). A daily snowfall record of 5.4 inches was set at Tulsa on Dec. 24 (previous record was 1.0 inches in 2002). A daily snowfall record of 3.0 inches was also set in Fort Smith on Dec. 24 (previous record was 0.5 inches in 1975). The liquid equivalent amounts estimated for Dec. 24 were from around one half to near two inches. Wind gusts in excess of 40 mph combined with the moderate to heavy snowfall to create a dangerous winter storm with near blizzard conditions across the northern portion of the area, and lead to snow drifts one to two feet high. The snow and near-blizzard conditions slowly came to an end late on Christmas Eve and early Christmas Day from west to east as the storm system moved quickly into the Upper Midwest. High pressure then settled into the region for the remainder of the holiday weekend.

A White Christmas is defined as 1 inch of snowfall on the ground Christmas morning, and Tulsa and Fort Smith both recorded an official White Christmas for 2009. Tulsa previously had a White Christmas in 2002, 2000, 1983, and 1966. Fort Smith had a White Christmas in 1990, 1975, and 1963.

An upper-level trough crossed the Southern Plains on the evening of the 29th, bringing widespread 1 to 2 inch snowfall totals across northeast OK (see Fig. 2) and a dusting to around one inch of snow in northwest AR. While most areas south of a McAlester to Fort Smith line had a mix of rain and snow with little frozen accumulation reported, the higher terrain areas did receive up to around 1 inch of snow as well. A weak passing wave brought the last round of non-accumulating snow flurries for the month to southeast OK on New Year's Eve.



Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 3a.), rainfall totals for December 2009 ranged from around 1 inch to around 3 inches across most of the HSA, with higher totals of 3 to 6 inches across far southeast OK. This corresponded to below normal December precipitation across much of the area (see Fig. 3b). Northwest AR and the adjacent portions of northeast OK were the driest this month, receiving between 25% and 50% of the normal December rainfall. A few locations from Okmulgee to Vinita and across far southeast OK received above normal precipitation this month.

December 2009 ranked as the 12th coldest December (average temperature 37.7°F) in Fort Smith, AR and was the 59th wettest (2.87") since records begin in 1882. This month was tied with 1896 as the 10th snowiest December on record with 3.0 inches of snowfall. Tulsa, OK recorded its 11th coldest December on record with

an average temperature of 34.6°F (records begin 1905), and had its 49th wettest December with 1.88 inches (records begin 1888). This month was also the 6th snowiest December with 7.4 inches recorded (records begin 1900).

Tulsa, OK (TSA): December, 2009 Monthly Observed Precipitation
Valid at 1/1/2010 1200 UTC- Created 1/1/10 23:45 UTC

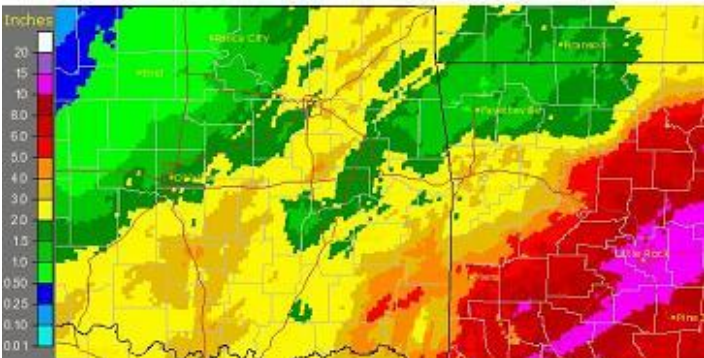


Fig. 3a. Estimated Observed Precip. for Dec. 2009

Tulsa, OK (TSA): December, 2009 Monthly Percent of Normal Precipitation
Valid at 1/1/2010 1200 UTC- Created 1/1/10 23:49 UTC



3b. Estimated % of Normal Precip. for Dec. 2009

Some of the larger precipitation reports (in inches) for December 2009 included:

Cloudy, OK (meso)	5.71	Hugo, OK (meso)	4.41	Talihina, OK (meso)	3.83
Okmulgee, OK (meso)	3.72	Wister, OK (meso)	3.57	Clayton, OK (meso)	3.40
Mountainburg, AR 2NE (coop)	3.28	Midland, AR (coop)	3.14	Tuskahoma, OK (coop)	3.13

According to the U.S. Drought Monitor (USDM) from December 29, 2009, 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 3% as of December 31, 2009. However, the following reservoirs were reporting a higher percentage within the flood pool: Wister Lake 18%; Sardis Lake 16%; Hugo Lake 12%; Eufaula Lake 9%; and Ft. Gibson Lake 8%.

Annual Summary

Mainstem river flooding occurred in 8 of the 12 months this year, with a total of 43 floods in 2009.

The 2009 annual precipitation totals were generally within $\pm 25\%$ of the normal annual rainfall across eastern OK and northwest AR (see Fig. 4b). However, portions of far northeast OK, southeast OK, and west central AR received between 125% and 150% of normal annual rainfall this year. A rainfall gradient can be seen across the HSA, from drier in the northwest to wetter in the southeast (Fig. 4a). 2009 rainfall totals ranged from around 35 inches to around 70 inches, with a large portion of the area receiving between 40 and 60 inches.

Tulsa, OK (TSA): Full Year 2009 Observed Precipitation
Valid at 1/1/2010 1200 UTC- Created 1/1/10 23:51 UTC

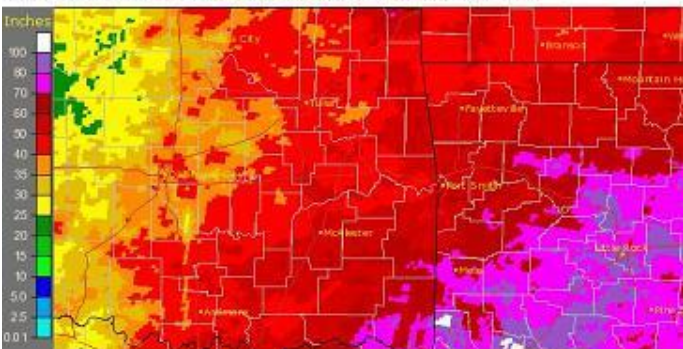
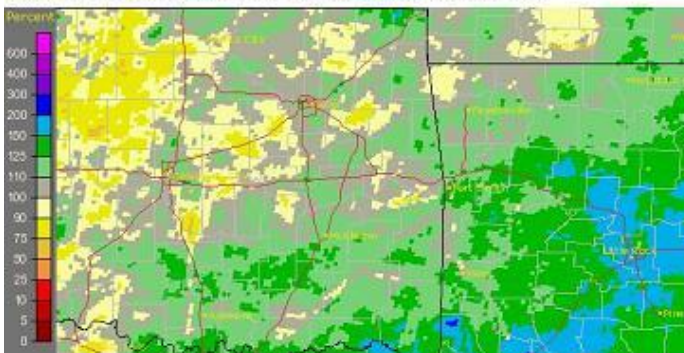


Fig. 4a. Estimated Observed Precipitation for 2009

Tulsa, OK (TSA): Full Year 2009 Percent of Normal Precipitation
Valid at 1/1/2010 1200 UTC- Created 1/1/10 23:55 UTC



4b. Estimated % of Normal Precipitation for 2009

2009 ranked as the 12th wettest year in Fort Smith, AR with an annual rainfall total of 56.46 inches (records began in 1882). This year also was the 58th coldest year with an average annual temperature of 61.3°F, and

tied with 1911 as the 71st snowiest year on record with 3.0 inches. Tulsa, OK recorded its 23rd wettest year since records began in 1888 with 46.12 inches of precipitation, and 2009 was the 6th snowiest year with 19.4 inches (snowfall records began in 1900). This year was the 39th coldest year on record beginning in 1905, with an average annual temperature of 60.1°F. According to OCS, 2009 ranked as the 8th wettest year on record across southeast Oklahoma (beginning in 1921), the 18th wettest for east central Oklahoma, and the 22nd wettest for northeast Oklahoma.

Some of the larger annual precipitation reports (in inches) for 2009 included:

Mountainburg, AR 2NE (coop)	64.08	Hugo, OK (meso)	60.83	Midland, AR (coop)	59.99
Clayton, OK (meso)	59.04	Fanshawe, OK (coop)	57.60	Odell, AR 2N (coop)	57.51
Ozark, AR (coop)	56.50	Fort Smith, AR (ASOS)	56.46	Natural Dam, AR (coop)	55.66

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

Rank since 1921 ("Last XX days" ending Dec. 31, 2009)	December 2009	Last 60 days Nov. 2 – Dec. 31	Water Year Oct. 1 – Dec. 31	Sept. 1 – Dec. 31	Last 180 days (July 5 – Dec. 31)	Year 2009
Northeast OK	39 th driest	15 th driest	24 th wettest	20 th wettest	15 th wettest	22 nd wettest
East Central OK	40 th driest	16 th driest	22 nd wettest	12 th wettest	11 th wettest	18 th wettest
Southeast OK	39 th wettest	26 th driest	14 th wettest	5 th wettest	3 rd wettest	8 th wettest

The Climate Prediction Center (CPC) outlook for January 2010 (issued December 31, 2009) indicates a slightly enhanced chance for below normal temperatures and equal chances for above, near, and below normal precipitation. For the 3-month period Jan-Feb-Mar 2010, CPC is forecasting a slightly enhanced chance for below normal temperatures near the Red River in southeast OK and equal chances for above, near, and below normal temperatures elsewhere (outlook issued December 17, 2009). CPC is also forecasting an enhanced chance for above normal precipitation across all of eastern OK for this same time period, with an equal chance for above, near, and below normal precipitation across northwest AR. Sea-surface temperatures in the equatorial Pacific indicate that moderate El Niño conditions currently exist, and these conditions are expected to continue for the next few months. According to CPC, the El Niño is likely near its peak, and therefore a strong event is not expected. An El Niño Advisory remains in effect.

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WFO Tulsa

Products issued:

- 1 River Flood Warnings (FLW)
- 7 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)