

# Oklahoma Water Resources Bulletin & Summary of Current Conditions

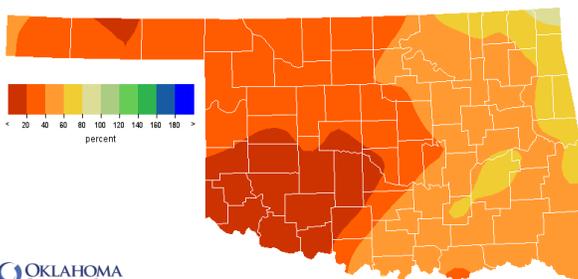


March 24, 2011

## PRECIPITATION

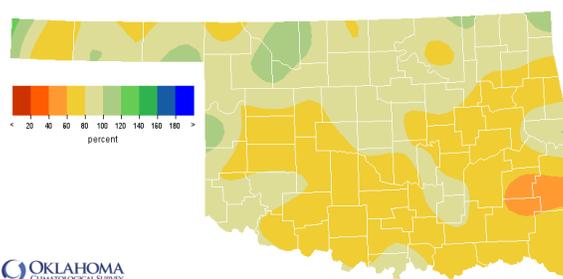
### Statewide Precipitation

CLIMATE DIVISION	Last 120 Days November 22, 2010 – March 21, 2011				Last 365 Days March 22, 2010 – March 21, 2011			
	TOTAL RAINFALL (INCHES)	DEPARTURE FROM NORMAL (INCHES)	PERCENT OF NORMAL	RANK SINCE 1921	TOTAL RAINFALL (INCHES)	DEPARTURE FROM NORMAL (INCHES)	PERCENT OF NORMAL	RANK SINCE 1921
Panhandle	0.87"	-2.41"	26%	6th driest	18.15"	-2.95"	86%	30th driest
North Central	1.84"	-4.05"	31%	5th driest	28.01"	-3.64"	88%	38th driest
Northeast	5.64"	-3.76"	60%	22nd driest	36.22"	-5.75"	86%	30th driest
West Central	1.10"	-4.21"	21%	2nd driest	22.09"	-7.00"	76%	16th driest
Central	2.42"	-5.86"	29%	1st driest	29.95"	-8.04"	79%	18th driest
East Central	6.42"	-5.18"	55%	11th driest	35.19"	-10.90"	76%	16th driest
Southwest	0.76"	-5.06"	13%	1st driest	24.06"	-6.74"	78%	20th driest
South Central	4.67"	-5.31"	47%	9th driest	30.55"	-10.41"	75%	15th driest
Southeast	7.99"	-6.59"	55%	3rd driest	32.24"	-18.70"	63%	3rd driest
<b>Statewide</b>	<b>3.48"</b>	<b>-4.70"</b>	<b>43%</b>	<b>4th driest</b>	<b>28.68"</b>	<b>-8.01"</b>	<b>78%</b>	<b>15th driest</b>



OKLAHOMA CLIMATOLOGICAL SURVEY  
Percentage of Normal Rainfall  
Last 120 Days

Nov 22, 2010 through Mar 21, 2011  
Created 2011-03-22 10:00:09 UTC. Copyright © 2011



OKLAHOMA CLIMATOLOGICAL SURVEY  
Percentage of Normal Rainfall  
Last 365 Days

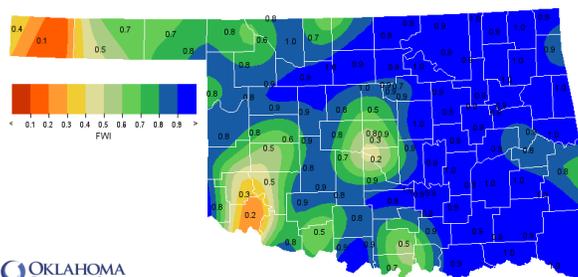
Mar 22, 2010 through Mar 21, 2011  
Created 2011-03-22 10:00:09 UTC. Copyright © 2011

## SOIL MOISTURE

### Fractional Water Index<sup>1</sup>

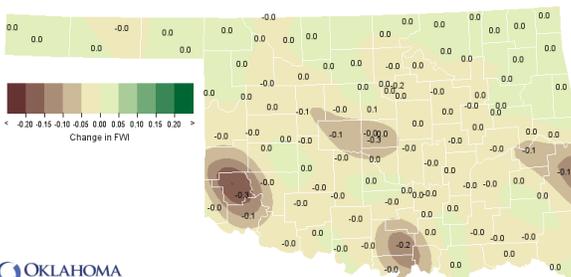
March 21, 2011

25 CM (~10 INCHES)



OKLAHOMA CLIMATOLOGICAL SURVEY  
25-cm Fractional Water Index

Mar 21, 2011  
Created 2011-03-22 10:00:09 UTC. Copyright © 2011



OKLAHOMA CLIMATOLOGICAL SURVEY  
7-Day Change in 25-cm Fractional Water Index

Mar 21, 2011  
Created 2011-03-22 10:00:09 UTC. Copyright © 2011

<sup>1</sup> The Fractional Water Index ranges from very dry soil having a value of 0 to soil at field capacity illustrated by a value of 1. Specifically, 1.0 to 0.8 equals Enhanced Growth, 0.8 to 0.5 equals Limited Growth, 0.5 to 0.3 equals Plants Wilted, 0.3 to 0.1 equals Plants Dying, and less than 0.1 equals Barren Soil.

## DROUGHT INDICES

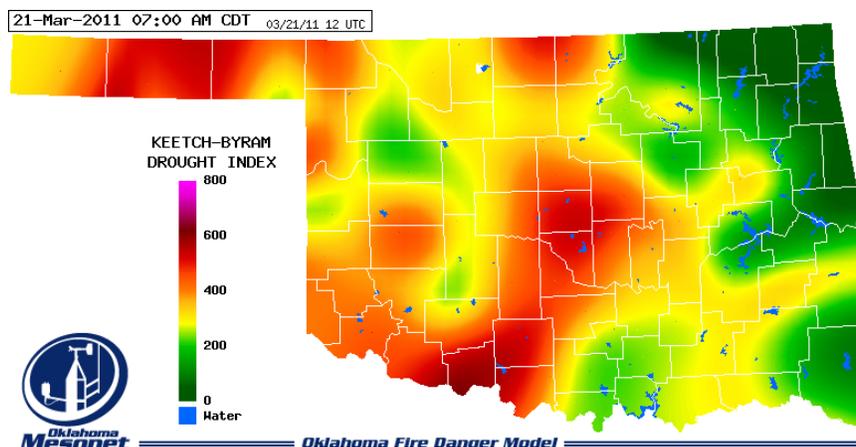
Palmer Drought Severity Index <sup>1</sup>					Standardized Precipitation Index <sup>2</sup> Through February 2010			
CLIMATE DIVISION	CURRENT STATUS 3/19/2011	VALUE		CHANGE IN VALUE	3-MONTH	6-MONTH	9-MONTH	12-MONTH
		3/19	2/19					
Northwest	INCIPIENT DROUGHT	-0.70	0.37	<b>-1.07</b>	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
North Central	NEAR NORMAL	-0.12	0.09	<b>-0.21</b>	VERY DRY	MODERATELY DRY	NEAR NORMAL	NEAR NORMAL
Northeast	NEAR NORMAL	0.15	-1.31	<b>1.46</b>	MODERATELY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
West Central	INCIPIENT DROUGHT	-0.81	-0.53	<b>-0.28</b>	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Central	MILD DROUGHT	-1.70	-1.34	<b>-0.36</b>	MODERATELY DRY	MODERATELY DRY	NEAR NORMAL	NEAR NORMAL
East Central	MILD DROUGHT	-1.10	-0.85	<b>-0.25</b>	MODERATELY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southwest	MILD DROUGHT	-1.51	-0.91	<b>-0.60</b>	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
South Central	MILD DROUGHT	-1.67	-0.57	<b>-1.10</b>	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southeast	MODERATE DROUGHT	-2.42	-2.13	<b>-0.29</b>	VERY DRY	MODERATELY DRY	VERY DRY	VERY DRY

- Five climate divisions are currently experiencing drought conditions, according to the PDSI. Two additional regions are considered in “incipient” drought.
- Eight climate divisions have undergone PDSI moisture decreases since February 19.
- Eight climate divisions are experiencing near long-term dry conditions, according to the SPI.

### Keetch-Byram Drought Fire Index<sup>3</sup>

MESONET STATION	COUNTY	CLIMATE DIVISION	CURRENT VALUE 3/21/2011
Walters	Cotton	Southwest	578
Grndfield	Tillman	Southwest	560
Norman	Cleveland	Central	551

- Stations currently at or above 600 (March 21) = 0
- Stations above 600 on February 21 = 0



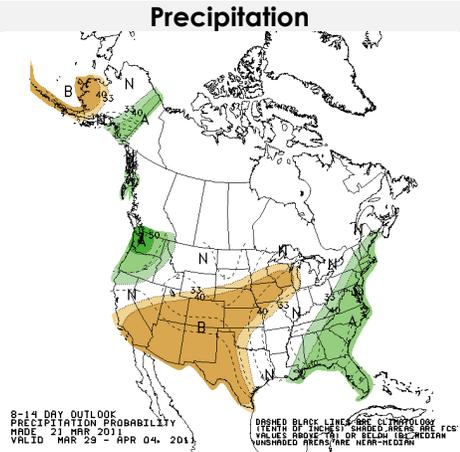
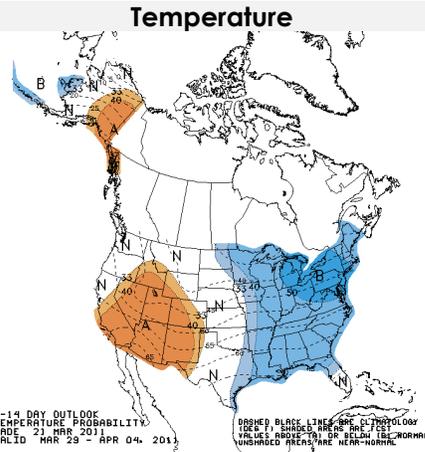
<sup>1</sup> The Palmer Drought Severity Index, the first comprehensive drought index developed in the United States, is calculated based on precipitation, temperature, and soil moisture. Though widely used by government agencies and states to trigger drought relief programs, the PDSI may underestimate or overestimate the severity of ongoing dry periods.

<sup>2</sup> The Standardized Precipitation Index, more sensitive than the PDSI, provides a comparison of precipitation over a specified period with precipitation totals from that same period for all years included in the historical record. The 3-month SPI provides a seasonal estimation of precipitation while the 6-month SPI can be very effective in showing precipitation over distinct seasons.

<sup>3</sup> The Keetch-Byram Drought Index measures the state of near-surface soil moisture (within the uppermost eight inches of soil) as well as the amount of fuel available for fires. KBDI values of 600 and above are often associated with more severe drought and increased wildfire occurrence.

# WEATHER/DROUGHT FORECAST

## 8- to 14-Day Outlook March 29 – April 4, 2011



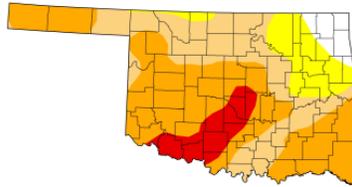
## Regional Drought Summary & Outlook

### U.S. Drought Monitor

Oklahoma

March 22, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	4.38	95.62	83.58	54.46	8.78	0.00
Last Week (03/15/2011 map)	4.40	95.60	82.84	35.79	1.86	0.00
3 Months Ago (12/21/2010 map)	14.73	85.27	38.09	0.85	0.00	0.00
Start of Calendar Year (12/29/2010 map)	13.82	86.18	47.90	1.50	0.00	0.00
Start of Water Year (09/28/2010 map)	66.28	33.72	4.21	0.00	0.00	0.00
One Year Ago (03/16/2010 map)	100.00	0.00	0.00	0.00	0.00	0.00



**Intensity:**

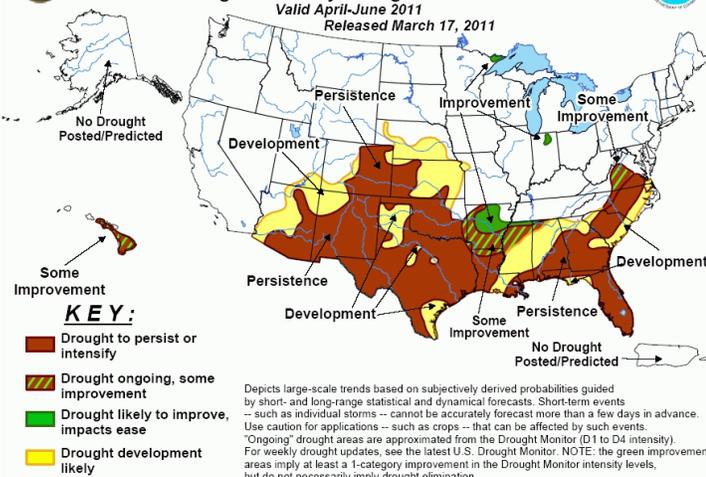
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

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

<http://drought.unl.edu/dm>

USDA National Drought Mitigation Center  
Released Thursday, March 24, 2011  
Eric Luebbehusen, United States Department of Agriculture

### U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period Valid April-June 2011 Released March 17, 2011



March 22 – The latest U.S. Drought Monitor reports that in Oklahoma and Texas, dry and unseasonably warm weather led to widespread intensification and expansion of drought. Temperatures averaged up to 18°F above normal across the region, with highs reaching the lower 90s; consequently, crop and pasture moisture demands were higher than normal. In eastern Texas, the expanded Extreme Drought (D3) region aligned with soil moisture percentile rankings consistently in the lowest 5th percentile. In western Texas, Extreme Drought (D3) was expanded in response to 180-day rainfall values that are 10 percent of normal or less. In south Texas and the Lower Valley, where precipitation has averaged 10 to 30 percent of normal over the past 90 days, Moderate to Severe Drought (D1 and D2, respectively) were expanded. Likewise in northern Texas and western Oklahoma where severely dry conditions over the past 90 days coupled with unseasonable warmth to cause an expansion of drought. Most notably, Extreme Drought now stretches from just east of Oklahoma City southwestward into north-central Texas; many locales in the heart of the expanded D3 region have reported less than 20 percent-of-normal precipitation over the past 90 days. Severe Drought (D2) also expanded across western portions of Oklahoma, reflecting soil moisture rankings in the lowest 20th percentile.

According to the latest Drought Outlook (March 17), the seasonal drought outlook for April-June 2011 is based in part on climate anomalies associated with the final stages of La Niña, stream flows, soil moisture conditions, observed precipitation anomalies, mountainous snow water content, and the CPC monthly and seasonal temperature and precipitation outlooks. Drought and dryness are expected to persist and/or intensify across the southern Atlantic region, southern portions of the central Gulf Coast, the southern and south-central Great Plains, and the Southwest, as late winter gives way to spring. The spring season in particular is usually the driest time of year for the Southwest, prior to the climatological onset of the summer monsoon. become established.

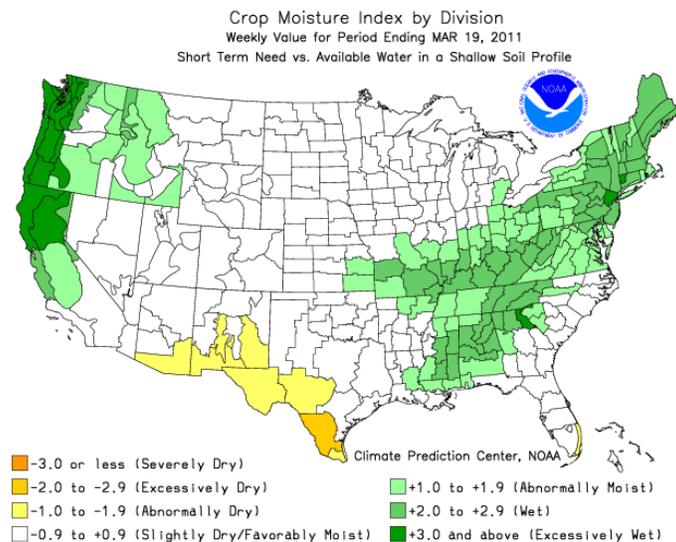
## CROP REPORT

March 21, 2011 – The need for rain continues to be the number one concern of producers across the state. According to the March 15th U.S. Drought Monitor, over 80 percent of the state was experiencing moderate or severe drought conditions with a portion of southwest Oklahoma in an extreme drought. Small grains and grasses are suffering due to the drought and it is affecting plans for spring planting. Most central and southwestern counties are still under burn bans. Topsoil and subsoil moisture conditions continued to worsen from the previous week with 81 percent of topsoil and 84 percent of subsoil rated short to very short. There were 6.3 days suitable for field work.

Small grain crops were rated mostly in the fair to poor range. Some producers are having fields appraised for insurance or considering grazing out the remaining wheat. Wheat jointing was 40 percent complete by week's end, a 15 point increase from the week prior. Rye jointing reached 48 percent complete by Sunday. Oats planted increased by 10 points to 83 percent complete and oats jointing reached 7 percent complete by week's end.

Seedbed preparations continued though rain is needed to ensure timely planting. Corn seedbeds prepared reached 45 percent complete by Sunday, even with the five-year average. Sorghum seedbed preparation was six points behind normal at 11 percent complete. Soybean seedbed preparation was 13 percent complete, ahead of the previous year but seven points behind normal. Peanut seedbeds prepared reached 22 percent complete by week's end, well behind the previous year. Cotton seedbed preparation was 23 percent complete, nine points behind normal.

Conditions were rated mostly in the fair to poor range, with 15 percent rated very poor. Some cattle producers are still haying or feeding supplements because of the lack of sufficient grasses. Livestock conditions were rated mostly in the good to fair range. Low pond levels are a concern for livestock producers as the drought continues.



## RESERVOIR STORAGE

- 18 reservoirs are currently operating at less than full capacity (compared to 26 four weeks ago).
- 11 reservoirs have experienced lake level decreases.

Storage in Selected Oklahoma Lakes & Reservoirs					
March 22, 2011					
Lake or Reservoir	Normal Pool Elevation  (feet)	Previous Elevation 2/22/2011  (feet)	Current Elevation 3/22/2011  (feet)	Change in Elevation  (feet)	Current Flood Control Storage  (acre-feet)
<b>North Central</b>					
Fort Supply	2004.00	2004.47	2004.24	(0.23)	450
Great Salt Plains	1125.00	1125.45	1125.44	(0.01)	3,692
Kaw*	1009.10	1010.73	1008.93	(1.80)	(3,291)
<b>Northeast</b>					
Birch	750.50	748.26	749.40	1.14	(1,238)
Copan	710.00	708.69	710.48	1.79	2,187
Fort Gibson	554.00	555.18	555.01	(0.17)	19,500
Grand*	742.00	742.25	743.26	1.01	55,701
Hudson	619.00	620.51	620.12	(0.39)	12,417
Hulah	733.00	732.21	733.17	0.96	556
Keystone*	723.00	720.54	723.25	2.71	4,224
Oologah*	638.00	637.18	639.38	2.20	44,120
Skiatook	714.00	709.03	709.41	0.38	(45,903)
<b>West Central</b>					
Canton	1615.40	1614.46	1615.16	0.70	(1,905)
Foss	1642.00	1640.72	1640.89	0.17	(7,393)
<b>Central</b>					
Arcadia	1006.00	1005.89	1006.18	0.29	335
Heyburn	761.50	761.13	761.79	0.66	407
Thunderbird	1039.00	1036.40	1036.26	(0.14)	(15,870)
<b>East Central</b>					
Eufaula*	585.00	580.68	581.48	0.80	(313,246)
Tenkiller	632.00	624.70	629.22	4.52	(34,994)
<b>Southwest</b>					
Fort Cobb	1342.00	1341.79	1341.99	0.20	(37)
Lugert-Altus	1559.00	1544.21	1544.99	0.78	(70,149)
Tom Steed	1411.00	1408.76	1408.49	(0.27)	(15,079)
<b>South Central</b>					
Arbuckle	872.00	871.23	871.29	0.06	(1,647)
McGee Creek**	175.90	175.44	175.39	(0.05)	(6,184)
Texoma*	615.00	614.38	614.02	(0.36)	(67,280)
Waurika*	951.40	950.58	950.44	(0.14)	(9,486)
<b>Southeast</b>					
Broken Bow*	599.50	589.33	591.74	2.41	(106,061)
Hugo*	405.10	404.12	404.89	0.77	(3,614)
Pine Creek*	433.00	432.75	433.54	0.79	1,561
Sardis	599.00	597.43	597.48	0.05	(20,122)
Wister	478.00	479.91	478.18	(1.73)	1,139

\* indicates seasonal pool operation

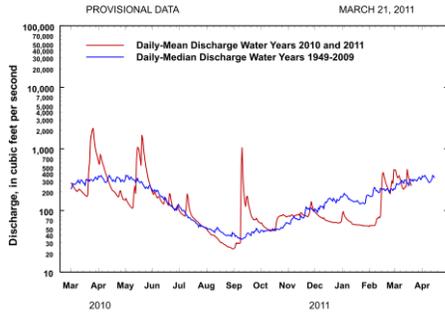
\*\* elevation in meters

negative numbers in red, parentheses

# STREAMFLOW CONDITIONS

## Baron Fork at Eldon

Baron Fork at Eldon, Oklahoma  
 Station No. 07197000 Northeast Oklahoma  
 Drainage Area 307 square miles

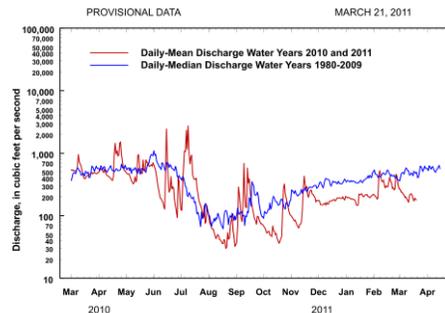


Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey

## Canadian River at Purcell

Canadian River at Purcell, Oklahoma  
 Station No. 07229200 Central Oklahoma  
 Drainage Area 25,939 square miles

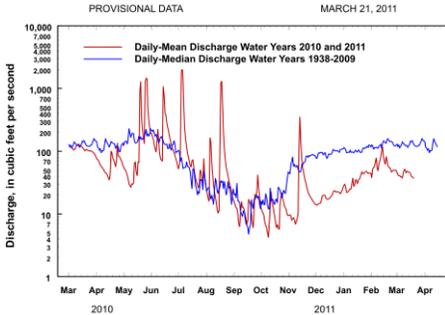


Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey

## Cimarron River near Waynoka

Cimarron River near Waynoka, Oklahoma  
 Station No. 07158000 Northwest Oklahoma  
 Drainage Area 13,334 square miles

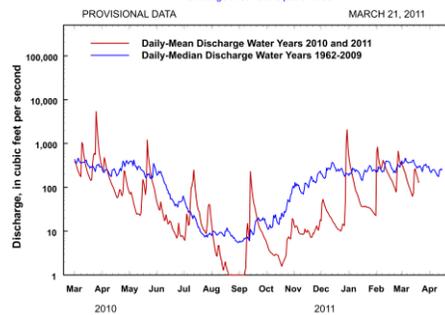


Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey

## Glover River near Glover

Glover River near Glover, Oklahoma  
 Station No. 07337900 Southeast Oklahoma  
 Drainage Area 315 square miles

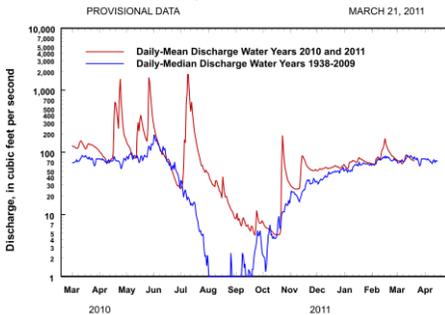


Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey

## North Fork of the Red River near Carter

North Fork of the Red River near Carter, Oklahoma  
 Station No. 07301500 Southwest Oklahoma  
 Drainage Area 2,337 square miles

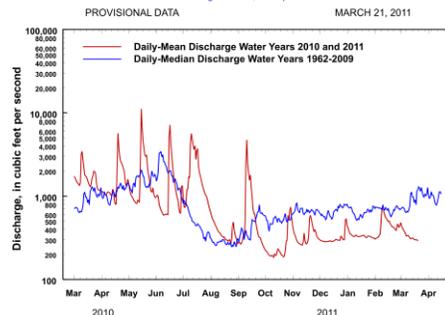


Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey

## Washita River near Dickson

Washita River near Dickson, Oklahoma  
 Station No. 07331000 South-Central Oklahoma  
 Drainage Area 7,202 square miles



Comparison of daily discharges for water years 2010 and 2011 and period of record

Data from U.S. Geological Survey



Water Bulletin information/data courtesy of National Weather Service, Climate Prediction Center, Oklahoma Climatological Survey, State Department of Agriculture, Food, and Forestry, Agricultural Statistics Service, U.S. Army Corps of Engineers, U.S. Department of Agriculture/Forest Service, U.S. Geological Survey, Western Drought Coordination Council, and National Drought Mitigation Center. For more information, visit [www.owrb.ok.gov](http://www.owrb.ok.gov) and [www.mesonet.org](http://www.mesonet.org).