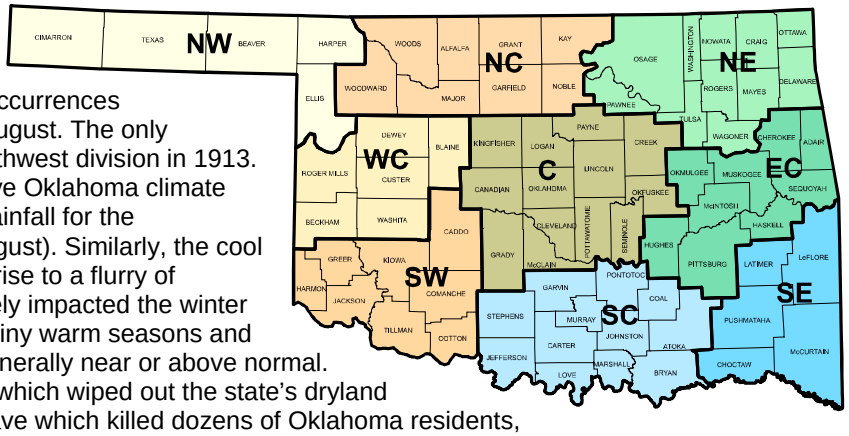
Oklahoma Water Resources Bulletin
& Summary of Current Conditions

SEPTEMBER 8, 2000 **OKLAHOMA WATER RESOURCES BOARD**

Statewide Precipitation & General Summary

August 2000 was the driest August on record in Oklahoma (since 1892). The statewide average rainfall value of 0.12 inches is only 4 percent of the normal. Seven of Oklahoma's nine climate divisions matched or set records for least rainfall in August. Three climate divisions (East Central, Southwest and South Central) observed 0.00 inches (when rounded to the nearest 1/100th inch) of rainfall for the month. When these results are verified, it will mark the second, third and fourth such occurrences within an Oklahoma climate division in August. The only previous such event occurred in the Southwest division in 1913.



Due to an exceptionally wet June, five Oklahoma climate divisions have observed above normal rainfall for the climatological summer (June through August). Similarly, the cool season drought of 1995-96, which gave rise to a flurry of February and March wildfires and severely impacted the winter wheat crop, was sandwiched between rainy warm seasons and precipitation totals for each year were generally near or above normal. The extended summer drought of 1998, which wiped out the state's dryland cotton crop and coincided with a heat wave which killed dozens of Oklahoma residents, was also sandwiched between two very wet cool seasons. Statewide, August 2000 was also the fifth warmest on record (85.4 F). At the close of the month, three Mesonet stations (Grandfield, Walters and Waurika) had observed 100+ degree temperatures for 30 consecutive days while more than half of the network's 114 stations had streaks of twelve days or more.

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 September 6) remain the South Central and Southeast climate divisions (74 and 76 percent of normal, respectively). The current state-averaged precipitation total is 29.35 inches, which is 1.73 inches below average and 94 percent of normal for the period.

PRELIMINARY STATEWIDE PRECIPITATION BY CLIMATE DIVISION

(IN INCHES)

DIVISION (#)	WATER YEAR OCTOBER 1, 1999 – SEPTEMBER 6, 2000			SUMMER JUNE 1 - SEPTEMBER 6, 2000			RAINFALL SINCE AUGUST 22
	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	TOTAL RAINFALL	DEPARTURE FROM NORMAL	PERCENT OF NORMAL	
Northwest (1)	16.02	-2.08	89	6.18	-2.12	74	0.01
North Central (2)	28.44	2.89	111	8.94	-1.23	88	0.03
Northeast (3)	39.49	3.07	108	13.08	1.52	113	0.24
West Central (4)	26.19	2.31	110	9.34	0.20	102	0.00
Central (5)	30.95	-0.12	99	10.86	0.82	108	0.02
East Central (6)	37.21	-2.53	94	14.10	3.45	132	0.11
Southwest (7)	25.41	0.18	101	8.29	-0.58	93	0.00
South Central (8)	25.60	-8.89	74	8.42	-1.53	85	0.02
Southeast (9)	34.58	-11.07	76	9.70	-2.03	83	0.15
STATE-AVERAGED	**29.35**	**-1.73**	**94**	**9.91**	**-0.27**	**97**	**0.07**

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 (September 2, below), moisture/drought conditions in Oklahoma continue to worsen and seven climate divisions are now in the drought category. The South Central, Southeast, Northwest and Southwest climate divisions are now in the **"moderate drought"** category while the East Central, West Central and Central regions are in "mild drought." All nine climate divisions have undergone PDSI moisture decreases since August 19; the Northeast ("near normal") climate division experienced the greatest decrease during the period.

The latest monthly Standardized Precipitation Index (through August, below) indicates that the South Central and Southeast climate divisions are experiencing long-term dryness, at least over the last 12 months. Although no other regions are experiencing long-term moisture deficits, virtually all areas are experiencing very dry to extremely dry SPI conditions throughout the past two months. The 6-, 9- and 12-month SPI time periods reflect "moderately dry" conditions in the South Central region and the 12-month SPI indicates "moderately dry" conditions in the Southeast. No other regions experienced a dry SPI reading among the *selected* time periods.

The latest Keetch-Byram Drought Index (September 5, 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. Statewide, 22 of the 115 Mesonet stations in Oklahoma report KBDI values in excess of 700, indicating severe fire/drought conditions (4 stations had readings above 700 on August 23). Ringling, in the South Central climate division, retains the highest KBDI value (759), followed by Burneyville (757; South Central) and Clayton (757; Southeast). As of August 29, according to the Oklahoma Department of Agriculture (Forestry Services), Statewide Wildfire Preparedness remains at Level 3 (generally very high to extreme fire danger). **A Burn Ban is now in effect** for all but Cimarron County in the Panhandle, which remains in a Red Flag Fire Alert.

In extending the Burn Ban, Governor Keating also declared a disaster-related emergency in those 76 counties. The Governor also activated the Oklahoma Drought Management Team, a standing group of state officials who will review Oklahoma's short-term and long-term response to wildfires and drought. An Executive Order signed August 29 by the Governor declares a disaster-related emergency due to severe drought conditions which may result in potentially damaging wildfires in 76 counties. The emergency declaration makes available the resources of all state departments and agencies to meet the emergency needs. Already, Carter, Comanche, Cotton, Jefferson, Love, Marshall and Tillman Counties have received a Secretarial Disaster Designation. The Governor has requested U.S. Agriculture Secretary Dan Glickman to extend the designation to 70 additional counties.

Climate Division (#)	***Palmer Drought Severity Index***				***Standardized Precipitation Index*** *through August*			
	Current Status 09/02/2000	Value 09/02	Value 08/19	Change In Value	3-Month	6-Month	9-Month	12-Month
Northwest (1)	Moderate Drought	-2.41	-1.33	-1.08	Near Normal	Near Normal	Near Normal	Near Normal
North Central (2)	Moist Spell	1.23	2.55	-1.32	Near Normal	Moderately Wet	Moderately Wet	Moderately Wet
Northeast (3)	Near Normal	-0.49	1.04	-1.53	Near Normal	Moderately Wet	Moderately Wet	Near Normal
West Central (4)	Mild Drought	-1.34	-0.40	-0.94	Near Normal	Near Normal	Moderately Wet	Near Normal
Central (5)	Mild Drought	-1.28	-0.50	-0.78	Near Normal	Near Normal	Near Normal	Near Normal
East Central (6)	Mild Drought	-1.44	-0.96	-0.48	Moderately Wet	Near Normal	Near Normal	Near Normal
Southwest (7)	Moderate Drought	-2.14	-1.49	-0.65	Near Normal	Near Normal	Near Normal	Near Normal
South Central (8)	Moderate Drought	-2.70	-2.63	-0.07	Near Normal	Moderately Dry	Moderately Dry	Moderately Dry
Southeast (9)	Moderate Drought	-2.43	-2.32	-0.11	Near Normal	Near Normal	Near Normal	Moderately Dry

Keetch-Byram Drought Fire Index

Mesonet Station	County	Climate Division	Current Value 09/05/2000	Anticipated Impact
Ringling	Jefferson	South Central	759	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	757	
Clayton	Pushmataha	Southeast	757	

22 total stations with KBDI values above 700

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 virtually all state rivers and streams are now reflecting the impacts of much below normal precipitation and runoff. Considering overall trends as well as current flows, the most recent data (September 6, 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) and *central* (Canadian River in McClain County) Oklahoma; **below average flow** in the *south central* (Washita River in Carter County), *southeast* (Glover River in McCurtain 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 (September 12-16) calls for no precipitation for all but the northeast quadrant of Oklahoma, where below normal rainfall is anticipated. Much above normal temperatures are expected for virtually 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, 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. La Niña episodes are generally believed to cause temporary warmer and drier conditions throughout most of the southern U.S., including Oklahoma. However, many scientists believe that a larger, longer lasting climate situation, the Pacific Decadal Oscillation, will persist for some time. This long-term pattern, which covers most of the Pacific Ocean, has significant implications for global climate, especially over North America.

Crop Report

September 3 - A few widely scattered showers crossed portions of the state, but most areas of Oklahoma failed to receive rainfall again last week for the fifth week in a row. The persistently dry conditions and extreme temperatures continue to diminish topsoil and subsoil moisture levels and stress crops and pastures. All areas averaged a maximum temperature of 100 degrees or greater last week. Sunday's scorching temperatures averaged a high of 105 degrees with 11 stations reaching or exceeding 110 degrees. Copious amounts of moisture are desperately needed throughout Oklahoma.

Dry conditions and extreme heat continued to slow preparation for planting wheat in many areas of the state. Sixty-one percent of the wheat seedbed has been prepared, slightly behind normal. Planting of fall crops will most likely be delayed in many areas if rainfall is not received soon. The Central and Northeast regions were the main areas able to plant wheat last week.

Dryland row crops remain hampered by the hot and dry weather. Corn remains in mostly good condition across the state. However, the extreme heat and lack of moisture has rapidly matured the crop significantly ahead of normal. As of Sunday, 70 percent of the crop had matured and 30 percent had been harvested, both well ahead of the five-year averages of 37 and 9 percent, respectively. Sorghum is in mostly fair condition, while heading progressed to 86 percent statewide. Sorghum coloring was at 59 percent last week while 27 percent of the crop was mature. Soybeans are in mostly fair condition, but the crop in most areas is in critical shape from lack of moisture. Rainfall is needed for proper filling of pods to occur. Cotton and peanuts are rated in mostly good to fair condition statewide. As of Sunday, nearly all peanuts in the state had set pods. Dryland peanuts continue to show signs of stress, while most irrigated peanuts are still in good condition.

Both alfalfa and all other hay are in mostly fair condition. The fourth cutting of alfalfa progressed last week to 65 percent complete and remained well ahead of the five-year average of 47 percent. The fifth cutting of alfalfa progressed primarily in the central part of the state and is at 12 percent cut. Hay conditions in the southern and western districts have been the most affected by the hot and dry conditions.

Pastures continue to suffer from the hot and dry conditions, especially in the south. Livestock being fed hay continues in areas most hurt from absence of adequate pastures. Pasture conditions continue to decline and are rated in fair to poor condition. Grasshoppers and armyworms continue to be a burden in the west and south.

Livestock remain in mostly good condition. Cattle auctions reported average marketings for the week. Water levels continue to decrease across the state as ponds and creeks are drying up and cattle producers in critical areas are hauling water to their herds. Insect pressures on cattle continue to be moderate to light statewide.

Reservoir Storage

Reservoir storage levels throughout much of Oklahoma continue to show signs of meager rainfall and runoff. As of September 7, the combined normal conservation pools of 31 selected major federal reservoirs across Oklahoma (see below) are approximately 90.1 percent full, a 3.7 percent decrease over that measured on August 23, according to information from the U.S. Army Corps of Engineers (Tulsa District). Thirty reservoirs (all but Hudson, in northeast Oklahoma) have experienced lake level decreases since that time. In addition, 30 reservoirs are currently operating at less than full capacity, compared to 29 two weeks ago. Still, only two reservoirs (**Lugert-Altus, only 35.6 percent**; and Tom Steed, 74 percent) are below 80 percent capacity.

Storage in Selected Oklahoma Lakes & Reservoirs
as of September 7, 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	13,116	94.4	0.00
Great Salt Plains	31,420	29,304	93.3	0.00
Kaw*	383,005	377,665	98.6	0.00
Keystone	505,381	412,767	81.7	0.00
Regional Totals/Averages	**933,706**	**832,852**	**89.2**	**0.00**
NORTHEAST				
Birch	19,225	17,721	92.2	0.00
Copan	43,400	38,933	89.7	0.00
Fort Gibson	365,200	346,320	94.8	0.00
Grand	1,672,000	1,480,980	88.6	0.00
Hudson	200,300	200,300	100.0	12.65
Hulah	31,160	27,475	88.2	0.00
Oologah	552,210	521,435	94.4	0.00
Skiatook	322,700	303,708	94.1	0.00
Regional Totals/Averages	**3,206,195**	**2,936,872**	**91.6**	**1.58**
WEST CENTRAL				
Canton	111,310	103,701	93.2	0.00
Foss	165,480	158,282	95.7	0.00
Regional Totals/Averages	**276,790**	**261,983**	**94.7**	**0.00**
CENTRAL				
Arcadia	27,520	25,396	92.3	0.00
Heyburn	7,105	6,374	89.7	0.00
Thunderbird	119,600	112,672	94.2	0.00
Regional Totals/Averages	**154,225**	**144,442**	**93.7**	**0.00**
EAST CENTRAL				
Eufaula*	2,368,223	2,103,097	88.8	0.00
Tenkiller	654,100	590,502	90.3	0.00
Regional Totals/Averages	**3,022,323**	**2,693,599**	**89.1**	**0.00**
SOUTHWEST				
Fort Cobb	80,010	76,699	95.9	0.00
Lugert-Altus	132,830	47,246	35.6	0.00
Tom Steed	88,970	65,794	74.0	0.00
Regional Totals/Averages	**301,810**	**189,739**	**62.9**	**0.00**
SOUTH CENTRAL				
Arbuckle	72,400	67,334	93.0	0.00
McGee Creek	113,930	101,108	88.7	0.00
Texoma*	2,539,946	2,364,171	93.1	0.00
Waurika*	177,264	150,898	85.1	0.00
Regional Totals/Averages	**2,903,540**	**2,683,511**	**92.4**	**0.00**
SOUTHEAST				
Broken Bow*	958,180	840,042	87.7	0.00
Hugo*	158,617	139,554	88.0	0.00
Pine Creek*	61,570	54,258	88.1	0.00
Sardis	274,330	259,127	94.5	0.00
Wister	60,162	54,010	89.8	0.00
Regional Totals/Averages	**1,512,859**	**1,346,991**	**89.0**	**0.00**
STATE TOTALS	**12,311,448**	**11,089,989**	**90.1**	**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. Three individual seeding flight operations were conducted from August 25 through September 6. The Program officially began spring season operations on March 1, 2000.

RECENT WEATHER MODIFICATION ACTIVITIES
AUGUST 25-SEPTEMBER 6, 2000

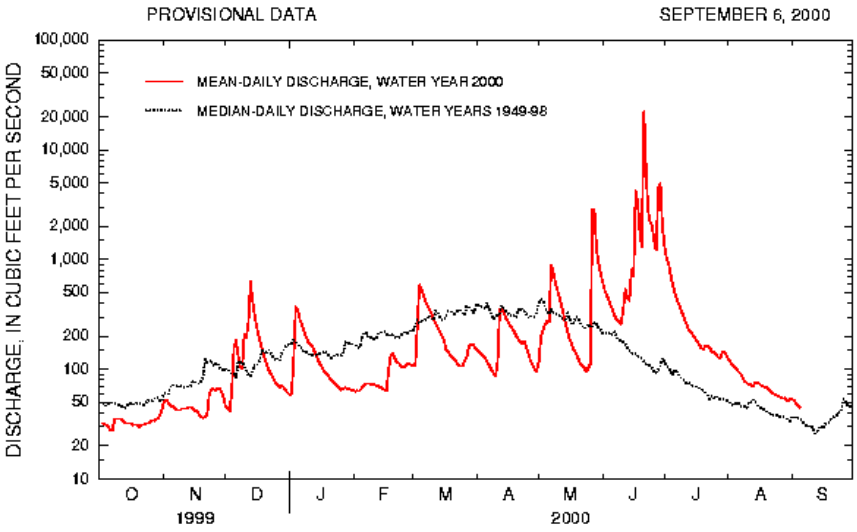
Date/ Flight(s)	*County Location(s)*	*Texas*	*Kansas*	*Hail*	*Rain*
02-Sep	Pontotoc				x
03-Sep	Beaver				x
05-Sep	McIntosh, Muskogee, Pittsburg, Latimer, Pushmataha				x

* Information may not reflect the most recent operations.

Baron Fork at Eldon, Oklahoma

Station No. 07197000
Northeast Oklahoma

Drainage Area 307 square miles



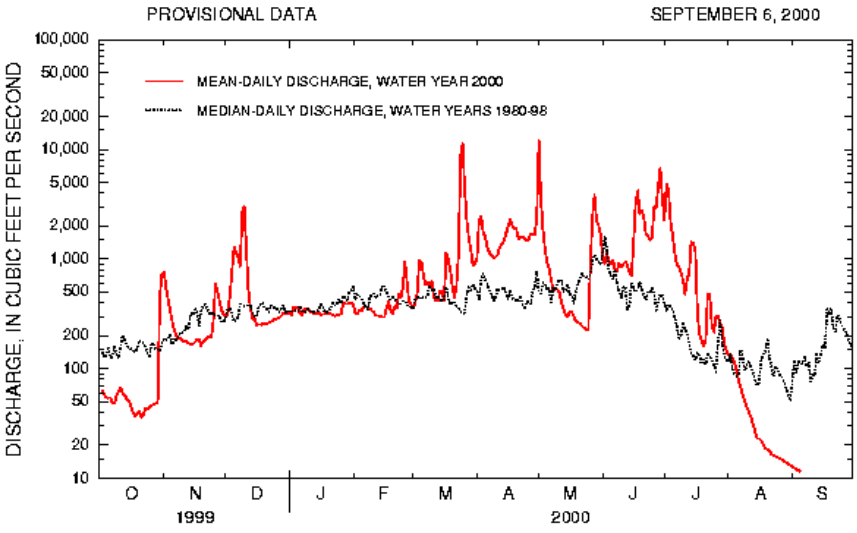
Comparison of daily discharges for water year 2000
and period of record for Baron Fork at Eldon, Oklahoma.

Data from U.S. Geological Survey

Canadian River at Purcell, Oklahoma

Station No. 07229200
Central Oklahoma

Drainage Area 25,939 square miles



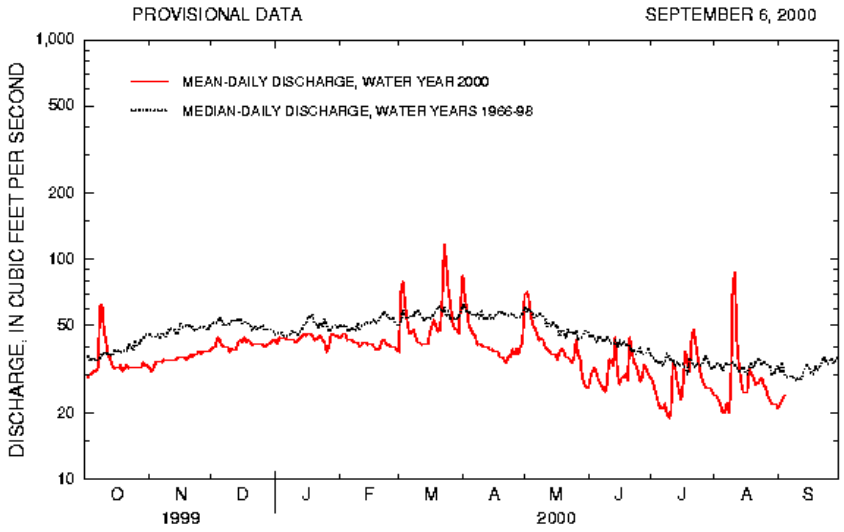
Comparison of daily discharges for water year 2000
and period of record for Canadian River at Purcell, Oklahoma.

Data from U.S. Geological Survey

Cimarron River near Forgan, Oklahoma

Station No. 07156900
Northwest Oklahoma

Drainage Area 8,536 square miles



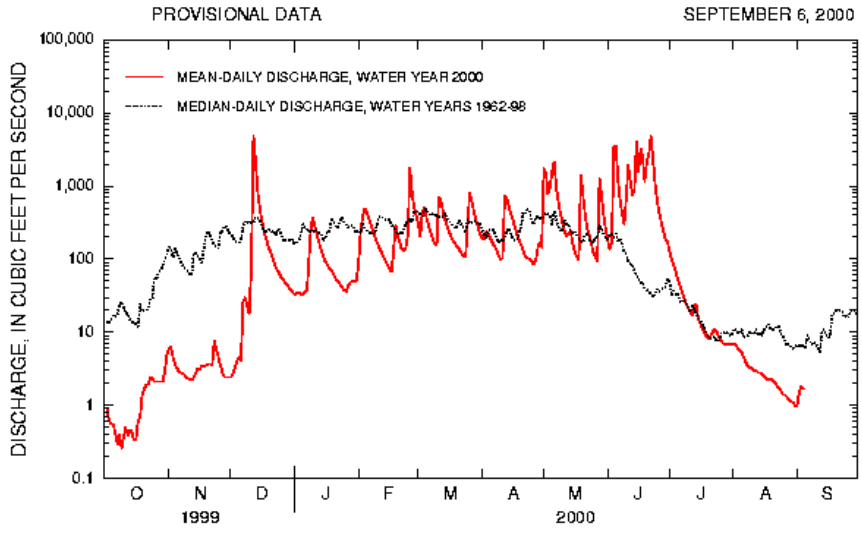
Comparison of daily discharges for water year 2000
and period of record for Cimarron River near Forgan, Oklahoma.

Data from U.S. Geological Survey

Glover River near Glover, Oklahoma

Station No. 07337900
Southeast Oklahoma

Drainage Area 315 square miles



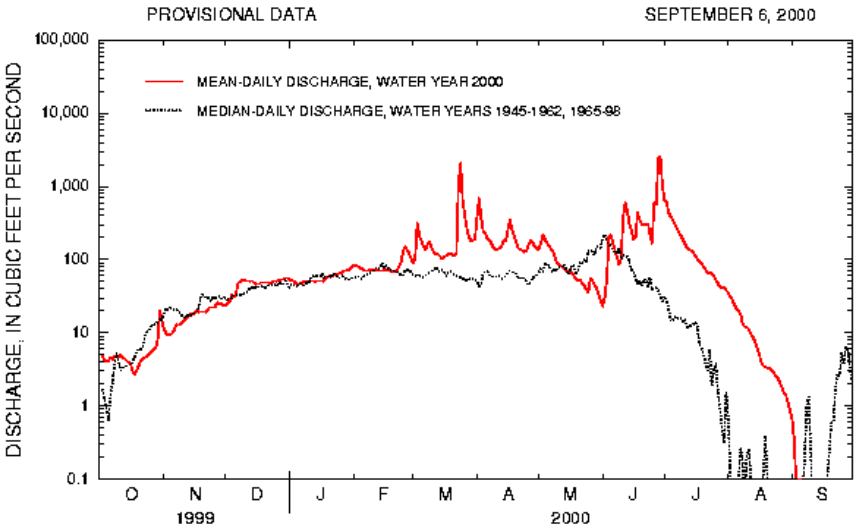
Comparison of daily discharges for water year 2000
and period of record for Glover River near Glover, Oklahoma.

Data from U.S. Geological Survey

North Fork Red River near Carter, Oklahoma

Station No. 07301500
Southwest Oklahoma

Drainage Area 2,337 square miles



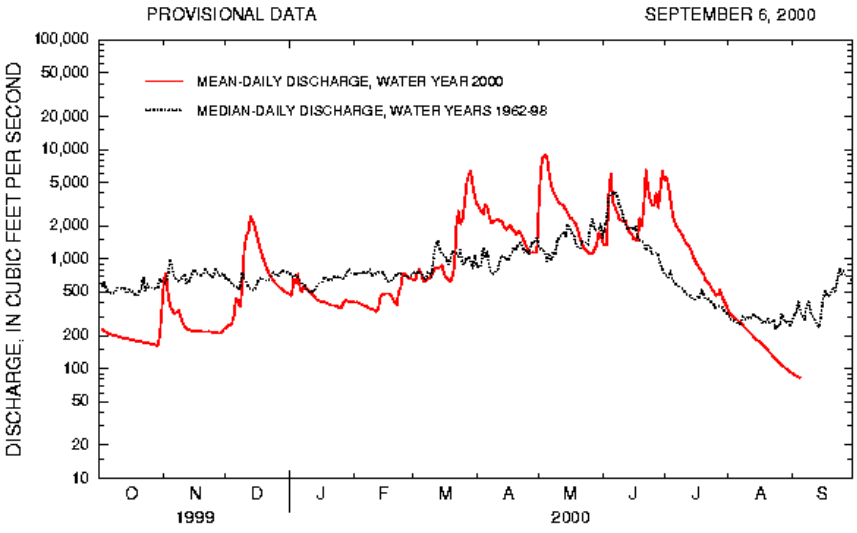
Comparison of daily discharges for water year 2000
and period of record for North Fork Red River near Carter, Oklahoma.

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