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 **January** YEAR **2018**
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 **February 1, 2018**

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.

Most of the region had below normal rainfall to start 2018, with the greatest deficits across northeast OK. Only a small portion of southeast OK had above normal rainfall. Temperatures were near to below normal this month as well. 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. This report, past E-5 reports, and monthly hydrology and climatology summaries can be found at http://www.weather.gov/tsa/hydro-monthly-summary.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for January 2018 ranged from around 0.10" to near 3" from northwest to southeast across most of eastern OK and northwest AR. A narrow swath of higher rainfall, around 3" to around 5", occurred across far southeast OK into west central AR. This corresponds to less than 5% to 90% of the normal January rainfall (Fig. 1b) for most of the area northwest to southeast across eastern OK and northwest AR. Isolated portions of southeast OK and west central AR had 90% to around 150% of the normal January rainfall.

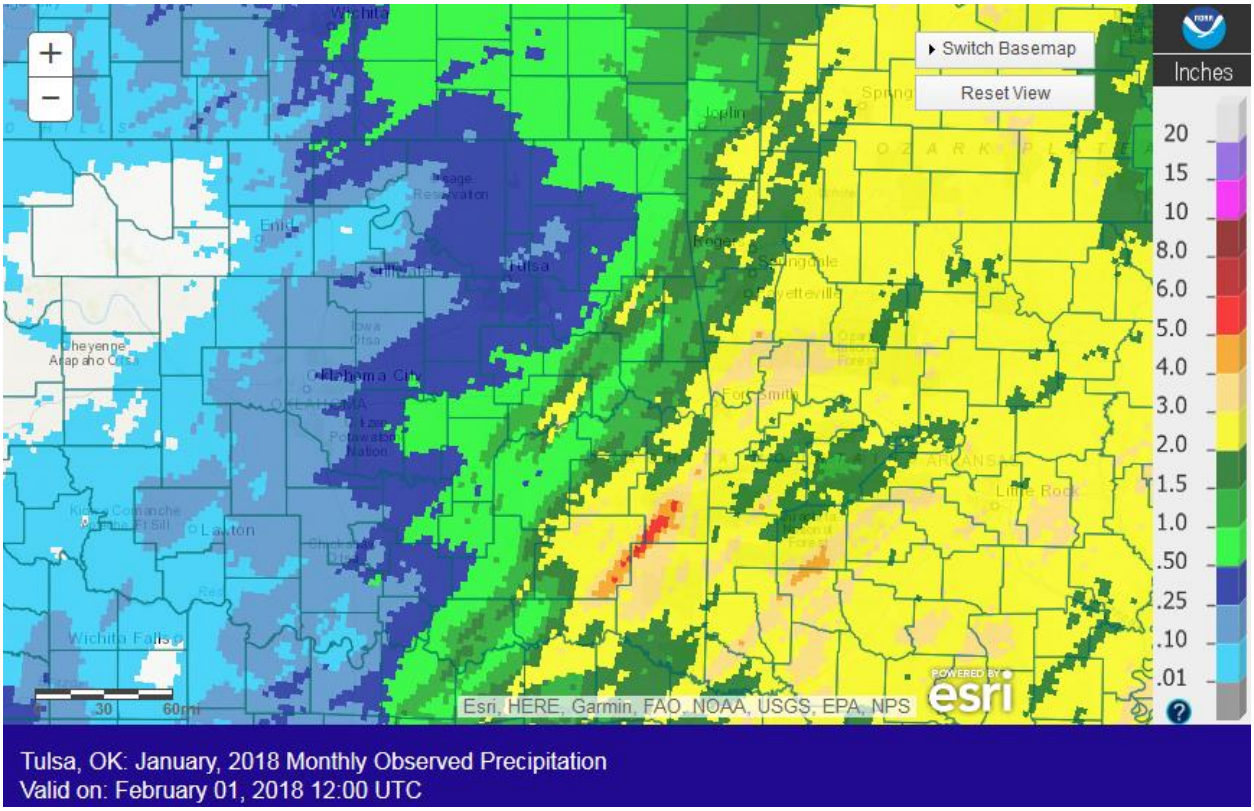


Fig. 1a. Estimated Observed Rainfall for January 2018

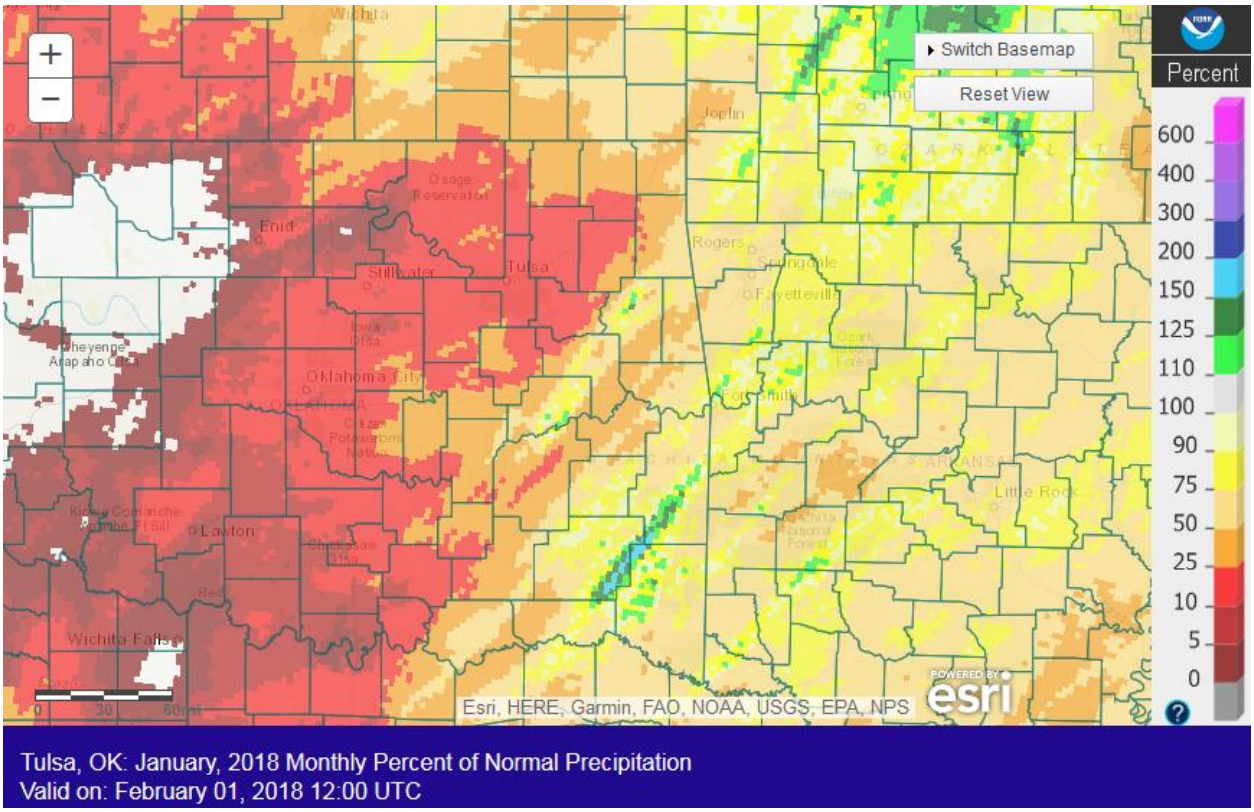


Fig. 1b. Estimated % of Normal Rainfall for January 2018

In Tulsa, OK, January 2018 ranked as the 56th warmest January (37.5°F, tied 1981; since records began in 1905), the 11th driest January (0.26"; since records began in 1888), and the 12th least snowy January (Trace, tied 18 other years; since records began in 1900). Fort Smith, AR had the 46th coldest January (38.1°F, tied 1983; since records began in 1883), the 65th wettest January (2.23", tied 1966; since records began in 1883), and the 29th least snowy January (Trace, tied 18 other years; since records began in 1884). Fayetteville, AR had the 19th coldest (33.8°F), the 27th driest (1.71"), and the 10th least snowy (Trace, tied 16 other years) January since records began in 1950.

Some of the larger precipitation reports (in inches) for January 2018 included:

Miami, OK (coop)	5.69	Cloudy, OK (meso)	4.77	Winslow 7NE, AR (coop)	4.40
Ozark, AR (coop)	3.58	Van Buren 2.1NNW, AR (coco)	3.40	Elkins 10.6SSE, AR (coco)	3.33
Greenwood 1.4W, AR (coco)	3.32	Riverdale 4.2E, AR (coco)	3.27	Mountainburg 2NE, AR (coop)	3.24

Some of the lowest precipitation reports (in inches) for January 2018 included:

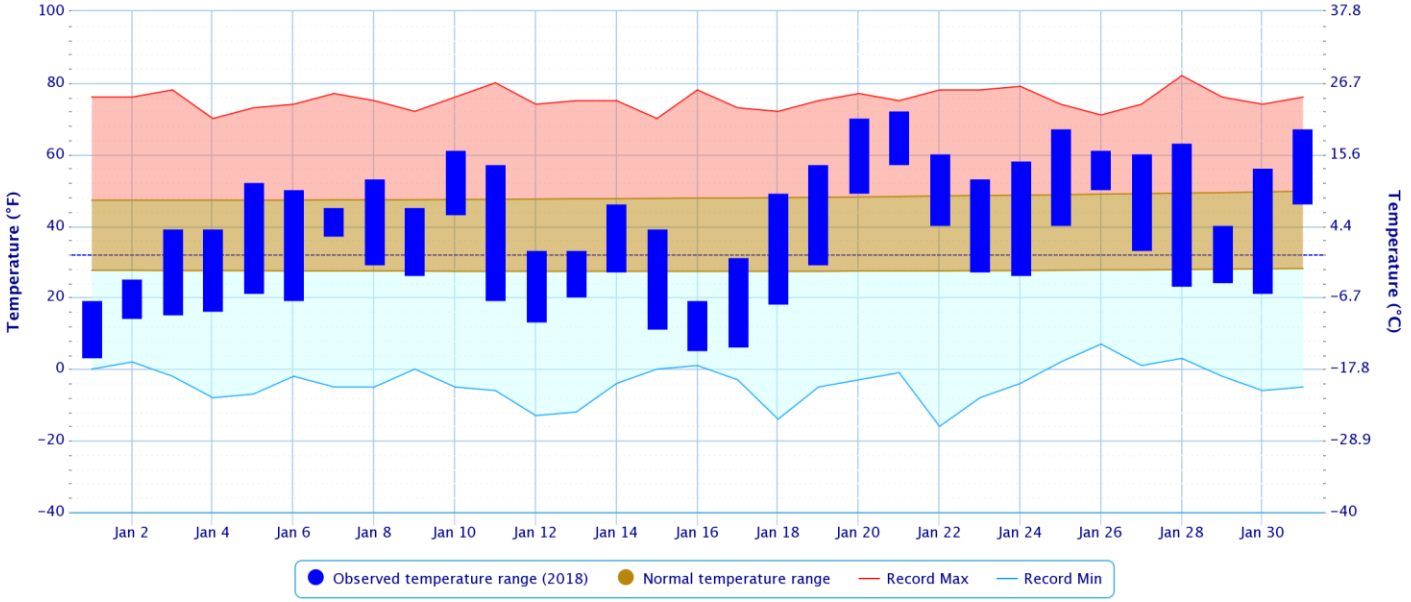
Burbank, OK (meso)	0.08	Ralston, OK (coop)	0.12	Pawnee, OK (coop)	0.14
Pawhuska 9.4ENE, OK (coco)	0.16	Pawnee, OK (meso)	0.18	Oilton, OK (meso)	0.23
Foraker, OK (meso)	0.23	Tulsa, OK (ASOS)	0.26	Jenks Riverside Arpt, OK (ASOS)	0.26

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

Rank since 1921	January 2018	Winter-to-Date (Dec 1-Jan 31)	Last 90 Days (Nov 3 – Jan 31)	Water-Year-to-Date (Oct 1– Jan 31)	Cool Growing Season (Sep 1 – Jan 31)	Last 180 Days (Aug 5 – Jan 31)	Last 365 Days (Feb 1, 2017 – Jan 31, 2018)
Northeast OK	**9th driest**	**3rd driest**	**4th driest**	33rd driest	23rd driest	43rd driest	27th wettest
East Central OK	25th driest	20th driest	**4th driest**	21st driest	**9th driest**	42nd driest	26th wettest
Southeast OK	42nd driest	46th driest	21st driest	25th driest	**8th driest**	32nd driest	46th driest
Statewide	14th driest	**9th driest**	**3rd driest**	17th driest	13th driest	46th driest	33rd wettest

Daily Temperature Data – Tulsa Area, OK (ThreadEx)

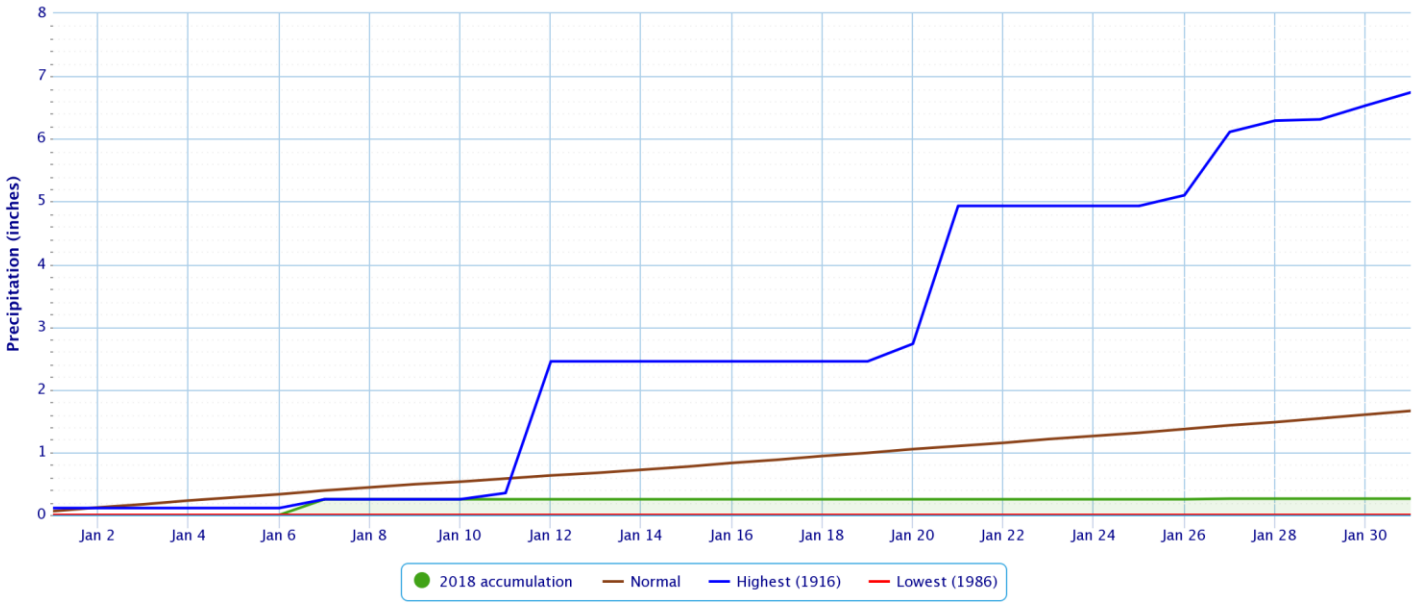
Period of Record – 1905-01-06 to 2018-01-31. Normals period: 1981-2010. Click and drag to zoom chart.



Powered by ACIS

Accumulated Precipitation – Tulsa Area, OK (ThreadEx)

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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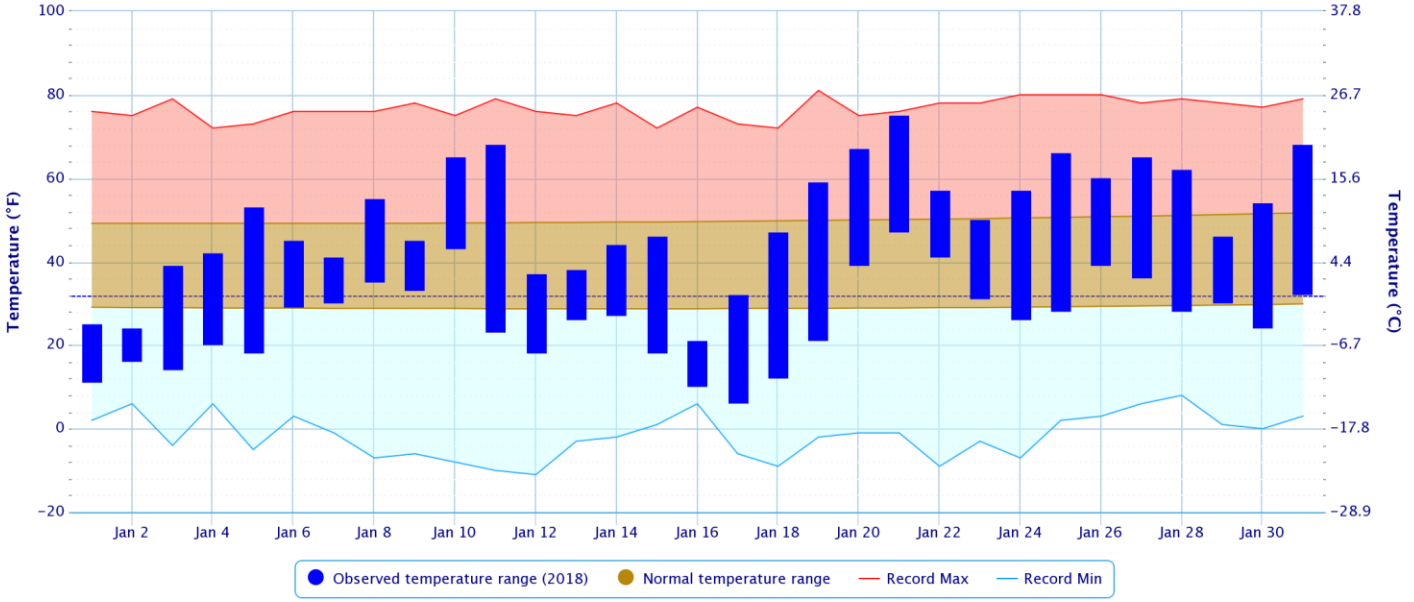
Daily Temperature Data – Fort Smith Area, AR (ThreadEx)

Period of Record – 1882-06-01 to 2018-01-31. Normals period: 1981-2010. Click and drag to zoom chart.



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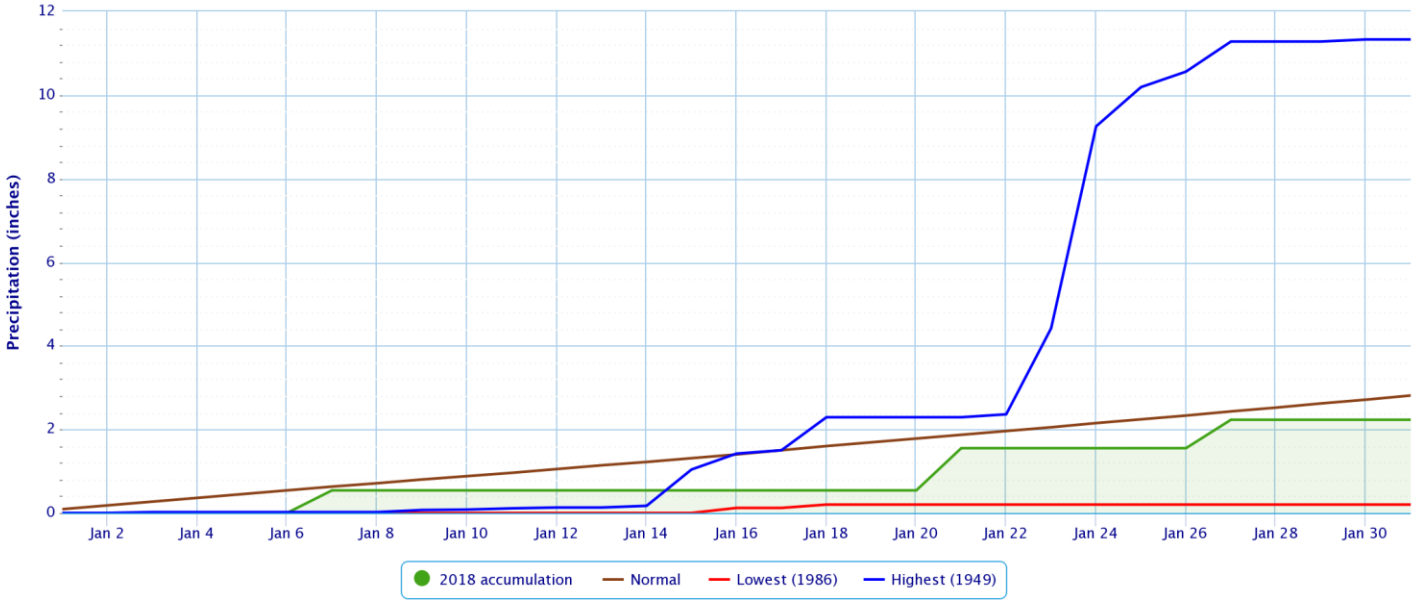
Accumulated Precipitation – Fort Smith Area, AR (ThreadEx)

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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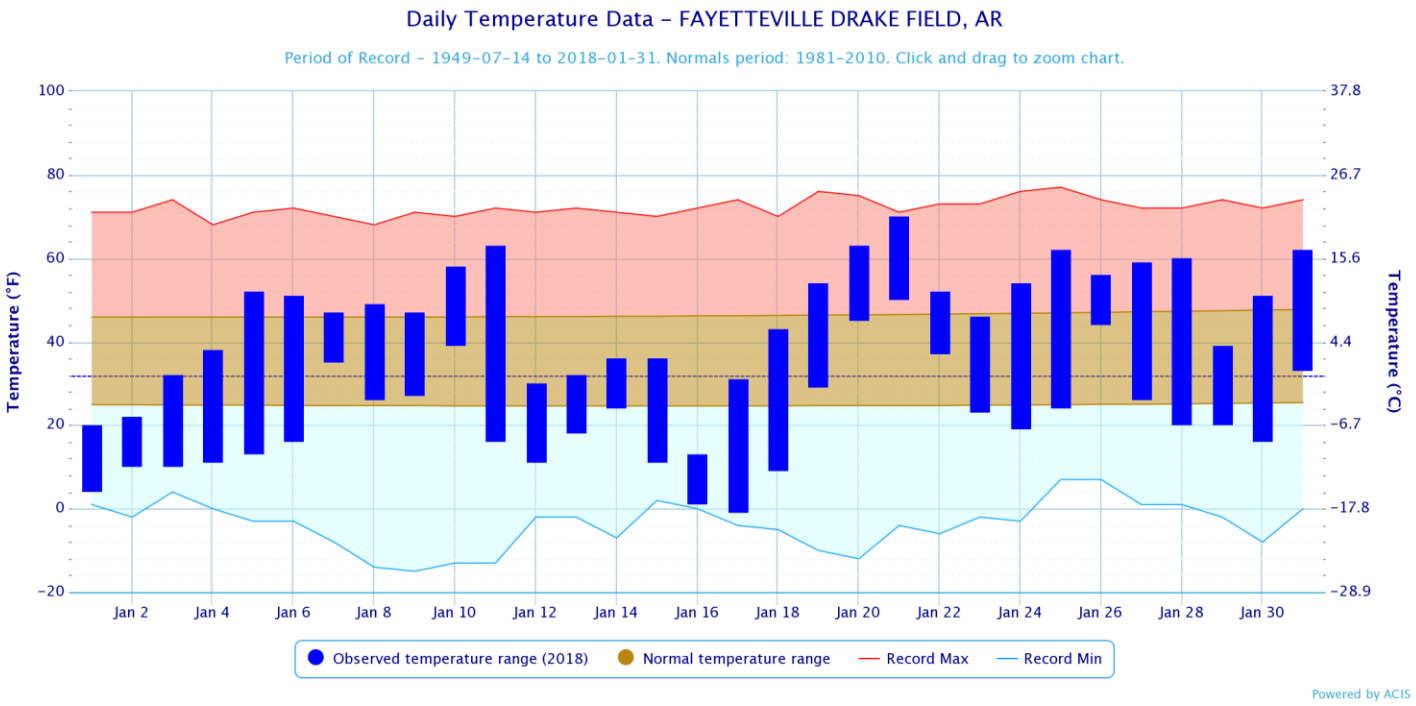
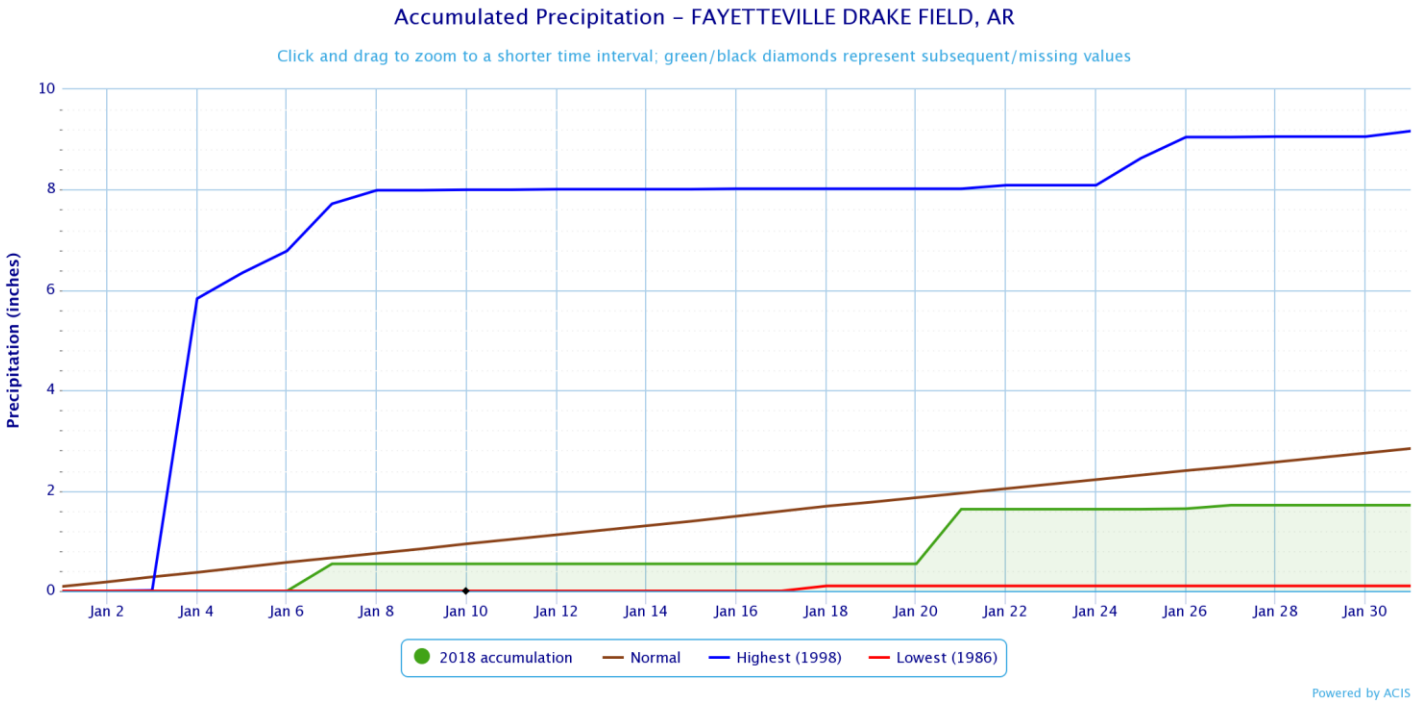




Drought

According to the U.S. Drought Monitor (USDM) from January 30, 2018 (Figs. 2, 3), Severe Drought (D2) impacted parts of Osage, Pawnee, Washington, Creek, Okfuskee, Okmulgee, McIntosh, Pittsburg, Latimer, Haskell, Le Flore, Sequoyah, Muskogee, Wagoner, Mayes, Cherokee, and Adair Counties in eastern OK and Washington, Madison, Crawford, Sebastian, and Franklin Counties in northwest AR. Moderate (D1) drought conditions were present across portions of Osage, Washington, Nowata, Craig, Ottawa, Delaware, Mayes, Rogers, Tulsa, Creek, Wagoner, Adair, Le Flore, Pushmataha, and Choctaw Counties in eastern OK and Benton, Carroll, Madison, and Washington Counties in northwest AR.

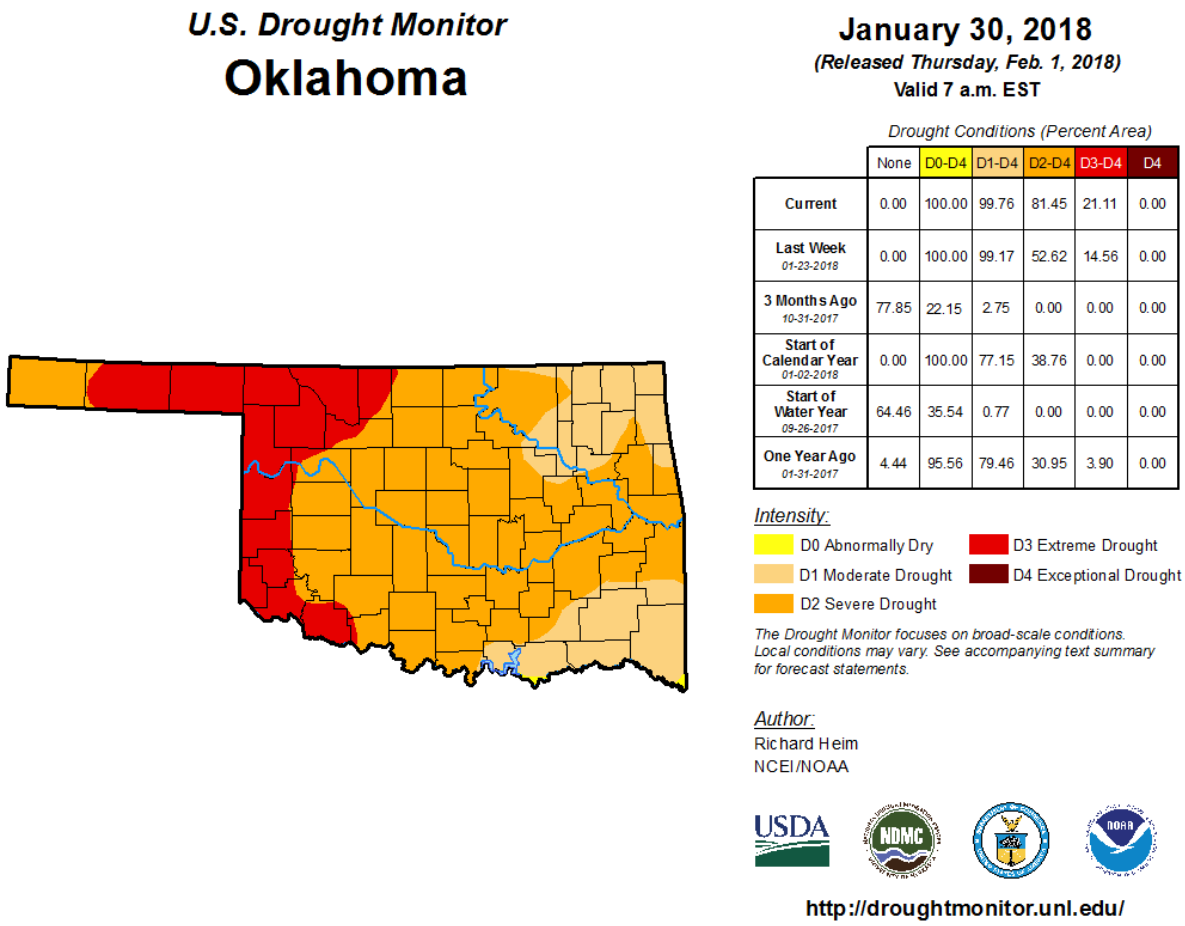


Fig. 2. Drought Monitor for Oklahoma

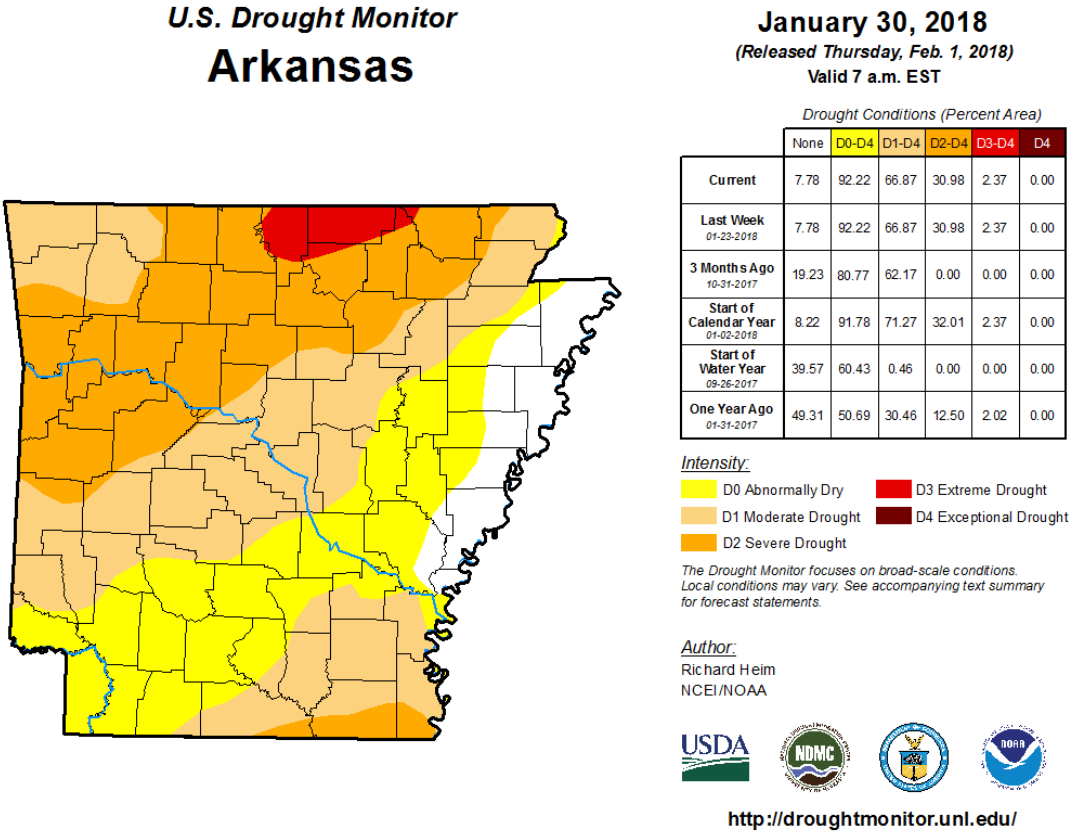
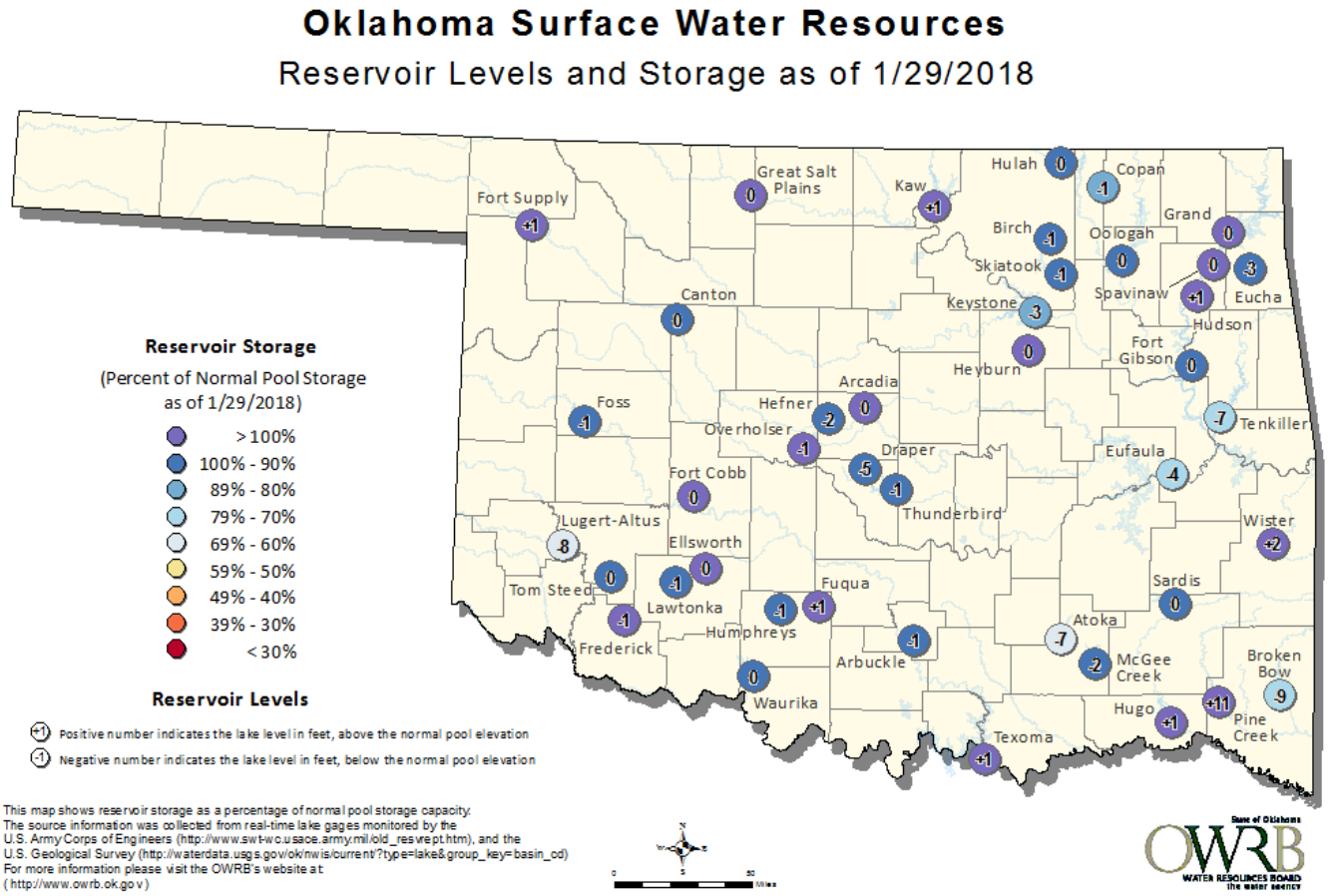


Fig.3. Drought Monitor for Arkansas

Reservoirs



According to the USACE, several of the lakes in the HSA were ±3% of their conservation pool levels as of 2/01/2018. However, a many reservoirs were operating at more than 3% below the top of their conservation pools: Eufaula Lake 74%, Tenkiller Lake 79%, Keystone Lake 81%, Beaver Lake 81%, Copan Lake 88%, Hulah Lake 94%, Birch Lake 95%, and Skiatook Lake 96%. Hudson Lake at 104% and Wister Lake at 106% were the only reservoirs more than 3% above their conservation pools.

Outlooks

The Climate Prediction Center (CPC) outlook for February 2018 (issued January 31, 2018) indicates an equal chance for above, near, and below normal temperatures and a slightly enhanced chance for below median precipitation across all of eastern OK and northwest AR. This outlook takes into account weather conditions forecast over the next 1-2 weeks, sub-seasonal climate signals, including the Madden-Julian Oscillation, and influence from the weak La Niña.

For the 3-month period February-March-April 2018, CPC is forecasting a slightly enhanced chance for above normal temperatures and an equal chance for above, near, and below median precipitation across all of eastern OK and northwest AR (outlook issued January 18, 2018). This outlook is based on both statistical and dynamical forecast tools and decadal timescale climate trends, as well as impacts from La Niña and the MJO. According to CPC, Pacific sea surface temperatures along the equator indicate weak La Niña conditions continue. La Niña conditions are predicted to continue through winter 2017-18, with a transition to ENSO neutral conditions during spring and continuing through the summer. The CPC La Niña Advisory remains in effect.

Summary of Heavy Precipitation Events Daily quality controlled rainfall maps can be found at: http://water.weather.gov/precip/index.php?location_type=wfo&location_name=tsa

2018 started off very cold, as an arctic anticyclone brought below freezing temperatures to eastern OK and northwest AR for several days (Fig. 4). Most locations had temperatures drop into the single digits during this time. Temperatures rose back above freezing on the 3rd.

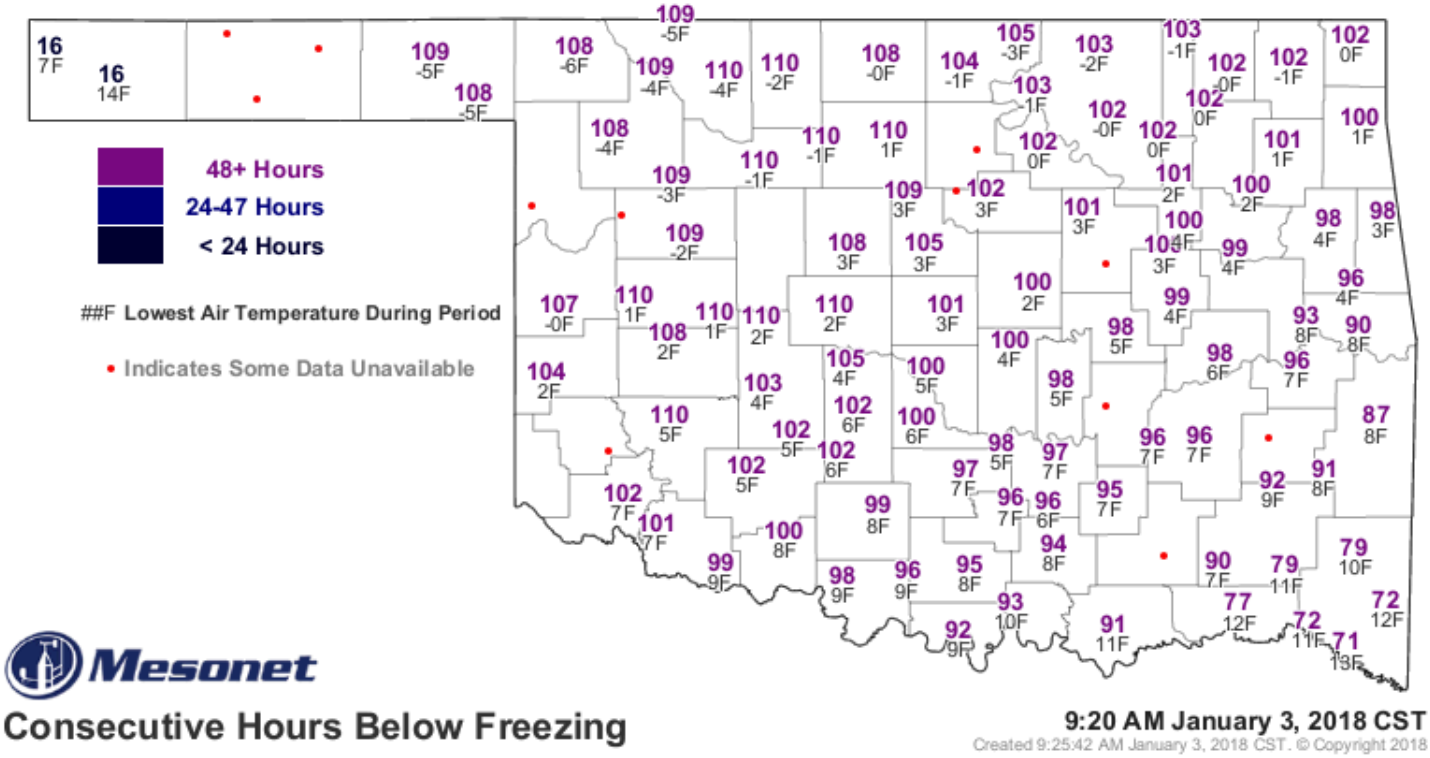


Fig. 4. OK Mesonet consecutive hours with below freezing temperatures ending at 9:20 am CST 1/03/2018.

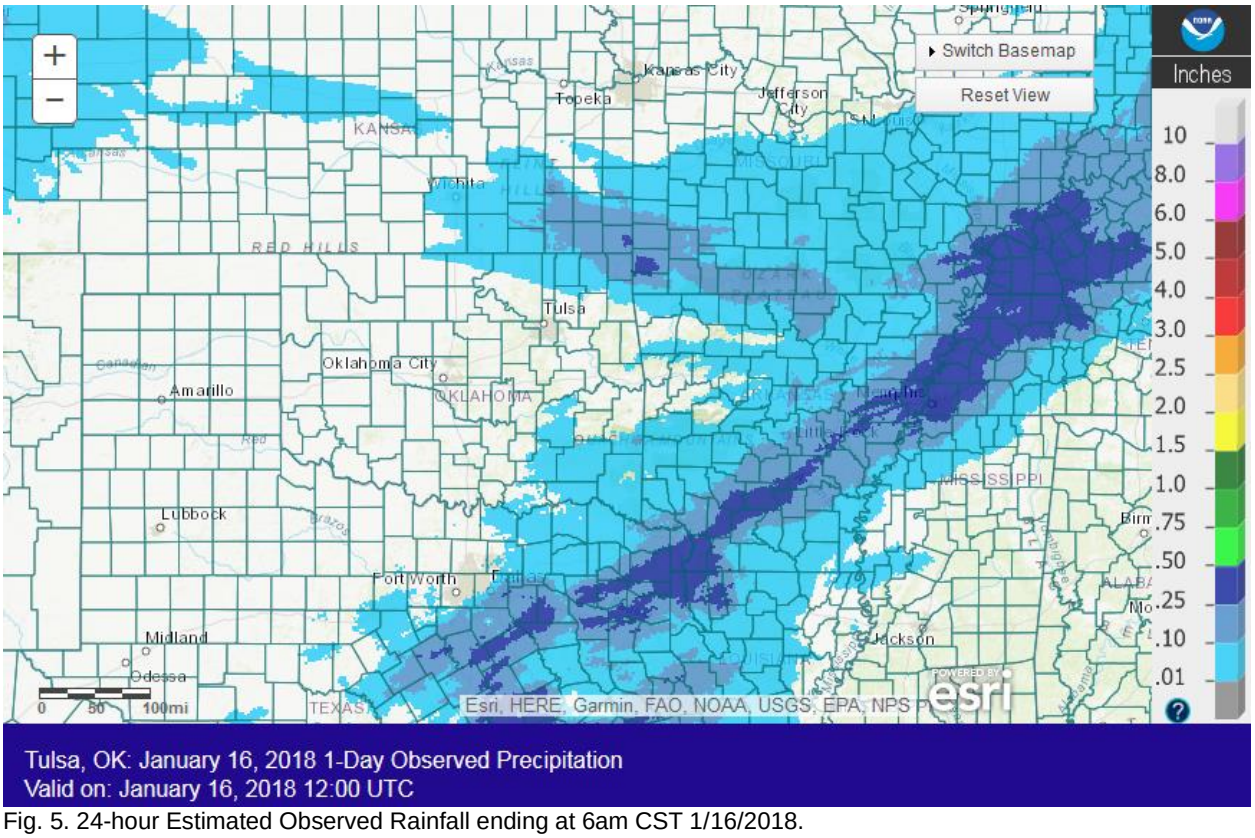


Fig. 5. 24-hour Estimated Observed Rainfall ending at 6am CST 1/16/2018.

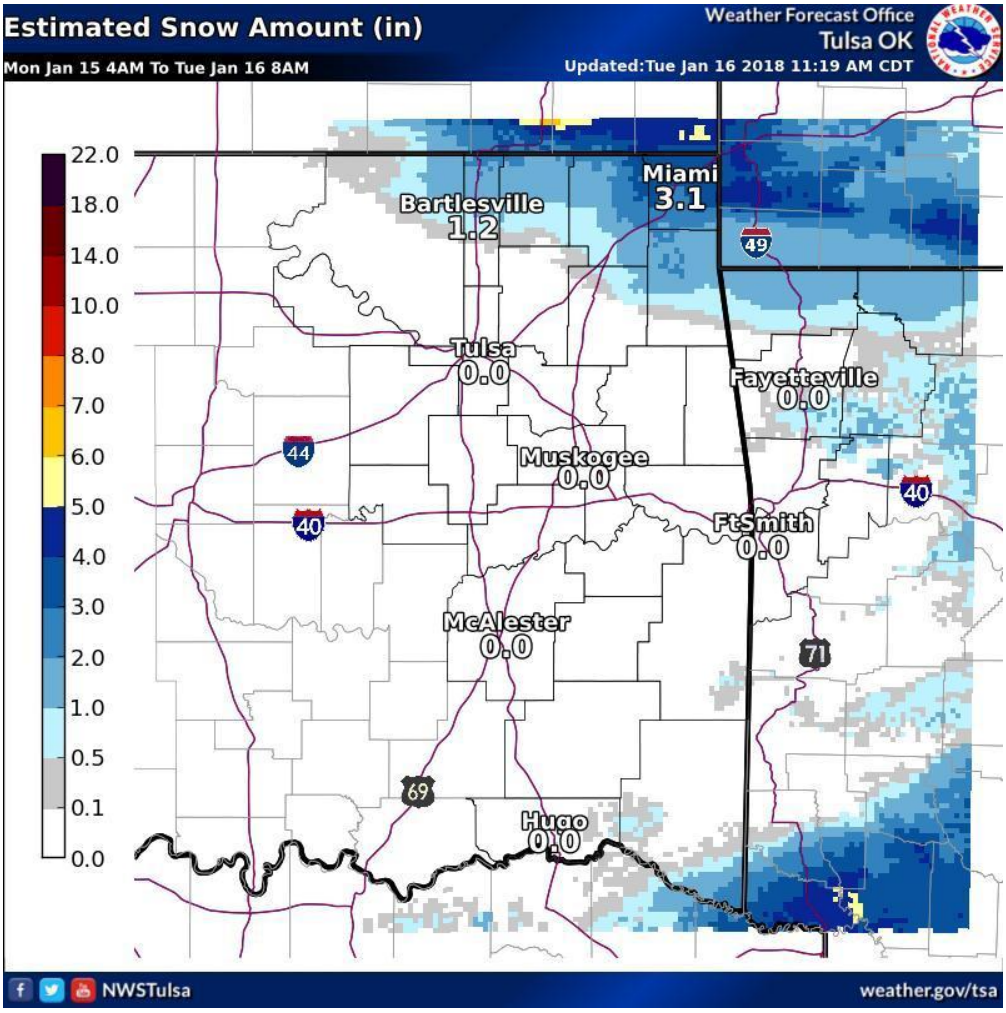


Fig. 6. Estimated snowfall totals from 4am CST 1/15/2018 through 8am CST 1/16/2018.

A cold front moved into the area on the 15th, bringing snow during the morning and afternoon to far northeast OK and along the AR/MO state line. Snowfall totals ranged from 0.5" to around 3" (Fig. 6). Liquid equivalent amounts ranged from a few hundredths to near 0.25" (Fig. 5).

A vigorous and progressive short-wave trough moved into the Plains on the 21st, helping to spawn showers and thunderstorms ahead of a cold front during the afternoon and evening hours. This activity affected locations along and southeast of a Stidham to Miami line, bringing 0.25" to 2" of rain to much of southeast and east central OK and northwest and west central AR. Training of storms resulted in isolated areas of 2"-2.5" and a swatch of 2"-4" in eastern Pushmataha and southern Le Flore Counties (Figs. 7, 8). Due to the antecedent drought, no flooding occurred. Two EF-1 tornadoes occurred in west central AR with this storm system (see https://arcg.is/1f5Ob4 for details).

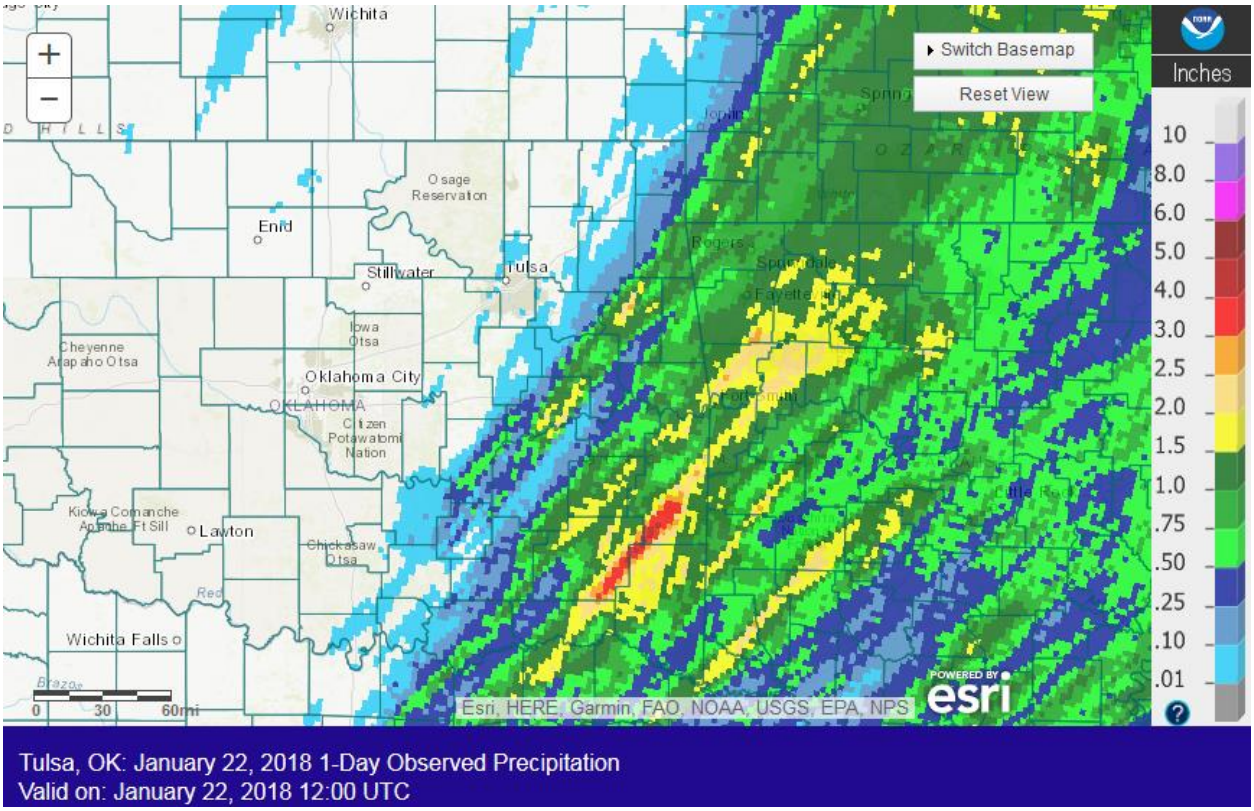


Fig. 7. 24-hour Estimated Observed Rainfall ending at 6am CST 1/22/2018.

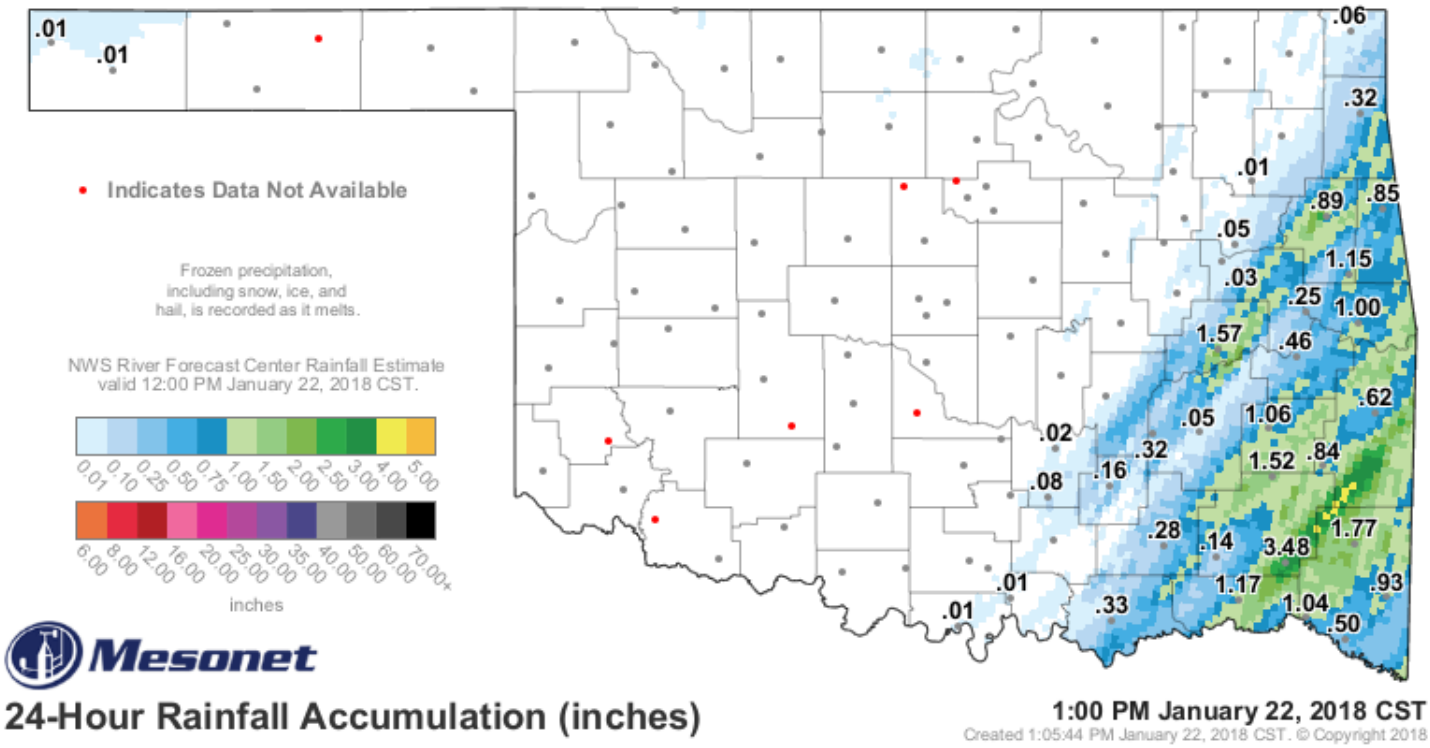


Fig. 8. 24-hour Estimated Observed Rainfall (image) and OK Mesonet measurements ending at 1:00 pm CST 1/22/2018.

Written by:
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Service Hydrologist
WFO Tulsa

Products issued in January 2018:

*CWYO2 became a daily river forecast point September 7, 2016
*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/EXA/EXB/CAN)
1 Urban and Small Stream Advisories (FLS)
0 Areal Flood Warnings (FLW)
0 Areal Flood Statements (FLS)
0 River Flood Warnings (FLW) (includes category increases)
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)
1 Drought Information Statements (DGT)

Preliminary Hydrographs:

None