

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

REPORT FOR:

MONTH

May

YEAR

2009

SIGNATURE

Steven F. Piltz
 (Meteorologist-in-Charge)

DATE

June 2, 2009

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)

Heavy rainfall at the end of April and continuing through most of May 2009 led to significant flash flooding and river flooding across the Tulsa HSA. Ten river forecast points went into flood this month, with several exceeding flood stage on more than one occasion. Normal precipitation ranges from 4.4 inches in Washington (OK) County to 6.4 inches in Le Flore County. The Ozark region of northwest Arkansas averages 5.1 inches for the month.

Summary of Rain Events

May 1-7:

A left-over outflow boundary provided a focus for heavy rain on the last day of the April, and rainfall totals on April 30th into the morning of May 1st were generally around one tenth to one quarter of an inch across a large portion of the HSA. However, locations north of Hwy 412, closest to the boundary, received between 0.5 and 1.5 inches of rain. Even higher amounts of 2 to 4 inches affected large portions of Mayes, Delaware, and Ottawa Counties.

Very efficient rain producing storms continued across this same region on May 1st, leading to very significant flash flooding. The hardest hit areas were Rogers and Mayes Counties in northeast OK, though western Delaware, Ottawa, northern Tulsa, northern Cherokee, and northern Adair Counties were also greatly affected (see Figs. 1-4). The mesonet station in Pryor measured over 5 inches of rain within 1 hour and received just over 7 inches between 5am and 11am! Over 25 swift water rescues occurred in Pryor, with additional swift water rescues reported in Locust Grove in Mayes County and in Peggs in northern Cherokee County. Water got inside numerous homes and businesses in Claremore, Pryor, Verdigris, Chelsea, and Peggs. Flash flooding was also reported in Washington (OK), Nowata, and Craig Counties, and later in the day, in Washington (AR), Benton, Carroll, and Madison Counties.

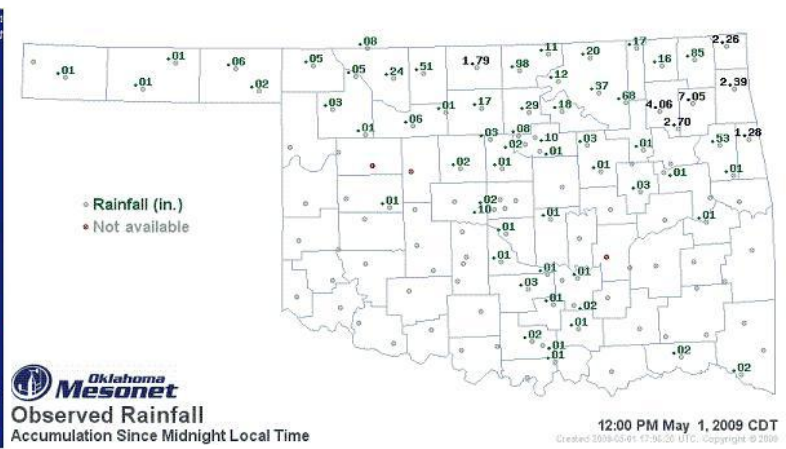
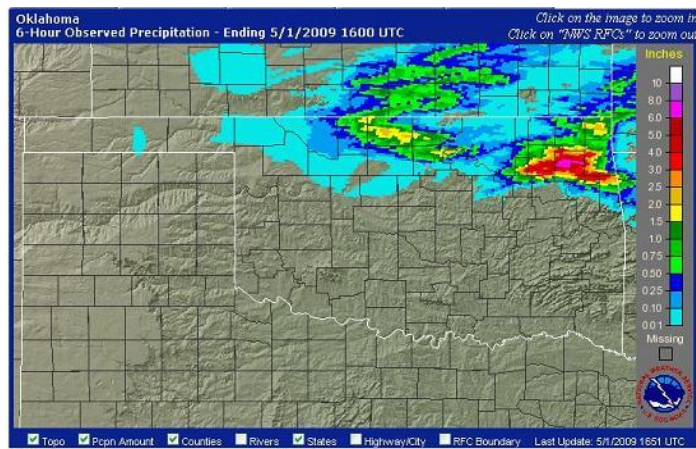


Fig. 1. 6-hour rainfall total ending at 11 AM CDT 05/01/2009

Fig. 2. Oklahoma Mesonet rainfall from Midnight to Noon 05/01/09 (courtesy OK Climatological Survey)

Tulsa, OK (TSA): 5/1/2009 1-Day Observed Precipitation
Valid at 5/1/2009 1200 UTC- Created 5/3/09 10:33 UTC



Fig. 3. 24-hour rain ending at 7am May 1, 2009

Tulsa, OK (TSA): 5/2/2009 1-Day Observed Precipitation
Valid at 5/2/2009 1200 UTC- Created 5/4/09 10:33 UTC

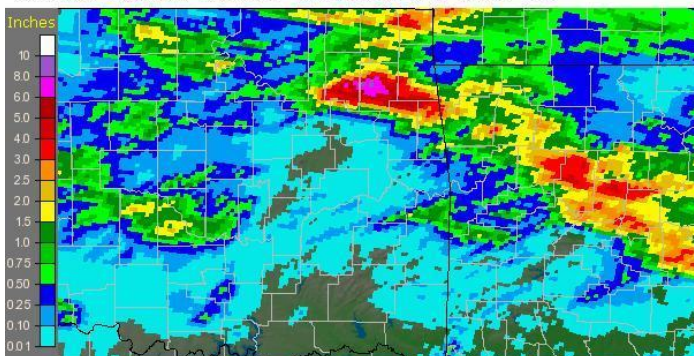


Fig. 4. 24-hour rain ending at 7am May 2, 2009

Widespread rain continued to affect the region on May 2 as a cold front stalled across the southern portion of the HSA. The highest rainfall totals of 1 to 4 inches occurred across southeast OK and northwest AR (see Fig. 5). Light rain continued over the next two days as an active pattern remained over the region, bringing an additional one half inch of rain or less.

Tulsa, OK (TSA): 5/3/2009 1-Day Observed Precipitation
Valid at 5/3/2009 1200 UTC- Created 5/5/09 10:34 UTC

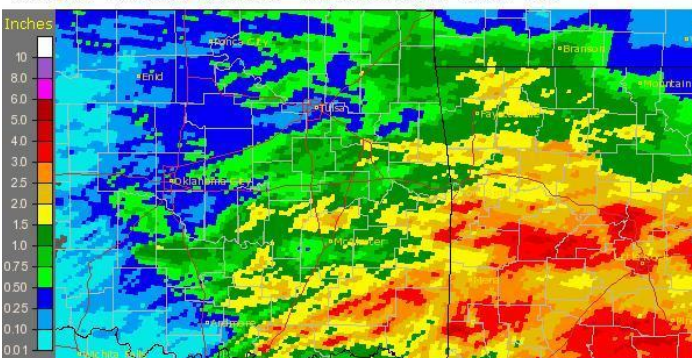


Fig. 5. 24-hour rain ending at 7am May 3, 2009

Tulsa, OK (TSA): 5/6/2009 1-Day Observed Precipitation
Valid at 5/6/2009 1200 UTC- Created 5/6/09 16:42 UTC

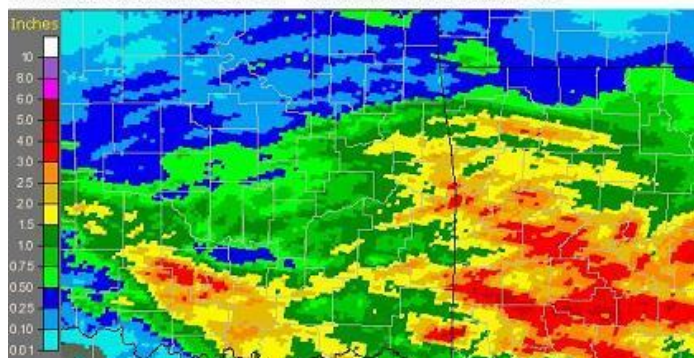


Fig. 6. 24-hour rain ending at 7am May 6, 2009

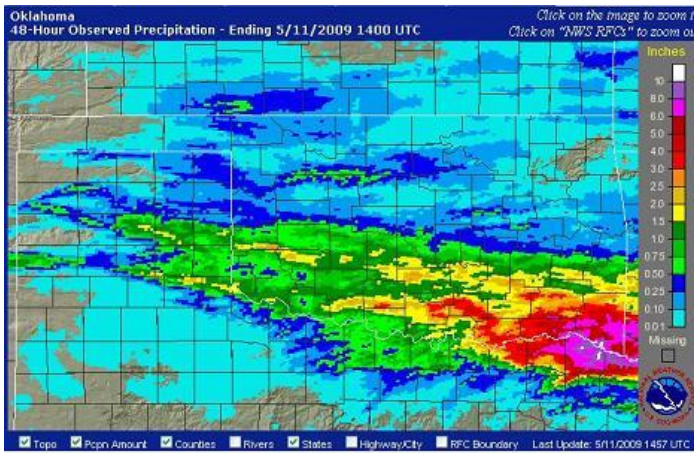
With a warm front poised just south of the Red River and a strong low-level jet in place on May 5, widespread showers and thunderstorms once again affected the region as a strong 300mb upper jet streak enhanced the lift. A very moist atmosphere again allowed the storms to be very efficient rain producers as the warm front slowly lifted north. Widespread 0.5 to 1.5 inches of rain fell south of a Bristow, OK to Bentonville, AR line (see Fig. 6), with higher amounts of 1.5 to around 3 inches affecting far east central OK and west central AR. This rainfall led to minor river flooding along the Arkansas River near Muskogee and at Van Buren and moderate river flooding along the Poteau River near Panama (refer to E3 report for details).

May 8-17:

A very strong MCS moved through Kansas and Missouri on May 8, causing extensive wind damage. The southern edge of the bow segment affected far northeast OK. Despite the fast movement of the MCS, around 0.5 to around 1.5 inches of rain fell north of a Pawhuska, OK to Fayetteville, AR line. This system also brought heavy rainfall north of the HSA, which eventually led to moderate flooding along the Neosho River near Commerce (see the E3 report for more information). Later in the day, additional thunderstorms developed along the outflow boundary, bringing from 0.25 to around 2 inches of rain to primarily east central OK and northwest AR.

A cold front moved through the region on May 9, before stalling just south of the Red River for several days. Heavy rain developed near the front and affected Le Flore, Pushmataha, and Choctaw Counties in southeast OK on the 9th. Choctaw County received the most rain, with estimates of 1.5 to near 6 inches. Most of Pushmataha and Le Flore Counties received 0.5 to 1.5 inches. Rain continued on the 10th, with widespread 0.5 to 1.5 inches across locations south of a McAlester to Poteau line and light totals elsewhere. Pushmataha and Choctaw Counties received an additional 1.5 to 3 inches on the 10th. These same areas continued to receive rain on the 11th, with widespread totals up to 1 inch across this area. Choctaw County again had the highest

totals of 1 to 2 inches (Fig. 7).



Tulsa, OK (TSA): Current Month to Date Departure from Normal Precipitation
Valid at 5/17/2009 1200 UTC - Created 5/17/09 22:47 UTC

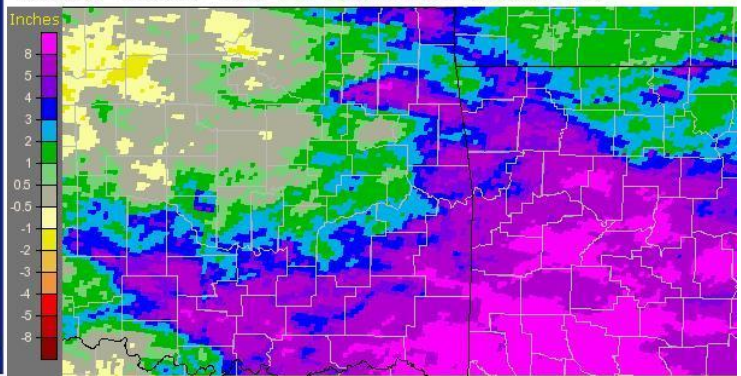


Fig. 7. 48-hour rainfall ending at 9 am May 11, 2009.

Fig. 8. Rainfall departure from normal 7am May 1 to 7am May 16, 2009

The stationary front that brought all of the rain to southeast OK moved north on May 12th, bringing rain to all of the HSA. The greatest rainfall of 0.75 to 2.5 inches occurred across far northeast OK, northwest AR, and along the Oklahoma-Arkansas state line. The front then returned south on May 13th, bringing a broken line of severe thunderstorms across the forecast area during the evening and overnight hours and continuing through the morning on the 14th. Rainfall totals were 0.5 to 1.5 inches across most of the HSA, though isolated areas received around 2 inches of rain. This rainfall led to rises on area rivers and streams; however, the Arkansas River at Van Buren was the only river to reach flood stage (see E3 report). The front became stationary across the middle of the HSA on the 14th bringing light rain to most of the area. A final MCS moved south out of Kansas and into eastern OK and northwest AR late on the 15th into the morning of the 16th before a drier period finally returned. The MCS brought severe winds to northeast OK and widespread rainfall of 0.25 to 0.75 inches. Some areas received up to 1.5 inches, with the highest totals around 2 inches reported in Latimer and Le Flore Counties in east central OK.

May 18-31:

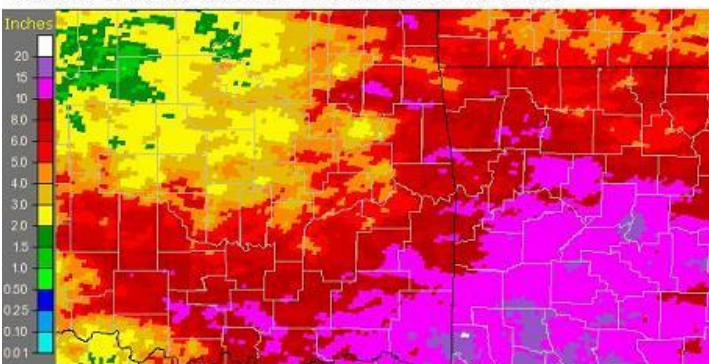
Despite the lull in rainfall, the Arkansas River near Muskogee briefly went just above flood stage as area reservoirs were returning to conservation pool levels. Showers and thunderstorms again affected the region as a low pressure system moved out of the Gulf of Mexico and up through Arkansas May 22-24. Rainfall amounts each of these three days was generally one half inch or less across eastern OK and northwest AR, with a few isolated higher totals near 1 inch. A weakening thunderstorm complex moved through southeast OK on the morning of the 26th, bringing 0.5 to near 1 inch of rainfall. Additional isolated showers and thunderstorms developed during the heat of the afternoon primarily along the higher terrain areas, bringing only light rainfall amounts.

Monthly Summary

Tulsa International Airport recorded a trace of rain or more for 22 consecutive days from April 25th through May 16th. Of those 22 days, 17 had measureable precipitation, and one day, May 1st, set a record high daily rainfall total of 3.01 inches (previous record was 2.10" in 1944). This broke the previous record of 13 consecutive days with a trace or more of rain, which had been set in April 1957 and May 1935. The first half of the month was very wet for the southern and eastern portions of the HSA. Some areas of southeast OK were over 8 inches above normal from May 1 through the morning of May 17, with the remainder of this area receiving 4 to 8 inches more than normal during the first half of the month (see Fig. 8).

Using the radar-derived observed precipitation from the RFCs (Fig. 9a.), a gradient of rainfall can be seen across the Tulsa HSA, with monthly totals from 1 to 2 inches in northwest Osage County to widespread 10 to 15 inches across southeast OK. Localized areas across eastern OK and northwest AR also received May rainfall totals of over 10 inches. Far eastern OK, southeast OK, and northwest AR received 110% to over 200% of the normal May rainfall (Fig. 9b.), while the remainder of the HSA received between 25% and 100% of normal precipitation for the month.

Tulsa, OK (TSA): May, 2009 Monthly Observed Precipitation
Valid at 6/1/2009 1200 UTC- Created 6/1/09 16:45 UTC



Tulsa, OK (TSA): May, 2009 Monthly Percent of Normal Precipitation
Valid at 6/1/2009 1200 UTC- Created 6/1/09 16:50 UTC

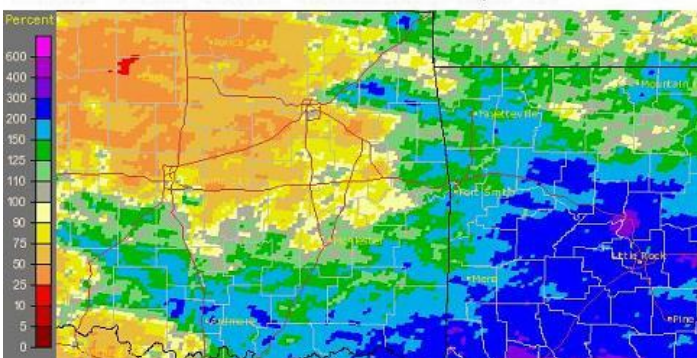


Fig. 9a. Observed Precipitation for May 2009

9b. Percent of Normal Precipitation for May 2009

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

Hugo, OK (meso)	12.06	Clayton, OK 14WNW (coop)	11.45	Clayton, OK (meso)	11.02
Talihina, OK (meso)	11.00	Pryor, OK (meso)	10.85	Midland, AR (coop)	10.74
Antlers, OK (meso)	10.70	Cloudy, OK (meso)	10.02	Antlers, OK (coop)	9.97

According to statistics from the Oklahoma Climatological Survey (OCS), northeast OK ranked as the 28th wettest April-May since records began in 1921, receiving 110% of its normal rainfall. For Spring 2009 (March-May), northeast OK was the 22nd wettest spring on record. Due to the wet period during the first half of 2008, the past 12 months rank as the 17th wettest for northeast OK. However, due to drier conditions during the second half of 2008, northeast OK ranks as the 41st driest water year so far (Oct 1-May 31). East central OK was the 32nd wettest April-May on record, ending the month with 107% of normal rain, and was the 40th wettest spring. East central OK also ranked as the 38th driest for the past 12 months and the 20th driest water year. Finally, southeast OK was the 7th wettest April-May, receiving 163% of normal rainfall, and was the 9th wettest spring on record. This area was also the 36th wettest for the past 12 month period, and for the water year-to-date, southeast OK ranks as the 37th driest.

According to the U.S. Drought Monitor (USDM) issued May 28th, no drought or abnormally dry conditions exist across the HSA.

The major reservoirs in the HSA were at 100% of their conservation pools by June 1, 2009, with most area reservoirs reporting levels within 15% of their flood control pools. The reservoirs utilizing the highest percentage of their flood control pools as of June 1 were as follows: Hugo Lake 51%, Wister Lake 50%, Oologah Lake 36%, Hulah Lake 25%, Sardis Lake 23%, and Copan Lake 20%.

The Climate Prediction Center (CPC) outlook for June 2009 (issued May 31, 2009) indicates an equal chance of above, near, and below normal temperatures and precipitation across the HSA. For the 3-month period Jun-Jul-Aug 2009, CPC is also outlooking an equal chance for above, near, and below normal temperatures and precipitation (outlook issued May 21, 2009). Sea-surface temperatures in the equatorial Pacific indicate that ENSO-neutral conditions exist and these conditions are expected to continue this June and through the remainder of the summer.

Nicole M^cGavock,
Service Hydrologist
WFO Tulsa

Products issued:

- 26 River Flood Warnings
- 158 River Flood Statements
- 1 River Flood Advisories
- 14 River Flood Watches
- 63 River Statements
- 5 Hydrologic Outlooks
- 0 Drought Information Statements