ANNUAL YIELD AND SELECTED HYDROLOGIC DATA FOR THE ARKANSAS RIVER BASIN COMPACT ARKANSAS--OKLAHOMA

1988 WATER YEAR

By M.A. Moore, T.E. Lamb, and L.D. Hauth

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CONVERSION FACTORS

For use of readers who prefer to use metric (International System) units, rather than the inch-pound units used in this report, the following conversion factors may be used:

Multiply inch-pound unit	By	To obtain metric unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4047	square meter (m^2)
	0.004047	square kilometer (km^2)
square mile (mi^2)	2.590	square kilometer (km^2)
cubic foot (ft^3)	0.02832	cubic meter (m^3)
acre-foot (acre-ft)	1233	cubic meter (m^3)
	1.233×10^{-6}	cubic kilometer (km^3)
cubic foot per second (ft^3/s)	28.32	liter per second (L/s)
	0.02832	cubic meter per second (m^3/s)

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ABSTRACT

The computed annual yield and deficiency of the subbasins as defined in the Arkansas River Compact, Arkansas-Oklahoma, are given in tables. Actual runoff from the subbasins and depletion caused by major reservoirs in the compact area are also given in tabular form. Monthly maximum, minimum, and mean discharges are shown for the 14 streamflow stations used in computing annual yield. Water-quality data are shown for the Arkansas River at Dam No. 13, near Van Buren, Arkansas, and Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma.

INTRODUCTION

The computed annual yields for subbasins in the Arkansas River basin as defined in the Arkansas River Basin Compact, Arkansas-Oklahoma, 1972, are presented in this report. The area included in the Compact is shown in figure 1. Water-quality data for the Arkansas River at Dam No. 13 near Van Buren, Arkansas, and Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma, are also included in the report.

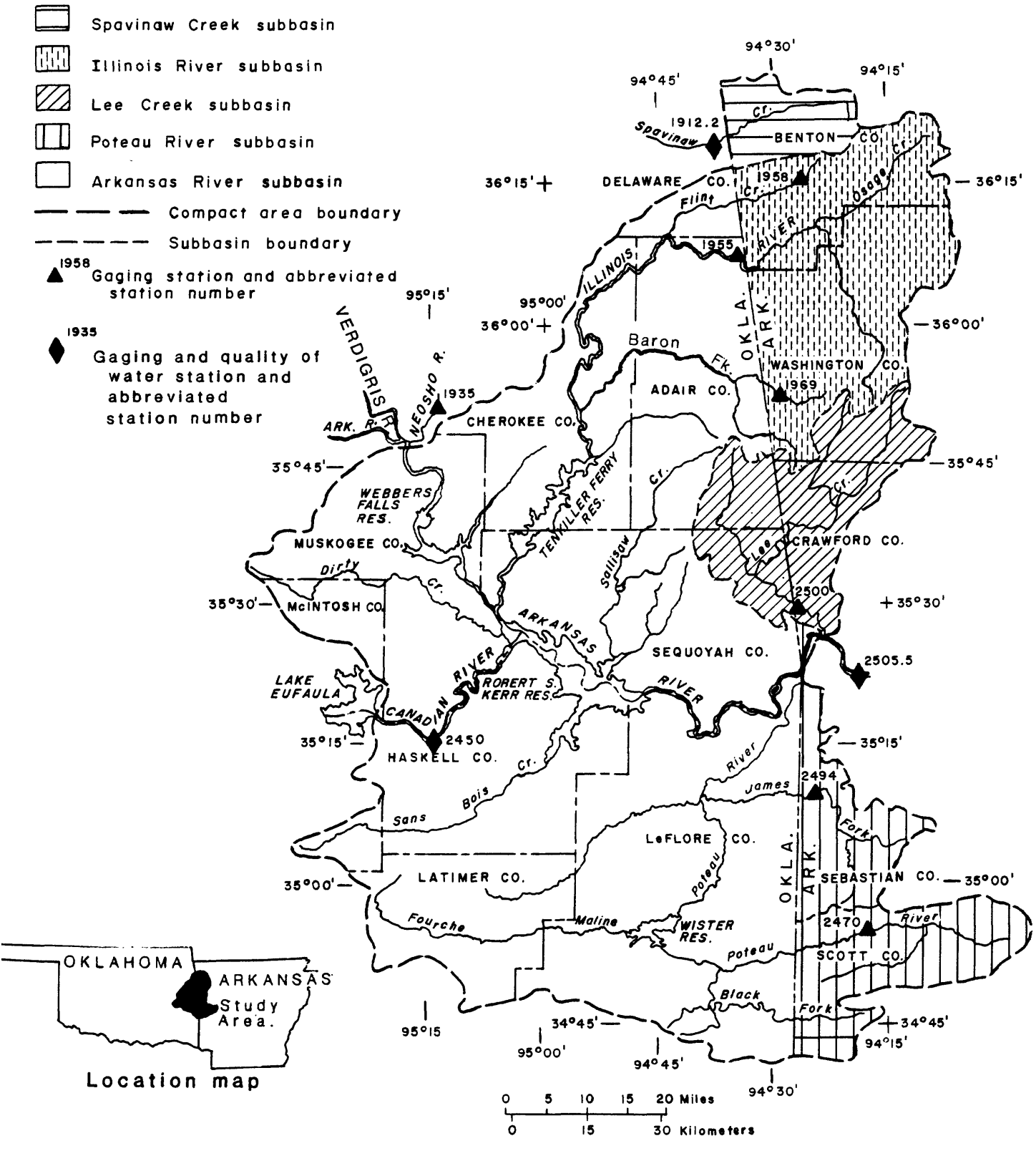

Figure 1.--Arkansas-Oklahoma Arkansas River Basin Compact area and subbasins.

This report was prepared by the U.S. Geological Survey in cooperation with the Arkansas-Oklahoma Arkansas River Compact Commission. Streamflow data were furnished by the Arkansas and Oklahoma Districts, U.S. 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 Wister Reservoirs. Water-quality data were provided by the U.S. Geological Survey.

DEFINITION OF TERMS

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

The term "Arkansas River Basin" means all of the drainage basin of the Arkansas River and its tributaries from a point immediately downstream from the confluence of the Neosho River with the Arkansas River (fig. 1) to a point immediately downstream from the confluence of Lee Creek with the Arkansas River, together with the drainage basin of Spavinaw Creek in Arkansas (top of fig. 1), but excludes that part of the drainage basin of the Canadian River upstream from 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 is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet.

Bacteria are microscopic unicellular organisms, typically spherical, rod-like, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Fecal coliform bacteria are present in the intestines or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all the organisms that produce blue colonies within 24 hours when incubated at $44.5^{\circ}C \pm 0.2^{\circ}C$ on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters (mL) of sample.

Fecal streptoccocal bacteria also are present in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, coccoid bacteria that are capable of growth in brain-heart infusion broth. These bacteria also are defined as all the organisms that produce red or pink colonies within 48 hours at $35^{\circ}C \pm 0.5^{\circ}C$ on KF-streptococcus agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Code numbers have been assigned for agencies collecting and analyzing samples, and are listed in water-quality tables of this report as follows:

1028 Oklahoma District, WRD, U.S. Geological Survey

80513 Arkansas District, WRD, U.S. Geological Survey

80020 National Water Quality Laboratory, WRD, U.S. Geological Survey

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 foot per second is the rate of discharge representing a volume of 1 cubic foot passing a specified point during 1 second.

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.

Dissolved refers to the material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved oxygen content of water in equilibrium with air is a function of atmospheric pressure and temperature and the dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved solids, with small temperature changes having the more significant effect. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen concentration in water of some streams.

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.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from, water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 feet above the bed), expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge by milligrams per liter by 0.0027.

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Sodium-absorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. Water varies, in respect to sodium hazard, from that which can be used for irrigation on almost all soils to that which generally is unsatisfactory for irrigation.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids concentration of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating that the sample consists of a water-suspended-sediment mixture and that the analytical method determines all of the constituent in the sample.)

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 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. Depletion caused by small reservoirs and minor diversion for municipal and agricultural use are considered insignificant at this time and data are not included in tables 1 and 3.

A compilation of the areas and capacities of lakes and ponds in Arkansas, updated in 1981, conducted by the Arkansas Soil and Water Conservation Commission was used to evaluate depletions caused by small reservoirs in the Poteau River, Lee Creek, Spavinaw Creek, and Illinois River subbasins. Analysis shows that their impact on the depletions in any subbasin, except Illinois River, is probably insignificant and further consideration is not necessary at this time. Total storage capacity in the Illinois River subbasin is 27,700 acre-feet of which 18,300 acre-feet is in one lake. There is not enough information presently collected to evaluate the magnitude of depletions in the Illinois River subbasin.

Streamflow data used in the computations are given in hydrologic station records (p. 15 to 36). 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 of the actual discharge, "good" means within 10 percent, and "fair" means within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Table 1.--Annual yield and deficiency for the subbasins as defined in the Arkansas-Oklahoma Arkansas River Basin Compact

[Average annual flow in cubic feet per second for 1988 water year]

Subbasin	Actual runoff from the subbasins	Total depletions (+) or accretions (-)	Annual yield	Percent depletion allowed	Minimum required flow	Deficiency
Spavinaw Creek	126	0	126	50	63	0
Illinois River	912	0	912	60	365	0
Lee Creek	682	0	682	100	0	0
Poteau River	464	0	464	60	186	0
Arkansas River	3,600	-499	3,101	60	1,240	0

Table 2.--Acutal runoff from the subbasins

[Mean discharge in cubic feet per second for the 1988 water year; D.A. = drainage area]

Month	Spavinaw Creek D.A.=135 square miles[a]	Illinois River D.A.=744 square miles[b]	Lee Creek D.A.=464 square miles[c]	Poteau River D.A.=536 square miles[d]	Arkansas River D.A.=4,553 square miles[e]
October	32	228	32	5	-1,047
November	84	831	742	136	3,025
December	409	3,270	2,590	2,200	14,350
January	140	1,080	622	604	16,610
February	109	648	436	599	-647
March	290	2,390	2,140	707	9,589
April	258	1,480	1,500	1,180	8,369
May	84	355	79	72	-527
June	31	188	9	9	-3,068
July	24	181	9	9	-2,415
August	16	115	0	23	-157
September	16	121	9	11	-1,459
1988 water year	126	912	682	464	3,600
1988 water year (acre-feet)	91,470	662,100	495,100	336,800	2,613,000

[a] Includes 31 square miles ungaged.

[b] Includes 63 square miles ungaged.

[c] Includes 38 square miles ungaged.

[d] Includes 125 square miles ungaged.

[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 ground water, and evaporation from reservoirs.

Table 3.--Annual depletion caused by major reservoirs

[1988 water year]

Reservoir	Year-end contents (acre-feet)	Change in contents in water year (acre-feet)	Precipitation on reservoir surface (inch)[a]	Evaporation from reservoir (inch)[b]	Depletion (acre-feet)	Depletion (Average annual cubic feet per second)
Webbers Falls-----	163,200	-5,500	39.74	72.43	+32,860	+45
Tenkiller Ferry---	618,200	-290,500	44.75	61.46	-254,600	-351
Robert S. Kerr----	486,800	-24,700	37.54	65.75	+102,900	+142
Wister----------	41,060	-270,300	45.49	58.45	-242,400	-335

[a] From U.S. Corps of Engineers, Tulsa District.

[b] Adjusted for pan coefficient of 0.70 (from Wisler and Brater, 1949).

SELECTED REFERENCES

Arkansas River Compact Committee, 1972, Arkansas River Basin Compact Arkansas-Oklahoma, 1972, with Supplemental Interpretive Comments, Supplement No. 1: Austin, Texas, 31 p.

Arkansas Soil and Water Conservation Commission, 1981, Arkansas State Water Plan - Lakes of Arkansas, 157 p.

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

HYDROLOGIC STATION RECORDS

07165570 Arkansas River near Haskell, Oklahoma

LOCATION.--Lat 35°49'23", long 95°38'39", in NE 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 east of Haskell, 23.5 mi upstream from Verdigris River, and at mile 483.7.

DRAINAGE AREA.--75,473 mi^2, of which 12,541 mi^2 probably is noncontributing.

AVERAGE DISCHARGE.--16 years, 10,060 ft^3/s.

EXTREMES.--June 1972 to current year: Maximum discharge, 259,000 ft^3/s Oct. 6, 1986; minimum daily, 87 ft^3/s Sept. 13, 1988.

REMARKS.--Records good. Flow regulated by Keystone Lake, 55.1 mi upstream.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	254,700	28,500	1,040	8,216	505,200
November	102,550	12,400	1,110	3,418	203,400
December	284,570	23,900	2,160	9,180	564,400
January	526,460	31,800	9,000	16,980	1,044,000
February	335,170	14,400	6,930	11,560	664,800
March	700,140	41,100	8,740	22,590	1,389,000
April	997,600	49,800	19,800	33,250	1,979,000
May	361,530	28,000	2,620	11,660	717,100
June	152,220	14,300	1,380	5,074	301,900
July	111,573	9,700	622	3,599	221,300
August	59,423	5,940	116	1,917	117,900
September	117,878	15,100	87	3,929	233,800
Water Year 1988	4,003,814	49,800	87	10,940	7,942,000

07176000 Verdigris River near Claremore, Oklahoma

LOCATION.--Lat 36°18'26", long 95°41'52", in SE 1/4 SW 1/4 sec.10, T.21 N., R.15 E., Rogers County, near left bank on downstream side of bridge on State Highway 20, 2.3 mi downstream from Caney River, 4.5 mi west of Claremore, 12.4 mi upstream from Bird Creek, and at mile 76.0.

DRAINAGE AREA.--6,534 mi^2.

AVERAGE DISCHARGE.--27 years (water years 1936-62), 3,723 ft^3/s; 24 years (water years 1965-88), 4,471 ft^3/s.

EXTREMES.--October 1935 to current year: Maximum discharge, 182,000 ft^3/s May 21, 1943; no flow at times in 1936, 1939-40, 1956.

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

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	5,210	436	119	168	10,330
November	47,815	10,500	122	1,594	94,840
December	234,480	15,900	1,020	7,564	465,100
January	322,250	20,400	5,310	10,400	639,200
February	105,610	6,470	1,220	3,642	209,500
March	328,370	20,200	1,210	10,590	651,300
April	756,100	30,000	12,700	25,200	1,500,000
May	133,538	16,000	323	4,308	264,900
June	5,750	438	29	192	11,410
July	2,624	338	33	84.6	5,200
August	2,020	145	41	65.2	4,010
September	26,200	4,250	51	873	51,970
Water Year 1988	1,969,967	30,000	29	5,382	3,907,000

STREAMFLOW

07177500 Bird Creek near Sperry, Oklahoma

LOCATION.--Lat 36°16'42", long 95°57'14", in NW 1/4 NW 1/4 sec.29, T.21 N., R.13 E., Tulsa County, on downstream side of county road bridge, 1.5 mi upstream from Delaware Creek, 2.4 mi downstream from Hominy Creek, 2.5 mi southeast of Sperry, and at mile 25.0.

DRAINAGE AREA.--905 mi^2.

AVERAGE DISCHARGE.--50 years, 530 ft^3/s.

EXTREMES.--October 1938 to current year: Maximum discharge, 90,000 ft^3/s Oct. 3, 1959; no flow at times in 1939, 1954-57, 1964-66, 1970.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	11,609	1,260	16	374	23,030
November	19,792	8,960	38	660	39,260
December	51,582	11,300	115	1,664	102,300
January	19,101	3,110	213	616	37,890
February	6,228	642	62	215	12,350
March	63,183	8,570	86	2,038	125,300
April	106,933	16,300	448	3,564	212,100
May	5,831	438	80	188	11,570
June	5,059	308	148	169	10,030
July	6,221	750	143	201	12,340
August	4,974	206	149	160	9,870
September	10,468	2,730	140	349	20,760
Water Year 1988	310,981	16,300	16	850	616,800

STREAMFLOW

07191220 Spavinaw Creek near Sycamore, Oklahoma

LOCATION.--Lat 36°20'07", long 94°38'24", in NE 1/4 NW 1/4 sec.4, T.21 N., R.25 E., Delaware County, on right bank 1.8 mi upstream from Cherokee Creek, 4.8 mi northeast of Row, 6.5 mi southeast of Sycamore, and at mile 35.0.

DRAINAGE AREA.--133 mi^2.

AVERAGE DISCHARGE.--27 years, 109 ft^3/s.

EXTREMES.--October 1961 to current year: Maximum discharge, 39,800 ft^3/s July 27, 1975; minimum, 1.2 ft^3/s Aug. 9, 1964.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	988	71	17	31.9	1,960
November	2,484	260	25	82.8	4,930
December	12,503	1,950	43	403	24,800
January	4,289	214	108	138	8,510
February	3,113	157	80	107	6,170
March	8,864	1,650	113	286	17,580
April	7,636	773	124	255	15,150
May	2,539	120	53	81.9	5,040
June	924	50	22	30.8	1,830
July	759	33	16	24.5	1,510
August	513	26	12	16.5	1,020
September	469	24	10	15.6	930
Water Year 1988	45,081	1,950	10	123	89,420

07193500 Neosho River below Fort Gibson Lake, near Fort Gibson, Oklahoma

LOCATION.--Lat 35°51'15", long 95°13'45", in SE 1/4 NW 1/4 sec.19, T.16 N., R.19 E., Cherokee County, on left bank 1.1 mi downstream from Fort Gibson Dam, 4.5 mi north of Fort Gibson, and at mile 6.6.

DRAINAGE AREA.--12,495 mi^2.

AVERAGE DISCHARGE.--38 years (1950-88), 8,425 ft^3/s.

EXTREMES.--May 1950 to current year: Maximum discharge, 223,000 ft^3/s May 26, 1957; minimum, 12 ft^3/s Oct. 10, 1957, Aug. 23, 1964.

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

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	45,679	6,530	15	1,474	90,600
November	241,334	32,700	15	8,044	478,700
December	752,730	64,400	3,060	24,280	1,493,999
January	750,450	63,000	8,050	24,210	1,489,000
February	237,890	12,400	,180	8,203	471,900
March	484,000	30,700	4,190	15,610	960,000
April	1,000,500	54,200	12,800	33,350	1,984,000
May	120,219	14,200	15	3,878	238,500
June	38,219	5,330	15	1,274	75,810
July	69,747	9,770	15	2,250	138,300
August	33,966	5,150	15	1,096	67,370
September	62,762	6,910	15	2,092	124,500
Water Year 1988	3,837,496	64,400	15	10,480	7,612,000

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Water years 1952 to current year

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1951 to September 1963, October 1973 to January 1982.
WATER TEMPERATURE: October 1951 to September 1963, October 1973 to Janauary 1982.

REMARKS: Samples were collected on a 6 week schedule and specific conductance, pH, water temperature, dissolved oxygen and alkalinity were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 496 microsiemens September 7, 1975; minimum daily 188 microsiemens October 18, 1974.

WATER TEMPERATURE: Maximum daily, 31.5°C July 31, August 1, 1955; minimum daily, 0.0°C January 23-25, 1962.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

[Five-digit numbers in parentheses are STORET parameter codes used for computer storage of data; MM = millimeter; CFS = cubic feet per second; FTU = nephelometric units; US/CM = microsiemens per centimeter at 25 degrees Celsius; MG/L = micrograms per liter; WW WAT TOT FLD = whole water total field; UG/L = micrograms per liter; UM-MF = micrometer membrane filter; MG/L = milligrams per liter; K = plate count outside ideal range; IT-FLD = incremental titration-field; UG/L = micrograms per liter; T/DAY = tons per day]

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	GAGE HEIGHT (FEET) (00065)	TURBIDITY (FTU) (00076)
OCT 1987									
06...	1045	19.0	21.5	750	1,028	80,020	259	6.98	2.2
NOV 1987									
18...	1320	11.0	3.5	--	1,028	1,028	6,670	8.40	--
JAN 1988									
11...	1420	8.5	4.0	740	1,028	80,020	--	11.76	18
FEB 1988									
09...	1100	7.5	8.5	--	1,028	80,020	5,360	7.98	19
MAR 1988									
22...	1115	12.5	23.5	--	1,028	1,028	13,600	10.92	--
APR 1988									
19...	1115	16.0	14.5	740	1,028	80,020	37,900	16.95	8.2
JUN 1988									
08...	1530	23.0	30.0	740	1,028	80,020	--	7.88	7.7
SEP 1988									
08...	1630	24.5	31.0	745	1,028	80,020	--	5.29	1.6

DATE	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	BICARBONATE WATER WH FET FIELD MG/L AS HCO3 (00440)	CARBONATE WATER WH FET FIELD MG/L AS CO3 (00445)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)
OCT 1987										
06...	293	7.6	83	7.93	8.30	2.2	96	120	0	0.58
NOV 1987										
18...	281	--	--	7.66	--	--	--	--	--	--
JAN 1988										
11...	454	12.7	112	8.25	8.00	.7	68	83	--	.41
FEB 1988										
09...	289	--	--	7.95	8.10	--	--	--	--	.33
MAR 1988										
22...	245	--	--	8.01	--	--	--	--	--	--
APR 1988										
19...	338	9.3	97	7.87	7.70	2.3	86	100	0	.52
JUN 1988										
08...	240	5.0	60	7.60	8.00	3.8	79	96	0	.94
SEP 1988										
08...	255	9.1	112	8.20	7.80	1.0	85	100	0	.53

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA--CONTINUED

WATER-QUALITY RECORDS DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHOROUS ORGANIC TOTAL (MG/L AS P) (00670)
OCT 1987 06...	--	0.020	--	--	0.60	--	--	0.070	0.030	0.07
NOV 1987 18...	--	--	--	--	--	--	--	--	--	--
JAN 1988 11...	--	.090	--	--	.50	--	--	.090	.060	.09
FEB 1988 09...	0.070	.070	0.040	0.760	.40	0.800	0.09	.090	.060	.09
MAR 1988 22...	--	--	--	--	--	--	--	--	--	--
APR 1988 19...	.010	.080	< .010	--	.60	< .100	--	.070	.050	.07
JUN 1988 08...	.100	.060	< .010	--	1.0	.470	--	.050	.010	.05
SEP 1988 08...	.070	.070	.020	.080	.60	.100	.09	.070	.030	.07

DATE	HARDNESS TOTAL (MG/L AS CACO3) (00900)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)	SODIUM PERCENT (00932)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P) (00671)	PHOSPHOROUS ORGANIC DISSOLVED (MG/L AS P) (00673)
OCT 1987 06...	130	34	40	7.2	10	0.4	14	3.4	--	0.03
NOV 1987 18	--	0	--	--	--	--	--	--	--	--
JAN 1988 11...	100	33	32	5.0	6.5	0.3	12	3.2	--	.06
FEB 09...	94	26	30	4.6	6.4	0.3	13	2.7	0.030	.03
MAR 1988 22	--	0	--	--	--	--	--	--	--	--
APR 1988 19...	120	37	40	5.5	7.9	0.3	12	2.3	< .010	.05
JUN 1988 08...	110	31	36	4.8	7.2	0.3	12	2.6	< .010	.01
SEP 1988 08...	110	22	34	5.4	8.7	0.4	15	3.0	.030	.0

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
OCT 1987 06...	11	38	0.30	2.0	1	63	<0.5	<1	<1	<3
NOV 1987 18...	--	--	--	--	--	--	--	--	--	--
JAN 1988 11...	6.7	31	.20	5.5	<1	46	< .5	<1	<1	<3
FEB 1988 09...	9.1	27	.20	11	--	--	--	--	--	--
MAR 1988 22...	--	--	--	--	--	--	--	--	--	--
APR 1988 19...	7.8	43	.20	6.0	<1	49	< .5	<1	<1	<3
JUN 1988 08...	10	34	.30	3.7	--	--	--	--	--	--
SEP 1988 08...	12	30	.10	4.1	1	50	< .5	3	2	<3

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA--CONTINUED

WATER-QUALITY RECORDS DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC DIS-SOLVED (UG/L) AS ZN (01090)
OCT 1987 06...	1	19	10	1	<10	<1	<1.0	240	<6	22
NOV 1987 18	--	--	--	--	--	--	--	--	--	--
JAN 1988 11...	3	24	<5	14	<10	5	<1.0	140	<6	18
FEB 1988 09...	--	--	--	--	--	--	--	--	--	--
MAR 1988 22	--	--	--	--	--	--	--	--	--	--
APR 1988 19...	1	6	<5	5	<10	2	<1.0	160	<6	6
JUN 1988 08...	--	--	--	--	--	--	--	--	--	--
SEP 1988 08...	3	21	<5	1	<10	<1	1.0	160	<6	29

DATE	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SED. SUSP. SIEVE DIAMETER PERCENT FINER THAN .062 MM (70331)
OCT 1987 06...	<10	9	<1	--	--	178	170	124	0.24	4
NOV 1987 18	--	--	--	--	--	--	--			
JAN 1988 11...	20	<4	<1	--	--	138	131	0.0	.19	92
FEB 1988 09...	--	--	--	--	--	143	135	2,070	.19	54
MAR 1988 22	--	--	--	--	--	--	--	--	--	--
APR 1988 19...	<10	9	<1	6	16	167	165	17,100	.23	52
JUN 1988 08...	--	--	--	16	4	147	148	.0	.20	--
SEP 1988 08...	29	6	<1	18	52	159	149	.0	.22	--

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA--CONTINUED

WATER-QUALITY RECORDS DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, NITRITE DISSOLVED (MG/L AS NO2) (71856)	MERCURY DISSOLVED (UG/L AS HG) (71890)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	DRAINAGE AREA (SQ. MI.) (81024)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ALKALINITY LAB (MG/L AS CACO3) (90410)
OCT 1987									
06...	--	--	<0.1	484	165	115	12,495	307	100
NOV 1987									
18...	--	--	--	484	--	--	12,495	--	--
JAN 1988									
11...	--	--	< .1	484	12	0.0	12,495	238	73
FEB 1988									
09...	0.09	0.13	--	484	67	970	12,495	234	68
MAR 1988									
22...	--	--	--	484	--	--	12,495	--	--
APR 1988									
19...	.01	--	.5	484	22	2250	12,495	283	87
JUN 1988									
08...	.13	--	--	484	--	--	12,495	259	80
SEP									
08...	.09	.07	< .1	484	--	--	12,495	258	86

07194500 Arkansas River near Muskogee, Oklahoma

LOCATION.--Lat 35°46'10", long 95°17'55", in NW 1/4 sec.21, T.15 N., R.19 E., Muskogee County, at bridge on U.S. Highway 62, 1.7 mi downstream from Neosho River, 3.5 mi northeast of Muskogee.

DRAINAGE AREA.--96,674 mi^2 of which 12,541 mi^2 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.

Monthly and yearly discharge

Month	Mean (ft^3/s)	Runoff in acre-feet
October	10,750	661,000
November	14,640	871,200
December	45,020	2,768,000
January	53,070	3,263,000
February	23,920	1,376,000
March	53,680	3,301,000
April	100,400	5,974,000
May	20,300	1,248,000
June	6,950	413,600
July	6,414	394,400
August	3,466	213,100
September	7,737	460,400
Water Year 1988	28,840	20,940,000

07195500 Illinois River near Watts, Oklahoma

LOCATION.--Lat 36°07'48", long 94°34'12", in NE 1/4 sec.18, T.19 N., R.26 E., Adair County, near right bank on downstream side of bridge on U.S. Highway 59, 1.5 mi north of Watts, 4.5 mi downstream from Cincinnati Creek, and at mile 106.2.

DRAINAGE AREA.--635 mi^2.

AVERAGE DISCHARGE.--33 years, 591 ft^3/s.

EXTREMES.--August 1955 to current year: Maximum discharge, 68,000 ft^3/s July 25, 1960; minimum, 8.6 ft^3/s Oct. 26, 1955, Sept. 19, Oct. 14, 1956.

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

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	6,891	473	135	222	13,670
November	21,917	2,730	180	731	43,470
December	86,377	17,400	337	2,786	171,300
January	29,491	1,610	566	951	58,500
February	16,337	1,080	408	563	32,400
March	64,198	11,100	486	2,071	127,300
April	37,951	4,250	522	1,265	75,280
May	10,433	502	231	337	20,690
June	5,803	345	145	193	11,510
July	5,641	312	118	182	11,190
August	3,569	156	85	115	7,080
September	3,543	158	85	118	7,030
Water Year 1988	292,151	17,400	85	798	579,500

07195855 Flint Creek near West Siloam Springs, Oklahoma

LOCATION.--Lat 36°12'58", long 94°36'15", in NE 1/4 NE 1/4 sec.14, T.20 N., R.25 E., Delaware County, on left bank 180 ft downstream from county bridge, 2.5 mi from Arkansas-Oklahoma State line, northwest of Siloam Springs, Okla.

DRAINAGE AREA.--59.8 mi^2.

AVERAGE DISCHARGE.--9 years, 44.8 ft^3/s.

EXTREMES.--June 1979 to current year: Maximum discharge, 5,590 ft^3/s Dec. 21, 1984; minimum daily, 0.40 ft^3/s Aug. 7, 1980.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	649	44	13	20.9	1,290
November	1,332	129	15	44.4	2,640
December	6,362	748	34	205	12,620
January	2,710	163	58	87.4	5,380
February	1,505	68	41	51.9	2,990
March	4,497	918	53	145	8,920
April	3,114	282	40	104	6,180
May	817	39	17	26.4	1,620
June	440.5	27	9.6	14.1	874
July	402.8	19	9.8	13.0	799
August	306.9	16	7.6	9.90	609
September	248.3	14	6.4	8.28	493
Water Year 1988	22,384.5	918	6.4	61.2	44,400

07196900 Baron Fork at Dutch Mills, Arkansas

LOCATION.--Lat 35°52'48", long 94°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 downstream from Fly Creek, and 2.9 mi upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--46.0 mi^2.

AVERAGE DISCHARGE.--30 years, 40.7 ft^3/s.

EXTREMES.--April 1958 to current year: Maximum discharge, 20,900 ft^3/s Nov. 18, 1985; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	110.6	21	1.2	3.57	219
November	1,550.9	433	4.0	51.7	3,080
December	6,852	1,810	13	221	13,590
January	1,747	132	30	56.4	3,470
February	1,031	127	19	35.6	2,040
March	4,723	833	24	152	9,370
April	2,818	449	25	93.9	5,590
May	332.6	22	4.0	10.7	660
June	45.52	4.7	.13	1.52	90
July	33.94	11	.19	1.09	67
August	32.73	4.1	.23	1.06	65
September	60.12	25	.26	2.00	119
Water Year 1988	19,337.41	1,810	0.13	52.8	38,360

STREAMFLOW

07245000 Canadian River near Whitefield, Oklahoma

LOCATION.--Lat 35°15'45", long 95°14'19", in SE 1/4 SE 1/4 sec.12, T.9 N., R.19 E., Haskell County, near right bank on downstream side of bridge, on State Highway 2, 0.8 mi north of Whitefield, 5.5 mi upstream from Taleka (Snake) Creek, 8.2 mi downstream from Eufaula Dam, and at mile 18.8.

DRAINAGE AREA.--47,576 mi^2, of which 9,700 mi^2 is probably noncontributing.

AVERAGE DISCHARGE.--25 years (water years 1939-63), 6,005 ft^3/s; 21 years (water years 1968-88), 5,864 ft^3/s.

EXTREMES.--July 1938 to current year: Maximum discharge, 281,000 ft^3/s May 10, 1943; minimum daily, 0.4 ft^3/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^2 of intervening area, completely regulated thereafter by Eufaula Lake.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	59,557	6,880	83	1,921	118,100
November	53,581	8,090	45	1,786	106,300
December	361,776	41,800	57	11,670	717,600
January	628,520	40,100	8,220	20,270	1,247,000
February	192,970	11,700	2,940	6,654	382,800
March	465,890	30,000	5,760	15,030	924,100
April	608,500	35,300	6,230	20,280	1,207,000
May	180,464	12,900	306	5,821	358,000
June	17,989	2,060	143	600	35,680
July	8,015	1,770	103	259	15,900
August	65,990	6,360	118	2,129	130,900
September	18,379	2,500	161	613	36,450
Water Year 1988	2,661,631	41,800	45	7,272	5,279,000

07247000 Poteau River at Cauthron, Arkansas

LOCATION.--Lat 34°55'08", long 94°17'55", in NW 1/4 SW 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 downstream from Cross Creek, 7.8 mi downstream from Jones Creek, and at mile 109.0.

DRAINAGE AREA.--203 mi^2.

AVERAGE DISCHARGE.--49 years, 217 ft^3/s.

EXTREMES.--February 1939 to current year: Maximum discharge, 32,200 ft^3/s May 20, 1960; no flow at times in most years.

REMARKS.--Records good. As of September 1974, flow from 92.2 mi^2 above this station is controlled by 16 floodwater-detention reservoirs with a total combined capacity of 39,082 acre-ft below the flood spillway crests, of which 33,524 acre-ft is flood-detention capacity, 2,100 acre-ft is water-supply storage, and 3,458 acre-ft is sediment-storage capacity.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	41.30	4.3	0.46	1.33	82
November	1,849.3	421	1.1	61.6	3,670
December	25,740	7,230	27	830	51,060
January	6,729	530	77	217	13,350
February	5,834	1,220	57	201	11,570
March	8,377	531	111	270	16,620
April	12,303	2,290	75	410	24,400
May	743.1	68	2.0	24.0	1,470
June	70.65	20	.87	2.35	140
July	102.09	44	.52	3.29	202
August	311.1	59	1.1	10.0	617
September	126.17	24	.97	4.21	250
Water Year 1988	62,226.71	7,230	.46	170	123,400

07249400 James Fork near Hackett, Arkansas

LOCATION.--Lat 35°09'45", long 94°24'25", in NW 1/4 NW 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 south of Hackett, 2.0 mi downstream from Elder Branch, 2.0 mi upstream from small tributary, and 3.6 mi upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--147 mi^2.

AVERAGE DISCHARGE.--30 years, 133 ft^3/s.

EXTREMES.--April 1958 to current year: Maximum discharge, 30,000ft^3/s May 14, 1968; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	51.79	3.7	0.87	1.67	103
November	740.3	149	1.4	24.7	1,470
December	18,877	5,120	17	609	37,440
January	5,585	665	61	180	11,080
February	5,731	1,490	59	198	11,370
March	5,913	626	65	191	11,730
April	11,082	2,840	54	369	21,980
May	751	51	12	24.2	1,490
June	140.6	13	1.7	4.69	279
July	57.90	3.9	.60	1.87	115
August	146.80	7.4	1.8	4.74	291
September	86.65	20	.60	2.89	172
Water Year 1988	49,163.04	5,120	.60	134	97,510

07250000 Lee Creek near Van Buren, Arkansas

LOCATION.--Lat 35°29'40", long 94°26'58", in SE 1/4 sec.21, T.12 N., R.27 E., Indian Meridian, Sequoyah County, Okla., on right bank 300 ft west of Arkansas-Oklahoma State line, 3.2 mi downstream from Webbers Creek, 6.8 mi northwest of Van Buren, and at mile 7.8.

DRAINAGE AREA.--426 mi^2.

AVERAGE DISCHARGE.--44 years (1930-36, 1950-88), 509 ft^3/s.

EXTREMES.--September 1930 to June 1937, October 1950 to current year: Maximum discharge, 80,600 ft^3/s May 6, 1960; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	928.7	118	8.3	30.0	1,840
November	20,504	4,380	30	683	40,670
December	73,704	12,300	212	2,378	146,200
January	17,674	1,040	307	570	35,060
February	11,644	1,010	218	402	23,100
March	61,038	11,200	340	1,969	121,100
April	41,317	8,810	283	1,377	81,950
May	2,213	256	16	71.4	4,390
June	316.3	24	3.6	10.5	627
July	287.6	74	1.0	9.28	570
August	48.61	5.6	.23	1.57	96
September	226.72	107	.18	7.56	450
Water Year 1988	229,901.93	12,300	.18	628	456,000

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

LOCATION.--Lat 35°20'56", long 94°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.

DRAINAGE AREA.--150,547 mi^2, of which 22,241 mi^2 is probably noncontributing.

AVERAGE DISCHARGE.--61 years, 32,360 ft^3/s.

EXTREMES.--October 1927 to current year: Maximum discharge, 850,000 ft^3/s May 12, 1943; no flow Nov. 2, 1975, Feb. 1, 1981, Oct. 17, 1987

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.

Monthly and yearly discharge

Month	Total (ft^3/s)	Maximum daily (ft^3/s)	Minimum daily (ft^3/s)	Mean (ft^3/s)	Runoff in acre-feet
October	368,542	30,700	0	11,890	731,000
November	634,901	75,100	416	21,160	1,259,000
December	2,452,200	186,000	27,600	79,100	4,864,000
January	2,860,100	148,000	41,900	92,260	5,673,000
February	916,700	53,100	18,100	31,610	1,818,000
March	2,589,600	130,000	19,600	83,540	5,136,000
April	3,995,800	160,000	74,400	133,200	7,926,000
May	808,969	73,500	92	26,100	1,605,000
June	140,637	13,200	61	4,680	279,000
July	138,153	14,100	30	4,457	274,000
August	172,864	12,400	261	5,576	342,900
September	210,962	22,000	92	7,032	418,400
Water Year 1988	15,289,428	186,000	0	41,770	30,330,000

07250550 ARKANSAS RIVER AT DAM NO. 13, NEAR VAN BUREN, ARKANSAS
(National tritium station)
(National stream-quality accounting network station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--Oct. 1969 to current water year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Oct. 1969 to Sept. 1981.
WATER TEMPERATURES: Oct. 1969 to Sept. 1972, Mar. 1974 to Sept. 1981.
SUSPENDED SEDIMENT DISCHARGE: Oct. 1970 to Sept. 1981.

INSTRUMENTATION.--Water-quality monitor Dec. 1969 to Sept. 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

[Five-digit numbers in parentheses are STORET parameter codes used for computer storage of data; CFS = cubic feet per second; US/CM = microsiemens per centimeter at 25 degrees Celsius; FTU = nephelometric units; MG/L = milligrams per liter; MM = millimeters; UM-MF = micrometer membrane filter; AC-FT = acre-feet, UG/L = micrograms per liter; T/DAY = tons per day]

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (FTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV 1987									
04...	1015	80513	80020	398	1,140	8.15	17.5	5.0	10.2
JAN 1988									
13...	1130	80513	80020	86,500	410	7.60	2.5	24	--
MAR 1988									
04...	0915	80513	80020	56,900	715	8.05	9.0	30	10.6
MAY 1988									
24...	0745	80513	80020	1,640	850	7.82	22.0	14	6.7
JUN 1988									
21...	1000	80513	80020	450	890	8.25	27.5	2.6	7.4
JUL 1988									
26...	1000	80513	80020	3,880	1,140	8.35	28.0	4.1	7.2

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	BAROMETRIC PRESSURE (MM OF HG) (00025)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)
NOV 1987									
04...	108	756	K310	6	230	61	18	140	57
JAN 1988									
13...	--	760	200	110	110	30	8.3	36	41
MAR 1988									
04...	92	760	K360	300	140	38	9.8	76	54
MAY 1988									
24...	78	751	8	14	190	52	14	90	51
JUN 1988									
21...	94	760	12	110	200	55	16	99	51
JUL 1988									
26...	93	758	3	48	220	55	19	150	60

07250550 ARKANSAS RIVER AT DAM NO. 13, NEAR VAN BUREN, ARKANSAS--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT FET FIELD MG/L AS CACO3 (00418)	CAR-BONATE WATER DIS IT FIELD MG/L A CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV 1987 04...	4	5.1	131	0	165	135	200	120	0.40
JAN 1988 13...	2	3.1	73	0	90	74	48	44	.20
MAR 1988 04...	3	3.2	84	0	101	83	120	61	.20
MAY 1988 24...	3	3.0	108	0	134	110	140	85	.30
JUN 1988 21...	3	3.5	120	0	150	123	150	89	.20
JUL 1988 26...	5	3.8	115	0	144	118	220	120	.30

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
NOV 1987 04...	3.0	645	549	0.88	693	--	<0.010	0.180
JAN 1988 13...	5.7	225	221	.31	52,500	0.350	.010	.360
MAR 1988 04...	5.6	369	370	.50	56,700	.450	.020	.470
MAY 1988 24...	5.6	471	464	.64	2,090	.460	.010	.470
JUN 1988 21...	1.6	499	491	.68	606	--	.010	<.100
JUL 1988 26...	1.7	661	639	.90	6,920	--	<.010	<.100

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
NOV 1987 04...	0.050	0.060	0.55	0.60	0.060	0.020	<10	2
JAN 1988 13...	.080	.110	.52	.60	.070	.070	50	<1
MAR 1988 04...	.050	.050	.55	.60	.090	.040	--	--
MAY 1988 24...	.100	.090	.80	.90	.110	.060	30	1
JUN 1988 21...	.050	.020	.95	1.0	.070	.030	<10	1
JUL 1988 26...	.040	<.010	.26	.30	.070	.030	--	--

07250550 ARKANSAS RIVER AT DAM NO. 13, NEAR VAN BUREN, ARKANSAS--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)
NOV 1987 04...	130	<0.5	<1	<3	2	47	<5	12
JAN 1988 13...	60	<.5	<1	<3	4	100	<5	4
MAR 1988 04...	--	--	--	--	--	--	--	--
MAY 1988 24...	100	<.5	<1	<3	1	22	<5	7
JUN 1988 21...	110	<.5	<1	<3	3	13	<5	8
JUL 1988 26...	--	--	--	--	--	--	--	--

DATE	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
NOV 1987 04...	1	<0.1	<10	<1	<1	1.0	590	<6
JAN 1988 13...	22	<.1	<10	3	<1	<1.0	220	<6
MAR 1988 04...	--	--	--	--	--	--	--	--
MAY 1988 24...	<1	<.1	<10	<1	<1	<1.0	450	<6
JUN 1988 21...	3	<.1	<10	5	--	<1.0	470	<6
JUL 1988 26...	--	--	--	--	--	--	--	--

DATE	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAMETER PERCENT FINER THAN 0.062 MM (70331)
NOV 1987 04...	26	11	12	68
JAN 1988 13...	22	22	5,140	91
MAR 1988 04...	--	65	9,990	61
MAY 1988 24...	7	21	93	79
JUN 1988 21...	8	14	17	53
JUL 1988 26...	--	14	147	53