ANNUAL YIELD AND SELECTED HYDROLOGIC DATA FOR THE ARKANSAS RIVER BASIN COMPACT ARKANSAS--OKLAHOMA 1989 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 James W. Trimble Lock and Dam, near Van Buren, Arkansas, and Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma.

INTRODUCTION

The computed annual yields, during the 1989 water year, 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 James W. Trimble Lock and Dam, near Van Buren, Arkansas, and Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma, also are included in the report.

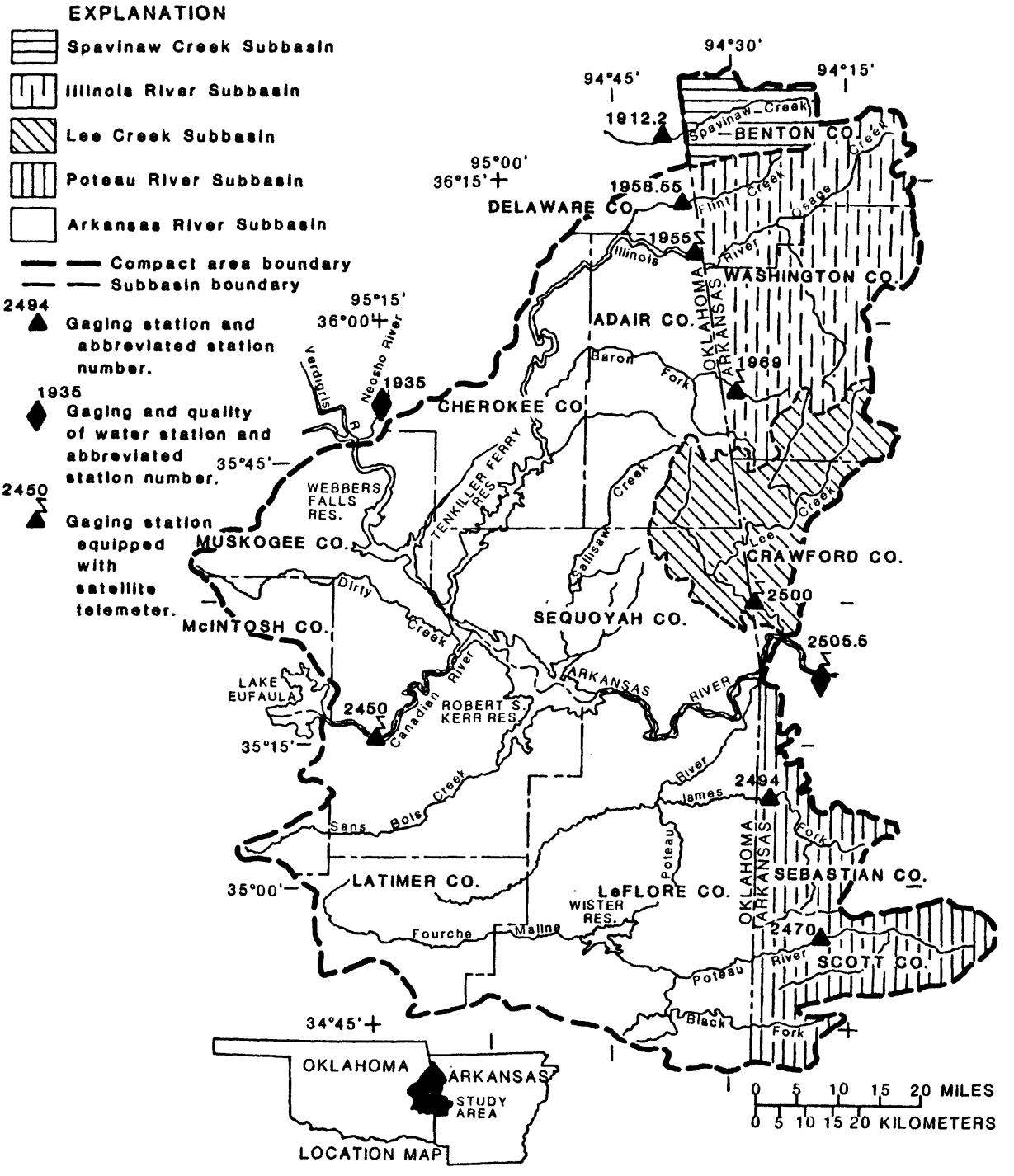

Figure 1.--Arkansas-Oklahoma Arkansas River Basin Compact area and subbasins.

This report was prepared by the U.S. Geological Survey in cooperation with the Arkansas-Oklahoma Arkansas River Compact Commission. Streamflow and water-quality data were furnished by the Arkansas and Oklahoma Districts, U.S. Geological Survey. The U.S. Army Corps of Engineers, Tulsa District furnished data from the Webbers Falls, Tenkiller Ferry, Robert S. Kerr and Wister Reservoirs.

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 °C ± 0.2 °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 streptococcal 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 °C ± 0.5 °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-adsorption-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 (Arkansas Soil and Water Conservation Commission, 1981), 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 35). 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 1989 water year]

Subbasin	Actual runoff from the subbasins	Total depletions (+) or accretions (-)	Annual yield	Percent depletion allowed	Minimum required flow	Deficiency
Spavinaw Creek	89	0	89	50	44	0
Illinois River	706	0	706	60	282	0
Lee Creek	826	0	826	100	0	0
Poteau River	881	0	881	60	352	0
Arkansas River	5,169	379	5,548	60	2,219	0

Table 2.--Actual runoff from the subbasins

[Mean discharge in cubic feet per second for the 1989 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	16	115	5	11	-1,802[f]
November	34	284	292	524	-215[f]
December	34	227	209	375	1,847
January	116	481	877	815	5,160
February	265	1,991	3,080	3,000	17,950
March	240	1,750	1,890	1,660	16,070
April	131	720	506	480	4,982
May	82	842	1,500	1,960	11,530
June	108	1,470	1,590	1,310	10,270
July	28	303	116	504	1,400
August	20	180	9	62	-2,447[f]
September	15	201	9	49	-1,591[f]
1989 water year	89	706	826	881	5,169
1989 water year (acre-feet)	64,430	511,100	598,000	637,800	3,742,000

[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 James W. Trimble Lock and Dam, 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

[1989 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-----	159,500	-3,200	46.16	71.16	+32,510	+45
Tenkiller Ferry---	656,800	+38,400	44.41	54.98	+62,830	+87
Robert S. Kerr----	540,600	+47,800	48.10	67.25	+170,400	+235
Wister----------	41,650	+60	51.56	54.03	+9,170	+13

[a] From U.S. Army 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 (REVISED).--Lat 35°49'15", long 95°38'19", in SW 1/4 NW 1/4 sec.32, T.16 N., R.16 E., Wagoner County, near left downstream abutment of old bridge downstream from 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.--17 years, 9,925 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 fair. Flow regulated by Keystone Lake, 55.1 mi upstream. Satellite telemeter at station.

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	76,427	7,580	467	2,465	151,600
November	56,357	5,060	262	1,879	111,800
December	73,382	6,200	491	2,367	145,600
January	70,708	7,010	457	2,281	140,200
February	148,251	16,800	701	5,295	294,100
March	144,561	15,900	846	4,663	286,700
April	210,710	31,100	480	7,024	417,900
May	165,689	14,200	351	5,345	328,600
June	547,650	34,000	7,060	18,250	1,086,000
July	330,760	17,300	2,410	10,670	656,100
August	325,460	31,300	1,090	10,500	645,500
September	710,700	43,700	12,000	23,690	1,410,000
Water Year 1989	2,860,655	43,700	262	7,837	5,674,000

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; 25 years (water years 1965-89), 4,529 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 poor. 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. Satellite telemeter at station.

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	3,417	330	55	110	6,780
November	23,167	3,470	40	772	45,950
December	12,666	1,430	115	409	25,120
January	19,040	3,080	100	614	37,770
February	45,679	3,440	212	1,631	90,600
March	64,742	9,370	275	2,088	128,400
April	130,087	10,900	237	4,336	258,000
May	92,854	11,500	150	2,995	184,200
June	393,180	27,100	4,330	13,110	779,900
July	176,100	8,740	2,270	5,681	349,300
August	61,996	5,860	185	2,000	123,000
September	226,150	13,000	3,970	7,538	448,600
Water Year 1989	1,249,078	27,100	40	3,422	2,478,000

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, near downstream side of right abutment of county road bridge (revised), 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.--Prior to regulation by Skiatook Lake, 46 years (1939-84), 484 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. Flow slightly regulated since October 1984 by Skiatook Lake. Satellite telemeter at station.

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	3,957	367	49	128	7,850
November	11,424	1,990	53	381	22,660
December	4,732	903	58	153	9,390
January	5,977	1,100	61	193	11,860
February	6,593	761	60	235	13,080
March	23,318	5,070	61	752	46,250
April	8,930	1,440	136	298	17,710
May	10,568	1,680	132	341	20,960
June	32,248	8,720	142	1,075	63,960
July	12,307	3,050	162	397	24,410
August	39,281	8,180	161	1,267	77,910
September	41,318	7,470	197	1,377	81,950
Water Year 1989	200,653	8,720	49	550	398,000

07191220 Spavinaw Creek near Sycamore, Oklahoma

LOCATION.--Lat 36°20'07", long 94°38'27", 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.--28 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 fair.

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	495	22	14	16.0	982
November	1,009	80	13	33.6	2,000
December	1,031	95	18	33.3	2,040
January	3,562	485	31	115	7,070
February	7,293	912	74	260	14,470
March	7,310	864	80	236	14,500
April	3,866	441	57	129	7,670
May	2,495	252	42	80.5	4,950
June	3,194	486	45	106	6,340
July	869	43	19	28.0	1,720
August	607	34	12	19.6	1,200
September	432.7	28	9.8	14.4	858
Water Year 1989	32,163.7	912	9.8	88.1	63,800

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

LOCATION (REVISED).--Lat 35°51'10", long 95°13'44", in NW 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.--39 years (1950-89), 8,403 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	92,128	8,170	15	2,972	182,700
November	187,223	17,500	15	6,241	371,400
December	160,710	12,800	15	5,184	318,800
January	243,402	20,900	15	7,852	482,800
February	318,285	23,300	15	11,370	631,300
March	397,120	26,500	2,690	12,810	787,700
April	204,750	19,600	15	6,825	406,100
May	147,545	17,100	15	4,760	292,700
June	297,409	18,700	15	9,914	589,900
July	153,297	12,700	15	4,945	304,100
August	204,035	12,700	15	6,582	404,700
September	351,955	16,900	15	11,730	698,100
Water Year 1989	2,757,859	26,500	15	7,556	5,470,000

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 1988 TO SEPTEMBER 1989

[Five-digit numbers in parentheses are STORET parameter codes used for computer storage of data; MM = millimeter; CFS = cubic feet per second; NTU = nephelometric turbidity units; US/CM = microsiemens per centimeter at 25 degrees Celsius; MG/L = micrograms per liter; WH 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	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	GAGE HEIGHT (FEET) (00065)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS (00400)	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	TURBIDITY (NTU) (00076)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION (00301)
OCT 1988													
12...	1345	1028	80020	7.78	5,450	268	7.70	19.0	22.0	4.2	760	6.8	74
JAN 1989													
19...	1515	1028	80020	5.24	15	274	8.00	10.0	24.5	7.0	750	14.2	128
FEB 1989													
24...	1330	1028	80020	8.76	8,680	262	8.20	4.5	12.0	13	755	12.8	100
APR 1989													
05...	1900	1028	80020	10.61	15,500	254	8.10	14.0	20.0	5.0	755	11.2	110
JUL 1989													
19...	1230	1028	80020	9.61	11,800	262	7.80	26.0	28.5	1.0	750	5.8	73
SEP 1989													
27...	1400	1028	80020	7.42	5,000	280	7.60	20.5	24.0	2.8	755	8.1	91

DATE	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 ADSORPTION RATIO (00931)	SODIUM PERCENT (00932)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE WATER DIS IT FIELD (MG/L AS HCO3) (00440)	CARBONATE WATER DIS IT FIELD (MG/L AS CO3) (00445)	ALKALINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (00410)
OCT 1988												
12...	K8	54	110	35	5.5	9.4	0.4	14	11	122	0	100
JAN 1989												
19...	K14	K8	120	39	6.0	9.6	0.4	14	3.2	112	0	92
FEB 1989												
24...	K14	49	110	36	5.4	8.1	0.3	13	2.7	99	0	81
APR 1989												
05...	K18	K3	110	36	4.8	7.7	0.3	13	2.9	95	0	78
JUL 1989												
19...	29	94	110	35	4.7	7.4	0.3	13	2.9	101	0	83
SEP 1989												
27...	K12	K2	120	39	5.3	8.9	0.4	14	3.2	112	0	92

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

WATER-QUALITY RECORDS DATA, WATER YEARS OCTOBER 1988 TO SEPTEMBER 1989

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
OCT 1988 12...	32	10	0.20	2.5	148	160	2,180	0.20	--	--	--
JAN 1989 19...	34	9.0	.10	2.3	162	160	6.56	.22	0.300	1.3	0.010
FEB 1989 24...	33	8.4	.10	3.6	143	148	3,350	.19	.430	1.9	.010
APR 1989 05...	34	8.0	.10	1.7	143	144	5,980	.19	.470	2.1	.020
JUL 1989 19...	30	7.9	.10	3.6	138	142	4,400	.19	.110	.49	.010
SEP 1989 27...	34	8.7	.20	5.1	151	160	2,040	.21	--	--	.010

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2) (71856)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4) (71845)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
OCT 1988 12...	--	--	0.030	--	0.04	--	0.57	0.60	0.090	0.030	--
JAN 1989 19...	0.03	0.310	.030	0.050	.04	0.06	.77	.80	.050	.020	0.010
FEB 1989 24...	0.03	.440	.030	.030	.04	.04	.37	.40	.050	.020	.010
APR 1989 05...	0.07	.490	.010	< .010	.01	--	.29	.30	.040	.010	< .010
JUL 1989 19...	0.03	.120	.060	.080	.08	.10	2.2	2.3	.050	.020	< .010
SEP 1989 27...	0.03	< .100	.030	.050	.04	.06	.47	.50	.050	.020	.020

DATE	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4) (00660)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	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)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
OCT 1988 12...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1989 19...	0.03	20	<1	51	<0.5	3	2	<3	6	30	<5	5
FEB 1989 24...	.03	40	<1	48	< .5	<1	1	<3	2	56	<5	4
APR 1989 05...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 1989 19...	--	<10	1	48	< .5	<1	1	<3	2	8	1	<4
SEP 1989 27...	.06	10	<1	58	< .5	<1	1	<3	1	7	1	4

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

WATER-QUALITY RECORDS DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L) AS ZN (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAMETER PERCENT FINER THAN 0.062 MM (70331)
OCT 1988 12...	--	--	--	--	--	--	--	--	--	8	118	79
JAN 1989 19...	5	0.2	<10	<1	<1	1.0	190	<6	40	8	0.32	95
FEB 1989 24...	5	<0.1	<10	1	<1	<1.0	150	<6	9	11	258	78
APR 1989 05...	--	--	--	--	--	--	--	--	--	9	377	81
JUL 1989 19...	33	.7	<10	1	<1	<1.0	120	<6	7	9	287	36
SEP 1989 27...	14	.1	<10	1	<1	<1.0	150	<6	12	15	203	49

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 mi² of which 12,541 mi² 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	5,852	359,800
November	9,805	583,400
December	8,328	512,100
January	11,210	689,000
February	18,860	1,047,000
March	21,360	1,314,000
April	18,900	1,125,000
May	13,920	856,000
June	43,860	2,610,000
July	22,250	1,368,000
August	22,120	1,360,000
September	46,260	2,753,000
Water Year 1989	20,140	14,580,000

07195500 Illinois River near Watts, Oklahoma

LOCATION (REVISED).--Lat 36°07'48", long 94°34'19", in NW 1/4 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.--34 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. Satellite telemeter at station.

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	3,590	153	96	116	7,120
November	7,527	708	112	251	14,930
December	6,187	453	115	200	12,270
January	12,531	2,260	144	404	24,860
February	44,014	6,730	367	1,572	87,300
March	43,059	5,290	574	1,389	85,410
April	19,002	1,900	308	633	37,690
May	22,187	1,830	285	716	44,010
June	31,253	4,630	313	1,042	61,990
July	8,937	587	194	288	17,730
August	5,591	294	148	180	11,090
September	5,986	453	109	200	11,870
Water Year 1989	210,882	6,730	96	578	418,300

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.--10 years, 44.1 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	271.9	10	7.9	8.77	539
November	541.2	33	8.7	18.0	1,070
December	447	29	11	14.4	887
January	1,141	134	17	36.8	2,260
February	3,366	473	35	120	6,680
March	2,889	261	52	93.2	5,730
April	1,309	90	26	43.6	2,600
May	928	58	20	29.9	1,840
June	1,587	242	19	52.9	3,150
July	562	25	12	18.1	1,110
August	361	16	11	11.6	716
September	397.5	25	8.5	13.2	788
Water Year 1989	13,800.6	473	7.9	37.8	27,370

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.--40.6 mi^2 (corrected).

AVERAGE DISCHARGE.--31 years, 41.0 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. Satellite telemeter at station.

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	34.59	1.7	0.71	1.12	69
November	403.72	116	.87	13.5	801
December	386.4	75	3.2	12.5	766
January	864.8	213	1.2	27.9	1,720
February	4,442	1,090	21	159	8,810
March	4,375	765	34	141	8,680
April	1,104.5	133	9.5	36.8	2,190
May	1,777.0	260	4.5	57.3	3,520
June	5,008	1,020	18	167	9,930
July	304.2	48	3.9	9.81	603
August	96.5	11	2.0	3.11	191
September	125.61	52	.36	4.19	249
Water Year 1989	18,921.32	1,090	.36	51.8	37,530

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 mi², of which 9,700 mi² is probably noncontributing.

AVERAGE DISCHARGE.--25 years (water years 1939-63), 6,005 ft³/s; 22 years (water years 1968-89), 5,927 ft³/s.

EXTREMES.--July 1938 to current year: Maximum discharge, 281,000 ft³/s May 10, 1943; minimum daily, 0.4 ft³/s Oct. 8, 1956.

REMARKS.--Records good. Prior to February 1964, occasional slight regulation by Conchas Lake in New Mexico and except for 54 mi² of intervening area, completely regulated thereafter by Eufaula Lake. Satellite telemeter at station.

Monthly and yearly discharge

Month	Total (ft³/s)	Maximum daily (ft³/s)	Minimum daily (ft³/s)	Mean (ft³/s)	Runoff in acre-feet
October	20,778	3,000	76	670	41,210
November	16,521	2,990	80	551	32,770
December	15,307	2,240	67	494	30,360
January	82,678	14,900	69	2,667	164,000
February	415,180	30,700	1,300	14,830	823,500
March	352,364	23,000	384	11,370	698,900
April	173,147	15,000	125	5,772	343,400
May	226,195	24,100	69	7,297	448,700
June	721,830	43,900	6,570	24,060	1,432,000
July	235,500	12,900	600	7,597	467,100
August	113,603	6,710	116	3,665	225,300
September	276,019	21,200	177	9,201	547,500
Water Year 1989	2,649,122	43,900	67	7,258	5,255,000

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.--50 years, 220 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	96.11	11	0.39	3.10	191
November	8,316.5	3,040	1.6	277	16,500
December	5,380	1,230	46	174	10,670
January	10,791	1,630	86	348	21,400
February	34,875	7,610	165	1,246	69,170
March	19,376	1,410	228	625	38,430
April	6,286	1,290	49	210	12,470
May	22,890	3,360	119	738	45,400
June	15,221	3,470	40	507	30,190
July	6,253	1,200	30	202	12,400
August	774.1	168	2.0	25.0	1,540
September	678.4	55	2.0	22.6	1,350
Water Year 1989	130,937.11	7,610	.39	359	259,700

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.--31 years, 136 ft^3/s.

EXTREMES.--April 1958 to current year: Maximum discharge, 30,000 ft^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	91.85	6.9	0.40	2.96	182
November	1,251.1	337	4.7	41.7	2,480
December	1,949	588	15	62.9	3,870
January	5,360	1,360	28	173	10,630
February	18,990	5,340	137	678	37,670
March	14,169	2,810	122	457	28,100
April	2,890	271	41	96.3	5,730
May	16,815	3,840	35	542	33,350
June	10,267	2,650	41	342	20,360
July	3,867	1,100	25	125	7,670
August	483.6	41	8.0	15.6	959
September	248.7	18	1.6	8.29	493
Water Year 1989	76,382.25	5,340	.40	209	151,500

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 mi².

AVERAGE DISCHARGE.--45 years (1930-36, 1950-89), 51.4 ft³/s.

EXTREMES.--September 1930 to June 1937, October 1950 to current year: Maximum discharge, 80,600 ft³/s May 6, 1960; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge

Month	Total (ft³/s)	Maximum daily (ft³/s)	Minimum daily (ft³/s)	Mean (ft³/s)	Runoff in acre-feet
October	146.0	8.6	1.7	4.71	290
November	8,113.8	1,990	1.9	270	16,090
December	5,921	622	66	191	11,740
January	24,971	5,300	80	806	49,530
February	79,074	12,400	444	2,824	156,800
March	53,817	5,780	509	1,736	106,700
April	13,937	1,880	107	465	27,640
May	42,837	6,930	100	1,382	84,970
June	43,847	6,200	195	1,462	86,970
July	3,336	314	25	108	6,620
August	254.4	21	1.8	8.21	505
September	198.2	7.4	5.8	6.61	393
Water Year 1989	276,452.4	12,400	1.7	757	548,300

07250550 Arkansas River at James W. Trimble Lock and Dam, 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 mi², of which 22,241 mi² is probably noncontributing.

AVERAGE DISCHARGE.--62 years, 32,400 ft³/s.

EXTREMES.--October 1927 to current year: Maximum discharge, 850,000 ft³/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", and October 1969 to September 1988, "at Dam No. 13," near Van Buren. Beginning April 26, 1970, daily discharge computed from relation between discharge, head, and gate openings. Flow regulated by many locks, dams, and reservoirs upstream. Satellite telemeter at station.

Monthly and yearly discharge

Month	Total (ft³/s)	Maximum daily (ft³/s)	Minimum daily (ft³/s)	Mean (ft³/s)	Runoff in acre-feet
October	150,350	11,400	1,240	4,850	298,200
November	337,094	28,900	15	11,240	668,600
December	355,900	32,100	1,600	11,480	705,900
January	657,420	56,500	1,240	21,210	1,304,000
February	1,671,600	135,000	12,000	59,700	3,316,000
March	1,677,000	101,000	29,400	54,100	3,326,000
April	940,683	82,000	823	31,360	1,866,000
May	1,148,530	89,000	2,350	37,050	2,278,000
June	2,476,900	138,000	38,500	82,560	4,913,000
July	997,200	49,000	13,900	32,170	1,978,000
August	731,284	61,500	84	23,590	1,451,000
September	1,623,900	88,100	34,100	54,130	3,221,000
Water Year 1989	12,767,861	138,000	15	34,980	25,330,000

07250550 ARKANSAS RIVER AT JAMES W. TRIMBLE LOCK AND DAM, 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 1988 TO SEPTEMBER 1989

[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; NTU = nephelometric turbidity units; MG/L = milligrams per liter; MM = millimeters; UM-MF = micrometer membrane filter; AC-FT = acre-feet, UG/L = micrograms per liter; WAT DIS = dissolved; TOT FET = total alkalinity, fixed end point titration; DIS IT = dissolved, incremental titration; TOT IT = total alkalinity, incremental titration; 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 (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT 1988									
12...	0845	80513	80020	12,300	1,180	8.42	18.0	3.5	9.3
DEC 1988									
19...	1015	80513	80020	10,800	571	8.21	7.0	4.9	12.9
FEB 1989									
01...	1030	80513	80020	49,500	578	8.50	8.5	25	11.8
APR 1989									
11...	1030	80513	80020	38,200	935	8.05	14.0	18	9.6
JUL 1989									
03...	1100	80513	80020	39,700	925	8.30	26.0	24	7.3
AUG 1989									
03...	1030	80513	80020	35,300	688	8.23	28.5	7.5	7.0

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)
OCT 1988									
12...	99	760	14	41	220	58	18	150	59
DEC 1988									
19...	108	752	17	36	140	42	9.5	53	44
FEB 1989									
01...	103	746	560	1,100	130	36	8.9	57	49
APR 1989									
11...	93	763	13	32	160	43	12	110	60
JUL 1989									
03...	92	752	360	71	150	41	11	110	61
AUG 1989									
03...	92	753	170	120	140	41	9.4	76	53

07250550 ARKANSAS RIVER AT JAMES W. TRIMBLE LOCK AND DAM, NEAR VAN BUREN, ARKANSAS--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY WAT DIS TOT FET FIELD MG/L AS CACO3 (00418)	CARBONATE WATER DIS IT FIELD MG/L A CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)
OCT 1988									
12...	5	4.2	136	14	138	137	220	100	0.30
DEC 1988									
19...	2	3.7	100	0	126	103	76	50	.20
FEB 1989									
01...	2	3.1	92	0	115	94	83	51	.20
APR 1989									
11...	4	3.0	96	0	117	96	170	65	.20
JUL 1989									
03...	4	3.9	94	0	115	94	170	63	.20
AUG 1989									
03...	3	3.9	94	0	113	93	110	54	.20

DATE	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT									
12...	1.7	653	633	0.89	1,700	--	<0.010	<0.100	0.020
DEC									
19...	1.5	305	299	.41	8,890	0.310	0.010	0.320	.030
FEB									
01...	1.4	296	296	.40	9,600	.170	0.010	0.180	.010
APR									
11...	2.8	482	468	.66	9,700	--	<0.010	0.270	.020
JUL									
03...	6.1	486	462	.66	2,100	--	<0.010	0.530	.020
AUG									
03...	4.2	375	358	.51	5,700	.090	0.030	0.120	.330

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	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)
OCT 1988										
12...	<0.010	0.58	0.60	0.110	0.050	<10	2	120	<0.5	1
DEC 1988										
19...	.030	0.78	0.80	0.080	0.030	<10	1	73	< .5	<1
FEB 1989										
01...	.010	0.78	0.80	0.100	0.020	--	--	--	--	--
APR 1989										
11...	.020	0.57	0.60	0.090	0.030	--	--	--	--	--
JUL 1989										
03...	.020	0.37	0.40	0.060	0.040	50	2	92	< .5	<1
AUG 1989										
03...	.330	0.55	0.60	0.100	0.030	<10	2	82	< .5	<1

07250550 ARKANSAS RIVER AT JAMES W. TRIMBLE LOCK AND DAM, NEAR VAN BUREN, ARKANSAS

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	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)	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)
OCT 1988 12...	<3	1	3	<5	11	<1	<0.1	<10	1
DEC 1988 19...	<3	2	15	<5	7	4	<0.1	<10	1
JUL 1989 03...	<3	3	24	<1	6	1	<0.1	<10	1
AUG 1989 03...	<3	3	28	<1	6	6	21	<10	2

DATE	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)	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 DIAM. % FINER THAN .062 MM (70331)
OCT 1988 12...	<1	1.0	540	<6	8	5	166	21
DEC 1988 19...	<1	1.0	300	<6	5	4	117	85
FEB 1989 01...	--	--	--	--	--	52	6,950	69
APR 1989 11...	--	--	--	--	--	35	3,610	82
JUL 1989 03...	<1	<1.0	380	<6	10	79	8,470	42
AUG 1989 03...	<1	<1.0	320	<6	13	38	3,620	59