

Oklahoma Water Resources Bulletin

& Summary of Current Conditions



AUGUST 25, 2000

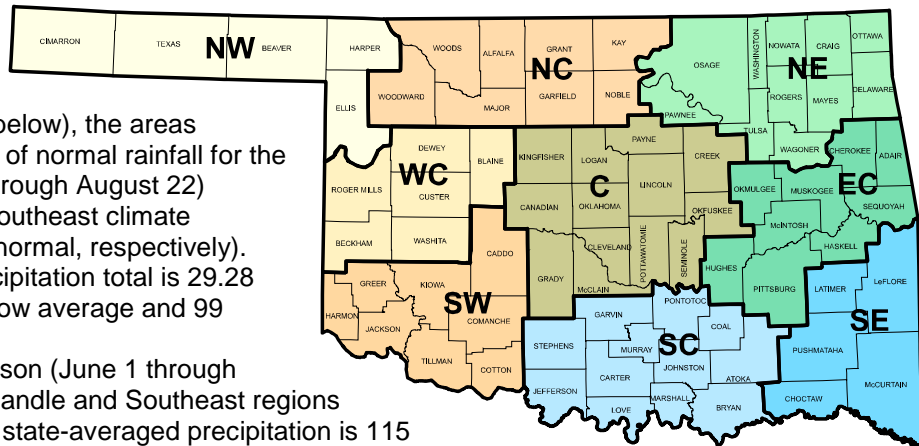
OKLAHOMA WATER RESOURCES BOARD

Statewide Precipitation & General Summary

A very hot and very dry August has caused further deterioration of Oklahoma's moisture and water supply situation. Of the Mesonet's 114 operational stations, 101 have yet to record at least one-tenth inch of rain on a single day in the month of August. Four Mesonet stations – including Grandfield, Walters, Waurika and Clayton – have experienced more than 20 consecutive days of temperatures exceeding 100 degrees.

According to preliminary Mesonet weather station data provided by the [Oklahoma Climatological Survey](#) and National Weather Service (see below), the areas experiencing the lowest percent of normal rainfall for the current water year (October 1 through August 22) remain the South Central and Southeast climate divisions (78 and 79 percent of normal, respectively). The current state-averaged precipitation total is 29.28 inches, which is 0.19 inches below average and 99 percent of normal for the period.

For the current summer season (June 1 through August 22), the Northwest/Panhandle and Southeast regions report precipitation deficits. The state-averaged precipitation is 115 percent of normal, although much of this surplus is a result of rainfall during the early summer season.



PRELIMINARY STATEWIDE PRECIPITATION BY CLIMATE DIVISION (IN INCHES)

DIVISION (#)	WATER YEAR OCTOBER 1, 1999 – AUGUST 22, 2000			SUMMER JUNE 1 - AUGUST 22, 2000			RAINFALL SINCE AUGUST 13
	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	
Northwest (1)	16.01	-0.92	95	6.17	-0.96	86	0.17
North Central (2)	28.41	4.41	118	8.90	0.28	103	0.07
Northeast (3)	39.25	4.79	114	12.83	3.23	134	0.00
West Central (4)	26.19	3.74	117	9.34	1.63	121	0.01
Central (5)	30.93	1.48	105	10.84	2.42	129	0.01
East Central (6)	37.09	-0.87	98	13.98	5.12	158	0.10
Southwest (7)	25.41	1.60	107	8.29	0.85	111	0.04
South Central (8)	25.58	-7.26	78	8.40	0.10	101	0.02
Southeast (9)	34.43	-9.39	79	9.54	-0.35	96	0.09
STATE-AVERAGED	29.28	-0.19	99	9.84	1.27	115	0.05

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, Agricultural Statistics Service, State Department of Environmental Quality, 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 19, below), moisture/drought conditions in Oklahoma continue to worsen and this dryness is slowly pushing northward into central areas of the state. Both the South Central and Southeast climate divisions are now in the “**moderate drought**” category while the Southwest and Northwest are in “mild drought.” All nine climate divisions have undergone PDSI moisture decreases since August 12; the West Central (“near normal”) climate division again experienced the greatest decrease during the period.

The latest monthly [Standardized Precipitation Index](#) (through July, below) indicates that moderately dry conditions exist in the Southeast climate division throughout various periods extending over much of the last 2½ years. However, virtually no other regions are experiencing long-term moisture deficits, according to the SPI. The 12-month SPI time period reflects “moderately dry” conditions in the Southeast region. No other regions experienced a dry SPI reading among the *selected* time periods. Throughout other periods over the past 72 months, only the Southeast (“moderately dry” according to the 11-, 15-, 18 and 30-month SPI’s) and South Central (“moderately dry” according to the 30-month SPI) climate divisions have experienced dry periods.

The latest [Keetch-Byram Drought Index](#) (August 23, 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 continue to worsen, especially in the south. Statewide, 27 of the 115 Mesonet stations in Oklahoma report KBDI values in excess of 600, indicating more severe fire/drought conditions (16 stations had readings above 600 on August 14). In addition, 4 stations currently report values above 700. Ringling, in the South Central climate division, retains the highest KBDI value (728), followed by Burneyville (720; South Central) and Clayton (703; Southeast). As of August 21, according to the Oklahoma Department of Agriculture (Forestry Services), [Statewide Wildfire Preparedness](#) has been downgraded to Level 3 (generally very high to extreme fire danger). **Governor Keating has issued a Burn Ban** for all but five counties in far northeast Oklahoma (those counties, however, remain in a Red Flag Fire Alert) and Cimarron County in the Panhandle. Outdoor burning, except in a charcoal grill, is prohibited in the Burn Ban counties.

CLIMATE DIVISION (#)	PALMER DROUGHT SEVERITY INDEX				STANDARDIZED PRECIPITATION INDEX THROUGH JULY			
	CURRENT STATUS 08/12/2000	VALUE		CHANGE IN VALUE	3-MONTH	6-MONTH	9-MONTH	12-MONTH
		08/19	08/12					
Northwest (1)	MILD DROUGHT	-1.33	-0.82	-0.51	NEAR NORMAL	MODERATELY WET	NEAR NORMAL	NEAR NORMAL
North Central (2)	UNUSUAL MOIST SPELL	2.55	2.93	-0.38	MODERATELY WET	VERY WET	VERY WET	MODERATELY WET
Northeast (3)	MOIST SPELL	1.04	1.58	-0.54	VERY WET	VERY WET	VERY WET	MODERATELY WET
West Central (4)	NEAR NORMAL	-0.40	0.24	-0.64	NEAR NORMAL	VERY WET	VERY WET	MODERATELY WET
Central (5)	INCIPIENT DROUGHT	-0.50	0.04	-0.54	MODERATELY WET	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
East Central (6)	INCIPIENT DROUGHT	-0.96	-0.71	-0.25	VERY WET	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southwest (7)	MILD DROUGHT	-1.49	-1.30	-0.19	NEAR NORMAL	MODERATELY WET	NEAR NORMAL	NEAR NORMAL
South Central (8)	MODERATE DROUGHT	-2.63	-2.42	-0.21	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southeast (9)	MODERATE DROUGHT	-2.32	-1.92	-0.40	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL	MODERATELY DRY

KEETCH-BYRAM DROUGHT FIRE INDEX

MESONET STATION	COUNTY	CLIMATE DIVISION	CURRENT VALUE 08/23/2000	ANTICIPATED IMPACT
Ringling	Jefferson	South Central	728	600-800: often associated with more severe drought; increased wildfire occurrence; intense deep burning fires with significant downwind spotting; live fuels also expected to burn actively.
Burneyville	Love	South Central	720	
Clayton	Pushmataha	Southeast	703	

4 stations with KBDI values above 700; 27 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.

Streamflow Conditions

For the current water year (beginning October 1, 1999), flows in most state streams are now reflecting the impacts of below normal precipitation and runoff. Considering overall trends as well as current flows, the most recent data (August 24, 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, 1999 compared to long-term, normal/median daily discharges) indicate **much below average flow (no flow)** in *south central* (Washita River in Carter County) Oklahoma; **below average flow** in the *central* (Canadian River in McClain County), *southeast* (Glover River in McCurtain County) and *northwest* (Cimarron River in Beaver County) regions; and **near average flow** in the *southwest* (North Fork/Red River in Beckham County) and *northeast* (Baron Fork in Cherokee County).

Weather Forecast

The National Weather Service [6- to 10-day outlook](#) (August 27-31) calls for no precipitation for all but the far western portion of the Panhandle, where normal rainfall is anticipated. Above normal temperatures are expected for all of Oklahoma during the period.

Current models indicate that the persistent cold water phenomenon in the equatorial Pacific Ocean, referred to as La Niña, continues to slowly weaken. Although these models vary somewhat, it is most likely that cold episode conditions will continue to gradually weaken over the next six months, giving way to near normal or slightly cooler than normal conditions in the tropical Pacific by the end of the year. La Niña episodes are generally believed to cause temporary warmer and drier conditions throughout most of the southern U.S., including Oklahoma. Scientists continue to debate whether this pattern hints at the presence of a larger, longer lasting climate situation, the Pacific Decadal Oscillation. This long-term pattern, which covers most of the Pacific Ocean, has significant implications for global climate, especially over North America.

Crop Report

August 20 – Widespread temperatures of 100 degrees or more and an absence of rainfall continues to plague the state, adding more stress to already suffering crops and pastures. Both topsoil and subsoil moisture supplies continue to decline, particularly in the southern half of Oklahoma. Statewide, topsoil moisture is mostly short while subsoil moisture is short to adequate.

Lack of soil moisture coupled with armyworm attacks have caused delays in preparation for wheat planting in northeast and east central Oklahoma. Wheat seedbed preparation remains ahead of the five-year average last week with 46 percent of the acreage prepared. Rain is needed to complete seedbed preparation across southern Oklahoma.

Dryland row crops are showing signs of stress from persistent high temperatures and lack of moisture. Corn is rated in mostly good condition across the state, but the southwest crop is in desperate need of rain. The crop progressed to 88 percent in the soft dough stage last week, compared to 96 percent for the five-year average. Sorghum continues in mostly good to fair condition, while heading progressed to 73 percent statewide. Soybeans are in mostly good to fair condition, but the southern half of the state's crop has been the most affected from the hot and dry conditions. Cotton and peanuts are rated in mostly good to fair condition statewide. Peanut progress slowed down slightly last week and, as of Sunday, 89 percent of the crop had set pods. Dryland peanuts are showing signs of stress, while some areas report the heat is restricting pod setting on irrigated peanuts. Cotton fields setting bolls elevated to 95 percent, slightly ahead of the five-year average.

Alfalfa is rated in mostly good to fair condition. Grasshoppers remain active and continue to be a problem for hay fields. The third cutting of alfalfa totaled 92 percent for the state, slightly ahead of normal. The fourth cutting of alfalfa jumped ahead last week to 48 percent completion and is well ahead of pace. All other hay is in mostly good condition statewide.

Excessive hot, dry weather continues to hurt pastures, especially in the south. Some producers have begun supplementing with hay. Range and pasture conditions have declined from the previous week, but are still rated in good to fair condition. Testing forages for nitrates has been reported. Grasshoppers and armyworms continued to burden pastures in the west and south. Livestock are still rated in mostly good condition. Cattle auctions report average marketings. Water levels continue to diminish and some producers are hauling water. Insect pressures on cattle continue to be moderate statewide.

The watermelon harvest continues full scale last week with 94 percent of the crop harvested. This brisk pace remains well ahead of the five-year average of 77 percent. Heat and disease problems continue to be a problem. The crop is in mostly fair condition.

Reservoir Storage

Reservoir storage levels throughout much of Oklahoma continue to show signs of meager rainfall and runoff. As of August 23, the combined normal conservation pools of 31 selected major federal reservoirs across Oklahoma (see below) are approximately 93.8 percent full, a 2.3 percent decrease over that measured on August 14, according to information from the [U.S. Army Corps of Engineers \(Tulsa District\)](#). Thirty reservoirs (all but Kaw) have experienced lake level decreases since that time. In addition, 29 reservoirs (all but Great Salt Plains and Hudson) are currently operating at less than full capacity, compared to 27 nine days ago. Still, only two reservoirs (**Lugert-Altus, only 51 percent**; and Tom Steed, 77 percent) are below 80 percent capacity.

Storage in Selected Oklahoma Lakes & Reservoirs				
as of August 23, 2000				
Climate Division	Conservation Storage	Present Storage	Percent of Storage	
Lake or Reservoir	(acre-feet)	(acre-feet)	conservation	flood
NORTH CENTRAL				
Fort Supply	13,900	13,542	97.4	0.00
Great Salt Plains	31,420	31,420	100.0	0.62
Kaw*	383,005	382,519	99.9	0.00
Keystone	505,381	470,333	93.1	0.00
Regional Totals/Averages	933,706	897,814	96.2	0.16
NORTHEAST				
Birch	19,225	18,542	96.4	0.00
Copan	43,400	40,955	94.4	0.00
Fort Gibson	365,200	363,704	99.6	0.00
Grand	1,672,000	1,502,170	89.8	0.00
Hudson	200,300	200,300	100.0	12.17
Hulah	31,160	29,673	95.2	0.00
Oologah	552,210	536,200	97.1	0.00
Skiatook	322,700	311,107	96.4	0.00
Regional Totals/Averages	3,206,195	3,002,651	93.7	1.52
WEST CENTRAL				
Canton	111,310	107,752	96.8	0.00
Foss	165,480	160,871	97.2	0.00
Regional Totals/Averages	276,790	268,623	97.0	0.00
CENTRAL				
Arcadia	27,520	26,488	96.3	0.00
Heyburn	7,105	6,772	95.3	0.00
Thunderbird	119,600	116,000	97.0	0.00
Regional Totals/Averages	154,225	149,260	96.8	0.00
EAST CENTRAL				
Eufaula*	2,368,223	2,206,773	93.2	0.00
Tenkiller	654,100	630,668	96.4	0.00
Regional Totals/Averages	3,022,323	2,837,441	93.9	0.00
SOUTHWEST				
Fort Cobb	80,010	78,447	98.0	0.00
Lugert-Altus	132,830	67,680	51.0	0.00
Tom Steed	88,970	68,476	77.0	0.00
Regional Totals/Averages	301,810	214,603	71.1	0.00
SOUTH CENTRAL				
Arbuckle	72,400	68,826	95.1	0.00
McGee Creek	113,930	102,681	90.1	0.00
Texoma*	2,572,298	2,471,835	96.1	0.00
Waurika*	177,264	154,728	87.3	0.00
Regional Totals/Averages	2,935,892	2,798,070	95.3	0.00
SOUTHEAST				
Broken Bow*	958,180	878,266	91.7	0.00
Hugo*	158,617	150,516	94.9	0.00
Pine Creek*	61,570	60,105	97.6	0.00
Sardis	274,330	262,681	95.8	0.00
Wister	60,162	57,515	95.6	0.00
Regional Totals/Averages	1,512,859	1,409,083	93.1	0.00
STATE TOTALS	12,343,800	11,577,545	93.8	0.41

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

Oklahoma Weather Modification Program

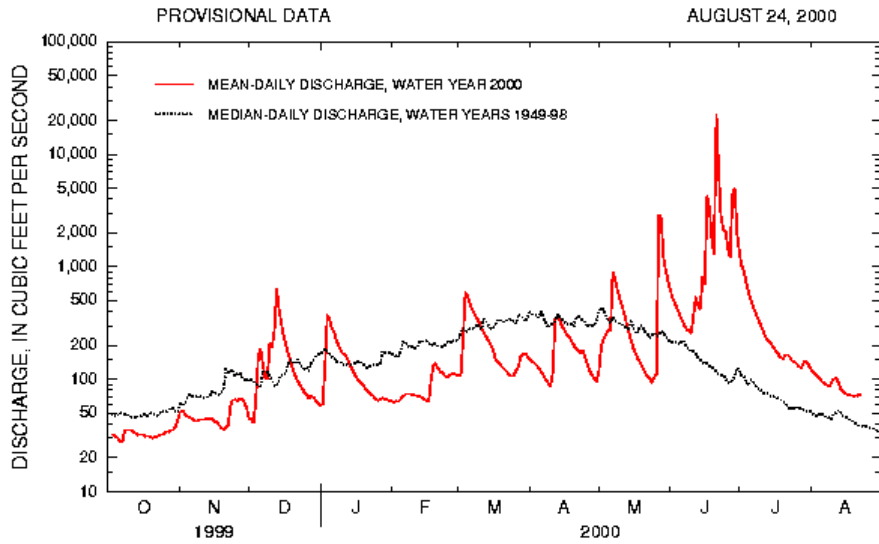
A brief summary/update of recent cloud seeding operations of the Oklahoma Weather Modification Program, including both hail suppression and rainfall enhancement, is presented below. Two individual seeding flight operations were conducted from August 16-24. The Program officially began spring season operations on March 1, 2000.

<i>RECENT WEATHER MODIFICATION ACTIVITIES</i>					
<i>AUGUST 16-24, 2000</i>					
<i>Date/ Flight(s)</i>	<i>County Location(s)</i>	<i>Texas</i>	<i>Kansas</i>	<i>Hail</i>	<i>Rain</i>
17-Aug	Kingfisher, Canadian				x
22-Aug	Sequoyah, Adair				x
* Information may not reflect the most recent operations.					

Baron Fork at Eldon, Oklahoma

Station No. 07197000
Northeast Oklahoma

Drainage Area 307 square miles



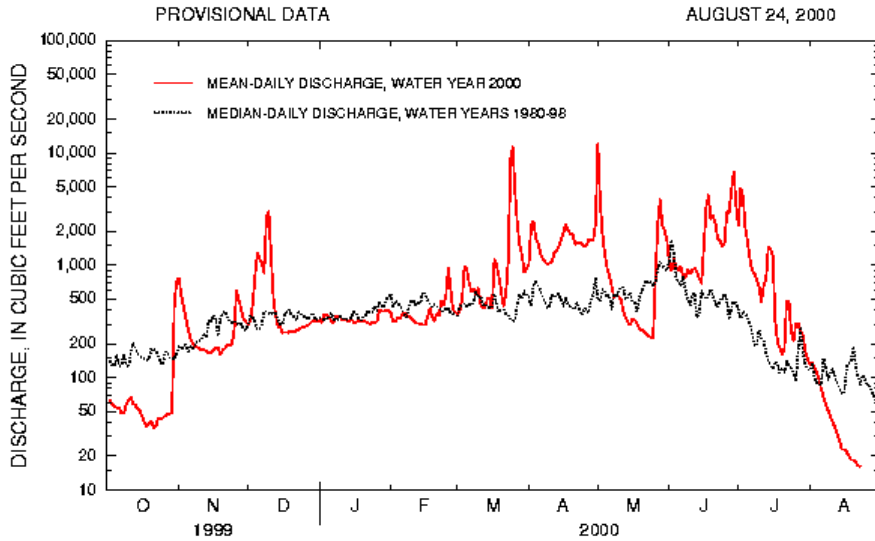
Comparison of daily discharges for water year 2000 and period of record for Baron Fork at Eldon, Oklahoma.

Data from U.S. Geological Survey

Canadian River at Purcell, Oklahoma

Station No. 07229200
Central Oklahoma

Drainage Area 25,939 square miles



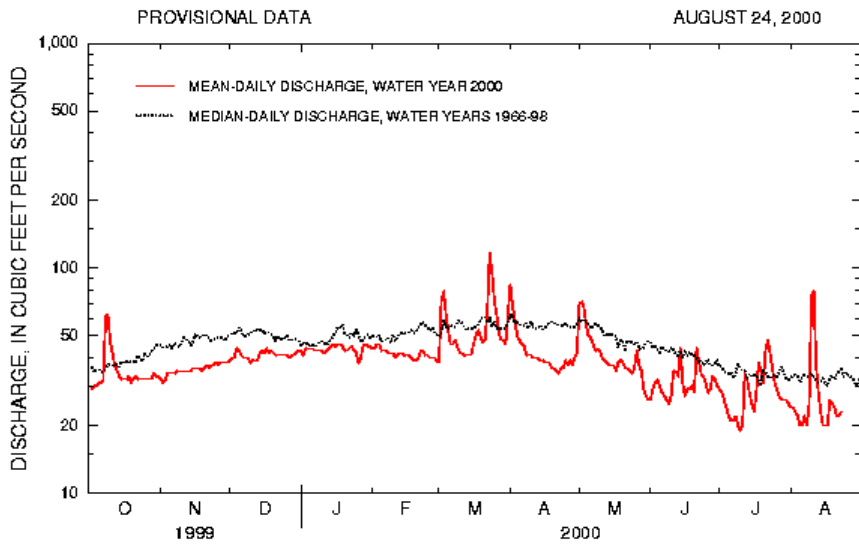
Comparison of daily discharges for water year 2000 and period of record for Canadian River at Purcell, Oklahoma.

Data from U.S. Geological Survey

Cimarron River near Forgan, Oklahoma

*Station No. 07156900
Northwest Oklahoma*

Drainage Area 8,536 square miles



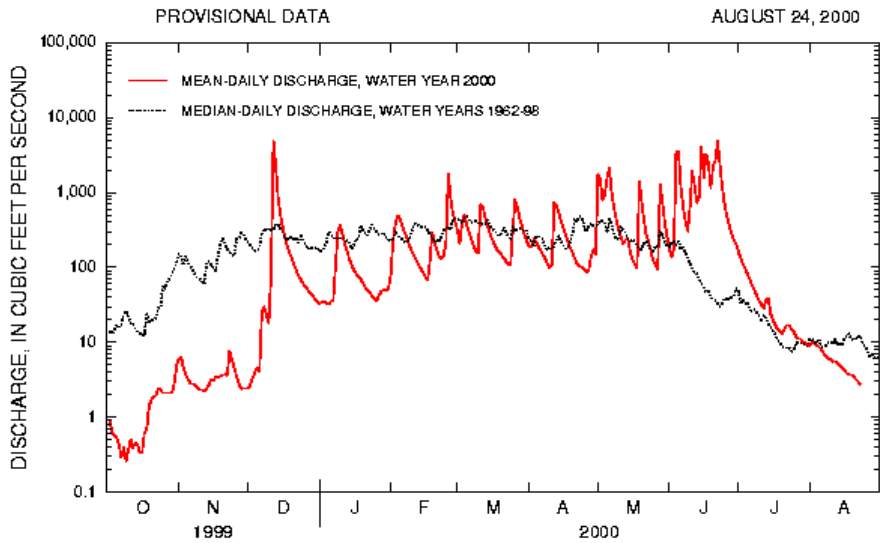
Comparison of daily discharges for water year 2000 and period of record for Cimarron River near Forgan, Oklahoma.

Data from U.S. Geological Survey

Glover River near Glover, Oklahoma

*Station No. 07337900
Southeast Oklahoma*

Drainage Area 315 square miles



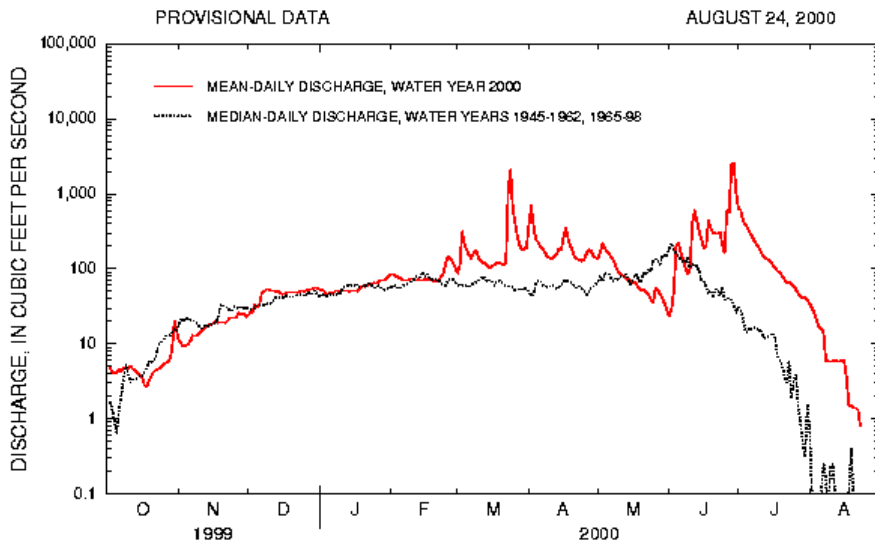
Comparison of daily discharges for water year 2000 and period of record for Glover River near Glover, Oklahoma.

Data from U.S. Geological Survey

North Fork Red River near Carter, Oklahoma

Station No. 07301 500
Southwest Oklahoma

Drainage Area 2,337 square miles



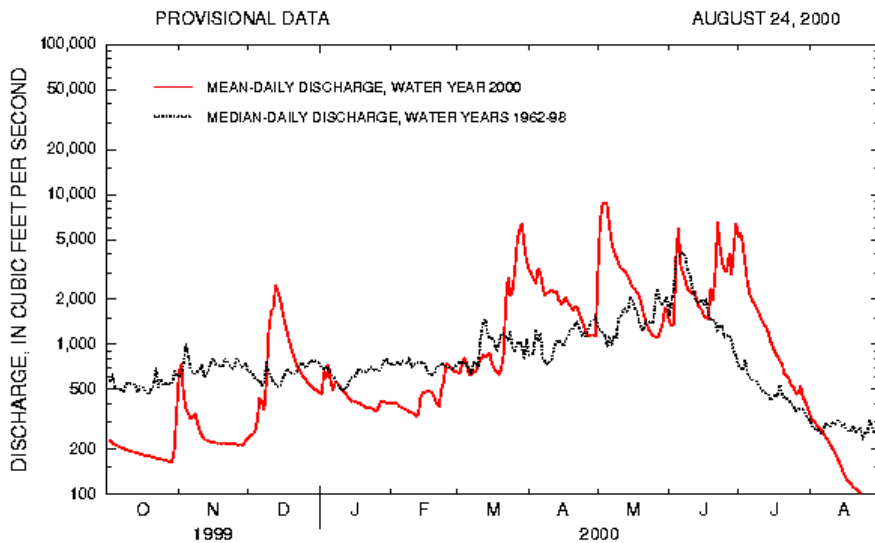
Comparison of daily discharges for water year 2000 and period of record for North Fork Red River near Carter, Oklahoma.

Data from U.S. Geological Survey

Washita River near Dickson, Oklahoma

Station No. 07331 000
South-Central Oklahoma

Drainage Area 7,202 square miles



Comparison of daily discharges for water year 2000 and period of record for Washita River near Dickson, Oklahoma.

Data from U.S. Geological Survey