

# Oklahoma Water Resources Bulletin & Summary of Current Conditions



AUGUST 29, 2001

OKLAHOMA WATER RESOURCES BOARD

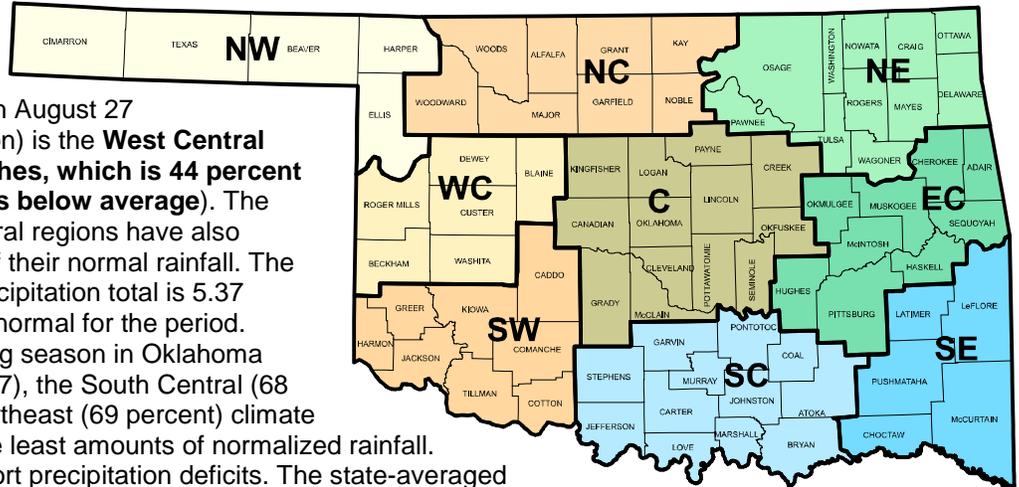
## Statewide Precipitation & General Summary

Scattered rainfall continues to alleviate emerging dry conditions. However, more rain is needed to bring the state out of the current dry episode.

According to preliminary Mesonet weather station data provided by the Oklahoma Climatological Survey and National Weather Service (see below), the area experiencing the lowest percent of normal rainfall from June 1 through August 27

(the current summer season) is the **West Central climate division (3.59 inches, which is 44 percent of normal and 4.54 inches below average)**. The Southwest and North Central regions have also received less than one-half their normal rainfall. The current state-averaged precipitation total is 5.37 inches, only 59 percent of normal for the period.

For the current growing season in Oklahoma (March 1 through August 27), the South Central (68 percent of normal) and Northeast (69 percent) climate divisions have received the least amounts of normalized rainfall. All regions continue to report precipitation deficits. The state-averaged total is 78 percent of normal.



### PRELIMINARY STATEWIDE PRECIPITATION BY CLIMATE DIVISION

DIVISION (#)	CURRENT GROWING SEASON MARCH 1 – AUGUST 27, 2001			SUMMER 2001 JUNE 1 – AUGUST 27, 2001			RAINFALL SINCE AUGUST 14
	TOTAL RAINFALL (INCHES)	DEPARTURE FROM NORMAL (INCHES)	PERCENT OF NORMAL	TOTAL RAINFALL (INCHES)	DEPARTURE FROM NORMAL (INCHES)	PERCENT OF NORMAL	
Northwest (1)	12.07	-1.35	90	4.26	-3.30	56	0.93
North Central (2)	13.36	-3.98	77	4.48	-4.62	49	1.04
Northeast (3)	15.55	-6.96	69	6.08	-4.07	60	1.13
West Central (4)	14.54	-1.70	90	3.59	-4.54	44	1.30
Central (5)	15.43	-4.35	78	5.68	-3.17	64	1.71
East Central (6)	19.45	-3.92	83	7.21	-2.14	77	1.90
Southwest (7)	13.12	-3.46	79	3.72	-4.12	47	1.83
South Central (8)	14.45	-6.66	68	5.28	-3.43	61	1.71
Southeast (9)	21.59	-4.59	82	7.92	-2.46	76	2.21
<b>STATE-AVERAGED</b>	<b>15.37</b>	<b>-4.42</b>	<b>78</b>	<b>5.37</b>	<b>-3.66</b>	<b>59</b>	<b>1.52</b>

Information and data contained in this update of Oklahoma's water resource conditions are courtesy of the National Weather Service, Climate Prediction Center, Oklahoma Climatological Survey, State Department of Agriculture, Oklahoma Forestry Services, 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. This publication is issued weekly during times of specific concern regarding statewide or regional water situations and periodically -- biweekly or monthly -- the remainder of the year.

For more information, visit <http://www.state.ok.us/~owrb/features/drought.html>.

### **Drought Indices**

According to the latest Palmer Drought Severity Index (August 25, below), drought conditions remain steady and areas have actually improved throughout much of Oklahoma. **However, six regions remain in the "moderate drought" category; two are in "mild drought."** Only four of Oklahoma's nine climate divisions have undergone PDSI moisture decreases (although relatively minor) since August 11; the Northeast ("moderate drought") climate division experienced the greatest decrease during the period.

The latest monthly Standardized Precipitation Index (through July, below) indicates that only the Northeast climate division (moderately dry, according to the 12-month SPI) is experiencing long-term dryness among the *selected* time periods (3-, 6-, 9- and 12-month SPI's). However, the 1-, 2-, 4- and 5-month SPI reports generally dry to very dry conditions for virtually all of Oklahoma, including **extremely dry conditions (2-month SPI) in the Southwest climate division.**

The latest Keetch-Byram Drought Index (August 27, below), which 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, indicates that drought-related fire conditions in Oklahoma have improved within the last two weeks. Statewide, 33 stations are currently above 600, generally indicative of more severe drought conditions (51 stations had a reading above 600 on August 13); three stations are above 700. Grandfield, in Southwest Oklahoma, reports the highest KBDI value (735), followed by Blackwell (North Central; 702) and Cherokee (North Central; 700). According to the Oklahoma Department of Agriculture (Forestry Services), Statewide Wildfire Preparedness remains at Level 3 (high fire danger). Effective August 21, a **Burning Ban continues for 44 counties throughout most of the western two-thirds of Oklahoma and a Red Flag Fire Alert is in effect for the remainder of the state.** Hot temperatures and dry and windy conditions have combined to increase fire danger across the state. In central and eastern areas, there is significant danger of wildland fires escaping control. Extra precautions should be taken when burning anything outdoors and outdoor burning should be avoided entirely when winds exceed 20 miles per hour.

<b>PALMER DROUGHT SEVERITY INDEX</b>					<b>STANDARDIZED PRECIPITATION INDEX THROUGH JULY 2001</b>			
CLIMATE DIVISION (#)	CURRENT STATUS 8/25/2001	VALUE		CHANGE IN VALUE	3-MONTH	6-MONTH	9-MONTH	12-MONTH
		8/25	8/11					
Northwest (1)	MOIST SPELL	1.05	0.63	0.42	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
North Central (2)	MODERATE DROUGHT	-2.38	-2.21	-0.17	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Northeast (3)	MODERATE DROUGHT	-2.90	-2.56	-0.34	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	MODERATELY DRY
West Central (4)	MODERATE DROUGHT	-2.32	-2.37	0.05	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Central (5)	MODERATE DROUGHT	-2.46	-2.52	0.06	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
East Central (6)	MODERATE DROUGHT	-2.07	-2.41	0.34	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southwest (7)	MILD DROUGHT	-1.64	-2.58	0.94	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
South Central (8)	MODERATE DROUGHT	-2.89	-2.83	-0.06	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southeast (9)	MILD DROUGHT	-1.97	-1.95	-0.02	NEAR NORMAL	NEAR NORMAL	MODERATELY WET	NEAR NORMAL

### **KEETCH-BYRAM DROUGHT FIRE INDEX**

MESONET STATION	COUNTY	CLIMATE DIVISION	CURRENT VALUE 8/27/2001	ANTICIPATED IMPACT
Grandfield	Tillman	Southwest	735	<b>600-800:</b> often associated with more severe drought; increased wildfire occurrence; intense deep burning fires with significant downwind spotting; live fuels also expected to burn actively.  <b>400-600:</b> lower litter and duff layers actively contribute to fire intensity and will burn actively; typical of late summer, early fall.
Blackwell	Kay	North Central	702	
Cherokee	Alfalfa	North Central	700	

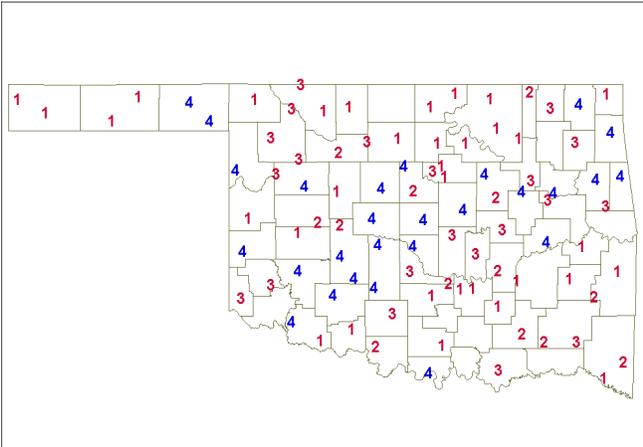
33 total stations above 600

*The PDSI may underestimate or overestimate the severity of ongoing dry periods. The SPI, 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. The Keetch-Byram Drought Index provides a gauge of dead fuel currently available for potential fires.*

**Soil Moisture**  
**August 26, 2001**  
*(courtesy Oklahoma Climatological Survey)*

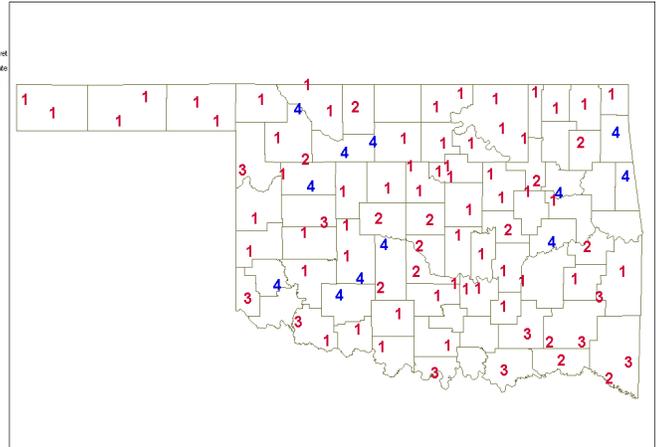
**5 cm**

Sun, Aug 26, 2001  
 0000 UTC  
 ## 5cm Cat. 4 = Moist/Wet  
 ## 5cm Cat. 3 = Adequate  
 ## 5cm Cat. 2 = Limited  
 ## 5cm Cat. 1 = Dry  
 --- County borders (OK)



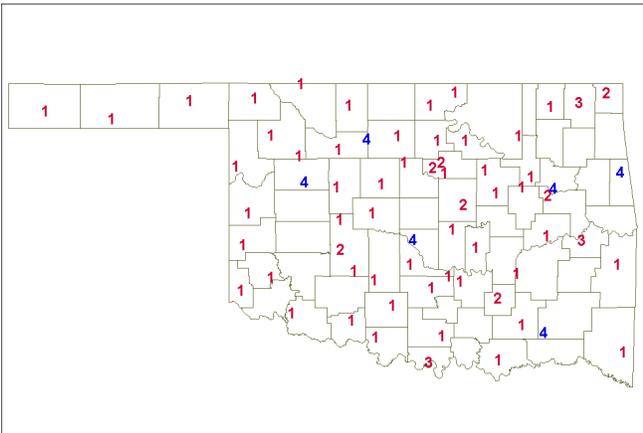
**25 cm**

Sun, Aug 26, 2001  
 0000 UTC  
 ## 25cm Cat. 4 = Moist/Wet  
 ## 25cm Cat. 3 = Adequate  
 ## 25cm Cat. 2 = Limited  
 ## 25cm Cat. 1 = Dry  
 --- County borders (OK)



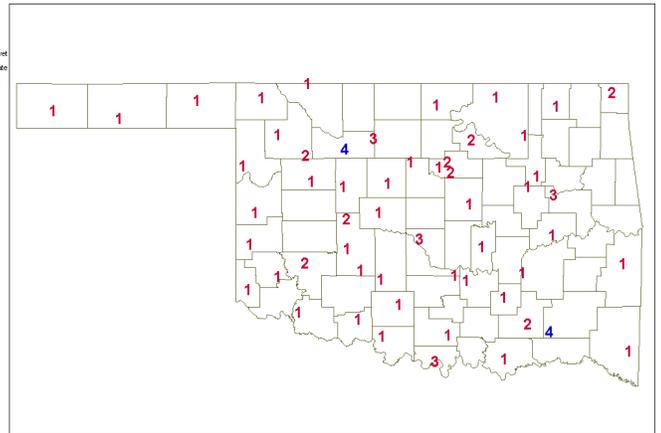
**60 cm**

Sun, Aug 26, 2001  
 0000 UTC  
 ## 60cm Cat. 4 = Moist/Wet  
 ## 60cm Cat. 3 = Adequate  
 ## 60cm Cat. 2 = Limited  
 ## 60cm Cat. 1 = Dry  
 --- County borders (OK)



**75 cm**

Sun, Aug 26, 2001  
 0000 UTC  
 ## 75cm Cat. 4 = Moist/Wet  
 ## 75cm Cat. 3 = Adequate  
 ## 75cm Cat. 2 = Limited  
 ## 75cm Cat. 1 = Dry  
 --- County borders (OK)



Category Description		Depth -- Metric Conversion	
Category 4	Moist/wet	5 cm	2 inches
Category 3	Adequate	25 cm	9.8 inches
Category 2	Limited	60 cm	23.6 inches
Category 1	Dry	75 cm	29.5 inches

### **Streamflow Conditions**

For the current water year (beginning October 1, 2000), flows in most state rivers and streams remain generally below or near average, although many hydrographs are spiked due to the recent rainfall. Considering overall trends as well as current flows, the most recent data (August 27, attached) from the six U.S. Geological Survey/OWRB stream gage sites selected to monitor the general condition of Oklahoma streams (daily streamflow since October 1, 2000 compared to long-term, normal/median daily discharges) indicate **much below average flow** in the *northwest* (Cimarron River Woods County); **below average flow** in *central* (Canadian River McClain County) Oklahoma; and **near average flow** in the *southwest* (North Fork/Red River Beckham County), *southeast* (Glover River McCurtain County), *northeast* (Baron Fork Cherokee County) and *south central* (Washita River Carter County) regions.

### **Weather Forecast**

The National Weather Service 8- to 14-day outlook (September 4-10) calls for normal precipitation for all but southeast Oklahoma, where above normal rainfall is likely. Below normal temperatures are expected for all but the Panhandle region, where normal temperatures are anticipated throughout the period.

Current models indicate that positive (warmer than normal) sub-surface temperature (SST) anomalies in the equatorial Pacific have risen to their highest levels since the 1997-98 El Niño episode. This trend is expected to continue during the remainder of 2001 and into the first half of 2002. El Niños, warm water patterns that increase the chances for cooler, wetter conditions in the southern U.S. (including Oklahoma), generally return every two to seven years.

### **Crop Report**

August 27 -- Widespread thunderstorms provided the state with much-needed moisture last week, although more rainfall is greatly needed to replenish soil moisture levels and reduce stress to crops and pastures. In some areas, the rains were too little, too late to benefit some of the failing crops. Corn, sorghum and soybean harvest was in full swing in some areas, but was interrupted by the storms. Farmers were also busy during the week preparing seedbeds and applying fertilizer for fall planting. Heavier than normal culling and early weaning was necessary for some livestock producers in the drier areas due to lack of sufficient pastures and a short hay crop. Grasshopper problems were still being reported in many areas as they continued to damage pastures and remaining crops. Farmers had 6.0 days suitable for fieldwork during the week.

Recent rains have improved soil moisture conditions in many areas and should boost progress preparing seedbeds. Wheat planting had begun in a few isolated areas. As of Sunday, half of the wheat ground had been prepared for seeding, ahead of normal pace for this time of year. Some producers are concerned about the possibility of grasshopper and armyworm damage to small grain seedlings, but most are electing to go ahead and plant as soon as possible. With most of the state receiving moisture last week, row crop conditions should improve in the wetter areas. Despite the rains, yield potential still remained a concern for both dryland and irrigated row crops. The continued heat and lack of precipitation has matured the corn, sorghum and soybean crops much quicker than normal and has led to an earlier harvest. Corn harvest was at 26 percent while sorghum and soybeans were both 13 percent harvested. As of Sunday, 44 percent of the sorghum acreage was coloring, ahead of normal for this time of year. Soybeans blooming advanced to 86 percent while one-third of the crop had reached the maturity stage. Soybean pod count was a concern in many growing areas and a few isolated fields have been cut for hay. The cotton crop improved from the previous week and the majority of the crop was rated mostly fair to good with 10 percent opening bolls. Fifteen percent of the state's peanuts were mature, 10 percentage points ahead of the five-year average. Haying activities continued where possible, but progressed slowly statewide. Both alfalfa and all other hay were rated in mostly poor or fair condition statewide. Below normal hay yields continued to be reported in most areas. Hay supplies heading into fall are a major concern for many farmers and ranchers as the production outlook for the remaining cuttings looks dismal.

Hay feeding continued in the drier areas that lacked sufficient grasses, yet hay was being conserved as much as possible due to the short supplies. Livestock were in mostly fair to good condition. Insect pressure on cattle was rated mostly moderate to light. Cattle auctions reported slightly above average marketings for the week. Adequate pasture availability remained a problem statewide. However, those areas that received the larger amounts of precipitation should display some improvement and may reduce supplementation for cattle in these areas. Range and pasture conditions were rated mostly poor to fair with the southwest and south central regions being the most affected. Culling and early weaning was necessary for some livestock producers in drier areas.

### Reservoir Storage

Despite the recent rainfall, reservoir storage levels continue to gradually decline in most areas. As of August 28, the combined normal conservation pools of 31 selected major federal reservoirs across Oklahoma (see below) are approximately 88.4 percent full, a 1.5 percent decrease from that recorded on August 15, according to information from the U.S. Army Corps of Engineers (Tulsa District). Twenty-six reservoirs have experienced lake level decreases since that time. Twenty-nine reservoirs are currently operating at less than full capacity (compared to 27 two weeks ago); four reservoirs (**Lugert-Altus, only 38.1 percent**; Keystone, 64.3 percent; Hulah, 74 percent; and Great Salt Plains, 79.6 percent) are below 80 percent capacity.

<b>Storage in Selected Oklahoma Lakes &amp; Reservoirs</b>				
<b>as of August 28, 2001</b>				
<b>Climate Division</b>	<b>Conservation Storage</b>	<b>Present Storage</b>	<b>Percent of Storage</b>	
<b>Lake or Reservoir</b>	<b>(acre-feet)</b>	<b>(acre-feet)</b>	<b>conservation</b>	<b>flood</b>
<b>NORTH CENTRAL</b>				
Fort Supply	13,900	12,860	92.5	0.00
Great Salt Plains	31,420	25,018	79.6	0.00
Kaw*	383,005	382,519	99.9	0.00
<b>Regional Totals/Averages</b>	<b>428,325</b>	<b>420,397</b>	<b>98.1</b>	<b>0.00</b>
<b>NORTHEAST</b>				
Birch	19,225	16,049	83.5	0.00
Copan	43,400	37,109	85.5	0.00
Fort Gibson	365,200	343,800	94.1	0.00
Grand	1,672,000	1,529,260	91.5	0.00
Hudson	200,300	200,300	100.0	11.11
Hulah	31,160	23,046	74.0	0.00
Keystone	278,122	178,857	64.3	0.00
Oologah	552,210	551,303	99.8	0.00
Skiatook	322,700	298,308	92.4	0.00
<b>Regional Totals/Averages</b>	<b>3,484,317</b>	<b>3,178,032</b>	<b>91.2</b>	<b>1.23</b>
<b>WEST CENTRAL</b>				
Canton	111,310	101,714	91.4	0.00
Foss	165,480	154,329	93.3	0.00
<b>Regional Totals/Averages</b>	<b>276,790</b>	<b>256,043</b>	<b>92.5</b>	<b>0.00</b>
<b>CENTRAL</b>				
Arcadia	27,520	26,683	97.0	0.00
Heyburn	7,105	6,177	86.9	0.00
Thunderbird	119,600	114,680	95.9	0.00
<b>Regional Totals/Averages</b>	<b>154,225</b>	<b>147,540</b>	<b>95.7</b>	<b>0.00</b>
<b>EAST CENTRAL</b>				
Eufaula*	2,368,223	1,998,442	84.4	0.00
Tenkiller	654,100	571,764	87.4	0.00
<b>Regional Totals/Averages</b>	<b>3,022,323</b>	<b>2,570,206</b>	<b>85.0</b>	<b>0.00</b>
<b>SOUTHWEST</b>				
Fort Cobb	80,010	77,406	96.7	0.00
Lugert-Altus	132,830	50,570	38.1	0.00
Tom Steed	88,970	74,973	84.3	0.00
<b>Regional Totals/Averages</b>	<b>301,810</b>	<b>202,949</b>	<b>67.2</b>	<b>0.00</b>
<b>SOUTH CENTRAL</b>				
Arbuckle	72,400	68,530	94.7	0.00
McGee Creek	113,930	112,596	98.8	0.00
Texoma*	2,564,210	2,219,593	86.6	0.00
Waurika*	190,200	180,908	95.1	0.00
<b>Regional Totals/Averages</b>	<b>2,940,740</b>	<b>2,581,627</b>	<b>87.8</b>	<b>0.00</b>
<b>SOUTHEAST</b>				
Broken Bow*	958,180	830,130	86.6	0.00
Hugo*	158,617	152,571	96.2	0.00
Pine Creek*	61,570	61,570	100.0	0.00
Sardis	274,330	270,982	98.8	0.00
Wister	60,162	49,054	81.5	0.00
<b>Regional Totals/Averages</b>	<b>1,512,859</b>	<b>1,364,307</b>	<b>90.2</b>	<b>0.00</b>
<b>STATE TOTALS</b>	<b>12,121,389</b>	<b>10,721,101</b>	<b>88.4</b>	<b>0.36</b>

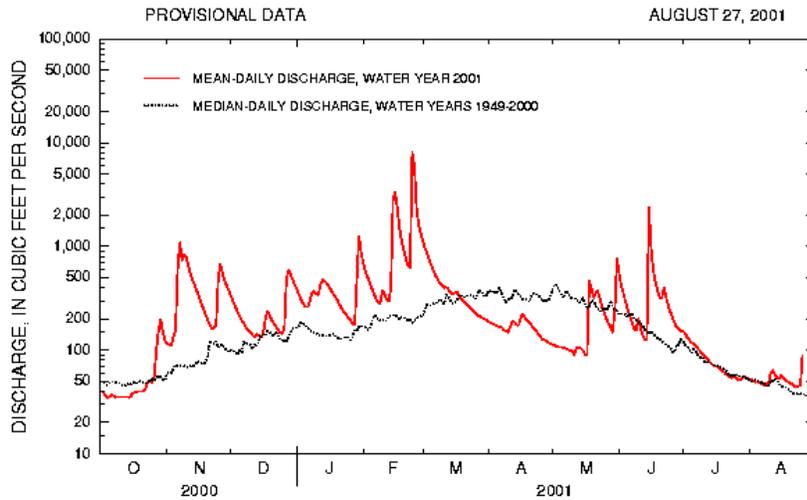
\* indicates seasonal pool operation; actual storage figures/percentages may vary.

### 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 year 2001 and period of record for Baron Fork at Eldon, Oklahoma.

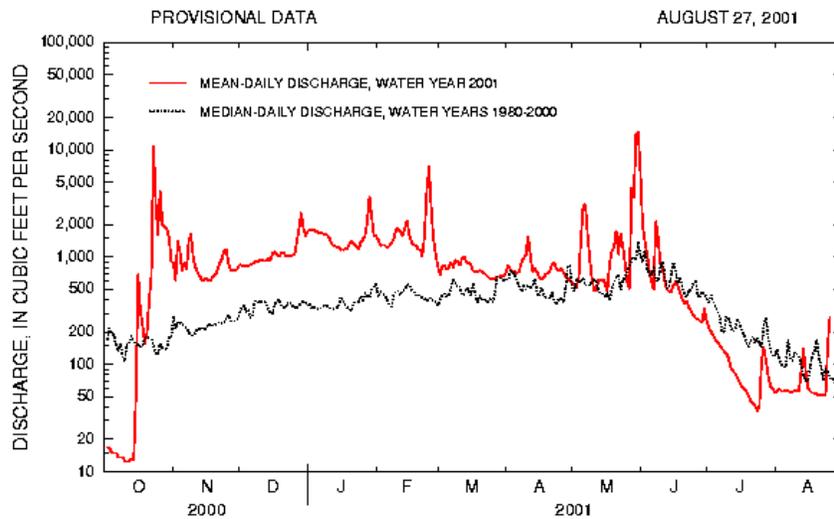
Data from U.S. Geological Survey

### 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 year 2001 and period of record for Canadian River at Purcell, Oklahoma.

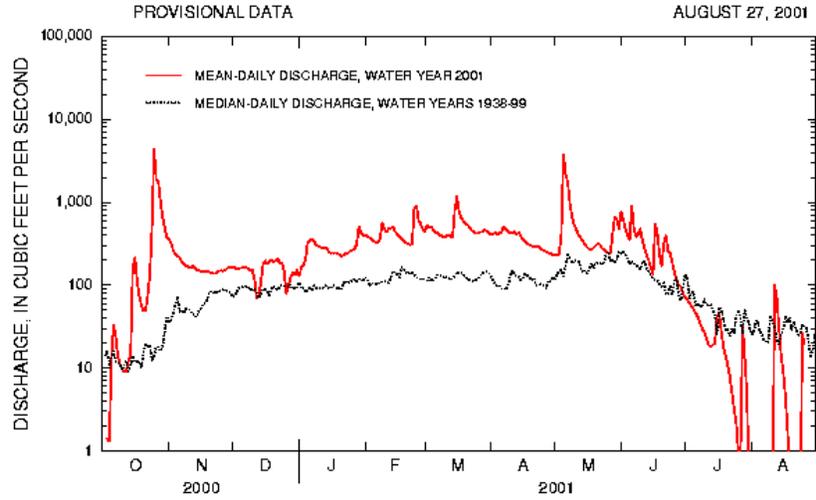
Data from U.S. Geological Survey

### 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 year 2001 and period of record for Cimarron River near Waynoka, Oklahoma.

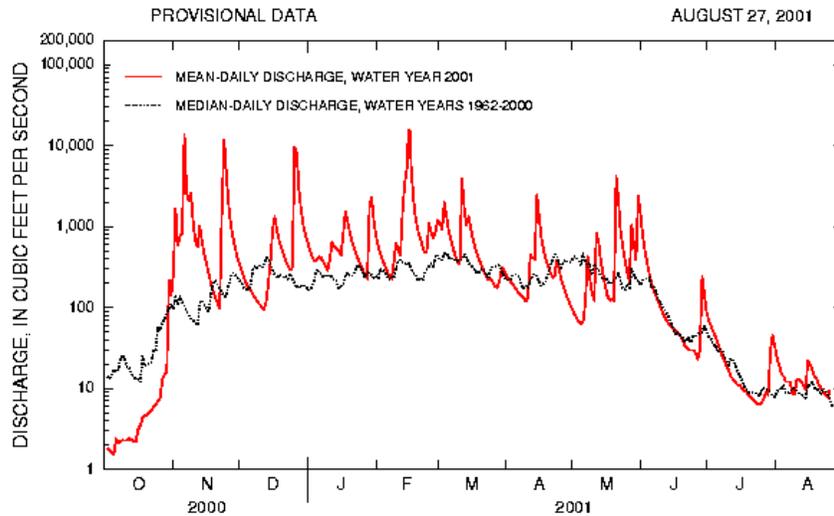
Data from U.S. Geological Survey

### 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 year 2001 and period of record for Glover River near Glover, Oklahoma.

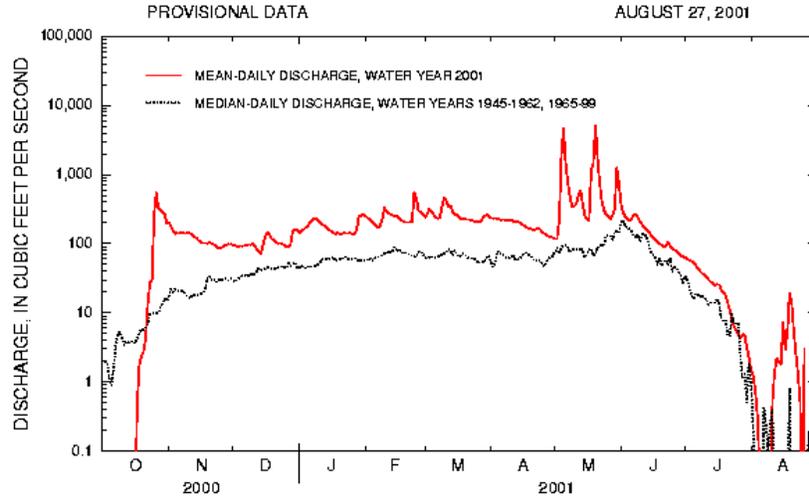
Data from U.S. Geological Survey

### North Fork of the Red River near Carter

North Fork Red River near Carter, Oklahoma

Station No. 07301500  
Southwest Oklahoma

Drainage Area 2,337 square miles



Comparison of daily discharges for water year 2001 and period of record for North Fork Red River near Carter, Oklahoma.

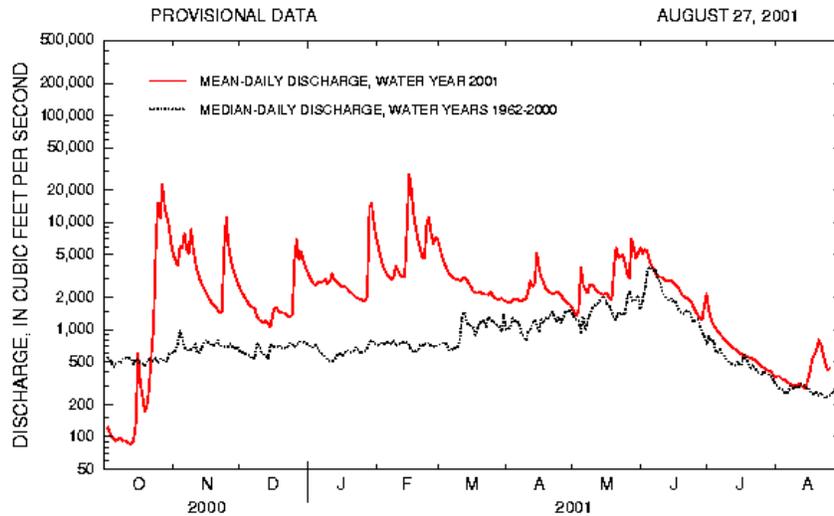
Data from U.S. Geological Survey

### 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 year 2001 and period of record for Washita River near Dickson, Oklahoma.

Data from U.S. Geological Survey