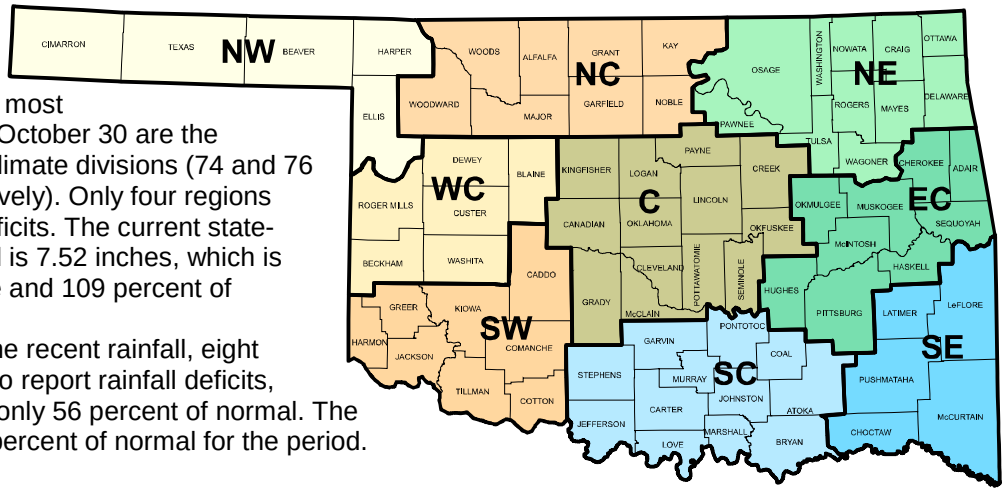
Oklahoma Water Resources Bulletin
& Summary of Current Conditions

NOVEMBER 1, 2000 **OKLAHOMA WATER RESOURCES BOARD**

Statewide Precipitation & General Summary

Continued rainfall, heavy in many areas, has greatly improved drought conditions throughout Oklahoma, although precipitation deficits remain in most climate divisions. 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 from September 1 (the general onset of this most recent dry period) through October 30 are the Northeast and Southeast climate divisions (74 and 76 percent of normal, respectively). Only four regions now report precipitation deficits. The current state-averaged precipitation total is 7.52 inches, which is 0.61 inches above average and 109 percent of normal for the period.



Since July 1, despite the recent rainfall, eight climate divisions continue to report rainfall deficits, including the Southeast at only 56 percent of normal. The state-averaged total is 82 percent of normal for the period.

PRELIMINARY STATEWIDE PRECIPITATION BY CLIMATE DIVISION

(IN INCHES)

DIVISION (#)	SEPTEMBER 1 – OCTOBER 30, 2000			JULY 1 – OCTOBER 30, 2000			RAINFALL SINCE OCTOBER 17
	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	
Northwest (1)	5.52	2.23	168	7.93	-0.22	97	4.58
North Central (2)	6.95	1.41	125	10.07	-1.23	89	4.74
Northeast (3)	6.17	-2.17	74	10.33	-4.09	72	3.09
West Central (4)	5.42	-0.10	98	7.15	-3.08	70	3.87
Central (5)	9.10	1.77	124	12.73	0.28	102	6.29
East Central (6)	8.61	-0.17	98	11.43	-3.01	79	4.68
Southwest (7)	8.89	2.67	143	10.06	-0.62	94	7.22
South Central (8)	9.17	0.83	110	11.29	-1.86	86	7.03
Southeast (9)	7.12	-2.22	76	8.89	-6.88	56	3.15
STATE-AVERAGED	**7.52**	**0.61**	**109**	**10.17**	**-2.18**	**82**	**5.04**

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 (October 28, below), moisture/drought conditions in Oklahoma have greatly improved over the last two weeks. Only one climate division, the Southeast ("mild drought") now reports drought conditions. All nine climate divisions have undergone dramatic PDSI moisture increases since October 14; the Southeast climate division experienced the most modest increase during the period.

The latest monthly Standardized Precipitation Index (through September, below) indicates that the South Central and Southeast climate divisions continue to experience long-term dryness of at least one year, with shorter-term dryness (6 months) in the Northwest and West Central regions. The 3-month SPI time period reflects "extremely dry" conditions in six separate climate divisions. Among other time periods, the SPI also indicates at least a 30-month period of dryness throughout southern Oklahoma.

The latest Keetch-Byram Drought Index (October 31, 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 greatly improved. Statewide, none of the more than 110 Mesonet stations in Oklahoma report KBDI values in excess of 600, the general threshold of severe drought (67 stations had readings above 600 on October 15). Only seven stations are above 500, indicative of moderate drought conditions. Ketchum Ranch, in South Central Oklahoma, has the highest KBDI value (585), followed by Broken Bow (574; Southeast) and Clayton (560; Southeast).

According to the Oklahoma Department of Agriculture (Forestry Services), as of October 23, Statewide Wildfire Preparedness remains at Level 2 (moderate fire danger). The Red Flag Fire Alert, previously in effect for 34 counties in Oklahoma, has been rescinded. However, caution is still advised when conducting outdoor burning, particularly when high winds and low humidities are forecasted. Avoid burning anything outdoors when winds exceed 20 mph.

Climate Division (#)	***Palmer Drought Severity Index***				***Standardized Precipitation Index*** *through September*			
	Current Status 10/28/2000	Value 10/28	Value 10/14	Change In Value	3-Month	6-Month	9-Month	12-Month
Northwest (1)	UNUSUAL MOIST SPELL	2.40	-3.00	5.40	EXTREMELY DRY	VERY DRY	NEAR NORMAL	NEAR NORMAL
North Central (2)	VERY MOIST SPELL	3.01	-0.63	3.64	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Northeast (3)	NEAR NORMAL	0.13	-1.61	1.74	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
West Central (4)	MOIST SPELL	1.69	-2.23	3.92	EXTREMELY DRY	MODERATELY DRY	NEAR NORMAL	NEAR NORMAL
Central (5)	MOIST SPELL	1.84	-1.84	3.68	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
East Central (6)	INCIPIENT MOIST SPELL	0.72	-1.11	1.83	VERY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
Southwest (7)	MOIST SPELL	1.99	-2.48	4.47	EXTREMELY DRY	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
South Central (8)	NEAR NORMAL	0.12	-3.10	3.22	EXTREMELY DRY	VERY DRY	MODERATELY DRY	VERY DRY
Southeast (9)	MILD DROUGHT	-1.79	-2.53	0.74	EXTREMELY DRY	NEAR NORMAL	MODERATELY DRY	MODERATELY DRY

Keetch-Byram Drought Fire Index

Mesonet Station	County	Climate Division	Current Value 10/31/2000	Anticipated Impact
Ketchum Ranch	Stephens	South Central	585	400-600: lower litter and duff layers actively contribute to fire intensity and will burn actively; typical of late summer, early fall.
Broken Bow	McCurtain	Southeast	574	
Clayton	Pushmataha	Southeast	560	600-800: associated with severe drought; increased wildfire occurrence; intense deep burning fires with significant downwind spotting; live fuels also expected to burn actively.
13 stations with KBDI values above 700; 67 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 many state rivers and streams are recovering somewhat from long-term below normal precipitation and runoff, although flows are currently spiked from the recent abundant rainfall. Considering overall trends as well as current flows, the most recent data (October 31, 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** in *southwest* (North Fork/Red River in Beckham County), *central* (Canadian River in McClain County) and *southeast* (Glover River in McCurtain County) Oklahoma; **below average flow** in the *south central* (Washita River in Carter County) and *northwest* (Cimarron River in Beaver County) regions; and **near average flow** in the *northeast* (Baron Fork in Cherokee County).

Weather Forecast

The National Weather Service 6- to 10-day outlook (November 5-9) calls for above normal precipitation for the entire state. Normal temperatures are expected for all but far western Oklahoma (including the Panhandle), where below normal temperatures are anticipated. The Climate Prediction Center forecasts a chance for above normal precipitation for virtually the entire state for the November through January 2001 period.

Current models indicate that the persistent cold water phenomenon in the equatorial Pacific Ocean, referred to as La Niña, has virtually disappeared and tropical Pacific sea levels, which indicate how much heat is stored in the ocean, have returned to near normal after three years of dramatic fluctuations. However, many scientists believe that a larger, longer lasting climate situation, the Pacific Decadal Oscillation, will persist for some time. This long-term pattern of ocean temperature fluctuations that waxes and wanes approximately every 10 to 20 years, has significant implications for global climate, especially over North America.

Crop Report

October 29 - Numerous thunderstorms continued across Oklahoma last week, bringing additional moisture and flooding in several locations. As a result of the wet conditions, row crop harvest and small grain planting was slowed or halted in many areas. Topsoil and subsoil levels experienced substantial increases last week and were rated 92 and 72 percent adequate or better, respectively. Farmers had 1.2 days suitable for fieldwork during the week.

Planting of fall small grains was hampered in most areas and producers are now anxious to get back in the fields to finish sowing their wheat. Emergence of earlier planted fields continued with the aid of accumulated moisture, although isolated fields will need to be replanted as a result of the heavy rains and flooding. Wheat seeding progressed to 61 percent planted, well behind the five-year average of 91 percent. Wheat that had emerged was at 46 percent last week, well below the normal of 66 percent. Last week's precipitation generally restricted the advancement of row crop harvest. Sorghum growers were only able to harvest an additional one percent of the crop, bringing the total to 74 percent. Soybean harvest progressed slightly last week where conditions allowed with 77 percent of the crop harvested by week's end. Peanut harvest was slowed in many growing areas as a result of the high moisture levels. As of Sunday, 82 percent of the crop had been dug while 60 percent had been combined. Cotton harvest was once again delayed by the rains and harvest totaled 62 percent by the end of the week. Cotton and peanut yield reduction was a concern among producers as a result of the excessive moisture levels. Alfalfa hay and all other hay conditions showed some improvement from last week and were rated in mostly fair to poor condition. The fourth cutting of alfalfa continued slightly and totaled 92 percent complete by week’s end. The fifth cutting of alfalfa progressed last week and totaled 51 percent cut.

Livestock were rated in mostly good to fair condition statewide. Stock water levels in ponds and streams improved in areas that experienced runoff, however levels in many areas remain low. Cattle auctions reported slightly below average marketings for the week. The price for feeder steers less than 800 pounds increased from last week and averaged $90.00 per cwt. The price for feeder heifers less than 800 pounds also increased from last week and averaged $85.00 per cwt. Insect pressures on cattle were mostly light statewide. Pastures once again showed much-needed improvement from the previous week and were starting to experience growth. However, pastures were still rated in mostly fair to poor condition statewide. Improved moisture levels should benefit pasture conditions during the coming weeks. Producers were hoping for mild weather to get pastures established before winter arrives.

Reservoir Storage

Reservoir storage levels in Oklahoma have improved significantly over the past two weeks, although some lakes remain low. As of October 31, the combined normal conservation pools of 31 selected major federal reservoirs across Oklahoma (see below) are approximately 90.9 percent full, a 7.3 percent increase over that measured on October 16, according to information from the U.S. Army Corps of Engineers (Tulsa District). Only one reservoir (Pine Creek) has experienced a lake level decrease since that time. Still, 24 reservoirs are operating at less than full capacity (compared to all 31 two weeks ago). Five reservoirs (Lugert-Altus, Keystone, Tom Steed, Hugo and Wister) are now below 80 percent capacity, compared to seven last week. Lugert-Altus is at only 34.1 percent.

Storage in Selected Oklahoma Lakes & Reservoirs as of October 31, 2000

Climate Division / *Lake or Reservoir*	*Conservation Storage* (acre-feet)	*Present Storage* (acre-feet)	*Percent of Storage* conservation	flood
NORTH CENTRAL				
Fort Supply	13,900	13,900	100.0	4.35
Great Salt Plains	31,420	31,420	100.0	9.61
Kaw*	400,264	400,264	100.0	4.00
Regional Totals/Averages	**445,584**	**445,584**	**100.0**	**5.99**
NORTHEAST				
Birch	19,225	16,580	86.2	0.00
Copan	43,400	36,491	84.1	0.00
Fort Gibson	365,200	356,785	97.7	0.00
Grand	1,672,000	1,492,321	89.3	0.00
Hudson	200,300	200,300	100.0	1.81
Hulah	31,160	30,780	98.8	0.00
Keystone	278,122	195,116	70.2	0.00
Oologah	552,210	508,350	92.1	0.00
Skiatook	322,700	288,002	89.2	0.00
Regional Totals/Averages	**3,484,317**	**3,124,725**	**89.7**	**0.20**
WEST CENTRAL				
Canton	111,310	103,701	93.2	0.00
Foss	165,480	156,013	94.3	0.00
Regional Totals/Averages	**276,790**	**259,714**	**93.8**	**0.00**
CENTRAL				
Arcadia	27,520	27,520	100.0	7.45
Heyburn	7,105	7,105	100.0	1.66
Thunderbird	119,600	119,600	100.0	12.04
Regional Totals/Averages	**154,225**	**154,225**	**100.0**	**7.05**
EAST CENTRAL				
Eufaula*	2,368,223	2,112,677	89.2	0.00
Tenkiller	654,100	575,128	87.9	0.00
Regional Totals/Averages	**3,022,323**	**2,687,805**	**88.9**	**0.00**
SOUTHWEST				
Fort Cobb	80,010	79,675	99.6	0.00
Lugert-Altus	132,830	45,343	34.1	0.00
Tom Steed	88,970	64,053	72.0	0.00
Regional Totals/Averages	**301,810**	**189,071**	**62.6**	**0.00**
SOUTH CENTRAL				
Arbuckle	72,400	71,518	98.8	0.00
McGee Creek	113,930	100,547	88.3	0.00
Texoma*	2,693,618	2,654,203	98.5	0.00
Waurika*	199,440	181,127	90.8	0.00
Regional Totals/Averages	**3,079,388**	**3,007,395**	**97.7**	**0.00**
SOUTHEAST				
Broken Bow*	919,465	776,355	84.4	0.00
Hugo*	158,617	121,836	76.8	0.00
Pine Creek*	53,750	43,497	80.9	0.00
Sardis	274,330	255,114	93.0	0.00
Wister	60,162	47,848	79.5	0.00
Regional Totals/Averages	**1,466,324**	**1,244,650**	**84.9**	**0.00**
STATE TOTALS	**12,230,761**	**11,113,169**	**90.9**	**1.32**

* 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. Eight seeding flight operations, five for rainfall enhancement and three for hail suppression, were conducted from October 18-30. The 1999-2000 Program officially ceased operations on October 31.

RECENT WEATHER MODIFICATION ACTIVITIES
OCTOBER 18-30, 2000

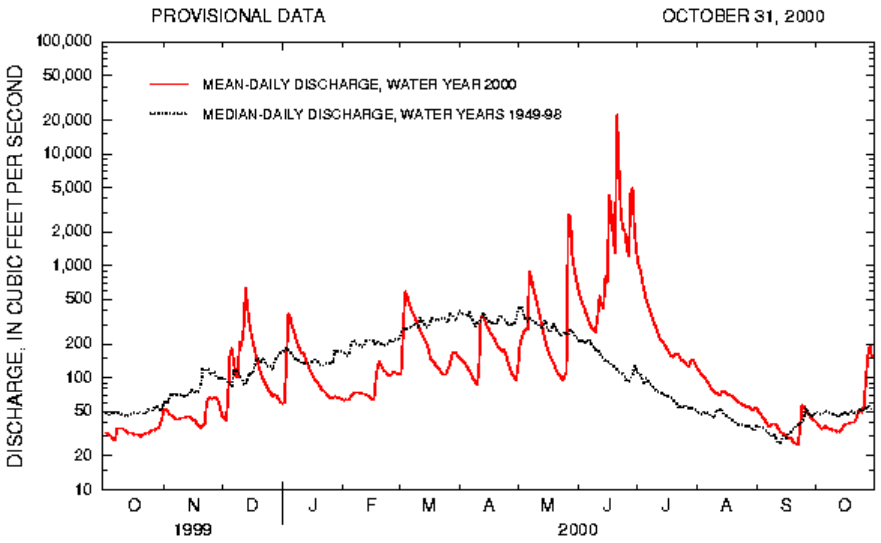
Date/ Flight(s)	*County Location(s)*	*Texas*	*Kansas*	*Hail*	*Rain*
20-Oct	Woodward, Harper, Ellis				x
20-Oct	Carter, Jefferson, Cotton, Tillman	x			x
21-Oct	Grady, Stephens, Comanche, Cotton, Tillman	x			x
22-Oct	Cotton				x
25-Oct	Beaver, Harper			x	
26-Oct	Harmon			x	
26-Oct	Okmulgee				x
28-Oct	Custer, Dewey			x	

* Information may not reflect the most recent operations.

Baron Fork at Eldon, Oklahoma

Station No. 07197000
Northeast Oklahoma

Drainage Area 307 square miles



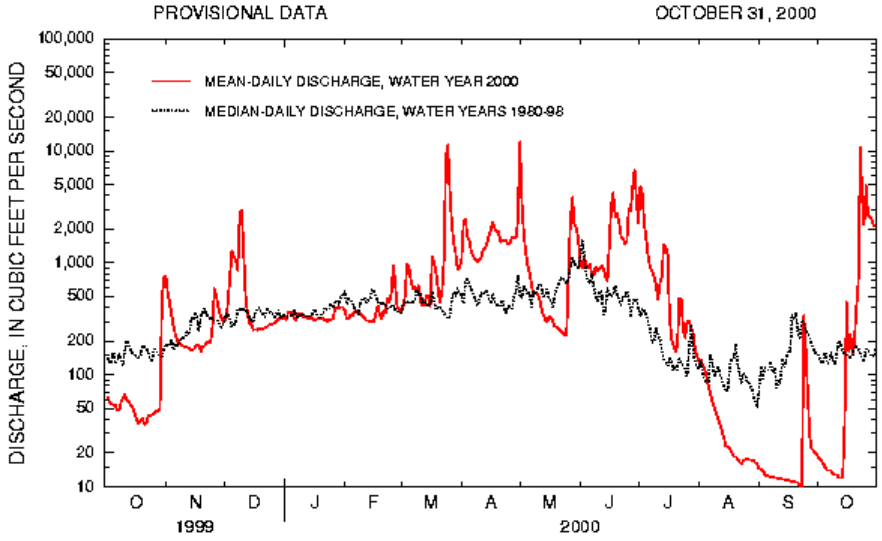
Comparison of daily discharges for water year 2000
and period of record for Baron Fork at Eldon, Oklahoma.

Data from U.S. Geological Survey

Canadian River at Purcell, Oklahoma

Station No. 07229200
Central Oklahoma

Drainage Area 25,939 square miles



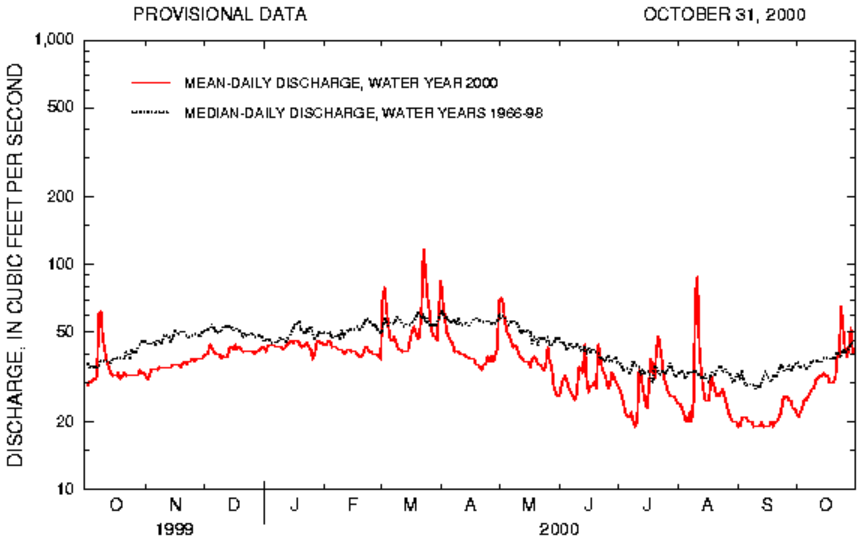
Comparison of daily discharges for water year 2000
and period of record for Canadian River at Purcell, Oklahoma.

Data from U.S. Geological Survey

Cimarron River near Forgan, Oklahoma

Station No. 07156900
Northwest Oklahoma

Drainage Area 8,536 square miles



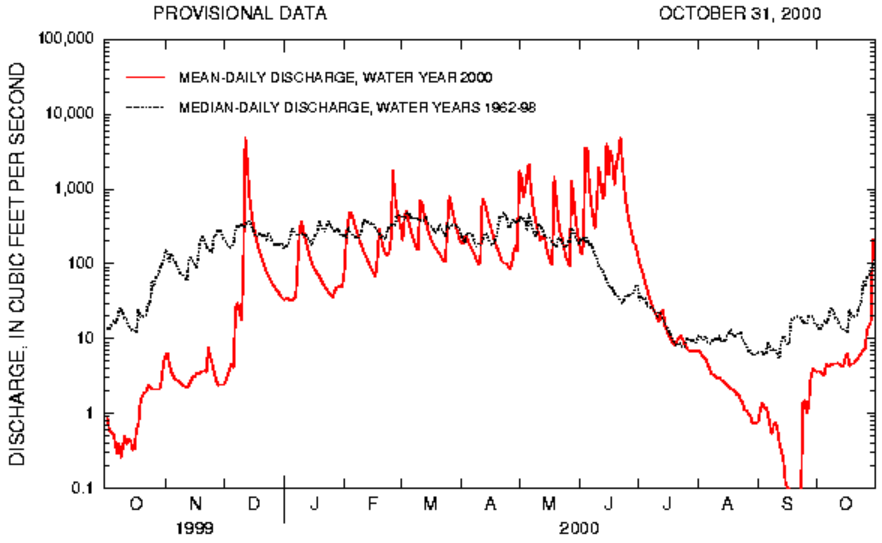
Comparison of daily discharges for water year 2000
and period of record for Cimarron River near Forgan, Oklahoma.

Data from U.S. Geological Survey

Glover River near Glover, Oklahoma

Station No. 07337900
Southeast Oklahoma

Drainage Area 31.5 square miles



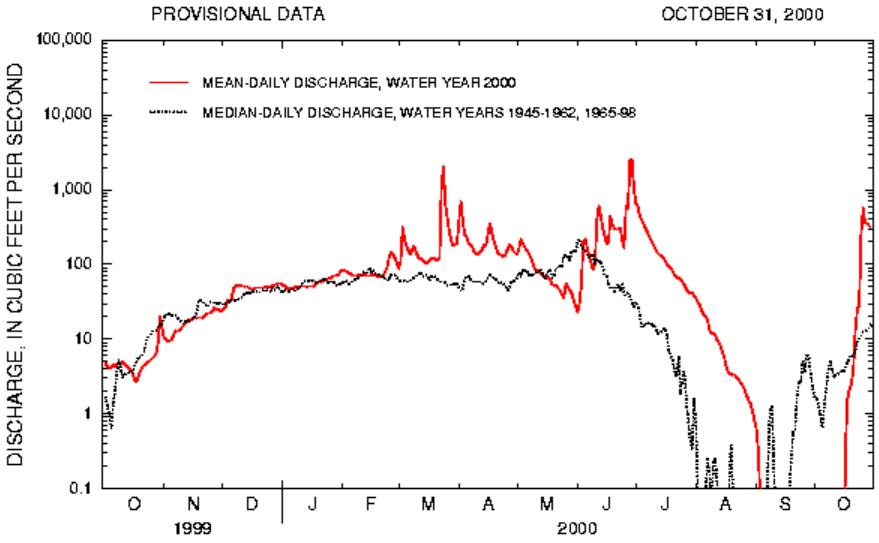
Comparison of daily discharges for water year 2000
and period of record for Glover River near Glover, Oklahoma.

Data from U.S. Geological Survey

North Fork Red River near Carter, Oklahoma

Station No. 07301500
Southwest Oklahoma

Drainage Area 2,337 square miles



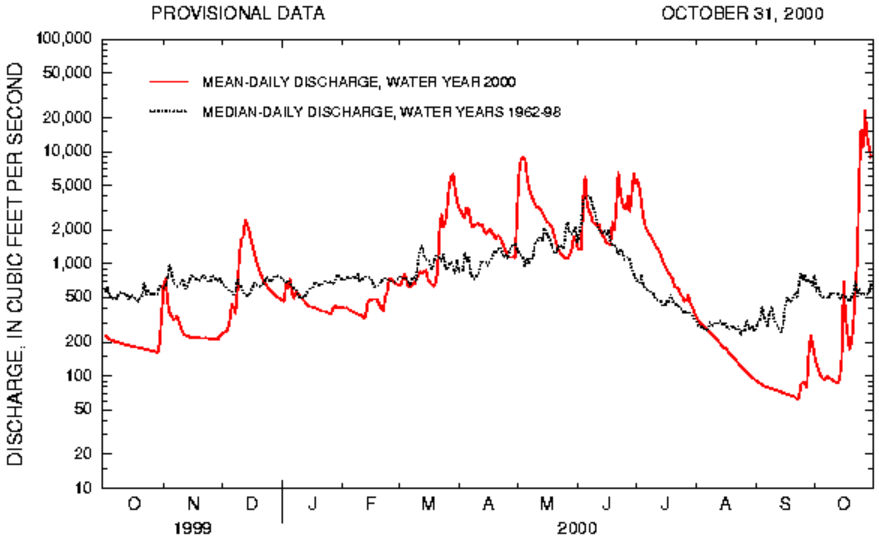
Comparison of daily discharges for water year 2000
and period of record for North Fork Red River near Carter, Oklahoma.

Data from U.S. Geological Survey

Washita River near Dickson, Oklahoma

Station No. 07331000
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