

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

REPORT FOR:

MONTH

June

YEAR

2013

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

July 2, 2013

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)

An "X" in the box indicates no flood stages were reached in this Hydrologic Service Area (HSA) during the month above.

Despite a wet start to the month, June 2013 saw below normal rainfall and a mostly quiet weather pattern for the last half of the month. Normal rainfall in the month of June ranges from 3.9 inches in McIntosh County to 5.9 inches in Wagoner County. The Ozark region of northwest Arkansas averages 5.1 inches for the month.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for June 2013 ranged from 0.50" to 7", with a large portion of the HSA receiving 2"-5". However, much of northwest AR only received 0.50" to near 2" this month. Only a few spots in southeast OK ended June with above normal rainfall. The majority of the HSA had only 25% to 90% of the normal June rainfall (Fig. 1b), while much of northwest AR only received 10% to 50% of the normal rainfall for the month.

Tulsa, OK (TSA): June, 2013 Monthly Observed Precipitation
 Valid at 7/1/2013 1200 UTC- Created 7/1/13 13:44 UTC

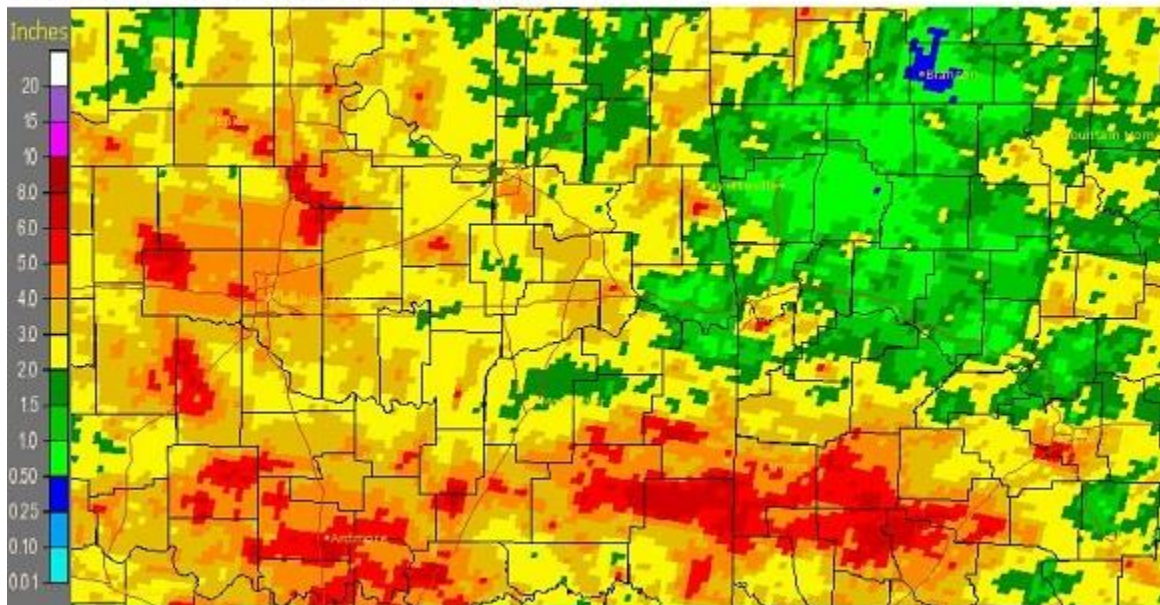


Fig. 1a. Estimated Observed Rainfall for June 2013

Tulsa, OK (TSA): June, 2013 Monthly Percent of Normal Precipitation
 Valid at 7/1/2013 1200 UTC- Created 7/1/13 13:48 UTC

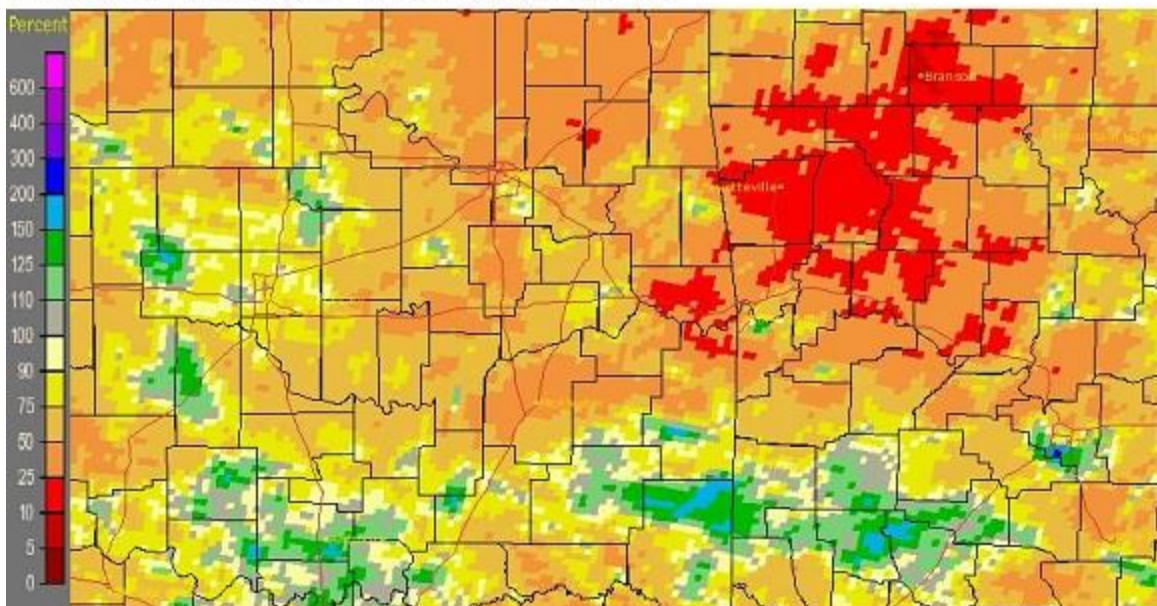


Fig. 1b. Estimated % of Normal Rainfall for June 2013

In Tulsa, OK, June 2013 ranked as the 34th warmest June (79.1°F; since records began in 1905) and the 17th driest June (1.69"; since records began in 1888). Fort Smith, AR was the 24th warmest June (79.9°F; since records began in 1882) and the 19th wettest June (6.10"; since records began in 1883). Fayetteville, AR was the 24th warmest (74.2°F) and the 6th driest (1.37") June since records began in 1950.

Some of the larger precipitation reports (in inches) for June 2013 included:

Okemah, OK (meso)	8.73	Eufaula, OK (meso)	7.50	Stigler, OK (meso)	7.25
Fort Smith, AR (ASOS)	6.10	Clayton, OK (meso)	5.62	Bristow, OK (meso)	5.42
Okmulgee, OK (meso)	5.37	Charleston 1.7E, AR (coco)	5.35	Talihina, OK (meso)	5.27

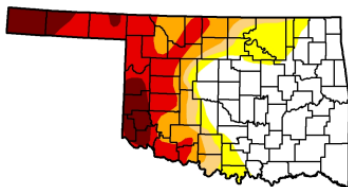
Some of the lowest precipitation reports (in inches) for June 2013 included:

Kingston, AR (coop)	0.74	Busch 0.4E, AR (coco)	1.09	Berryville 5NW, AR (coop)	1.22
Kingston 2S, AR (coop)	1.24	Fayetteville, AR (ASOS)	1.37	Claremore 2ENE, OK (coop)	1.42
Hindsville 10NNE, AR (coop)	1.45	Bella Vista 2.0E, AR (coco)	1.54	Tulsa, OK (ASOS)	1.69

U.S. Drought Monitor Oklahoma

June 25, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)						
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	
Current	46.86	53.14	42.09	36.76	26.35	8.69	
Last Week (06/18/2013 map)	46.86	53.14	42.09	36.76	26.35	8.44	
3 Months Ago (03/26/2013 map)	0.00	100.00	100.00	83.07	53.07	9.90	
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	100.00	94.89	37.06	
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	99.98	95.33	42.09	
One Year Ago (06/18/2012 map)	32.88	67.12	33.24	15.20	3.40	0.00	



Intensity:
 D0 Abnormally Dry
 D1 Drought - Moderate
 D2 Drought - Severe
 D3 Drought - Extreme
 D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>

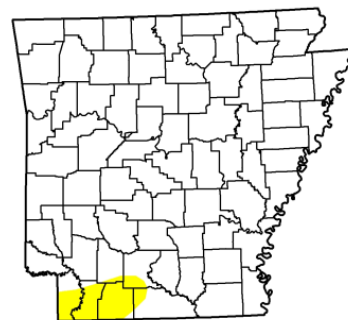


Fig. 2. Drought Monitor for Oklahoma

U.S. Drought Monitor Arkansas

June 25, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)						
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	
Current	96.30	3.70	0.00	0.00	0.00	0.00	
Last Week (06/18/2013 map)	95.19	4.81	1.03	0.00	0.00	0.00	
3 Months Ago (03/26/2013 map)	40.22	59.78	26.49	5.49	0.00	0.00	
Start of Calendar Year (01/01/2013 map)	24.37	75.63	54.32	41.05	24.37	0.00	
Start of Water Year (09/25/2012 map)	0.11	99.89	91.37	73.93	41.99	8.74	
One Year Ago (06/18/2012 map)	0.29	99.71	94.54	83.48	0.21	0.00	



Intensity:
 D0 Abnormally Dry
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<http://droughtmonitor.unl.edu>



Fig. 3. Drought Monitor for Arkansas

According to the [U.S. Drought Monitor](http://droughtmonitor.unl.edu) (USDM) from June 25, 2013 (Figs 2, 3), only northeast Kay County and the portion of Osage County near the OK-KS state line remained in Moderate (D1) Drought in eastern OK and northwest AR. Portions of Osage, Pawnee, Washington, Nowata, and northern Tulsa Counties in northeast OK were classified as abnormally dry (D0), but not experiencing drought conditions.

Most of the major reservoirs in the HSA were operating within $\pm 3\%$ of the top of their conservation pools, with just a couple lakes still well below normal. Skiatook Lake was operating at 80% and Heyburn Lake was at 90%. The following lakes were $\geq 103\%$ of their pools: Eufaula Lake 112%, Ft. Gibson Lake 107%, Tenkiller Lake 107%, Hudson Lake 106%, Beaver Lake 106%, Wister Lake 105%, and Oologah Lake 104%.

According to statistics from the [Oklahoma Climatological Survey \(OCS\)](#):

Rank since 1921	June 2013	Last 60 Days (May 2 – Jun 30)	Last 90 Days (Apr 2 – Jun 30)	Warm Growing Season (Mar 1 – Jun 30)	Year-to-Date 2013 (Jan 1 – Jun 30)	Water Year-to-Date (Oct 1, 2012 – Jun 30, 2013)	Last 365 Days (Jul 1, 2012 – Jun 30, 2013)
Northeast OK	19 th driest	41 st wettest	31 st wettest	40 th wettest	32 nd wettest	36 th driest	14 th driest
East Central OK	45 th wettest	33 rd wettest	27 th wettest	34 th wettest	26 th wettest	35 th driest	24 th driest
Southeast OK	31 st wettest	32 nd wettest	35 th wettest	32 nd wettest	35 th wettest	24 th driest	23 rd driest
Statewide	38 th driest	38 th driest	39 th wettest	38 th driest	41 st wettest	27 th driest	16 th driest

Outlooks

The [Climate Prediction Center \(CPC\)](#) outlook for July 2013 (issued June 30, 2013) indicates equal chances for above, near, and below normal temperatures and precipitation across all of northeast OK and northwest AR. This outlook is based primarily on dynamical computer models, which indicate near or below normal temperatures are more likely during the first half of the month and no clear temperature signal is indicated for the full month of July.

For the 3-month period Jul-Aug-Sep 2013, CPC is forecasting an 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 June 20, 2013). According to CPC, ENSO neutral conditions remained through June. ENSO neutral conditions are expected to continue through Summer 2013, followed by high uncertainty in the ENSO state from late 2013 onwards. Therefore, this outlook is primarily based on recent trends and dynamic computer model output, with some input from statistical forecast tools and long-term trends.

Summary of Precipitation Events

June 1-14

May 29-June 1 Tornado/Flood Events:

Three rounds of heavy rain, large hail, and tornadoes affected eastern OK and northwest AR from May 29 through the morning of June 1. The third round of severe weather and heavy, flooding rain once again affected Oklahoma on May 31st. Thunderstorms initially developed across much of central OK along a cold front/dryline, and tracked northeast into eastern OK during the afternoon and evening hours. Several rotating storms affected eastern OK, with 8 tornadoes confirmed. A long-lived HP supercell brought numerous tornadoes and widespread flooding to the Oklahoma City metro area (see NWS Norman <http://www.srh.noaa.gov/oun/?n=events-20130531> for details), before moving east along I-40 into eastern OK. This slow moving storm continued to be a prolific rain producer, bringing widespread 3"-8" of rain to all of Okfuskee and McIntosh Counties, as well as portions of Okmulgee, Muskogee, Pittsburg, and Haskell Counties (see Fig. 4). 7.54" of rain was measured 3 miles east of Okemah, OK. This heavy rain resulted in widespread flash flooding, and unfortunately, one fatality occurred when a 69-year old woman drowned after her car was swept into Alabama Creek (about 5 miles south of Clearview in Okfuskee Co.) early on June 1. A teenage passenger was able to escape through the vehicle's sunroof. Okfuskee County Emergency Management reported that 20 people were evacuated from Weleetka on June 1 due to flooding. Additionally, several roadways and bridges have damage from flooding. Okmulgee County Emergency Management reported approximately 25 homes and one nursing home were evacuated in Henryetta due to flooding from

Coal Creek (which according to local media spread out over 100 yards wide above the embankment). Dewar had more than 50 homes affected by the flooding, which were not accessible. Water rescues took place in both communities, and many roads were barricaded due to high water. Widespread 1"-3" of rain fell elsewhere in east central OK and west central AR as the storm finally began to weaken. 0.50"-around 3" of rain also occurred along the counties that border KS.

24-hr rainfall totals >3" ending 7 am CDT 6/01/2013:

Okemah 3E, OK	7.54	Okemah, OK	6.50	Eufaula 5W, OK	6.01
Stigler 4WNW, OK	5.40	Eufaula 4.6ENE, OK	5.10	Whitefield 1N, OK	4.80
Okmulgee 5SE, OK	3.64	Scipio 1S, OK	3.30	Charleston 1.7E, AR	3.24
Natural Dam, AR	3.01				

The final week of May 2013 brought 2"-10" of rain to most of eastern OK and northwest AR. The exceptions were along the Red River (Choctaw County received 0.50" or less of rain) and from central Creek County, through Wagoner County, into western Washington County AR, and through Benton and Carroll Counties (this area received 0.50" to less than 2") (see Figs. 5, 6). Mainstem river flooding occurred (or flooding from the May 29th rainfall was exacerbated) from this widespread heavy rain on May 30th-31st, causing moderate flooding along Bird Creek, the Caney River, the Neosho River, and the Poteau River. Minor flooding also occurred along Bird Creek, the Caney River, the Spring River, and the Kiamichi River. Refer to the E3 report for specific details. Preliminary hydrographs are available at the end of this report. More information about the severe weather from May 29-31, 2013 can be found at http://www.srh.noaa.gov/tsa/?n=weather-event_2013may30-31.

Tulsa, OK (TSA): 6/1/2013 1-Day Observed Precipitation
Valid at 6/1/2013 1200 UTC- Created 6/3/13 13:45 UTC

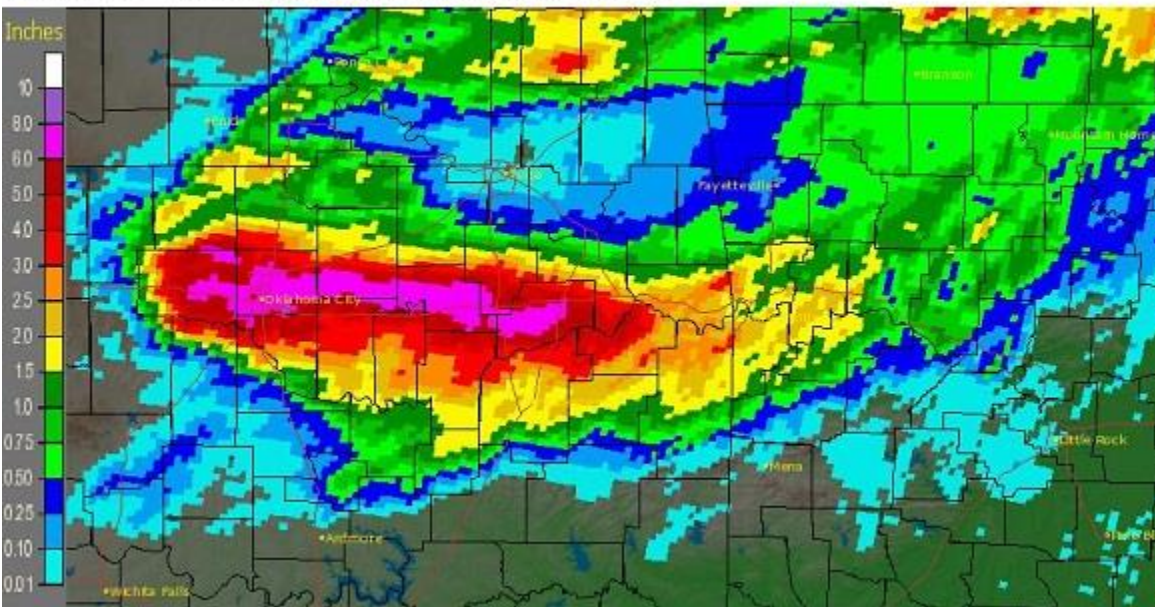


Fig. 4. 24-hr Estimated Observed Rainfall ending at 7am CDT 6/01/2013.

Tulsa, OK (TSA): Current 7-Day Observed Precipitation
 Valid at 6/2/2013 1200 UTC- Created 6/2/13 22:48 UTC

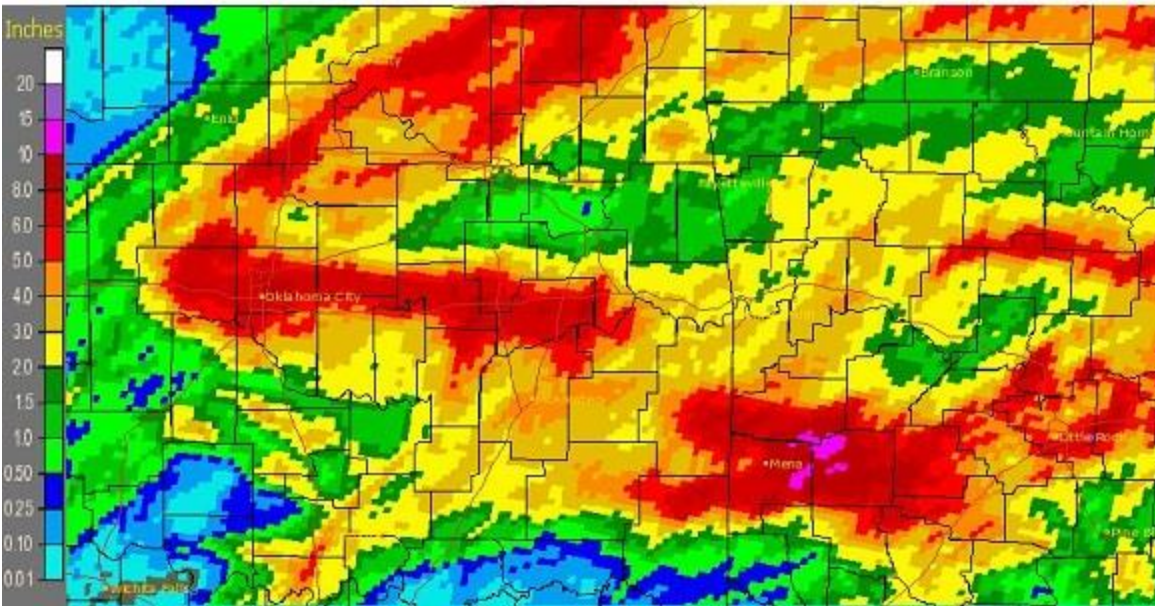


Fig. 5. 7-Day Estimated Observed Rainfall ending at 7am CDT 6/02/2013.

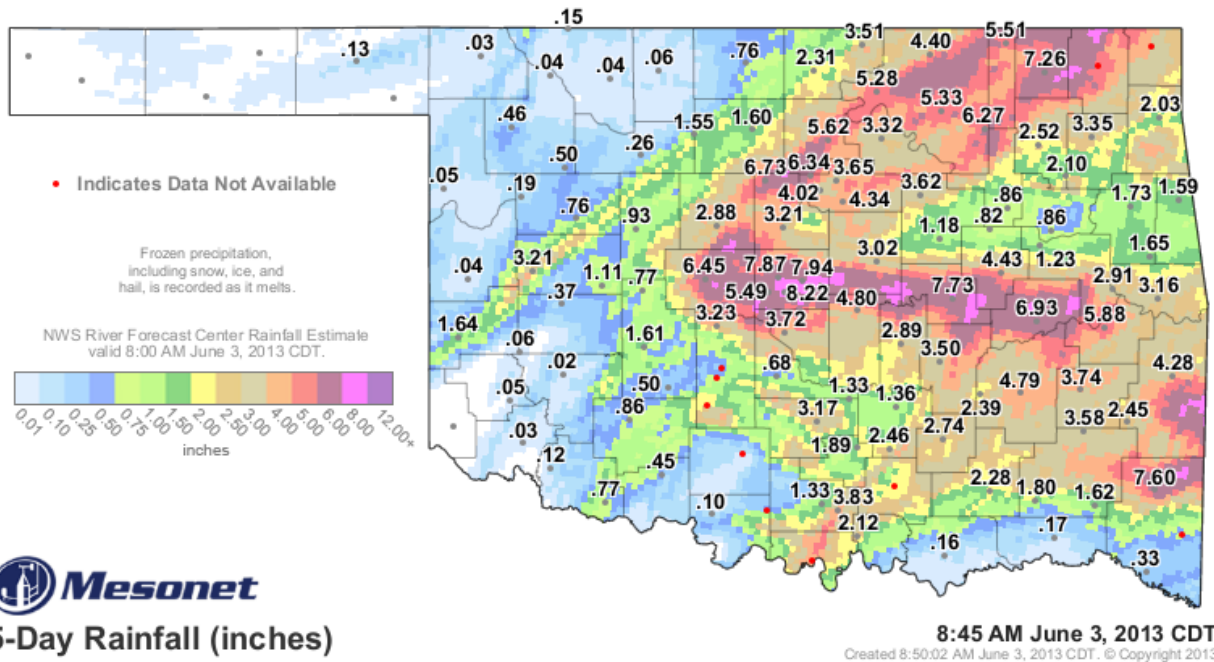


Fig. 6. 5-Day Measured and radar estimated observed rainfall ending at 8:45am CDT 6/03/2013.

Thunderstorms that developed over southwest KS/OK Panhandle congealed into a thunderstorm complex that affected locations primarily along and west of the Hwy 75 corridor late on the 3rd through the morning of the 4th. A second MCS developed near a frontal boundary in southwest KS/northwest OK on the 4th, and once again moved into the HSA during the early morning hours of the 5th and dissipating by early afternoon. This storm complex progressed further east than the previous one, bringing rain to most of the area. The two MCSs combined rainfall totals ranged from 0.50" to near 2.5". The eastern fringes of a third MCS brought 0.25" to 0.75" of rain to western Choctaw County during the early hours of the 6th.

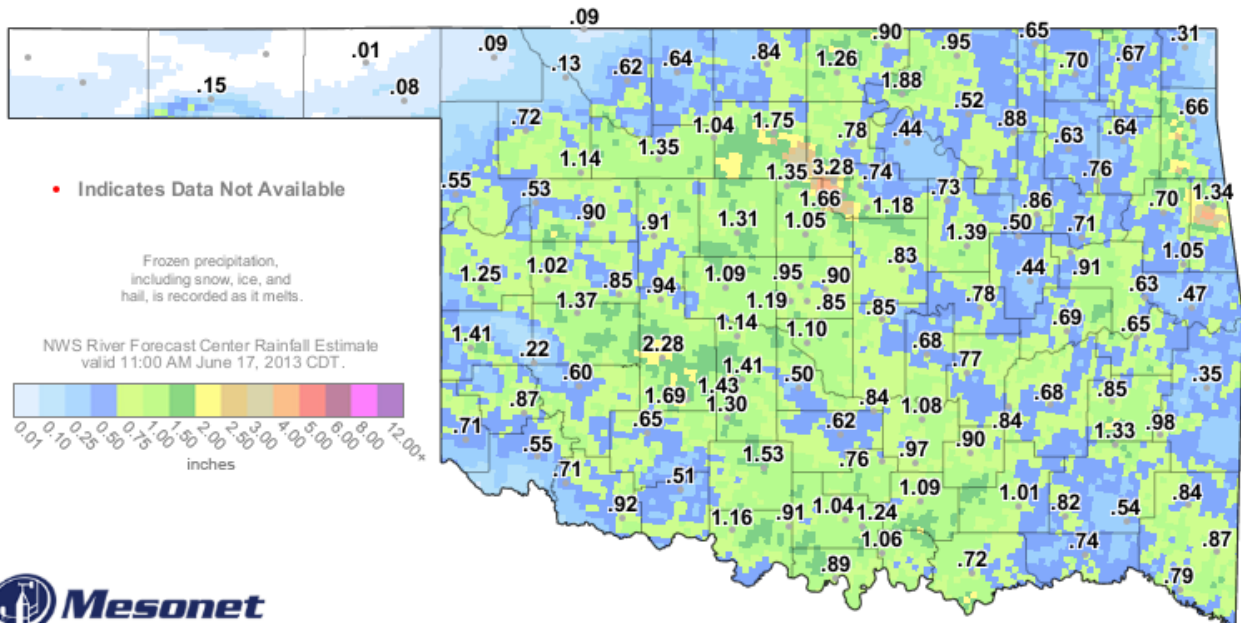
An MCS moved southeast across western/central OK and affected southern Pushmataha and Choctaw Counties during the early morning hours of the 9th. Rainfall was light across Pushmataha County, with higher totals of 0.25" to near 1".

June 15-30

After several hot and humid days, the mid-level ridge shifted east of the HSA while a mid-level trough approached from the west on the 15th. A weak cap allowed showers and thunderstorms to develop during the afternoon and evening hours. This activity was most widespread across Pawnee and Osage Counties, the Fort Smith area, as well as from Muskogee County, through Cherokee County, and up into Ottawa County. Rainfall totals in these areas were 0.50" to around 2". Elsewhere, the rainfall was more isolated, producing generally around 0.25" or less.

Widely scattered thunderstorms developed during the day on the 16th, typical of summer time convection. Some of these storms produced locally heavy rain, small hail, and damaging winds. This activity waned during the evening hours. Later, an MCS entered eastern Kay/western Osage County around 2am on the 17th, and moved southeast across the remainder of the area through the overnight and morning hours. The MCS brought 0.30" to around 1" of rain to all of eastern OK and most of northwest AR, with eastern Benton, Carroll, and Madison Counties receiving less than 0.10" (Figs. 7, 8). Combined with the rainfall from the 16th, 24-hr rainfall totals (ending at 7am 6/17; see Fig. 9) were 0.5" to 2" across a large portion of the region. Isolated higher totals of 2" to around 4" occurred in south Tulsa, central Adair, and southern Le Flore Counties, including: Talihina 3ENE, OK 4.31"; Jenks 0.9W, OK 3.18"; and Tulsa 8S, OK 3.02". An MCV remained over northeast OK after the MCS had weakened, resulting in light scattered rain during the afternoon of the 17th.

Other than one or two isolated thunderstorms, the remainder of June 2013 was rain free. The first 100°F+ occurred on the 27th, when Tulsa reached 100°F and Fort Smith hit 101°F.



Observed Rainfall Since Midnight (inches)

12:05 PM June 17, 2013 CDT
Created 12:09:32 PM June 17, 2013 CDT. © Copyright 2013

Fig. 7. Rainfall totals from MCS.

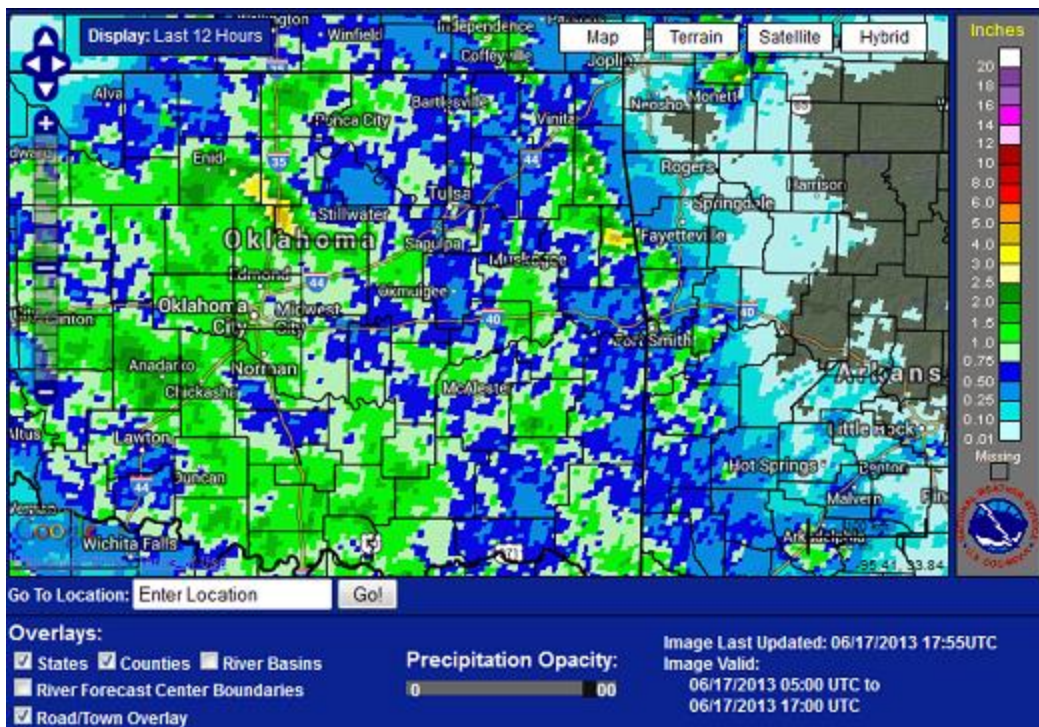


Fig. 8. Rainfall totals from MCS.

Tulsa, OK (TSA): Current 1-Day Observed Precipitation
 Valid at 6/17/2013 1200 UTC- Created 6/17/13 17:55 UTC

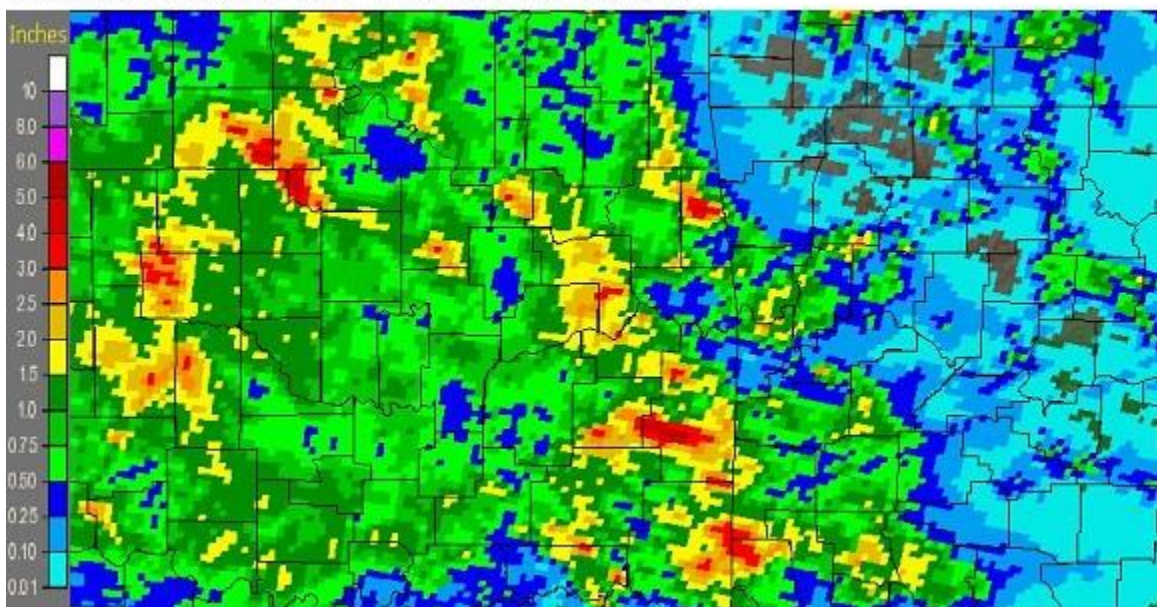


Fig. 9. 24-hour Estimated Observed Rainfall ending at 7am CDT 6/17/2013.

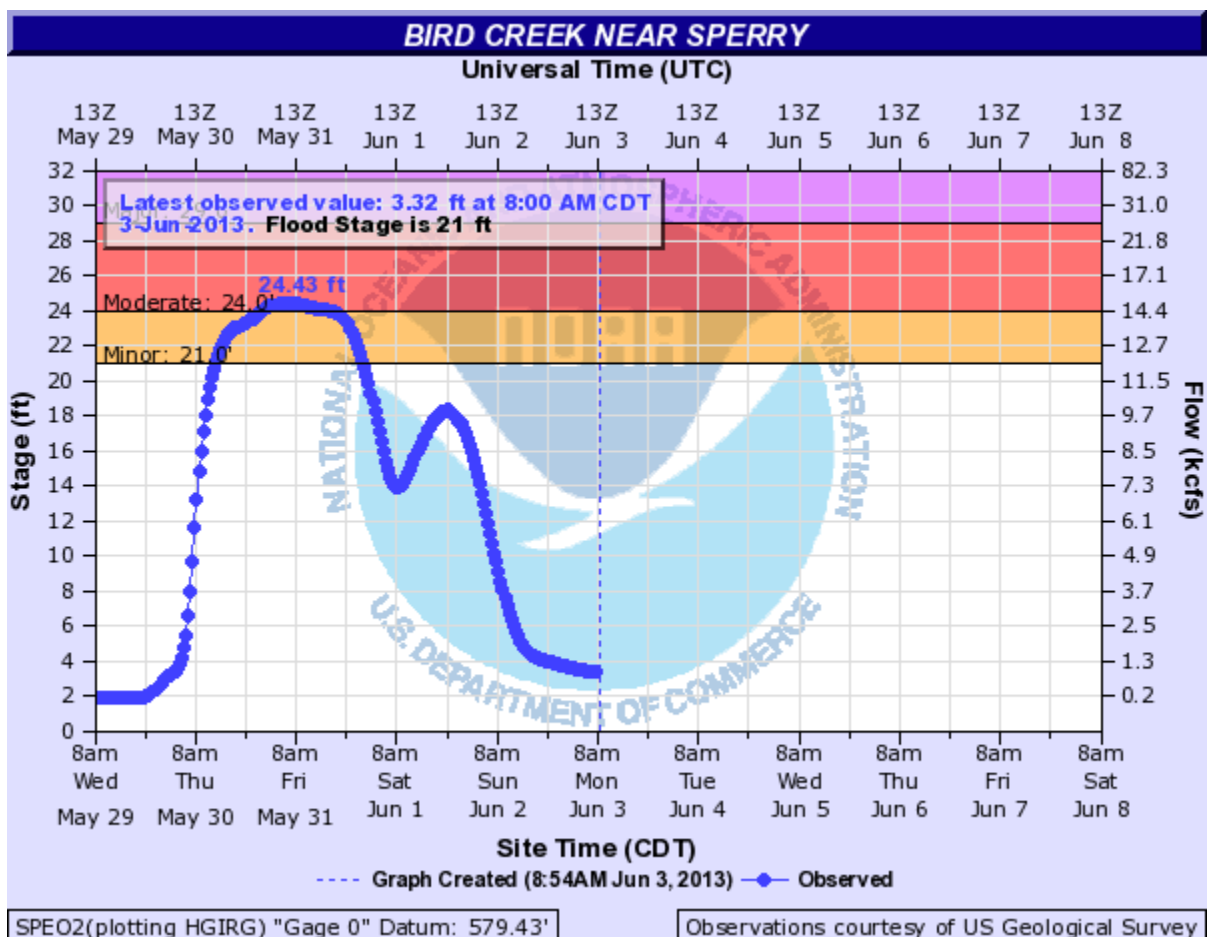
Written by:

Nicole McGavock
 Service Hydrologist
 WFO Tulsa

Products issued in June 2013:

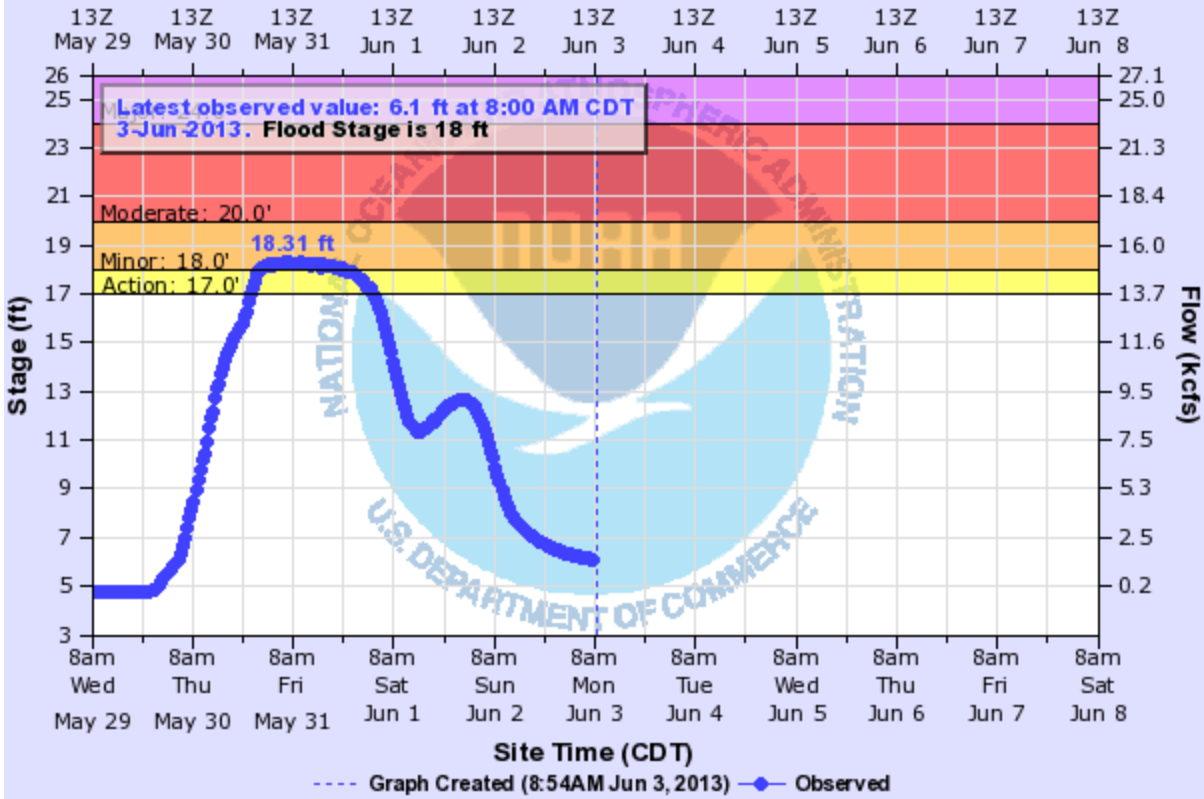
- 8 Flash Flood Warnings (FFW)
- 8 Flash Flood Statements (FFS)
- 0 Flash/Areal Flood Watches (FFA) (3 Watch FFA CON/EXT/CAN)
- 8 Urban and Small Stream Advisories (FLS)
- 6 Areal Flood Warnings (FLW)
- 2 Areal Flood Statements (FLS)
- 8 River Flood Warnings (FLW)
- 78 River Flood Statements (FLS)
- 2 River Flood Advisories (FLS) (5 Advisory FLS CON/EXT/CAN)
- 0 River Flood Watches (FFA) (5 Watch FFA CON/EXT/CAN)
- 0 River Statements (RVS)
- 0 Hydrologic Outlooks (ESF)
- 1 Drought Information Statements (DGT)

Preliminary Hydrographs:



BIRD CREEK NEAR OWASSO

Universal Time (UTC)

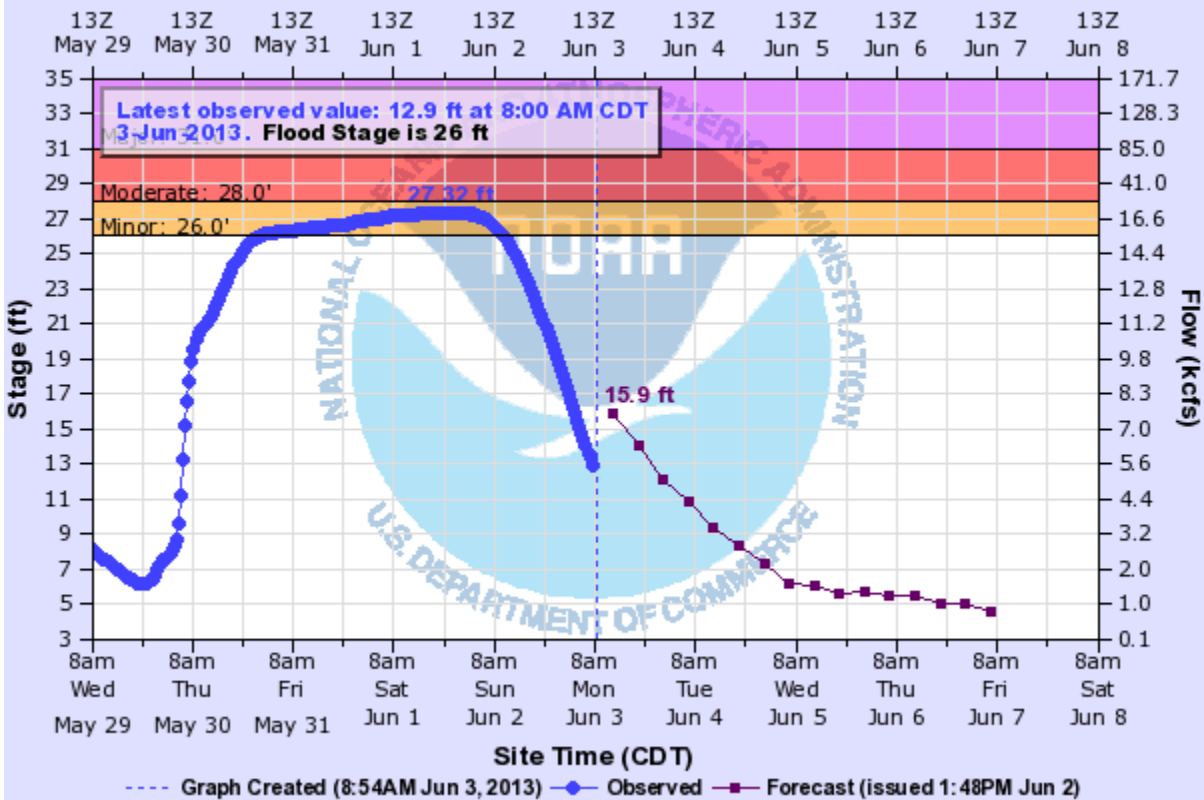


OWSO2(plotting HGIRG) "Gage 0" Datum: 560.17'

Observations courtesy of US Geological Survey

CANEY RIVER NEAR RAMONA

Universal Time (UTC)

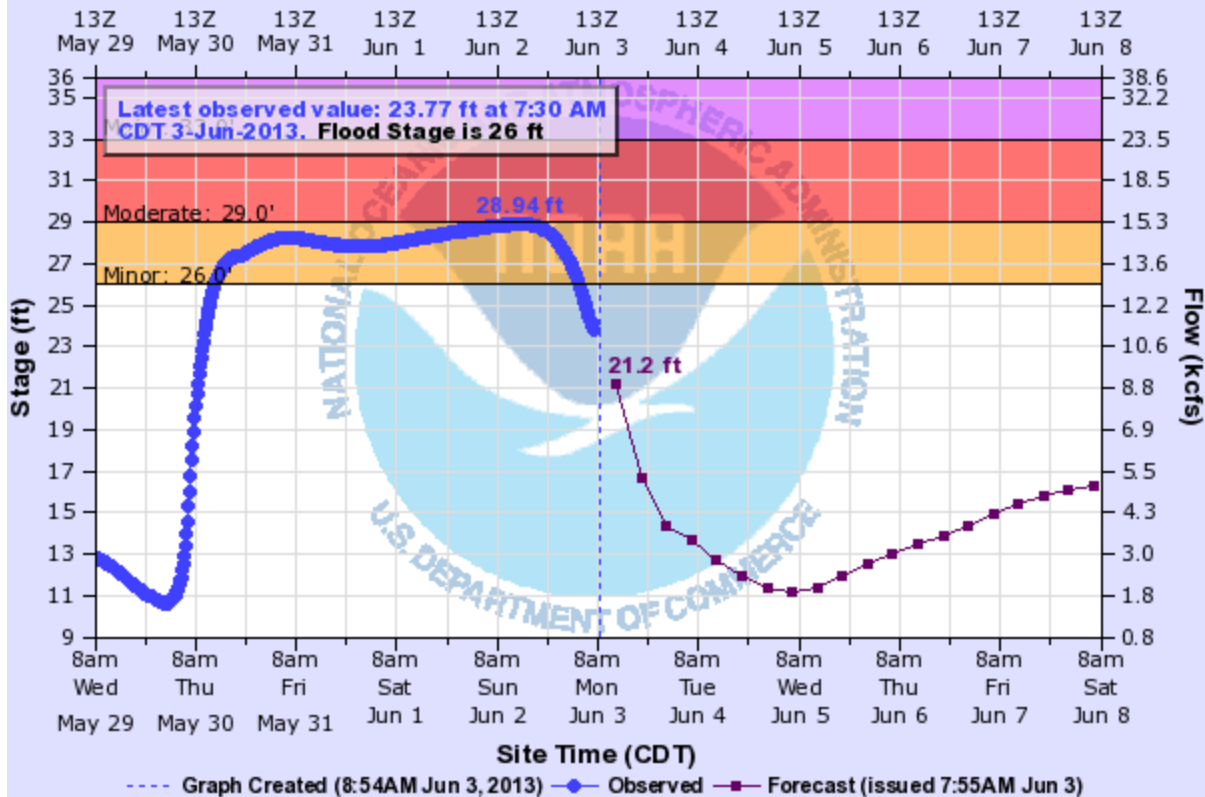


RAMO2(plotting HGIRG) "Gage 0" Datum: 586.43'

Observations courtesy of US Geological Survey

CANEY RIVER NEAR COLLINSVILLE

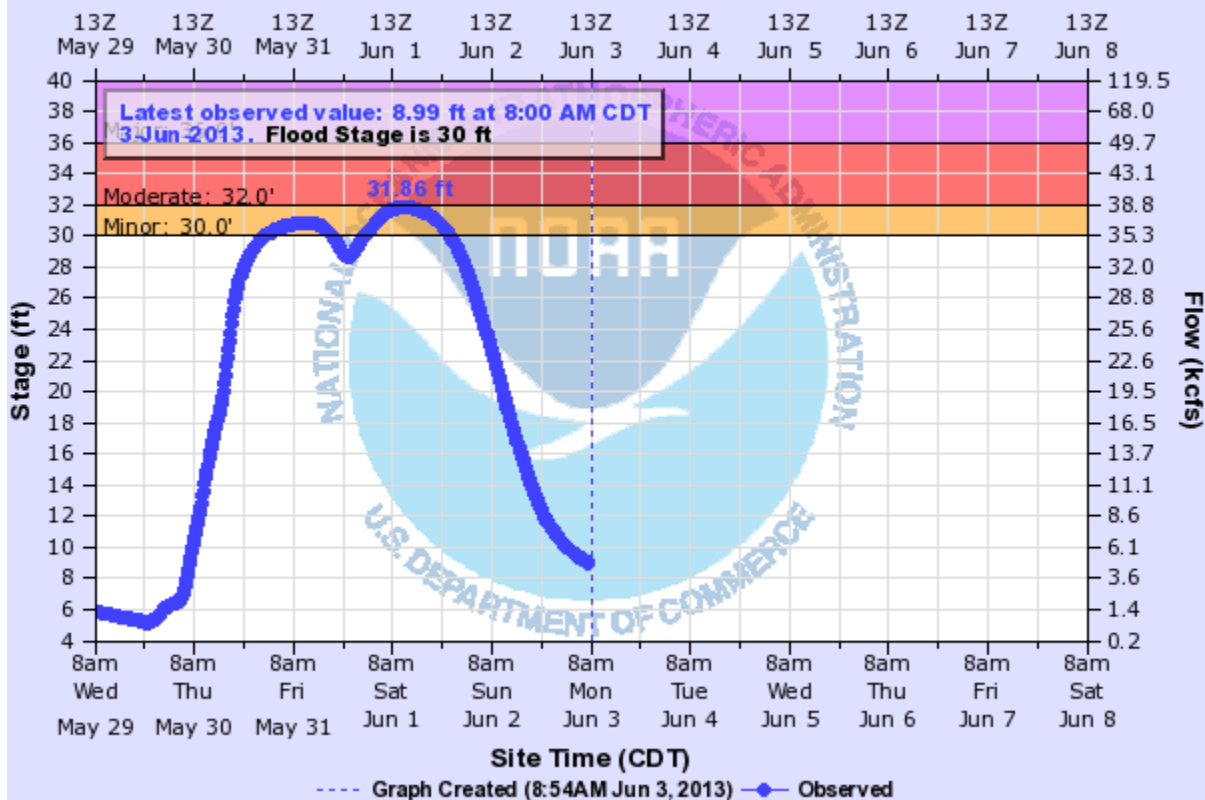
Universal Time (UTC)



CVLO2(plotting HGIRG) "Gage 0" Datum: 565.72'

VERDIGRIS RIVER NEAR LENAPAH

Universal Time (UTC)

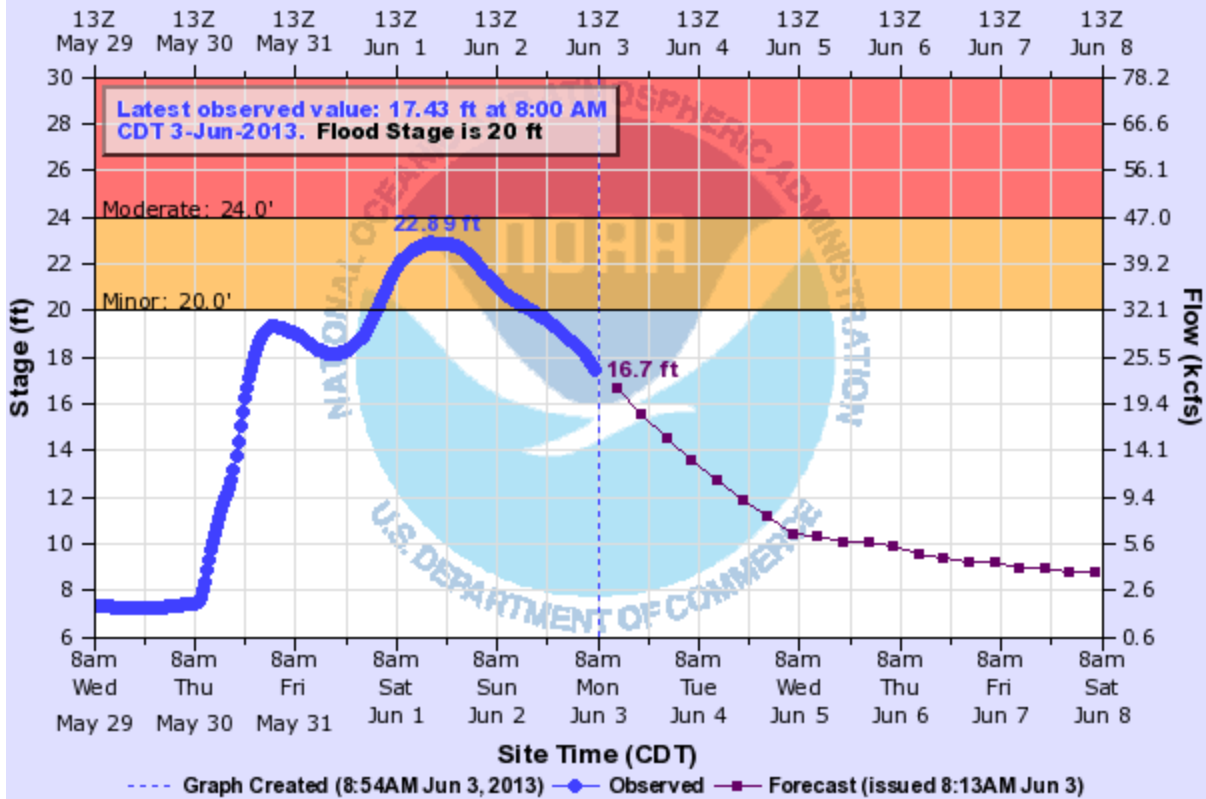


LEPO2(plotting HGIRG) "Gage 0" Datum: 644.9'

Observations courtesy of US Geological Survey

SPRING RIVER NEAR QUAPAW

Universal Time (UTC)

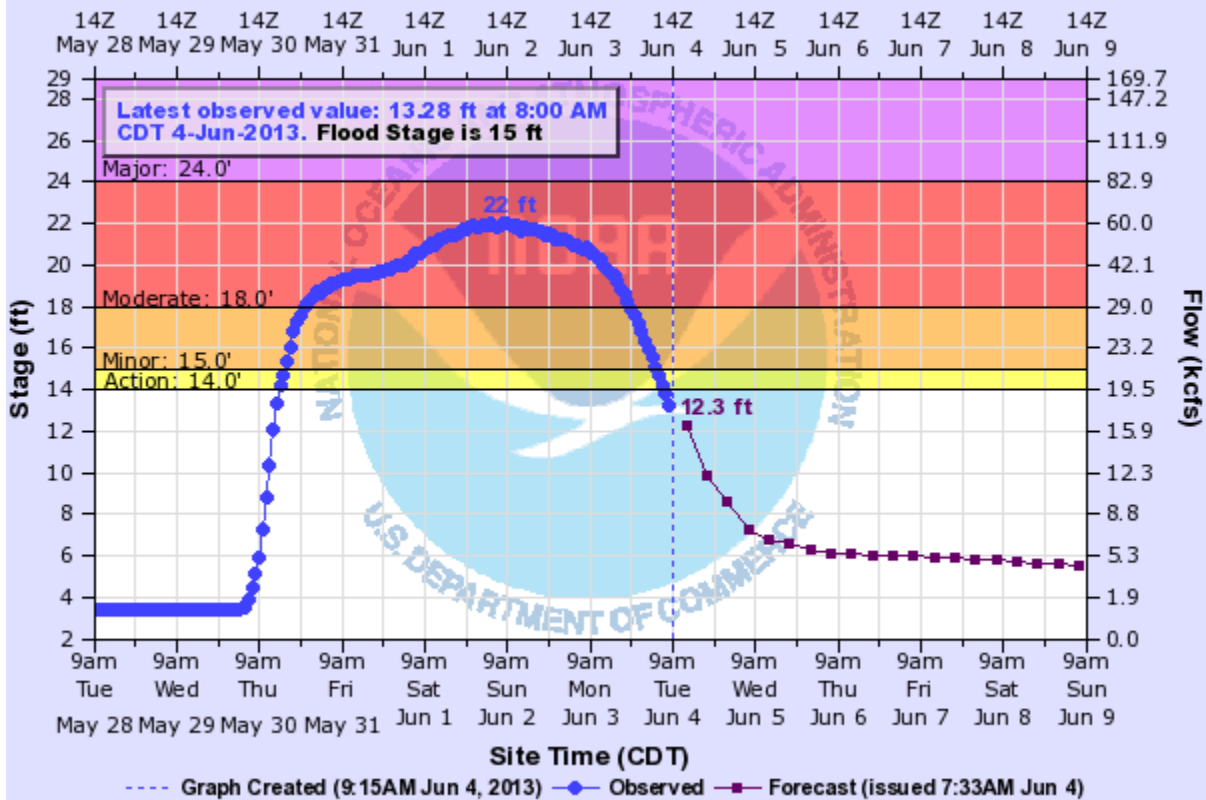


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Observations courtesy of US Geological Survey

NEOSHO RIVER NEAR COMMERCE

Universal Time (UTC)

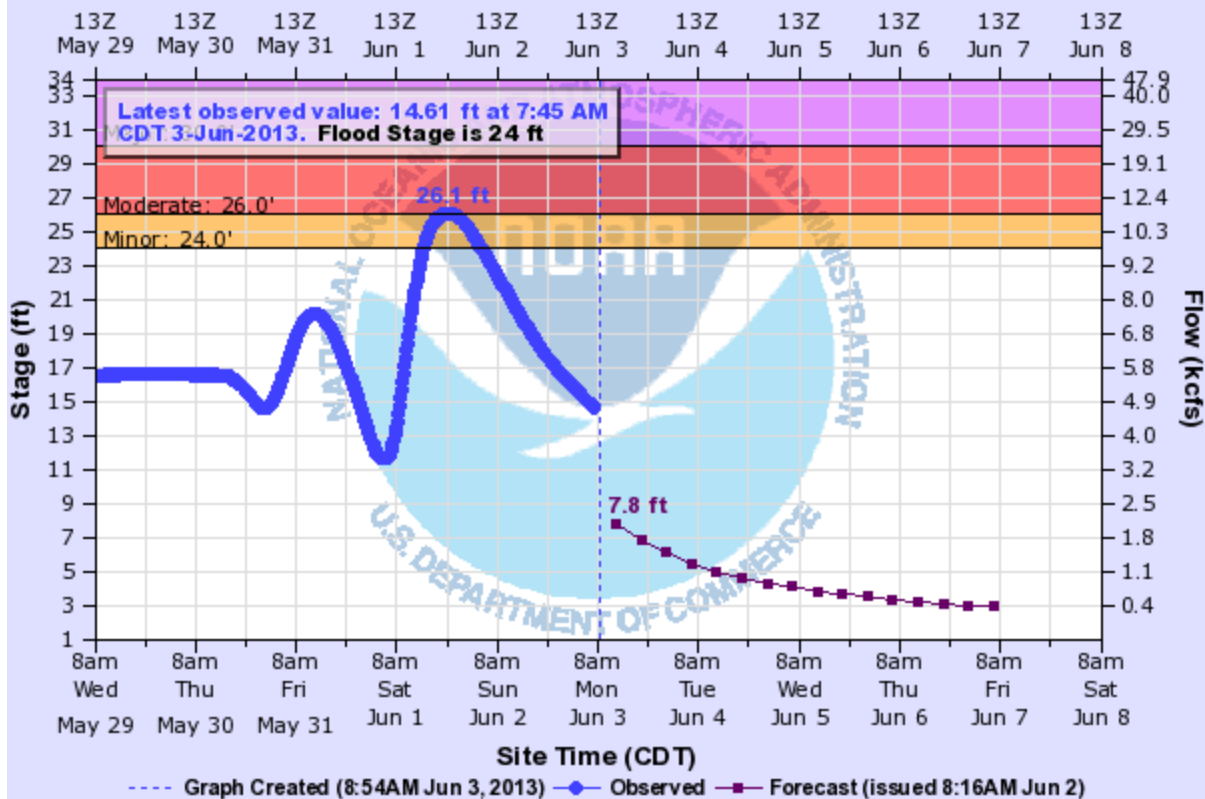


COMO2(plotting HGIRG) "Gage 0" Datum: 748.97'

Observations courtesy of US Geological Survey

POTEAU RIVER NEAR POTEAU

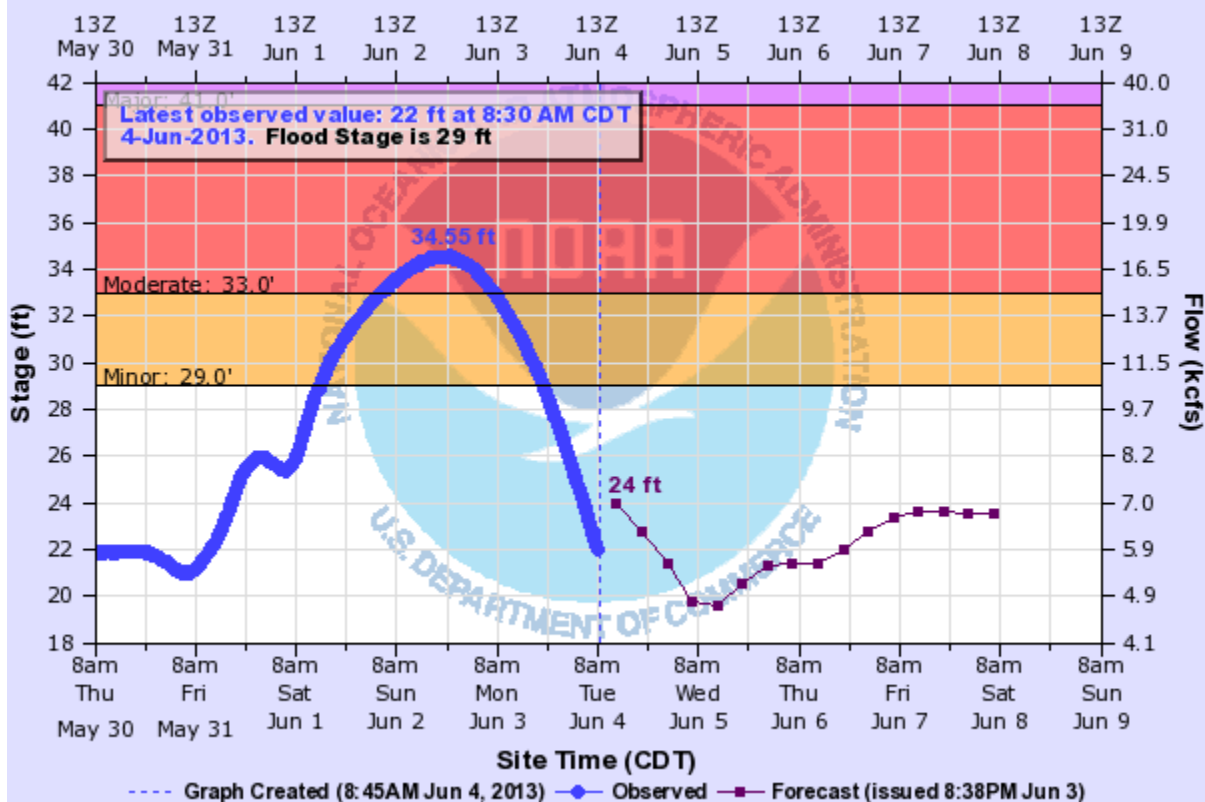
Universal Time (UTC)



PTAO2(plotting HGIRG) "Gage 0" Datum: 409.4'

POTEAU RIVER NEAR PANAMA

Universal Time (UTC)

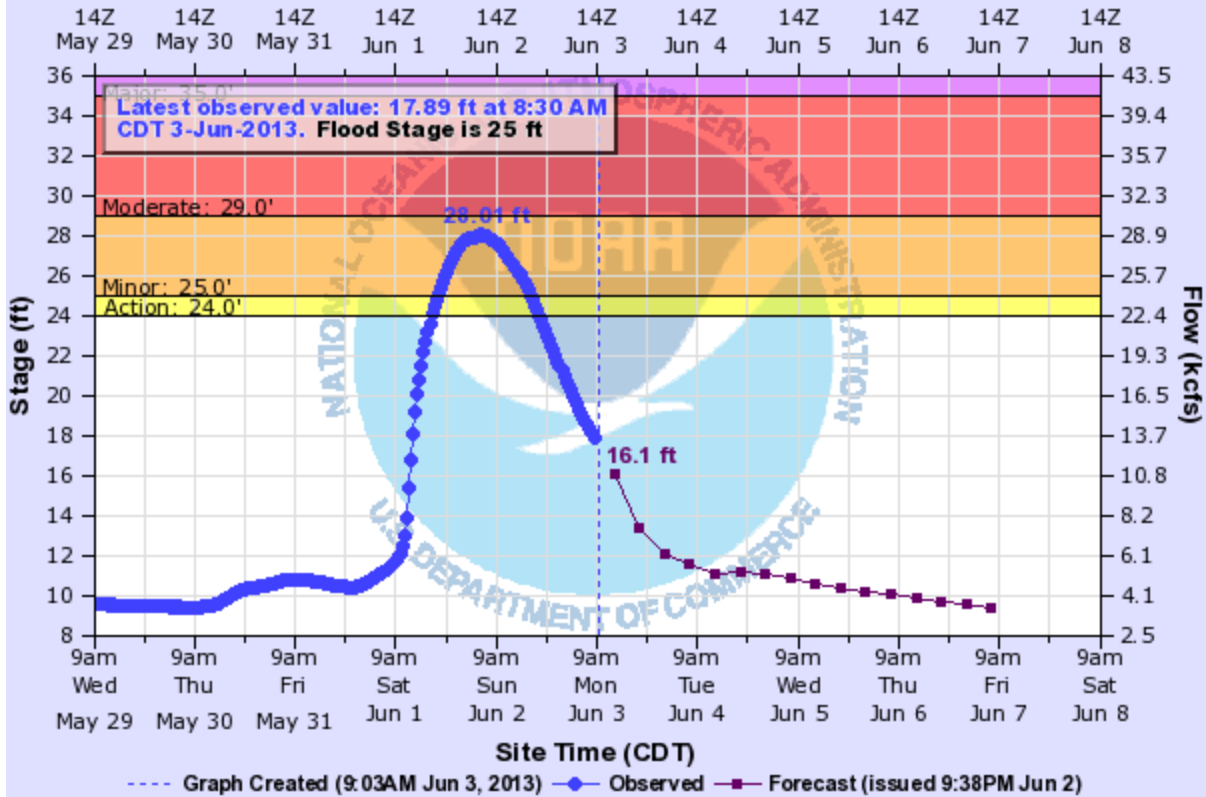


PANO2(plotting HGIRG) "Gage 0" Datum: 387.97'

Observations courtesy of US Geological Survey

KIAMICHI RIVER NEAR ANTLERS

Universal Time (UTC)

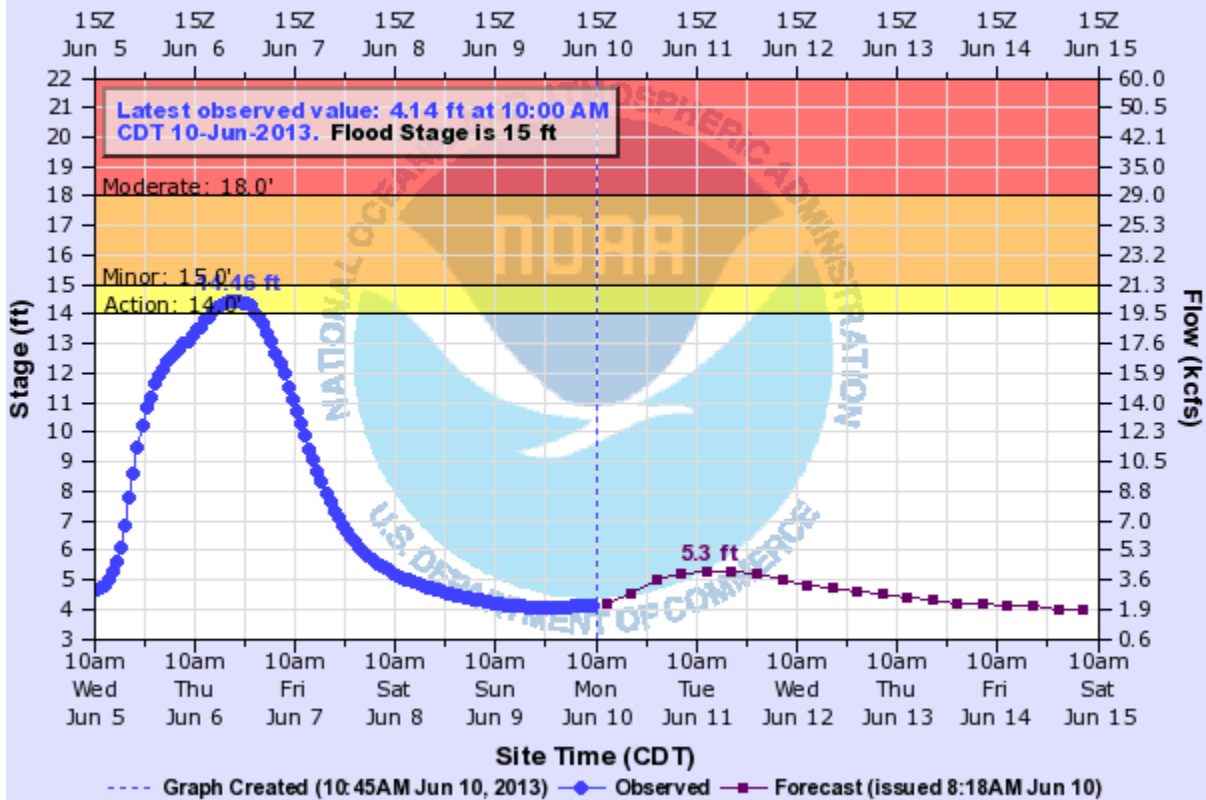


ANTO2(plotting HGIRG) "Gage 0" Datum: 419.82'

Observations courtesy of US Geological Survey

NEOSHO RIVER NEAR COMMERCE

Universal Time (UTC)

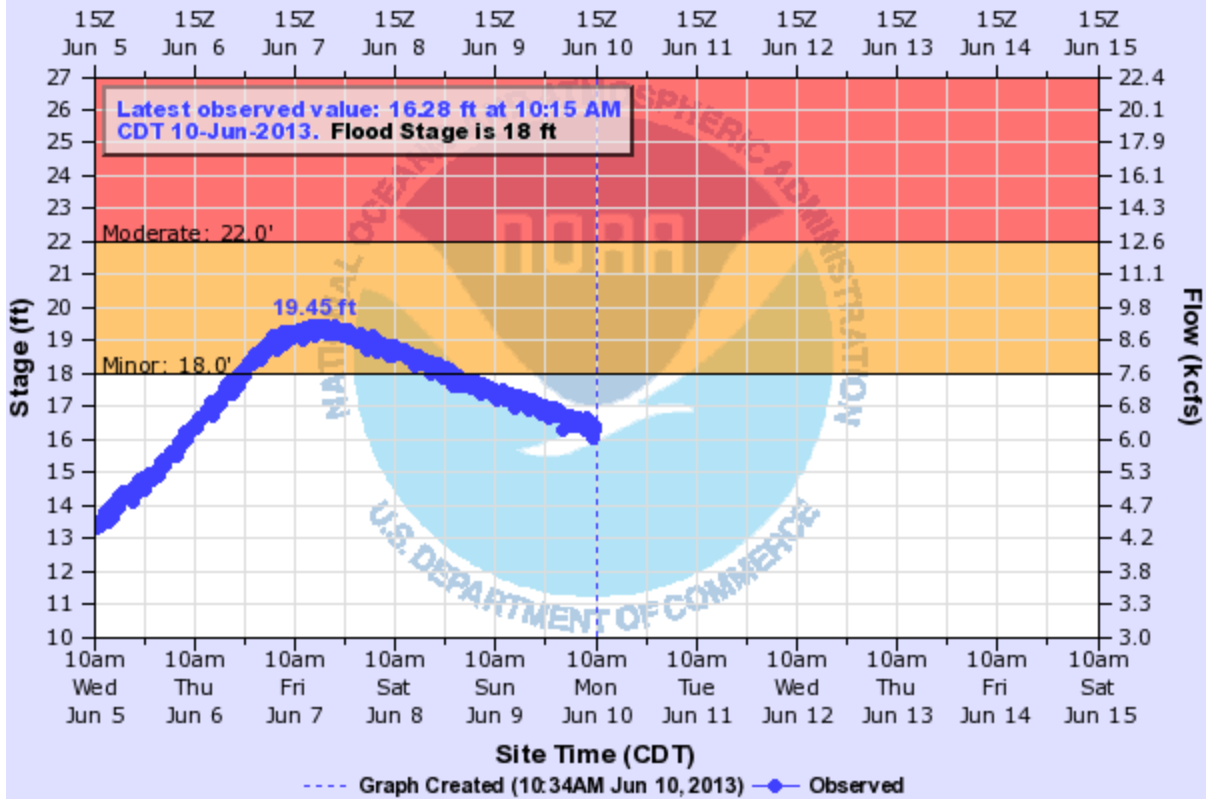


COMO2(plotting HGIRG) "Gage 0" Datum: 748.97'

Observations courtesy of US Geological Survey

DEEP FORK RIVER NEAR BEGGS

Universal Time (UTC)



BGS02(plotting HGIRG) "Gage 0" Datum: 632.55'

Observations courtesy of US Geological Survey