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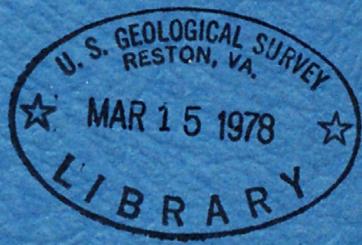


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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

REPORT OF THE ANNUAL YIELD OF THE ARKANSAS RIVER BASIN  
FOR THE ARKANSAS RIVER BASIN COMPACT  
ARKANSAS—OKLAHOMA

1977 WATER YEAR



Prepared in cooperation with the  
Arkansas Division of Soil and Water Resources

Open-file report  
Little Rock, Arkansas  
1978



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By G. Louis Ducret, Jr.

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INTRODUCTION

The computed annual yields for subbasins in the Arkansas River basin as defined in the Arkansas River Basin Compact, Arkansas-Okahoma, 1972, are presented in this report. The area bounded by the Compact is shown in figure 1.

This report was prepared by the Water Resources Division of the U.S. Geological Survey in cooperation with the Arkansas Division of Soil and Water Resources. Streamflow data were furnished by the Arkansas and Oklahoma Districts of the Water Resources Division, Geological Survey, and the U.S. Army Corps of Engineers, Tulsa District. The Tulsa District also provided data from the Webbers Falls, Tenkiller Ferry, Robert S. Kerr, and Mister Reservoirs.

DEFINITION OF TERMS

The following terms used in this report are taken from Article II of the Arkansas River Basin Compact, Arkansas-Okahoma, 1972.

The term "Arkansas River Basin" means all of the drainage basin of the Arkansas River and its tributaries from a point immediately below the confluence of the Grand-Neosho River with the Arkansas River (fig. 1)

EXPLANATION

 Spavinow Creek Subbasin

 Illinois River Subbasin

 Lee Creek Subbasin

 Poteau River Subbasin

 Arkansas River Subbasin

— — — Compact area boundary

— — — Subbasin boundary

▲ Gaging station and abbreviated station number

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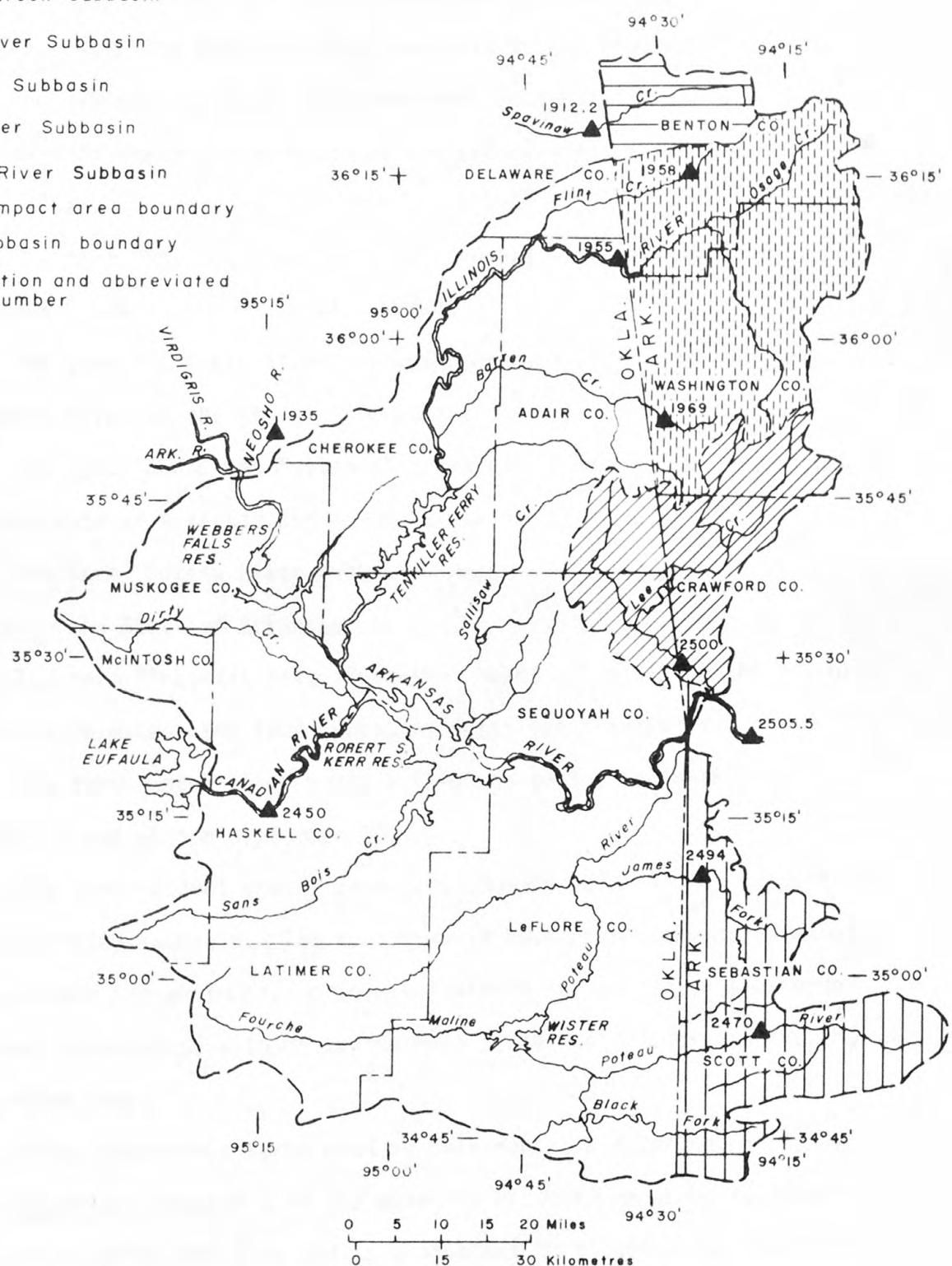


Figure 1.--Map showing Arkansas-Oklahoma Arkansas River Compact Area and Subbasins.

near Muskogee, Okla., to a point immediately below the confluence of Lee Creek with the Arkansas River near Van Buren, Ark., together with the drainage basin of Spavinaw Creek in Arkansas, but excluding that part of the drainage basin of the Canadian River above Lake Eufaula Dam.

The term "Spavinaw Creek Subbasin" means the drainage area of Spavinaw Creek in the State of Arkansas.

The term "Illinois River Subbasin" means the drainage area of Illinois River in the State of Arkansas.

The term "Lee Creek Subbasin" means the drainage area of Lee Creek in the State of Arkansas and in the State of Oklahoma.

The term "Poteau River Subbasin" means the drainage area of Poteau River in the State of Arkansas.

The term "Arkansas River Subbasin" means all areas of the Arkansas River Basin except the four subbasins described previously.

The term "water year" means a 12-month period beginning on October 1 and ending September 30.

The term "annual yield" means the computed annual gross runoff from any specified subbasin. The runoff would have passed any certain point on a stream and would have originated within any specified area under natural conditions, without any manmade depletion or accretion during the water year.

Other hydrologic terms used in this report are defined as follows:

Acre-foot (acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Cubic feet per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a specified point during 1 second, and is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

Discharge is the volume of water that passes a given point within a given period of time.

Instantaneous discharge is the discharge at a particular instant of time.

Mean discharge is the arithmetic average of individual daily mean discharges during a specific period.

Drainage area of a stream at a specified point on the stream is that area enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream upstream from the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas within the area, unless otherwise noted.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel.

The following factors may be used to convert the English units published herein to selected units of the International System (SI):

Multiply English units	By	To obtain SI units
Length		
inch (in)	25.4	millimeter (mm)
foot (ft)	.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Area		
acre	4047	square meter ( $m^2$ )
square mile ( $mi^2$ )	.004047	square kilometer ( $km^2$ )
	2.590	square kilometer ( $km^2$ )
Volume		
cubic foot ( $ft^3$ )	.02832	cubic meter ( $m^3$ )
cfs-day ( $ft^3/s\cdot day$ )	2447	cubic meter ( $m^3$ )
acre-foot (acre-ft)	1233	cubic meter ( $m^3$ )
	$1.233 \times 10^{-6}$	cubic kilometer ( $km^3$ )
Flow		
cubic foot per second ( $ft^3/s$ )	28.32	liter per second (l/s)
	.02832	cubic meter per second ( $m^3/s$ )

#### COMPUTATION OF ANNUAL YIELD

The annual yield and deficiency (table 1) for each subbasin were computed as described in Appendix I to the Arkansas River Basin Compact Arkansas-Oklahoma, 1972, supplement No. 1. Actual runoff for the subbasins (table 2) was computed as described in the Compact except for the stations Arkansas River at Muskogee, which has been discontinued, and Arkansas River at Van Buren, which has been moved 7.9 miles (12.7 km) downstream.

Annual depletion caused by major reservoirs (table 3) was computed for the four major reservoirs in the basin as described in Appendix I to the Compact. Depletions caused by small reservoirs and minor diversion for

Table 1.--Annual yield and deficiency for the subbasins as defined in the Compact

[Average annual flow in cubic feet per second for 1977 water year]

Subbasin	(1) Actual runoff from the subbasins	(2) Total depletions or accretions (+) (-)	(3) Annual yield	(4) Percent depletion allowed	(5) Minimum required flow	(6) Deficiency
Spavinaw Creek	45.9	0	45.9	50	23.0	0
Illinois River	279	0	279	60	112	0
Lee Creek	278	0	278	100	0	0
Poteau River	318	0	318	60	127	0
Arkansas River	1,399	-141	1,258	60	503	0

Table 2.--Actual runoff from the subbasins

[Mean discharge in cubic feet per second for the 1977 water year]

Month	Spavinaw Creek D.A.=135 sq mi <sup>a</sup>	Illinois River D.A.=744 sq mi <sup>b</sup>	Lee Creek D.A.=464 sq mi <sup>c</sup>	Poteau River D.A.=536 sq mi <sup>d</sup>	Arkansas River D.A.=4,553 sq mi <sup>e</sup>
October	27	155	70	88	1,423
November	24	165	93	55	928
December	24	167	190	220	1,119
January	22	156	116	474	1,906
February	26	211	264	359	2,729
March	58	1,085	2,069	1,986	7,710
April	57	471	371	453	4,530
May	26	160	46	55	-4,492f
June	30	120	9	15	-1,038f
July	22	140	32	9	2,032
August	19	107	28	16	-293f
September	215	424	56	52	405
1977 Water Year (cfs)	46	279	278	318	1,399
1977 Water Year (acre-ft)	33,300	202,000	201,300	230,200	1,013,000

a Includes 31 sq mi ungaaged.

b Includes 72 sq mi ungaaged.

c Includes 38 sq mi ungaaged.

d Includes 186 sq mi ungaaged.

e Computed by subtracting drainage area at Arkansas River at Muskogee, Canadian River near Whitefield, Illinois River Subbasin, Lee Creek Subbasin, and Poteau River Subbasin from drainage area at Arkansas River at Dam No. 13, near Van Buren, Ark.

f Negative discharge caused by storage in reservoirs, seepage into groundwater, and evaporation from reservoirs.

Table 3.--Annual depletion caused by major reservoirs

Reservoir	[1977 Water Year]						Depletion (Average cfs year)
	Yearend contents (acre-ft)	Change in contents in water year (acre-ft)	Precipitation on reservoir surface (In.)	Evaporation from reservoir (In.) <sup>c</sup>	Depletion (acre-ft)		
Webbers Falls----	153,100	-7,200	37.74 <sup>a</sup>	46.81 <sup>b</sup>	+8,240	+11.4	
Tenkille Ferry---	593,600	-164,800	39.75 <sup>a</sup>	42.38 <sup>a,b</sup>	-154,150	-213	
Robert S. Kerr----	422,400	-34,600	31.24 <sup>b</sup>	46.79 <sup>b</sup>	+37,390	+51.6	
Wister-----	29,920	+2,860	42.24 <sup>a,b</sup>	41.08 <sup>a,d</sup>	+6,300	+8.7	

a From climatological data-Oklahoma; U.S. Dept. of Commerce, NOAA.

b From U.S. Corps of Engineers, Tulsa District.

c Adjusted for pan coefficient of 0.70 (from Wisler).

d Some monthly totals estimated.

municipal and agricultural use are insignificant at this time and data are not included in tables 1 and 3.

Streamflow data used in the computations are given in streamflow records (p. 11-25). The station description under "Remarks" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent, "good" is within 10 percent, and "fair" is within 15 percent. "Poor" means that daily discharges have been less than "fair" accuracy.

## REFERENCES

Arkansas River Compact Committee, March 1972, Arkansas River Basin Compact Arkansas-Oklahoma, 1972, with Supplemental Interpretive Comments, Supplement Number 1: Austin, Tex., 31 p.

U.S. Department of Commerce, NOAA, Climatological Data-Oklahoma: Vol. 85, No. 10-12, Vol. 86, No. 1-9, October 1976 September 1977

Wisler, C. D., and Brater, E. F., 1949, Hydrology: New York, N.Y., John Wiley & Sons, Inc., 150 p.

## STREAMFLOW RECORDS

## STREAMFLOW

07165570 Arkansas River near Haskell, Okla.

LOCATION.--Lat  $35^{\circ}49'23''$ , long  $95^{\circ}38'39''$ , in NE $\frac{1}{4}$  sec. 31, T. 16 N., R. 16 E., Muskogee County, near right bank on downstream side of bridge on State Highway 104, 2.0 mi (3.2 km) east of Haskell, 23.5 mi (37.8 km) upstream from Verdigris River, and at mile 483.7 (778.3 km).

DRAINAGE AREA.--75,473 mi<sup>2</sup> (195,475 km<sup>2</sup>), of which 12,541 mi<sup>2</sup> (32,481 km<sup>2</sup>) probably is noncontributing.

AVERAGE DISCHARGE.--5 years, 11,330 ft<sup>3</sup>/s (320.9 m<sup>3</sup>/s).

EXTREMES.--June 1972 to current year: Maximum discharge, 106,000 ft<sup>3</sup>/s (3,001 m<sup>3</sup>/s) Nov. 6, 1974; minimum daily, 193 ft<sup>3</sup>/s (5.47 m<sup>3</sup>/s) Feb. 26, 1977.

REMARKS.--Records good. Flow regulated by Keystone Lake, 55.1 mi (88.7 km) upstream.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	36,322	2,670	292	1,172	72,040
November	28,814	2,410	270	960	57,150
December	32,279	2,400	296	1,041	64,030
January	35,936	3,200	347	1,159	71,280
February	15,379	1,150	193	549	30,500
March	22,378	2,560	231	722	44,390
April	19,127	1,160	254	638	37,940
May	261,309	27,600	531	8,429	518,300
June	459,320	30,500	4,320	15,310	911,100
July	290,220	17,900	1,600	9,362	575,700
August	176,318	22,100	689	5,688	349,700
September	410,373	21,400	693	13,680	814,000
Water Year 1977	1,787,775	30,500	193	4,898	3,546,000

## STREAMFLOW

07176000 Verdigris River near Claremore, Okla.

LOCATION.--Lat  $36^{\circ}18'26''$ , long  $95^{\circ}41'52''$ , in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.10, T.21 N., R.15 E., Rogers County, near left bank on downstream side of pier of bridge on State Highway 20, 2.3 mi (3.7 km) downstream from Caney River, 4.5 mi (7.2 km) west of Claremore, 12.4 mi (20.0 km) upstream from Bird Creek, and at mile 76.0 (122.3 km).

DRAINAGE AREA.--6,534 mi<sup>2</sup> (16,923 km<sup>2</sup>).

AVERAGE DISCHARGE.--27 years (water years 1936-62), 3,723 ft<sup>3</sup>/s (105.4 m<sup>3</sup>/s); 13 years (water years 1965-77), 4,117 ft<sup>3</sup>/s (116.6 m<sup>3</sup>/s).

EXTREMES.--October 1935 to current year: Maximum discharge, 182,000 ft<sup>3</sup>/s (5,150 m<sup>3</sup>/s) May 21, 1943; no flow at times in 1936, 1939-40, 1956.

REMARKS.--Records fair. Flow regulated since May 1963 by Oologah Lake 14.3 mi (23.0 km) upstream; some regulation by dams in Kansas since 1949 and by Hulah Lake since 1950.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	4,472	691	72	144	8,870
November	1,688	95	33	56.3	3,350
December	1,752	80	32	56.5	3,480
January	2,322	116	42	74.9	4,610
February	3,091	263	77	110	6,130
March	4,798	464	77	155	9,520
April	7,494	3,060	81	250	14,860
May	147,658	19,900	340	4,763	292,900
June	217,498	18,800	798	7,250	431,400
July	396,540	28,900	1,010	12,790	786,500
August	90,797	6,690	216	2,929	180,100
September	153,700	10,800	1,350	5,123	304,900
Water Year 1977	1,031,810	28,900	32	2,827	2,047,000

## STREAMFLOW

07177500 Bird Creek near Sperry, Okla.

LOCATION.--Lat  $36^{\circ}16'42''$ , long  $95^{\circ}57'14''$ , in NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec.29, T.21 N., R.13 E., Tulsa County, on downstream side of right pier of county road bridge, 1.5 mi (2.4 km) upstream from Delaware Creek, 2.4 mi (3.9 km) downstream from Hominy Creek, 2.5 mi (4.0 km) southeast of Sperry, and at mile 25.0 (40.2 km).

DRAINAGE AREA.--905 mi<sup>2</sup> (2,344 km<sup>2</sup>).

AVERAGE DISCHARGE.--39 years, 493 ft<sup>3</sup>/s (13.96 m<sup>3</sup>/s).

EXTREMES.--October 1938 to current year: Maximum discharge, 90,000 ft<sup>3</sup>/s (2,550 m<sup>3</sup>/s) Oct. 3, 1959; no flow at times in 1939, 1954-57, 1964-66, 1970.

REMARKS.--Records good.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	654.5	175	1.8	21.1	1,300
November	257.3	12	5.8	8.58	510
December	274.7	12	5.8	8.86	545
January	345.2	16	9.9	11.1	685
February	1,162.4	273	8.6	41.5	2,310
March	4,212.3	785	9.3	136	8,360
April	808	92	13	26.9	1,600
May	44,922	9,900	18	1,449	89,100
June	4,230	1,280	17	141	8,390
July	3,246.1	1,330	4.0	105	6,440
August	11,348.96	5,540	.76	366	22,510
September	16,565	3,290	18	552	32,860
Water Year 1977	88,026.46	9,900	.76	241	174,600

## STREAMFLOW

07191220 Spavinaw Creek near Sycamore, Okla.

LOCATION.--Lat  $36^{\circ}19'57''$ , long  $94^{\circ}58'24''$ , in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 21 N., R. 25 E., Delaware County, on right bank 1.8 mi (2.9 km) upstream from Cherokee Creek, 4.8 mi (7.7 km) northeast of Row, 6.5 mi (10.5 km) southeast of Sycamore, and at mile 35.0 (56.3 km).

DRAINAGE AREA.--133 mi<sup>2</sup> (344 km<sup>2</sup>).

AVERAGE DISCHARGE.--16 years, 112 ft<sup>3</sup>/s (3.172 m<sup>3</sup>/s).

EXTREMES.--October 1961 to current year: Maximum discharge, 39,800 ft<sup>3</sup>/s (1,127 m<sup>3</sup>/s) July 27, 1975; minimum, 1.2 ft<sup>3</sup>/s (0.034 m<sup>3</sup>/s) Aug. 9, 1964.

REMARKS.--Records good.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	811	34	22	26.2	1,610
November	701	25	22	23.4	1,390
December	737	31	21	23.8	1,460
January	675	26	20	21.8	1,340
February	700	28	23	25.0	1,390
March	1,753	281	22	56.5	3,480
April	1,675	148	30	55.8	3,320
May	763	30	18	24.6	1,510
June	873.8	67	8.9	29.1	1,730
July	676	39	14	21.8	1,340
August	591.7	33	9.3	19.1	1,170
September	6,344	4,660	18	211	12,580
Water Year 1977	16,300.5	4,660	8.9	44.7	32,330

## STREAMFLOW

07193500 Neosho River below Fort Gibson Lake, near Fort Gibson, Okla.

LOCATION.--Lat  $35^{\circ}51'15''$ , long  $95^{\circ}13'45''$ , in SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 19, T. 16 N., R. 20 E., Cherokee County, on left bank 1.1 mi (1.8 km) downstream from Fort Gibson Dam, 4.5 mi (7.2 km) north of Fort Gibson, and at mile 6.6 (10.6 km).

DRAINAGE AREA.--12,495 mi<sup>2</sup> (32,362 km<sup>2</sup>).

AVERAGE DISCHARGE.--27 years (1950-77), 7,790 ft<sup>3</sup>/s (220.6 m<sup>3</sup>/s).

EXTREMES.--May 1950 to current year: Maximum discharge, 223,000 ft<sup>3</sup>/s (6,320 m<sup>3</sup>/s) May 26, 1957; minimum, 12 ft<sup>3</sup>/s (0.34 m<sup>3</sup>/s) Oct. 10, 1957, Aug. 23, 1964.

REMARKS.--Records good. Flow completely regulated by Fort Gibson Lake.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	51,047	5,560	15	1,647	101,300
November	17,540	4,790	15	585	34,790
December	34,025	4,640	15	1,098	67,490
January	42,077	6,950	15	1,357	83,460
February	12,138	1,780	15	434	24,080
March	61,723	7,570	15	1,991	122,400
April	65,570	9,620	15	2,186	130,100
May	68,679	7,590	15	2,215	136,200
June	486,210	42,200	1,070	16,210	964,400
July	545,020	43,500	1,920	17,580	1,081,000
August	199,292	14,200	15	6,429	395,300
September	269,968	15,600	28	8,999	535,500
Water Year 1977	1,853,289	43,500	15	5,078	3,676,000

## STREAMFLOW

07194500 Arkansas River near Muskogee, Okla.

LOCATION.--Lat  $35^{\circ}46'10''$ , long  $95^{\circ}17'55''$ , in NW $\frac{1}{4}$  sec. 21, T. 15 N., R. 19 E., at bridge on U.S. Highway 62, 1.7 mi (2.7 km) downstream from Neosho River, 3.5 mi (5.6 km) northeast of Muskogee.

DRAINAGE AREA.--96,674 mi<sup>2</sup> (250,386 km<sup>2</sup>) of which 12,541 mi<sup>2</sup> (32,481 km<sup>2</sup>) probably is noncontributing.

REMARKS.--Gaging station discontinued Sept. 30, 1970, due to backwater conditions. Streamflow computed by combining flow at station 07165570 Arkansas River near Haskell, station 07176000 Verdigris River near Claremore, station 07177500 Bird Creek near Sperry, station 07193500 Neosho River below Fort Gibson Lake near Fort Gibson, and adjusting the total for the ungaged intervening drainage area.

Month	Monthly and yearly discharge	
	Mean (cfs)	Runoff in acre-feet
October	3,009	185,000
November	1,623	96,580
December	2,217	136,300
January	2,615	160,800
February	1,198	66,530
March	3,194	196,400
April	3,139	186,800
May	18,880	1,161,000
June	39,110	2,327,000
July	39,990	2,459,000
August	15,920	978,900
September	29,130	1,733,000
Water Year 1977	13,390	9,694,000

## STREAMFLOW

07195500 Illinois River near Watts, Okla.

LOCATION.--Lat  $36^{\circ}07'48''$ , long  $94^{\circ}34'12''$ , in NE $\frac{1}{4}$  sec. 18, T. 19 N., R. 26 E., Adair County, near right bank on downstream side of pier of bridge on U.S. Highway 59, 1.5 mi (2.4 km) north of Watts, 4.5 mi (7.2 km) downstream from Cincinnati Creek, and at mile 106.2 (170.9 km).

DRAINAGE AREA.--635 mi<sup>2</sup> (1,645 km<sup>2</sup>).

AVERAGE DISCHARGE.--22 years, 600 ft<sup>3</sup>/s (16.99 m<sup>3</sup>/s).

EXTREMES.--August 1955 to current year: Maximum discharge, 68,000 ft<sup>3</sup>/s (1,930 m<sup>3</sup>/s) July 25, 1960; minimum, 8.6 ft<sup>3</sup>/s (0.24 m<sup>3</sup>/s) Oct. 26, 1955, Sept. 19, Oct. 14, 1956.

REMARKS.--Records good. Some regulation at low flow by Lake Francis Dam, 0.8 mi (1.29 km) above station. Since July 2, 1957, small diversion above station for municipal water supply for city of Siloam Springs, Ark.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	3,973	192	108	128	7,880
November	3,908	182	112	130	7,750
December	4,178	261	105	135	8,290
January	3,849	167	106	124	7,630
February	4,616	199	135	165	9,160
March	25,339	8,410	152	817	50,260
April	12,299	1,170	187	410	24,400
May	4,469	187	114	144	8,860
June	3,455	212	86	115	6,850
July	3,723	224	81	120	7,380
August	3,016	140	72	97.3	5,980
September	10,783	3,960	78	359	21,390
Water Year 1977	83,608	8,410	72	229	165,800

## STREAMFLOW

07195800 Flint Creek at Springtown, Ark.

LOCATION.--Lat  $36^{\circ}15'20''$ , long  $94^{\circ}25'50''$ , in NW $\frac{1}{4}$  sec. 7, T. 18 N., R. 32 W., Benton County, on right bank 20 ft (6 m) downstream from State Highway 12, 0.8 mi (1.3 km) southwest of Springtown.

DRAINAGE AREA.--14.2 mi<sup>2</sup> (36.8 km<sup>2</sup>).

AVERAGE DISCHARGE.--16 years, 14.6 ft<sup>3</sup>/s (0.413 m<sup>3</sup>/s).

EXTREMES.--June 1961 to current year: Maximum discharge, 6,730 ft<sup>3</sup>/s (191 m<sup>3</sup>/s) Aug. 14, 1961; no flow for part of July 9, 29, 30, Aug. 7, 1964, result of pumpage for irrigation above gage.

REMARKS.--Records good. Some diversion for irrigation above gage.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	251.5	19	6.8	8.11	499
November	240.6	17	6.4	8.02	477
December	248.9	20	6.3	8.03	494
January	228.3	9.5	6.2	7.36	453
February	225.3	9.7	7.0	8.05	447
March	412.7	44	6.6	13.3	819
April	300.7	20	6.7	10.0	596
May	171.6	7.6	4.6	5.54	340
June	124.7	8.8	2.9	4.16	247
July	132.51	8.5	.91	4.27	263
August	113.20	7.0	.56	3.65	225
September	586.6	363	3.0	19.6	1,160
Water Year 1977	3,036.61	363	.56	8.32	6,020

## STREAMFLOW

07196900 Baron Fork at Dutch Mills, Ark.

LOCATION.--Lat  $35^{\circ}52'48''$ , long  $94^{\circ}29'11''$ , on line between secs. 21 and 22, T. 14 N., R. 33 W., Washington County, near right bank on downstream side of bridge on State Highway 59 at Dutch Mills, 2.2 mi (3.5 km) downstream from Fly Creek, and 2.9 mi (4.7 km) upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--46.0 mi<sup>2</sup> (119 km<sup>2</sup>).

AVERAGE DISCHARGE.--19 years, 40.3 ft<sup>3</sup>/s (1.141 m<sup>3</sup>/s).

EXTREMES.--April 1958 to current year: Maximum discharge, 17,100 ft<sup>3</sup>/s (484 m<sup>3</sup>/s) July 13, 1972; no flow at times in 1963, 1967.

REMARKS.--Records good.

## Monthly and yearly discharge

Month	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	131.7	12	1.1	4.25	261
November	171.5	13	2.2	5.72	340
December	193.4	44	2.0	6.24	384
January	175.9	21	2.1	5.67	349
February	351.7	39	5.6	12.6	698
March	3,560.5	1,640	8.4	115	7,060
April	717.8	109	6.4	23.9	1,420
May	100.9	7.5	1.0	3.25	200
June	10.72	.99	.12	.36	21
July	181.77	50	.21	5.86	361
August	80.46	9.0	.62	2.60	160
September	287.90	58	.90	9.60	571
Water Year 1977	5,964.25	1,640	.12	16.3	11,830

## STREAMFLOW

07245000 Canadian River near Whitefield, Okla.

LOCATION.--Lat  $35^{\circ}15'45''$ , long  $95^{\circ}14'19''$ , in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.12, T.9 N., R.19 E., Haskell County, near right bank on downstream side of pier of bridge on State Highway 2, 0.8 mi (1.3 km) north of Whitefield, 5.5 mi (8.8 km) upstream from Taleka (Snake) Creek, 8.2 mi (13.2 km) downstream from Eufaula Dam, and at mile 18.8 (30.2 km).

DRAINAGE AREA.--47,576 mi<sup>2</sup> (123,222 km<sup>2</sup>), of which 9,700 mi<sup>2</sup> (25,123 km<sup>2</sup>) is probably noncontributing.

AVERAGE DISCHARGE.--25 years (water years 1939-63), 6,005 ft<sup>3</sup>/s (170.1 m<sup>3</sup>/s); 10 years (water years 1968-77), 5,776 ft<sup>3</sup>/s (163.6 m<sup>3</sup>/s).

EXTREMES.--July 1938 to current year: Maximum discharge, 281,000 ft<sup>3</sup>/s (7,960 m<sup>3</sup>/s) May 10, 1943; minimum daily, 0.4 ft<sup>3</sup>/s (0.011 m<sup>3</sup>/s) Oct. 8, 1956.

REMARKS.--Records good. Prior to February 1964, occasional slight regulation by Conchas Lake in New Mexico and except for 54 mi<sup>2</sup> (140 km<sup>2</sup>) of intervening area, completely regulated thereafter by Eufaula Lake.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	48,195	5,250	58	1,555	95,590
November	61,816	6,820	68	2,061	122,600
December	38,425	6,150	59	1,240	76,220
January	54,943	5,930	62	1,772	109,000
February	14,541	2,810	68	519	28,840
March	17,541	2,500	60	566	34,790
April	41,281	4,310	86	1,376	81,880
May	111,955	14,000	56	3,611	222,100
June	93,434	7,200	86	3,114	185,300
July	49,161	4,770	70	1,586	97,510
August	47,504	5,440	82	1,532	94,220
September	29,209	3,340	73	974	57,940
Water Year 1977	608,005	14,000	56	1,666	1,206,000

## STREAMFLOW

07247000 Poteau River at Cauthron, Ark.

LOCATION.--Lat  $34^{\circ}55'08''$ , long  $94^{\circ}17'55''$ , in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.16, T.3 N., R.31 W., Scott County, on right bank at downstream side of highway bridge at Cauthron, 2.9 mi (4.7 km) downstream from Cross Creek, 7.8 mi (12.6 km) downstream from Jones Creek, and at mile 109.0 (175.4 km).

DRAINAGE AREA.--203 mi<sup>2</sup> (526 km<sup>2</sup>).

AVERAGE DISCHARGE.--38 years, 214 ft<sup>3</sup>/s (6.060 m<sup>3</sup>/s).

EXTREMES.--February 1939 to current year: Maximum discharge, 32,200 ft<sup>3</sup>/s (912 m<sup>3</sup>/s) May 20, 1960; no flow at times in most years.

REMARKS.--Records good. As of September 1973, flow from 74.8 mi<sup>2</sup> (194 km<sup>2</sup>) above this station is controlled by 12 floodwater-detention reservoirs with a total combined capacity of 32,660 acre-ft (40.3 hm<sup>3</sup>) below the flood spillway crests, of which 29,546 acre-ft (36.4 hm<sup>3</sup>) is flood-detention capacity, 2,100 acre-ft (2.58 hm<sup>3</sup>) is water-supply storage, and 1,014 acre-ft (1.25 hm<sup>3</sup>) is sediment-storage capacity.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	732.17	262	0.48	23.6	1,450
November	389.8	41	2.6	13.0	773
December	2,530.3	498	8.7	81.6	5,020
January	5,491.9	1,070	9.5	177	10,890
February	3,727	316	73	133	7,390
March	23,760	8,350	54	766	47,130
April	6,074	728	45	202	12,050
May	423.1	44	3.0	13.6	839
June	88.67	22	.55	2.96	176
July	77.69	10	.51	2.51	154
August	196.22	61	.51	6.33	389
September	609.71	223	.58	20.3	1,210
Water Year 1977	44,100.56	8,350	.48	121	87,470

## STREAMFLOW

07249400 James Fork near Hackett, Ark.

LOCATION.--Lat  $35^{\circ}09'45''$ , long  $94^{\circ}24'25''$ , in NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 34, T. 6 N., R. 32 W., Sebastian County, near left bank on downstream side of bridge on State Highway 45, 1.7 mi (2.7 km) south of Hackett, 2.0 mi (3.2 km) downstream from Elder Branch, 2.0 mi (3.2 km) upstream from small tributary, and 3.6 mi (5.8 km) upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--147 mi<sup>2</sup> (381 km<sup>2</sup>).AVERAGE DISCHARGE.--19 years, 129 ft<sup>3</sup>/s (3.653 m<sup>3</sup>/s).

EXTREMES.--April 1958 to current year: Maximum discharge, 30,000 ft<sup>3</sup>/s (850 m<sup>3</sup>/s) May 14, 1968; no flow Aug. 16 to Dec. 12, 1963, Sept. 14-21, 1965.

REMARKS.--Records good.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	1,083.02	288	0.65	34.9	2,150
November	783.5	84	9.5	26.1	1,550
December	1,940	290	13	62.6	3,850
January	4,142	452	21	134	8,220
February	2,868	223	55	102	5,690
March	16,350	5,450	46	527	32,430
April	2,493	284	26	83.1	4,940
May	710	36	10	22.9	1,410
June	159.66	53	.96	5.32	317
July	135.7	13	1.7	4.38	269
August	121.58	15	.23	3.92	241
September	405.66	104	.96	13.5	805
Water Year 1977	31,192.12	5,450	.23	85.5	61,870

## STREAMFLOW

07250000 Lee Creek near Van Buren, Ark.

LOCATION.--Lat  $35^{\circ}29'40''$ , long  $94^{\circ}26'58''$ , in SE $\frac{1}{4}$  sec. 21, T. 12 N., R. 27 E., Indian Meridian, Sequoyah County, Okla., on right bank 300 ft (91 m) west of Arkansas-Oklahoma State line, 3.2 mi (5.1 km) downstream from Webbers Creek, 6.8 mi (10.9 km) northwest of Van Buren, and at mile 7.8 (12.6 km).

DRAINAGE AREA.--426 mi<sup>2</sup> (1,103 km<sup>2</sup>).

AVERAGE DISCHARGE.--33 years (1930-36, 1950-77), 506 ft<sup>3</sup>/s (14.33 m<sup>3</sup>/s).

EXTREMES.--September 1930 to June 1937, October 1950 to current year:  
Maximum discharge, 80,600 ft<sup>3</sup>/s (2,280 m<sup>3</sup>/s) May 6, 1960; no flow at times.

REMARKS.--Records good.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	2,004.2	358	8.4	64.7	3,980
November	2,488	145	49	82.9	4,930
December	5,390	773	41	174	10,690
January	3,305	326	49	107	6,560
February	6,794	553	151	243	13,480
March	58,943	16,900	242	1,901	116,900
April	10,229	1,270	90	341	20,290
May	1,281	90	16	41.3	2,540
June	290.9	59	1.7	9.70	577
July	957.3	253	3.3	30.9	1,900
August	747	72	12	24.1	1,480
September	1,525	330	11	50.8	3,020
Water Year 1977	93,954.4	16,900	1.7	257	186,400

## STREAMFLOW

07250550 Arkansas River at Dam No. 13, near Van Buren, Ark.

LOCATION.--Lat  $35^{\circ}20'56''$ , long  $94^{\circ}17'54''$ , in sec. 28, T. 8 N., R. 31 W., Sebastian County, in Dam No. 13 control house on right bank, and at mile 308.9 (497.0 km).

DRAINAGE AREA.--150,547 mi<sup>2</sup> (389,917 km<sup>2</sup>), of which 22,241 mi<sup>2</sup> (57,604 km<sup>2</sup>) is probably noncontributing.

AVERAGE DISCHARGE.--50 years, 31,480 ft<sup>3</sup>/s (891.5 m<sup>3</sup>/s).

EXTREMES.--October 1927 to current year: Maximum discharge, 850,000 ft<sup>3</sup>/s (24,100 m<sup>3</sup>/s) May 12, 1943; no flow Nov. 2, 1975.

REMARKS.--Records good. Prior to October 1969, published as 07250500 Arkansas River at Van Buren. Beginning Apr. 26, 1970, daily discharge computed from relation between discharge, head, and gate openings. Flow regulated by many locks, dams, and reservoirs upstream.

Month	Monthly and yearly discharge				
	Cfs-days	Maximum daily (cfs)	Minimum daily (cfs)	Mean (cfs)	Runoff in acre-feet
October	195,259	14,200	107	6,299	387,300
November	147,743	12,300	54	4,925	293,000
December	159,732	13,400	69	5,153	316,800
January	218,204	12,500	54	7,039	432,800
February	147,839	11,300	73	5,280	293,200
March	514,780	106,000	1,490	16,610	1,021,000
April	310,064	28,300	254	10,340	615,000
May	566,171	50,800	98	18,260	1,123,000
June	1,239,760	80,400	7,460	41,330	2,459,000
July	1,357,561	82,700	131	43,790	2,693,000
August	536,551	36,300	211	17,310	1,064,000
September	931,300	39,700	17,400	31,040	1,847,000
Water Year 1977	6,324,964	106,000	54	17,330	12,550,000





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