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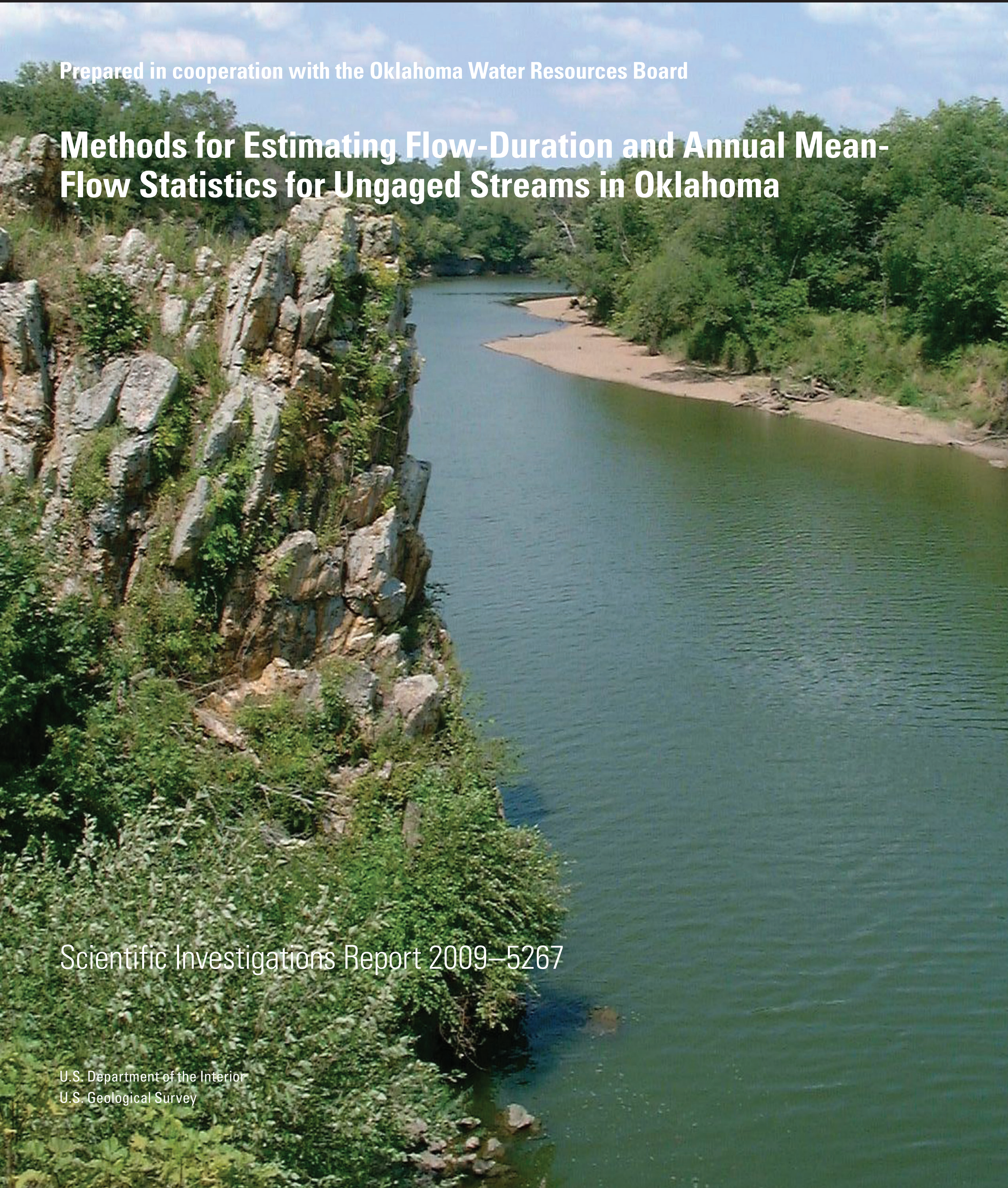
Methods for Estimating Flow-Duration and Annual Mean-Flow Statistics for Ungaged Streams in Oklahoma



Scientific Investigations Report 2009–5267

U.S. Department of the Interior
U.S. Geological Survey

On the cover: Photograph shows Spring Creek near Quapaw, Oklahoma. The photograph was taken by U.S. Geological Survey staff.

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Contents

Figures

Tables

Conversion Factors and Datums

Multiply	By	To obtain
Length		
inch (in.)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
yard (yd)	0.9144	meter (m)
Area		
square mile (mi^2)	2.590	square kilometer (km^2)
Flow rate		
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Methods for Estimating Flow-Duration and Annual Mean-Flow Statistics for Ungaged Streams in Oklahoma

By Rachel A. Esralew and S. Jerrod Smith

Abstract

Flow statistics can be used to provide decision makers with surface-water information needed for activities such as water-supply permitting, flow regulation, and other water rights issues. Flow statistics could be needed at any location along a stream. Most often, streamflow statistics are needed at ungaged sites, where no flow data are available to compute the statistics. Methods are presented in this report for estimating flow-duration and annual mean-flow statistics for ungaged streams in Oklahoma.

Flow statistics included the (1) annual (period of record), (2) seasonal (summer-autumn and winter-spring), and (3) 12 monthly duration statistics, including the 20th, 50th, 80th, 90th, and 95th percentile flow exceedances, and the annual mean-flow (mean of daily flows for the period of record). Flow statistics were calculated from daily streamflow information collected from 235 streamflow-gaging stations throughout Oklahoma and areas in adjacent states.

A drainage-area ratio method is the preferred method for estimating flow statistics at an ungaged location that is on a stream near a gage. The method generally is reliable only if the drainage-area ratio of the two sites is between 0.5 and 1.5.

Regression equations that relate flow statistics to drainage-basin characteristics were developed for the purpose of estimating selected flow-duration and annual mean-flow statistics for ungaged streams that are not near gaging stations on the same stream. Regression equations were developed from flow statistics and drainage-basin characteristics for 113 unregulated gaging stations.

Separate regression equations were developed by using U.S. Geological Survey streamflow-gaging stations in regions with similar drainage-basin characteristics. These equations can increase the accuracy of regression equations used for estimating flow-duration and annual mean-flow statistics at ungaged stream locations in Oklahoma. Streamflow-gaging stations were grouped by selected drainage-basin characteristics by using a k-means cluster analysis. Three regions were identified for Oklahoma on the basis of the clustering of gaging stations and a manual delineation of distinguishable hydrologic and geologic boundaries: Region 1 (western Oklahoma excluding the Oklahoma and Texas Panhandles), Region 2 (north- and south-central Oklahoma), and Region 3 (eastern and central Oklahoma).

A total of 228 regression equations (225 flow-duration regressions and three annual mean-flow regressions) were developed using ordinary least-squares and left-censored (Tobit) multiple-regression techniques. These equations can be used to estimate 75 flow-duration statistics and annual mean-flow for ungaged streams in the three regions. Drainage-basin characteristics that were statistically significant independent variables in the regression analyses were (1) contributing drainage area; (2) station elevation; (3) mean drainage-basin elevation; (4) channel slope; (5) percentage of forested canopy; (6) mean drainage-basin hillslope; (7) soil permeability; and (8) mean annual, seasonal, and monthly precipitation.

The accuracy of flow-duration regression equations generally decreased from high-flow exceedance (low-exceedance probability) to low-flow exceedance (high-exceedance probability) . This decrease may have happened because a greater uncertainty exists for low-flow estimates and low-flow is largely affected by localized geology that was not quantified by the drainage-basin characteristics selected.

The standard errors of estimate of regression equations for Region 1 (western Oklahoma) were substantially larger than those standard errors for other regions, especially for low-flow exceedances. These errors may be a result of greater variability in low flow because of increased irrigation activities in this region.

Regression equations may not be reliable for sites where the drainage-basin characteristics are outside the range of values of independent variables used to develop the equations. The equations are not accurate for streams that are regulated by water-supply reservoirs, streams that are affected by local irrigation activity, or streams that are affected by urban change.

Introduction

Successful management of reservoir operations, permitting for stream withdrawals, and maintenance of water-quality standards are supported by knowledge of the magnitude of flow that can be expected in a stream at any given time. Flow-duration statistics that describe the percentage of time a stream discharge is equaled or exceeded, and annual mean-flow statistics (mean of annual daily flow), commonly are used by State agencies and other water-resources managers to help effectively manage Oklahoma surface-water resources (R.S. Fabian, Oklahoma Water Resources Board, oral and written communication, June 2007).

The historic continuous daily streamflow information collected at U.S. Geological Survey (USGS) streamflow-gaging stations provides a valuable resource for estimating flow statistics during a range of temporal circumstances, including annual, monthly, and seasonal time periods. This information can be calculated at streamflow-gaging stations where long-term daily streamflow record is available, generally 10 or more years of record, and is the criteria used in previous studies in Oklahoma (Heimann and Tortorelli, 1987; Tortorelli, 2002; Lewis and Esralew, 2009). The Interagency Advisory Committee on Water Data also recommends at least 10 years of data for computation of long-term streamflow statistics (Interagency Advisory Committee on Water Data, 1982). The USGS has collected daily streamflow at 235 gaging stations in the study area for 10 or more years (fig. 1).

The number and location of long-term gaging stations is limited in any given drainage-basin by user priorities and geographical constraints. The operation of a long-term gaging station at every location where streamflow is needed is not feasible. Because of the need for estimating flow-duration and annual mean-flow statistics for ungaged stream locations in Oklahoma, the USGS, in cooperation with the Oklahoma Water Resources Board (OWRB), investigated methods for estimating long-term streamflow statistics at ungaged stream locations.

Streamflow information can be extrapolated for an ungaged stream location near a gaging station on the same stream reach, from the gaging-station record, to estimate the flow statistics. The drainage-area ratio method is the preferred method for estimating flow statistics (Ries and Friezs, 2000).

However, alternative methods are needed in Oklahoma to estimate flow statistics at ungaged stream locations that are not near gaging stations. Statistics calculated at gaging stations with long-term daily mean-streamflow record are highly variable at in any given drainage basin. Streamflow statistics are strongly related to physical drainage-basin characteristics such as size, topography, geology, land-cover, and climate (Ries and others, 2008). Regression equations that describe the relation of physical drainage-basin characteristics to streamflow can be developed to estimate streamflow statistics at ungaged stream locations for flow-duration and annual mean-flow statistics.

One of the challenges involved with developing regression equations that accurately describe flow is selection of the appropriate independent variables. Drainage-basin characteristics that influence streamflow variability such as contributing drainage area, drainage-basin hillslope and main-channel slope, soil permeability, forested area, and mean annual, seasonal, and monthly precipitation, vary across Oklahoma.

The influence that these variables have on streamflow also may vary across Oklahoma. For example, streamflow may be affected by the amount of forested area in some drainage basins in eastern Oklahoma that are heavily forested, but forested area may not have a strong influence on streamflow in most drainage basins in less forested western Oklahoma. Selection of independent variables for regression equations that account for the variation in streamflow statistics for the entire state may be difficult and may result in regression estimates that have high error.

Regression equations can be developed for smaller, more homogeneous regions to minimize the error of streamflow estimates (Haan, 1977). Statistical methods can be used to group gaging stations with similar physical drainage-basin characteristics, as has been done for other studies (Hortness and Berenbrock, 2001; Risley and others, 2008). Statistical stream groupings can be defined by grouping streams with similar drainage-basin characteristics through statistical analysis and visual inspection to define regression regions for Oklahoma. Comparison of regional regression equations, in terms of differences in independent variable selection and regression accuracy, can be used to evaluate and provide context for differences in streamflow variability in Oklahoma as a function of these drainage-basin characteristics.

Purpose and Scope

The purpose of this report is to document the methods and results of a study designed to estimate flow-duration statistics (annual, seasonal, and monthly) and annual mean flow for ungaged streams in Oklahoma. This report includes (1) a description of the study area and how variability of physical characteristics and anthropogenic activities may affect streamflow, (2) a summary of calculated flow-duration and annual mean-flow statistics at gaging stations with long-term (10 or more years) daily streamflow data, (3) a summary of available methods for estimating flow statistics at ungaged sites, (4) a description of the data and methods used to develop regression equations for estimating flow-duration and annual mean-flow statistics, and (5) a discussion of the results of the regression analysis, including the selection of independent variables, accuracy and limitations, and an example computation.

The regression equations presented in this report are only applicable to streams in Oklahoma and near the Oklahoma state line. However, the methods documented in this report can be applied elsewhere by using USGS streamflow data that are available from gaging stations throughout the United States.

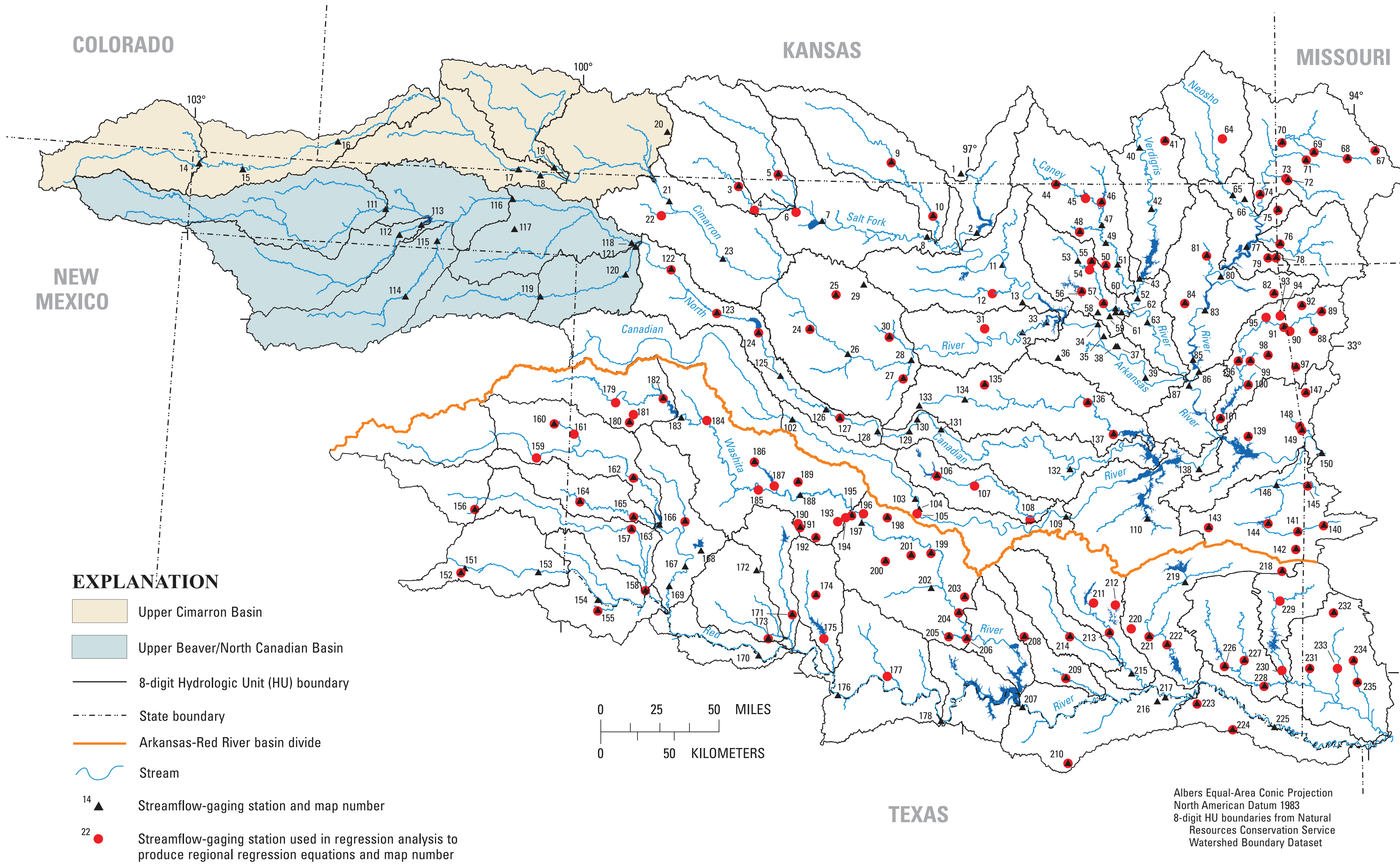

Figure 1. Streamflow-gaging stations with 10 or more years of data where flow-duration and annual mean-flow statistics were computed, including stations that were used initially in regression analysis.

Regression equations and computed flow-duration and annual mean-flow statistics at gaging stations are integrated into the USGS StreamStats Web-based tool available at *http://water.usgs.gov/osw/streamstats/index.html*. StreamStats allows users to obtain flow statistics, drainage-basin characteristics, and other information for user-selected stream sites. The user can 'point and click' on a stream location or a GIS-based interactive map of Oklahoma and StreamStats will delineate the drainage-basin upstream from the selected location, compute drainage-basin characteristics, and compute flow statistics at the ungaged stream locations by using regression estimates. The user also can 'point and click' on USGS gaging stations and receive flow statistics and information about those stations.

Previous Investigations

A study by Lewis and Esralew (2009) determined annual flow-duration statistics for the 1-, 2-, 5-, 10-, 15-, 20-, 30-, 40-, 50- (median), 60-, 70-, 80-, 90-, 95-, 98- and 99-percent exceedance probabilities, and annual mean-flow (the mean of all daily flows for the period of record), for gaging stations in and near Oklahoma that had long-term streamflow record (10 or more years) through 2007. The methods used in this study for determining flow-duration and annual mean-flow statistics are the same as that described in Lewis and Esralew (2009).

Regression equations that relate streamflow statistics to drainage-basin characteristics have been developed in previous investigations. Studies were completed, in Oklahoma, to estimate peak-flow frequency statistics at ungaged stream locations with a drainage area less than 2,510 square miles (Tortorelli and Bergman, 1985; Tortorelli, 1997). Methods for developing regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations by using drainage-basin characteristics were similar to those methods used by Risley and others (2008) for Oregon, Perry and others (2004) for Kansas, Hortness and Berenbrock (2001) for Idaho, and Ries and Friesz (2000) for Massachusetts.

Acknowledgments

The authors would like to thank Jery Stedinger (Cornell University), Stacey Archfield, Julie Kiang, Charles Perry, John Risley, and Adam Stonewall (U.S. Geological Survey) for providing knowledge and expertise regarding the methods used in the regression analysis. The authors would like to thank Robert Tortorelli, U.S. Geological Survey, for working with the OWRB to obtain support for the study, and for providing his knowledge and expertise regarding flow statistics, regression methods, and gaging history. The authors would like to thank Robert Blazs, Tony Coffey, David Adams, and Dale Boyle for helping with questions about historic gage records, and all U.S. Geological Survey staff, who have collected and processed historic streamflow data. The authors also appreciate the efforts of Seth Tribbey and Jason R. Masoner (U.S. Geological Survey), who assisted with spatial data preprocessing. The authors also greatly appreciate the help of Alan H. Rea, Kenneth D. Skinner, and Kernell G. Ries (U.S. Geological Survey) who provided technical support and solutions to many problems with computing drainage-basin characteristics and creation of the StreamStats web application.

Description of Study Area and Factors that Affect Streamflow in the Study Area

Flow statistics and drainage-basin characteristics were computed at selected gaging stations in Oklahoma and adjacent areas of Arkansas, Kansas, Missouri, and Texas. The study area includes a wide range of physiographic and climatic characteristics that contribute to streamflow variability throughout Oklahoma.

Definition of Study Area Boundary

Streams selected for this study included those streams that are in 8-digit hydrologic unit (HU) boundaries in Oklahoma or are in HU boundaries adjacent to the Oklahoma state border (fig. 1, table 1). Streams selected for regression analysis have drainage-basin areas completely in these 8-digit HU boundaries. These boundaries were used because the digitally preprocessed drainage-basin characteristic variables in the regression equations were only available for this area (S.J. Smith and R.A. Esralew, U.S. Geological Survey, written commun., 2009). Drainage-basin characteristics could not be computed for gaging stations that were along main stems of the largest river systems in the state (the Arkansas, Canadian, Cimarron, Neosho, Red, and Verdigris Rivers), because the drainage areas extend outside of the study area (S.J. Smith and R.A. Esralew, U.S. Geological Survey, written commun., 2009).

Landscape and Climate Characteristics

Oklahoma has diverse physical and climatic characteristics that can affect streamflow. Statistics calculated from data collected from gaging stations in the study area are related to physical and climatic characteristics of the drainage basin such as drainage-basin size, topography, land cover, and climate. Drainage-basin characteristics that describe drainage area, drainage-basin hillslope, channel slope, soil permeability, drainage-basin and station elevation, mean precipitation, and forested area were considered as independent variables in regression equations to estimate flow-duration and annual mean-flow statistics at ungaged sites.

Contributing drainage area is considered the drainage-basin area that can contribute runoff to the stream location of

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma.

[no., number; Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Period of record, water years used to compute flow duration and annual mean flow statistics; HU 8, 8-digit hydrologic unit; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; L&D, lock and dam; SCS, soil conservation service; 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile]

Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
1	07146500	Arkansas River at Arkansas City, Kans.	37.06	-97.06	11030013	36,100	No	U	1922-1942	No
								R	1943-2007	No
2	07148140	Arkansas River near Ponca City, Okla.	36.69	-96.93	11060001	38,900	No	R	1977-1993	No
3	07148350	Salt Fork Arkansas River near Winchester, Okla.	36.96	-98.78	11060002	827	Yes	U	1960-1993	Yes
4	07148400	Salt Fork Arkansas River near Alva, Okla.	36.82	-98.65	11060002	982	Yes	U	1938-1951, 1980-2007	Yes
5	07149000	Medicine Lodge River near Kiowa, Kans.	37.04	-98.47	11060003	885	Yes	U	1938-1950, 1955, 1960-2007	Yes
6	07149500	Salt Fork Arkansas River near Cherokee, Okla.	36.82	-98.32	11060004	2,360	Yes	U	1941-1950	Yes
7	07150500	Salt Fork Arkansas River near Jet, Okla.	36.75	-98.13	11060004	3,190	Yes	R	1942-1993	No
8	07151000	Salt Fork Arkansas River at Tonkawa, Okla.	36.67	-97.31	11060004	4,520	Yes	R	1942-2007	No
9	07151500	Chikaskia River near Corbin, Kans.	37.13	-97.60	11060005	813	Yes	U	1950-1965, 1976-2007	Yes
10	07152000	Chikaskia River near Blackwell, Okla.	36.81	-97.28	11060005	1,870	Yes	U	1936-2007	Yes
11	07152500	Arkansas River at Ralston, Okla.	36.50	-96.73	11060006	46,900	No	U	1926-1975	No
								R	1977-2007	No
12	07153000	Black Bear Creek at Pawnee, Okla.	36.34	-96.80	11060006	538	Yes	U	1945-2007	Yes
13	07153100	Ranch Creek at Cleveland Dam near Cleveland, Okla.	36.28	-96.58	11060006	21.9	Yes	R	1945-1963	No
14	07154500	Cimarron River near Kenton, Okla.	36.93	-102.96	11040001	1,110	Yes	U	1951-1966	No[4]
								UI	1971-2007	No

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

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Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
15	07155000	Cimarron River above Ute Creek near Boise City, Okla.	36.91	-102.62	11040002	1,970	Yes	U	1943-1954	No[4]
16	07155590	Cimarron River near Elkhart, Kans.	37.12	-101.90	11040002	2,800	Yes	U	1971-1981	No[4]
								UI	1983-2007	No
17	07156900	Cimarron River near Forgan, Okla.	37.01	-100.49	11040006	4,220	Yes	U	1966-1977	No[4]
								UI	1983-1986, 1988-2007	No
18	07157000	Cimarron River near Mocane, Okla.	36.98	-100.31	11040006	4,310	No	U	1943-1965	No
19	07157500	Crooked Creek near Englewood, Kans.	37.03	-100.21	11040007	822	Yes	U	1943-1963	No[4]
								UI	1983-2007	No[4]
20	07157900	Cavalry Creek near Coldwater, Kans.	37.27	-99.35	11040008	41.5	Yes	U	1967-1981	No[4]
21	07157950	Cimarron River near Buffalo, Okla.	36.85	-99.32	11050001	7,190	No	U	1960-1994, 2002-2007	No
22	07157960	Buffalo Creek near Lovedale, Okla.	36.77	-99.37	11050001	401	Yes	U	1967-1993	No[5]
23	07158000	Cimarron River near Waynoka, Okla.	36.52	-98.88	11050001	8,500	No	U	1938-2007	No
24	07158400	Salt Creek near Okeene, Okla.	36.10	-98.19	11050002	181	Yes	U	1961-1967, 1975-1979	Yes
25	07159000	Turkey Creek near Drummond, Okla.	36.32	-98.00	11050002	255	Yes	U	1948-1970	No[5]
26	07159100	Cimarron River near Dover, Okla.	35.95	-97.91	11050002	10,800	No	U	1974-2007	No
27	07159750	Cottonwood Creek near Seward, Okla.	35.81	-97.48	11050002	320	Yes	U	1973-1982, 1990-2002	Yes

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

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Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
28	07160000	Cimarron River near Guthrie, Okla.	35.92	-97.43	11050002	12,000	No	U	1938-1976, 1984-2007	No
29	07160350	Skeleton Creek at Enid, Okla.	36.38	-97.80	11050002	70	Yes	UUrb	1996-2007	No
30	07160500	Skeleton Creek near Lovell, Okla.	36.06	-97.59	11050002	412	Yes	U	1950-2007	Yes
31	07163000	Council Creek near Stillwater, Okla.	36.12	-96.87	11050003	30	Yes	U	1934-1993	No[5]
32	07163500	Cimarron River at Oilton, Okla.	36.09	-96.58	11050003	13,700	No	U	1935-1945	No
33	07164000	Cimarron River at Mannford, Okla.	36.16	-96.40	11050003	13,900	No	U	1939-1950, 1960-1963	No
34	07164500	Arkansas River at Tulsa, Okla.	36.14	-96.01	11110101	62,100	No	U	1926-1964	No
								R	1965-2007	No
35	07164600	Joe Creek at 61st Street at Tulsa, Okla.	36.08	-95.96	11110101	11.6	Yes	UUrb	1989-2007	No
36	07165500	Polecat Creek below Heyburn Reservoir near Heyburn, Okla.	35.95	-96.29	11110101	123	Yes	R	1951-1979	No
37	07165562	Haikey Creek at 101st Street South at Tulsa, Okla.	36.02	-95.85	11110101	17.9	Yes	UUrb	1988-2007	No
38	07165565	Little Haikey Creek at 101st Street South at Tulsa, Okla.	36.02	-95.86	11110101	5.48	Yes	UUrb	1988-2007	No
39	07165570	Arkansas River near Haskell, Okla.	35.82	-95.64	11110101	62,900	No	R	1973-2007	No
40	07170500	Verdigris River at Independence, Kans.	37.22	-95.68	11070103	2,890	No	U	1895-1903, 1922-1959	No
								R	1967-2007	No
41	07170700	Big Creek near Cherryvale, Kans.	37.27	-95.47	11070103	36.8	Yes	U	1958-1980	Yes
								R	1982-2007	No

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

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Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
42	07171000	Verdigris River near Lenapah, Okla.	36.85	-95.59	11070103	3,640	No	U	1939-1959	No
								R	1967-2007	No
43	07171400	Verdigris River near Oologah, Okla.	35.50	-97.19	11070105	4,340	No	R	1964-1992	No
44	07172000	Caney River near Elgin, Kans.	37.00	-96.32	11070106	429	Yes	U	1940-2007	Yes
45	07173000	Caney River near Hulah, Okla.	36.93	-96.09	11070106	711	Yes	U	1938-1993	Yes
46	07174200	Little Caney River below Cotton Creek near Copan, Okla.	36.90	-95.97	11070106	503	Yes	U	1944-1981	Yes
47	07174400	Caney River above Coon Creek at Bartlesville, Okla.	36.76	-95.97	11070106	1,390	Yes	R	1986-2007	No
48	07174600	Sand Creek at Okesa, Okla.	36.72	-96.13	11070106	138	Yes	U	1960-1993	Yes
49	07174700	Caney River near Ochelata, Okla.	36.64	-95.93	11070106	1,750	Yes	R	1957-1976	No
50	07175000	Double Creek near Ramona, Okla.	36.51	-95.94	11070106	2.45	Yes	U	1954-1969	No[5]
51	07175500	Caney River near Ramona, Okla.	36.51	-95.84	11070106	1,960	Yes	R	1984-2007	No
52	07176000	Verdigris River near Claremore, Okla.	36.31	-95.70	11070105	6,530	No	U	1936-1962	No
								R	1964-2007	No
53	07176465	Birch Creek below Birch Lake near Barnsdall, Okla.	36.53	-96.16	11070107	66	Yes	R	1978-1992	No
54	07176500	Bird Creek at Avant, Okla.	36.49	-96.06	11070107	369	Yes	U	1945-1976	Yes
								R	1978-2007	No
55	07176800	Candy Creek near Wolco, Okla.	36.54	-96.05	11070107	31.4	Yes	U	1970-1981	Yes
56	07177000	Hominy Creek near Skiatook, Okla.	36.35	-96.11	11070107	340	Yes	U	1944-1981	Yes

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
57	07177500	Bird Creek near Sperry, Okla.	36.28	-95.95	11070107	907	Yes	U	1939-1984	Yes
								R	1985-2007	No
58	07177650	Flat Rock Creek at Cincinnati Avenue at Tulsa, Okla.	36.22	-96.00	11070107	8.11	Yes	UUrb	1988-2007	No
59	07177800	Coal Creek at Tulsa, Okla.	36.19	-95.91	11070107	8.23	Yes	UUrb	1988-2007	No
60	07178000	Bird Creek near Owasso, Okla.	36.25	-95.87	11070107	1,020	Yes	R	1987-2007	No
61	07178040	Mingo Creek at 46th Street North at Tulsa, Okla.	36.22	-95.86	11070107	58.8	Yes	UUrb	1987-1997	No
62	07178200	Bird Creek at State Highway 266 near Catoosa, Okla.	36.22	-95.82	11070107	1,100	Yes	R	1989-2007	No
63	07178600	Verdigris River near Inola, Okla.	36.16	-95.62	11070105	7,910	No	U	1944-1962	No
64	07184000	Lightning Creek near McCune, Kans.	37.28	-95.03	11070205	196	Yes	U	1939-1946, 1960-2007	Yes
65	07185000	Neosho River near Commerce, Okla.	36.93	-94.96	11070206	5,880	No	U	1939-1962	No
								R	1964-2007	No
66	07185095	Tar Creek at 22nd Street Bridge at Miami, Okla.	36.90	-94.87	11070206	44.7	Yes	UUrb	1984-1993, 2005-2007	No
67	07185500	Stahl Creek near Miller, Mo.	37.19	-93.84	11070207	4.02	Yes	U	1950-1976	Yes
68	07185700	Spring River at LaRussell, Mo.	37.15	-94.06	11070207	306	Yes	U	1958-1973, 1976-1980	Yes
69	07185765	Spring River at Carthage, Mo.	37.19	-94.33	11070207	448	Yes	U	1967-1980, 2002-2007	Yes
70	07186000	Spring River near Waco, Mo.	37.25	-94.57	11070207	1,160	Yes	U	1924-2007	Yes

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
71	07186400	Center Creek near Carterville, Mo.	37.14	-94.38	11070207	229	Yes	U	1962-1991	No[5]
72	07187000	Shoal Creek above Joplin, Mo.	37.02	-94.52	11070207	427	Yes	U	1942-2007	Yes
73	07187500	Shoal Creek near Joplin, Mo.	37.03	-94.54	11070207	442	Yes	U	1925-1941	No[5]
74	07188000	Spring River near Quapaw, Okla.	36.93	-94.75	11070207	2,520	Yes	U	1939-2007	Yes
75	07188500	Lost Creek at Seneca, Mo.	36.84	-94.61	11070206	40.8	Yes	U	1949-1959	No[5]
76	07189000	Elk River near Tiff City, Mo.	36.63	-94.59	11070208	851	Yes	U	1940-2007	Yes
77	07189500	Neosho River near Grove, Okla.	36.61	-94.82	11070206	9,970	No	U	1925-1939	No
78	07189540	Cave Springs Branch near South West City, Mo.	36.55	-94.62	11070206	8	Yes	U	1998-2007	Yes
79	07189542	Honey Creek near South West City, Mo.	36.55	-94.68	11070206	48.6	Yes	U	1998-2007	Yes
80	07190500	Neosho River near Langley, Okla.	36.44	-95.05	11070209	10,300	No	R	1940-2007	No
81	07191000	Big Cabin Creek near Big Cabin, Okla.	36.57	-95.15	11070209	450	Yes	U	1948-2007	Yes
82	07191220	Spavinaw Creek near Sycamore, Okla.	36.33	-94.64	11070209	132	Yes	U	1962-2007	Yes
83	07191500	Neosho River near Chouteau, Okla.	36.23	-95.18	11070209	11,500	No	R	1965-2007	No
84	07192000	Pryor Creek near Pryor, Okla.	36.28	-95.33	11070209	227	Yes	U	1948-1963	Yes
85	07192500	Neosho River near Wagoner, Okla.	35.93	-95.27	11070209	12,300	No	R	1940-1949	No
86	07193500	Neosho River below Fort Gibson Lake near Fort Gibson, Okla.	35.85	-95.23	11070209	12,500	No	R	1954-1989	No
87	07194500	Arkansas River near Muskogee, Okla.	35.77	-95.30	11110102	84,100	No	U	1926-1952	No
								R	1965-1970, 2004-2007	No

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
88	07194800	Illinois River at Savoy, Ark.	36.10	-94.34	11110103	167	Yes	U	1979-1980, 1986, 1996-2007	Yes
89	07195000	Osage Creek near Elm Springs, Ark.	36.22	-94.29	11110103	130	Yes	U	1951-1975, 1976-2007	Yes
90	07195430	Illinois River South of Siloam Springs, Ark.	36.11	-94.53	11110103	568	Yes	U	1995-2006	Yes
91	07195500	Illinois River near Watts, Okla.	36.13	-94.57	11110103	630	Yes	U	1955-2007	Yes
92	07195800	Flint Creek at Springtown, Ark.	36.26	-94.43	11110103	14.7	Yes	U	1961-2007	Yes
93	07195855	Flint Creek near West Siloam Springs, Okla.	36.22	-94.60	11110103	59.8	Yes	R	1980-2007	No
94	07195865	Sager Creek near West Siloam Springs, Okla.	36.20	-94.61	11110103	19.1	Yes	U	1996-2007	Yes
95	07196000	Flint Creek near Kansas, Okla.	36.19	-94.71	11110103	116	Yes	U	1956-1990, 1993-2007	Yes
96	07196500	Illinois River near Tahlequah, Okla.	35.92	-94.92	11110103	950	Yes	U	1936-2007	Yes
97	07196900	Baron Fork at Dutch Mills, Ark.	35.88	-94.49	11110103	41.1	Yes	U	1958-2007	Yes
98	07196973	Peacheater Creek at Christie, Okla.	35.95	-94.70	11110103	24.9	Yes	U	1992-2003	Yes
99	07197000	Baron Fork at Eldon, Okla.	35.92	-94.84	11110103	312	Yes	U	1949-2007	Yes
100	07197360	Caney Creek near Barber, Okla.	35.78	-94.86	11110103	90.2	Yes	U	1998-2007	Yes
101	07198000	Illinois River near Gore, Okla.			11110103	1,610	Yes	U	1939-1951	Yes
			35.57	-95.07				R	1953-2007	No
102	07228500	Canadian River at Bridgeport, Okla.	35.54	-98.32	11090202	20,500	No	U	1945-1964	No
								R	1970-2007	No
103	07229100	Canadian River near Noble, Okla.	35.08	-97.38	11090202	21,100	No	R	1965-1975	No

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
104	07229200	Canadian River at Purcell, Okla.	35.01	-97.35	11090202	21,100	No	R	1980-2007	No
105	07229300	Walnut Creek at Purcell, Okla.	35.00	-97.37	11090202	202	Yes	U	1966-1993	Yes
106	07230000	Little River below Lake Thunderbird near Norman, Okla.	35.22	-97.21	11090203	257	Yes	U	1953-1964	No[5]
								R	1966-2007	No
107	07230500	Little River near Tecumseh, Okla.	35.17	-96.93	11090203	463	Yes	U	1944-1964	Yes
								R	1966-2007	No
108	07231000	Little River near Sasakwa, Okla.	34.97	-96.51	11090203	888	Yes	U	1943-1961	Yes
								R	1966-2007	No
109	07231500	Canadian River at Calvin, Okla.	34.98	-96.24	11090202	23,200	No	U	1906-1964	No
								R	1965-2007	No
110	07232000	Gaines Creek near Krebs, Okla.	34.98	-95.62	11090204	585	Yes	U	1943-1963	No[6]
111	07232500	Beaver River near Guymon, Okla.	36.72	-101.49	11100101	1,610	Yes	U	1938-1971	No[4]
								UI	1978-1993	No
112	07232900	Coldwater Creek near Guymon, Okla.	36.57	-101.38	11100103	960	Yes	UI	1981-2007	No
113	07233000	Coldwater Creek near Hardesty, Okla.	36.64	-101.21	11100103	1,030	Yes	U	1940-1964	No[4]
114	07233500	Palo Duro Creek near Spearman, Texas	36.20	-101.31	11100104	625	Yes	U	1944-1971	No[4]
115	07233650	Palo Duro Creek at Range, Okla.	36.54	-101.08	11100104	826	Yes	R	1992-2007	No
116	07234000	Beaver River at Beaver, Okla.	36.82	-100.52	11100201	4,990	Yes	U	1938-1971	No[4]
								RI	1979-2007	No

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117	07234100	Clear Creek near Elmwood, Okla.	36.65	-100.50	11100201	162	Yes	U	1966-1993	No[4]
118	07234500	Beaver River near Fort Supply, Okla.	36.59	-99.59	11100201	6,540	Yes	U	1938-1950	No[4]
119	07235000	Wolf Creek at Lipscomb, Texas	36.24	-100.28	11100203	475	Yes	R	1962-1971	No
								RI	1978-2007	No
120	07236000	Wolf Creek near Fargo, Okla.	36.40	-99.62	11100203	1,470	Yes	U	1943-1958	No[4]
121	07237000	Wolf Creek near Fort Supply, Okla.	36.57	-99.55	11100203	1,500	Yes	R	1943-1971	No
								RI	1978-1993	No
122	07237500	North Canadian River at Woodward, Okla.	36.44	-99.28	11100301	8,380	Yes	U	1939-1971	Yes
								RI	1979-2007	No
123	07238000	North Canadian River near Seiling, Okla.	36.18	-98.92	11100301	9,060	Yes	U	1947-1971	Yes
								RI	1979-2007	No
124	07239000	North Canadian River at Canton, Okla.	36.08	-98.60	11100301	9,290	Yes	U	1938-1947	No[5]
								R	1949-1993, 2001-2002	No
125	07239300	North Canadian below Weavers Creek near Watonga, Okla.	35.81	-98.42	11100301	7,840	Yes	R	1984-2007	No
126	07239450	North Canadian River near Calumet, Okla.	35.62	-98.07	11100301	8,060	Yes	R	1989-2007	No
127	07239500	North Canadian River near El Reno, Okla.	35.56	-97.96	11100301	9,820	Yes	U	1903-1907, 1939-1947	No[5]
								R	1949-2007	No
128	07241000	North Canadian River below Lake Overholser near OKC, Okla.	35.48	-97.66	11100301	8,320	Yes	R	1953-1987, 1989-2007	No

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129	07241500	North Canadian River near Oklahoma City, Okla.	35.49	-97.43	11100302	8,460	Yes	R	1939-1960	No
130	07241520	North Canadian River at Britton Road at OKC, Okla.	35.57	-97.37	11100302	8,510	Yes	R	1989-2007	No
131	07241550	North Canadian River near Harrah, Okla.	35.50	-97.19	11100302	8,600	Yes	R	1969-2007	No
132	07242000	North Canadian River near Wetumka, Okla.	35.27	-96.21	11100302	9,390	Yes	R	1938-2007	No
133	07242350	Deep Fork near Arcadia, Okla.	35.65	-97.36	11100303	101	No	UUrb	1970-1986	No
134	07242380	Deep Fork at Warwick, Okla.	35.68	-97.01	11100303	532	No	R	1988-2007	No
135	07243000	Dry Creek near Kendrick, Okla.	35.78	-96.85	11100303	68.4	Yes	U	1956-1994	Yes
136	07243500	Deep Fork near Beggs, Okla.	35.67	-96.07	11100303	2,000	Yes	U	1939-2007	Yes
137	07244000	Deep Fork near Dewar, Okla.	35.48	-95.88	11100303	2,300	Yes	U	1938-1950	Yes
138	07245000	Canadian River near Whitefield, Okla.	35.26	-95.24	11090204	37,900	No	U	1939-1963	No
								R	1965-2007	No
139	07245500	Sallisaw Creek near Sallisaw, Okla.	35.46	-94.86	11110104	181	Yes	U	1943-1976	Yes
140	07247000	Poteau River at Cauthron, Ark.	34.92	-94.30	11110105	204	Yes	U	1939-2007	Yes
141	07247015	Poteau River at Loving, Okla.	34.88	-94.48	11110105	268	Yes	U	1992-2007	Yes
142	07247250	Black Fork below Big Creek near Page, Okla.	34.77	-94.51	11110105	94.3	Yes	U	1992-2007	Yes
143	07247500	Fourche Maline near Red Oak, Okla.	34.91	-95.16	11110105	120	Yes	U	1939-1991, 1992-2007	Yes
144	07248500	Poteau River near Wister, Okla.	34.94	-94.72	11110105	994	Yes	U	1938-1948	Yes
								R	1950-1984	No

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
145	07249400	James Fork near Hackett, Ark.	35.16	-94.41	11110105	147	Yes	U	1958-2007	Yes
146	07249413	Poteau River near Panama, Okla.	35.17	-94.65	11110105	1,770	Yes	R	1990, 1993-2007	No
147	07249500	Cove Creek near Lee Creek, Ark.	35.72	-94.41	11110104	34.8	Yes	U	1950-1970	Yes
148	07249985	Lee Creek near Short, Okla.	35.52	-94.46	11110104	434	Yes	U	1931-1936, 1950-1991, 1993-2007	Yes
149	07250000	Lee Creek near Van Buren, Ark.	35.49	-94.45	11110104	438	Yes	U	1931-1936, 1951-1993	Yes
150	07250550	Arkansas River at James W. Trimble L&D near Van Buren, Ark.	35.35	-94.30	11110104	128,800	No	U	1928-1963	No
								R	1970-2007	No
151	07299200	Prairie Dog Town Fork Red River near Lakeview, Texas	34.57	-100.75	11120105	2,020	No	U	1963-1980	No
152	07299300	Little Red River near Turkey, Texas	34.54	-100.77	11120105	148	Yes	U	1968-1981	No[5]
153	07299540	Prairie Dog Town Fork Red River near Childress, Texas	34.57	-100.19	11120105	2,960	No	U	1965-2007	No
154	07299570	Red River near Quanah, Texas	34.41	-99.74	11130101	3,550	No	U	1960-1982	No
155	07299670	Groesbeck Creek at State Highway 6 near Quanah, Texas	34.35	-99.74	11130101	320	Yes	U	1962-2007	Yes
156	07299890	Lelia Lake Creek below Bell Creek near Hedley, Texas	34.94	-100.70	11120201	71.5	Yes	U	1998-2007	No[5]
157	07300500	Salt Fork Red River at Mangum, Okla.	34.86	-99.51	11120202	1,350	Yes	U	1938-2007	No[5]
158	07301110	Salt Fork Red River near Elmer, Okla.	34.48	-99.38	11120202	1,870	Yes	U	1980-2007	No[5]

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
159	07301300	North Fork Red River near Shamrock, Texas	35.26	-100.24	11120302	817	Yes	U	1965-1991, 2000-2007	No[5]
160	07301410	Sweetwater Creek near Kelton, Texas	35.47	-100.12	11120302	297	Yes	U	1962-2007	No[5]
161	07301420	Sweetwater Creek near Sweetwater, Okla.	35.42	-99.97	11120302	437	Yes	U	1986-2007	No[5]
162	07301500	North Fork Red River near Carter, Okla.	35.17	-99.51	11120302	2,100	Yes	U	1938-1962, 1964-2007	Yes
163	07303000	North Fork Red River below Altus Dam near Lugert, Okla.	34.89	-99.31	11120302	2,120	Yes	R	1978-2007	No
164	07303400	Elm Fork of North Fork Red River near Carl, Okla.	35.01	-99.90	11120304	438	Yes	U	1960-1979, 1995-2007	Yes
165	07303500	Elm Fork of North Fork Red River near Mangum, Okla.	34.93	-99.50	11120304	846	Yes	U	1905-1908, 1938-1976	Yes
166	07304500	Elk Creek near Hobart, Okla.	34.91	-99.11	11120303	549	Yes	U	1905-1907, 1950-1966	Yes
								R	1967-1987	No
167	07305000	North Fork Red River near Headrick, Okla.	34.63	-99.10	11120303	3,850	Yes	R	1945-2007	No
168	07305500	West Otter Creek at Snyder Lake near Mountain Park, Okla.	34.73	-98.99	11120303	132	Yes	R	1976-2007	No
169	07307028	North Fork Red River near Tipton, Okla.	34.51	-99.21	11120303	4,290	Yes	R	1985-2007	No
170	07308500	Red River near Burkburnett, Texas	34.11	-98.53	11130102	14,600	No	U	1960-2007	No

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

[no., number; Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Period of record, water years used to compute flow duration and annual mean flow statistics; HU 8, 8-digit hydrologic unit; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; L&D, lock and dam; SCS, soil conservation service; 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile]

Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
171	07311000	East Cache Creek near Walters, Okla.	34.36	-98.28	11130202	694	Yes	U	1938-1960	No[5]
								R	1962-1963, 1970-2007	No
172	07311200	Blue Beaver Creek near Cache, Okla.	34.62	-98.56	11130203	24.7	Yes	R	1964-2003	No
173	07311500	Deep Red Creek near Randlett, Okla.	34.22	-98.45	11130203	604	Yes	U	1950-2007	Yes
174	07313000	Little Beaver Creek near Duncan, Okla.	34.49	-98.11	11130208	157	Yes	U	1949-1963	Yes
175	07313500	Beaver Creek near Waurika, Okla.	34.22	-98.05	11130208	564	Yes	U	1954-1976	No[5]
								R	1978-1993	No
176	07315500	Red River near Terral, Okla.	33.88	-97.93	11130201	22,800	No	R	1945-1999, 2001-2007	No
177	07315700	Mud Creek near Courtney, Okla.	34.00	-97.57	11130201	574	Yes	U	1961-2007	Yes
178	07316000	Red River near Gainesville, Texas	33.73	-97.16	11130210	24,800	No	R	1945-2007	No
179	07316500	Washita River near Cheyenne, Okla.	35.63	-99.67	11130301	763	Yes	U	1938-2007	No[5]
180	07319500	Sandstone Creek near Berlin, Okla.	35.51	-99.56	11130301	45.2	Yes	U	1953-1972	Yes
181	07323000	Sandstone Creek near Cheyenne, Okla.	35.55	-99.53	11130301	86.1	Yes	U	1952-1974	Yes
182	07324200	Washita River near Hammon, Okla.	35.66	-99.31	11130301	1,350	Yes	U	1970-1987, 1990-2007	Yes
183	07324400	Washita River near Foss, Okla.	35.54	-99.17	11130302	1,550	Yes	R	1962-1987, 1990-2007	No
184	07325000	Washita River near Clinton, Okla.	35.53	-98.97	11130302	1,950	Yes	U	1936-1960	Yes
								R	1962-2007	No
185	07325500	Washita River at Carnegie, Okla.	35.12	-98.56	11130302	3,100	Yes	U	1938-2006	Yes

Table 1. Description of streamflow-gaging stations in and near Oklahoma and periods of record where flow-duration and annual mean-flow statistics were calculated, and if selected periods of record were used in regression equations for estimating flow-duration and annual mean flow statistics at ungaged stream locations in Oklahoma. —Continued

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Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
186	07325800	Cobb Creek near Eakly, Okla.	35.29	-98.59	11130302	132	Yes	U	1969-2007	Yes
187	07326000	Cobb Creek near Fort Cobb, Okla.	35.14	-98.44	11130302	311	Yes	U	1940-1958	Yes
								R	1960-2007	No
188	07326500	Washita River at Anadarko, Okla.	35.08	-98.24	11130302	3,660	Yes	R	1964-2007	No
189	07327000	Sugar Creek near Gracemont, Okla.	35.18	-98.26	11130302	206	Yes	U	1956-1974	Yes
190	073274406	Little Washita River above SCS Pond no. 26 near Cyril, Okla.	34.91	-98.25	11130302	3.65	Yes	U	1996-2007	Yes
191	07327442	Little Washita River near Cyril, Okla.	34.89	-98.23	11130302	13.3	Yes	U	1993-2007	Yes
192	07327447	Little Washita River near Cement, Okla.	34.84	-98.12	11130302	62.3	Yes	U	1992-2007	Yes
193	07327490	Little Washita River near Ninnekah, Okla.	34.94	-97.95	11130302	208	Yes	U	1952-1986	Yes
194	07327550	Little Washita River east of Ninnekah, Okla.	34.96	-97.90	11130302	232	Yes	U	1992-2007	Yes
195	07328000	Washita River near Tabler, Okla.	34.97	-97.87	11130303	4,670	Yes	U	1940-1952	Yes
196	07328070	Winter Creek near Alex, Okla.	34.99	-97.76	11130303	33.1	Yes	U	1967-1986	Yes
197	07328100	Washita River at Alex, Okla.	34.93	-97.77	11130303	4,790	Yes	R	1965-2007	No
198	07328180	North Criner Creek near Criner, Okla.	34.97	-97.58	11130303	7.19	Yes	U	1989-2007	No[5]
199	07328500	Washita River near Pauls Valley, Okla.	34.75	-97.25	11130303	5,290	Yes	U	1938-1960	Yes
								R	1962-2007	No
200	07329000	Rush Creek at Purdy, Okla.	34.70	-97.60	11130303	140	Yes	U	1940-1953, 1982-1994	Yes
201	07329500	Rush Creek near Maysville, Okla.	34.74	-97.41	11130303	202	Yes	U	1955-1976	Yes

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Map no.	USGS station ID	Station name	Location		HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
			Latitude (decimal degrees)	Longitude (decimal degrees)						
202	07329700	Wildhorse Creek near Hoover, Okla.	34.54	-97.25	11130303	604	Yes	R	1970-1995, 2001-2007	No
203	07329852	Rock Creek at Sulphur, Okla.	34.50	-96.99	11130303	44.1	Yes	U	1990-2007	Yes
204	07329900	Rock Creek at Dougherty, Okla.	34.40	-97.04	11130303	137	Yes	U	1957-1966	Yes
205	07330500	Caddo Creek near Ardmore, Okla.	34.24	-97.11	11130303	296	Yes	U	1937-1950	Yes
206	07331000	Washita River near Dickson, Okla.	34.23	-96.98	11130303	7,160	Yes	U	1929-1960	Yes
								R	1962-2007	No
207	07331600	Red River at Denison Dam near Denison, Texas	33.82	-96.56	11140101	33,800	No	U	1924-1943	No
								R	1945-1989, 1998-2007	No
208	07332400	Blue River at Milburn, Okla.	34.25	-96.55	11140102	203	Yes	U	1966-1987	Yes
209	07332500	Blue River near Blue, Okla.	34.00	-96.24	11140102	477	Yes	U	1937-2007	Yes
210	07332600	Bois D'Arc Creek near Randolph, Texas	33.48	-96.21	11140101	72.1	Yes	U	1963-1985	No[5]
211	07333500	Chickasaw Creek near Stringtown, Okla.	34.46	-96.03	11140103	32.6	Yes	U	1956-1968	Yes
212	07333800	McGee Creek near Stringtown, Okla.	34.44	-95.87	11140103	88.8	Yes	U	1956-1968	Yes
213	07334000	Muddy Boggy Creek near Farris, Okla.	34.27	-95.91	11140103	1,090	Yes	U	1938-1986	Yes
								R	1988-2007	No
214	07335000	Clear Boggy Creek near Caney, Okla.	34.25	-96.21	11140104	713	Yes	U	1943-1989	Yes
215	07335300	Muddy Boggy Creek near Unger, Okla.	34.03	-95.75	11140103	2,260	Yes	R	1989-2007	No
216	07335400	Sanders Creek near Chicota, Texas	33.85	-95.54	11140101	175	Yes	R	1968-1986	No

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Map no.	USGS station ID	Station name	Location: Latitude (decimal degrees)	Location: Longitude (decimal degrees)	HU 8	Drainage area (square miles)[1]	Is Drainage completely within preprocessed area?[2]	Type of record (U/R/I/Urb)	Period of record	Was period used in regression analysis?[3]
217	07335500	Red River at Arthur City, Texas	33.88	-95.50	11140101	38,600	No	R	1945-2007	No
218	07335700	Kiamichi River near Big Cedar, Okla.	34.64	-94.61	11140105	39.6	Yes	U	1966-2007	Yes
219	07335790	Kiamichi River near Clayton, Okla.	34.57	-95.34	11140105	708	Yes	R	1984-2007	No
220	07336000	Tenmile Creek near Miller, Okla.	34.30	-95.74	11140105	68.3	Yes	U	1956-1970	Yes
221	07336200	Kiamichi River near Antlers, Okla.	34.25	-95.61	11140105	1,130	Yes	U	1973-1982	Yes
								R	1984-2007	No
222	07336500	Kiamichi River near Belzoni, Okla.	34.20	-95.48	11140105	1,420	Yes	U	1926-1972	Yes
223	07336750	Little Pine Creek near Kanawha, Texas	33.84	-95.27	11140106	75.3	Yes	U	1969-1980	No[5]
224	07336800	Pecan Bayou near Clarksville, Texas	33.69	-94.99	11140106	98.9	Yes	U	1962-1978	No[5]
225	07336820	Red River near De Kalb, Texas	33.68	-94.69	11140106	41,400	No	R	1969-1999, 2003-2007	No
226	07337500	Little River near Wright City, Okla.	34.07	-95.05	11140107	648	Yes	U	1930-1931, 1945-1968	Yes
								R	1970-1989	No
227	07337900	Glover River near Glover, Okla.	34.10	-94.90	11140107	320	Yes	U	1962-2007	Yes
228	07338500	Little River below Lukfata Creek near Idabel, Okla.	33.94	-94.76	11140107	1,230	Yes	U	1930-1968	Yes
								R	1970-2007	No
229	07338750	Mountain Fork at Smithville, Okla.	34.46	-94.64	11140108	322	Yes	U	1992-2007	Yes
230	07339000	Mountain Fork near Eagletown, Okla.	34.04	-94.62	11140108	800	Yes	U	1924-1968	Yes
								R	1969-2007	No

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			Latitude (decimal degrees)	Longitude (decimal degrees)						
231	07339500	Rolling Fork near DeQueen, Ark.	34.05	-94.41	11140109	183	Yes	U	1949-1973	Yes
232	07340300	Cossatot River near Vandervoort, Ark.	34.38	-94.24	11140109	89.1	Yes	U	1967-2007	Yes
233	07340500	Cossatot River near DeQueen, Ark.	34.05	-94.21	11140109	361	Yes	U	1938-1974	Yes
234	07341000	Saline River near Dierks, Ark.	34.10	-94.08	11140109	120	Yes	U	1939-1974	Yes
235	07341200	Saline River near Lockesburg, Ark.	33.96	-94.06	11140109	253	Yes	U	1963-1974	Yes

[1]Drainage area determined from ArcGIS software version 9.2 with National Hydrography Dataset 10-meter resolution elevation data.

[2]Basin characteristics could not be computed for gages where the drainage areas extend outside of the preprocessed hydrologic unit (S.J. Smith and R.A. Esralew, U.S. Geological Survey, written commun., 2009). Streamflow statistics computed from gages in which basin characteristics could not be computed were not included in the regression analysis.

[3] If a period of record for a streamflow-gaging station was used in the regression analysis, drainage-basin characteristics were computed and are presented in this report.

[4]Flow duration and annual mean-flow statistics from gages in the Upper Beaver/North Canadian Basin and Upper Cimarron Basin (fig. 1) were not included in the final regression analysis because streams in these basins are substantially affected by irrigation withdrawals and diversions. Estimation of flow duration and annual mean flow statistics in this region using an unregulated period of record would not reflect current conditions and not be useful for application of these regressions for effective water-resources management.

[5]This station was a significant outlier in the regression analysis and was not used to produce the regression equations listed in table 3, 4, or 5.

[6]Gaines Creek near Krebs could not be used in regression analysis because the 10-85 channel slope, soil permeability, and percent forest canopy could not be accurately computed for the period of record of available streamflow data. The streamflow-gaging station was discontinued and is now located at the same site as Lake Eufaula.

interest. The larger the contributing drainage area the greater the amount of water from precipitation is available as runoff to a stream. The entire drainage area upstream from a stream location can be considered "contributing" in most drainage basins in eastern, central, and most of western Oklahoma. Not all of the drainage area in a watershed in far western parts of the study area (including the Oklahoma and Texas Panhandles), contributes to streamflow because of playa lakes. Playa lakes are the largest noncontributing area in the study area. Playa lakes are dry lake beds that are formed as runoff collects in depressions and almost entirely infiltrates to groundwater or the water evaporates. Water that enters these lake beds does not directly reach the stream as runoff, therefore, areas that drain to playas can be considered noncontributing (Briere, 2002). Areas upstream from playa lakes were not included in computation of contributing drainage area in this report.

Topography in the most northwestern part of the state is a flat upland surface originated on alluvial sands that evolves eastward to sandstone hills consisting of soft, flat-lying red Permian sandstones and shales. Areas in the northwest part of the state tend to be less topographically variable (smaller channel slope and lower drainage-basin hillslopes) than observed in the eastern part of the state, where the Ouachita Mountains in the southeast consist of high hills and ridges formed by tightly folded and faulted sandstones and shales, and the Ozark Plateau in the northeast, which form a deeply dissected plateau of limestones and cherts (Johnson and others, 1979). Elevation is variable across the state with the Great Plains in the Oklahoma Panhandle at more than 5,000 feet above the North American Vertical Datum of 1988 (NAVD 88). Elevations decrease eastward with the Arkansas and Red Rivers exiting the state of Oklahoma at less than 500 feet above NAVD 88 (fig. 2).

Slope of the land surface or stream channel can affect the rate and amount of precipitation that is carried as runoff to a stream. Drainage basins that have lower average hillslopes and streams with lower slopes may result in a decreased magnitude of surface runoff from precipitation, potentially facilitating infiltration of runoff to groundwater through increased residence time of runoff on the land surface. Drainage basins that have greater hillslopes and channels that have steeper slopes also have the possibility to cause an increase in the magnitude of surface runoff during precipitation (Vieux, 2001). Although soil permeability is highly variable throughout the state, generally soils in the western two-thirds of the state have greater permeability than soils in the north- and south-central parts of the state (fig. 3). The eastern and central parts of the state generally have soils of intermediate permeability as compared to soils in western and north- and south-central Oklahoma. Soils with lower permeability may yield more runoff and less base flow compared to soils with higher permeability. Higher permeability in soils can result in more infiltration and a greater potential for contribution of groundwater during base flow (Thomas, 1966).

Forested landcover is highly variable across Oklahoma, with eastern Oklahoma having the greatest density of forested canopy (fig. 4). Because of increased evapotranspiration demands from vegetation during the growing season, forested areas can result in lower peak flow and a lower rate and smaller volume of surface runoff during precipitation events, especially during that time of year. Forested areas also typically have lower base flow per unit drainage area compared to unforested areas (Chang, 2006, p. 203-204).

The magnitude and frequency of precipitation in a drainage basin during the course of a year can heavily affect the magnitude, duration, and frequency of elevated streamflow and base flow. Oklahoma has a diverse climate that is largely influenced by the geographic location of the state on the leeward side of the Rocky Mountains. Annual precipitation increases from 16 inches in the far west to 56 inches in the southeast. Average annual precipitation follows an east-west gradient in Oklahoma (fig. 5). Precipitation falls in the form of widespread rains and locally intense thunderstorms and generally is greatest in late spring and early autumn (Eddy, 1982). Convective spring and summer storms also can cause substantial runoff. Precipitation can be highly variable during summer and early autumn because of the influence of periodic tropical disturbances from the Gulf of Mexico (Arndt, 2003). Absence of autumn-season rains may cause a prolonged period of less than average streamflow (Tortorelli, 1991).

Anthropogenic Activities

Many streams throughout the study area are affected by anthropogenic activities that can alter the flow regime and affect streamflow statistics. Anthropogenic activities that may affect flow-duration and annual mean-flow statistics include, but are not limited to, regulation, irrigation withdrawals, and urban change.

The effect of regulation on flow downstream from dams is variable and depends on water uses for the reservoir. Managed releases of water downstream from reservoirs may influence the shape of the hydrograph and can affect the flow regime. Surface-water withdrawals, especially from large water-supply reservoirs, may reduce streamflow magnitude downstream depending on how much is withdrawn (Collier and others, 2000).

Oklahoma has more than 2,250 floodwater retarding (FWR) structures, mostly built by the Soil Conservation Service, currently the Natural Resources Conservation Service (NRCS), from the period of 1957 to present (S.J. Smith and R.A. Esralew, U.S. Geological Survey, written commun., 2009). Construction of FWR structures can reduce the magnitude of peaks and prolong the return to base flow during runoff. However, these structures may not have a strong effect on flow exceedance probabilities even though the structures hold flow during runoff, because the total amount of discharge downstream from the structure is unchanged during the course of streamflow events (Tortorelli and Bergman, 1985). This change in streamflow timing during runoff is not likely to have

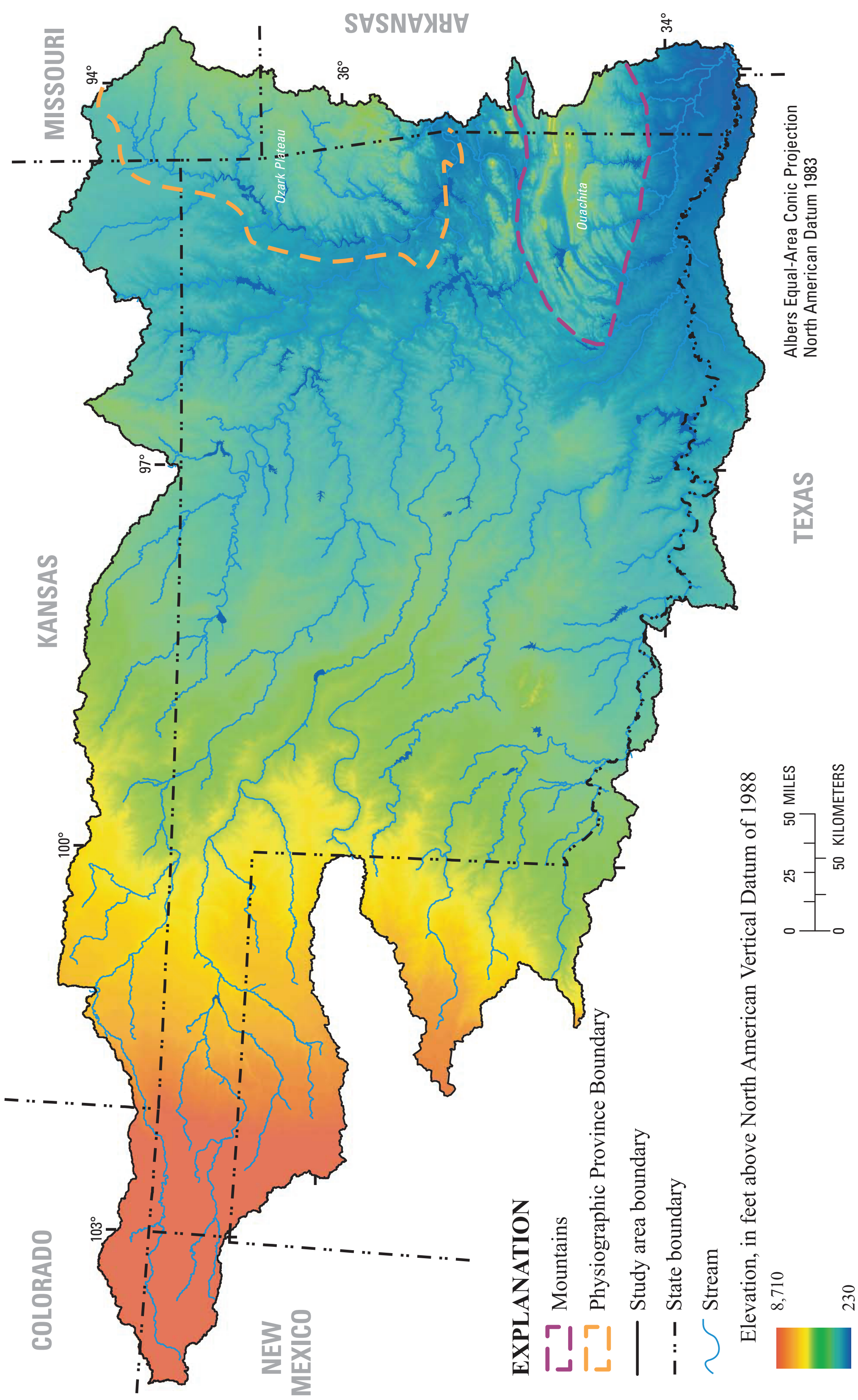

Figure 2. Land-surface elevation in Oklahoma and parts of adjacent states.

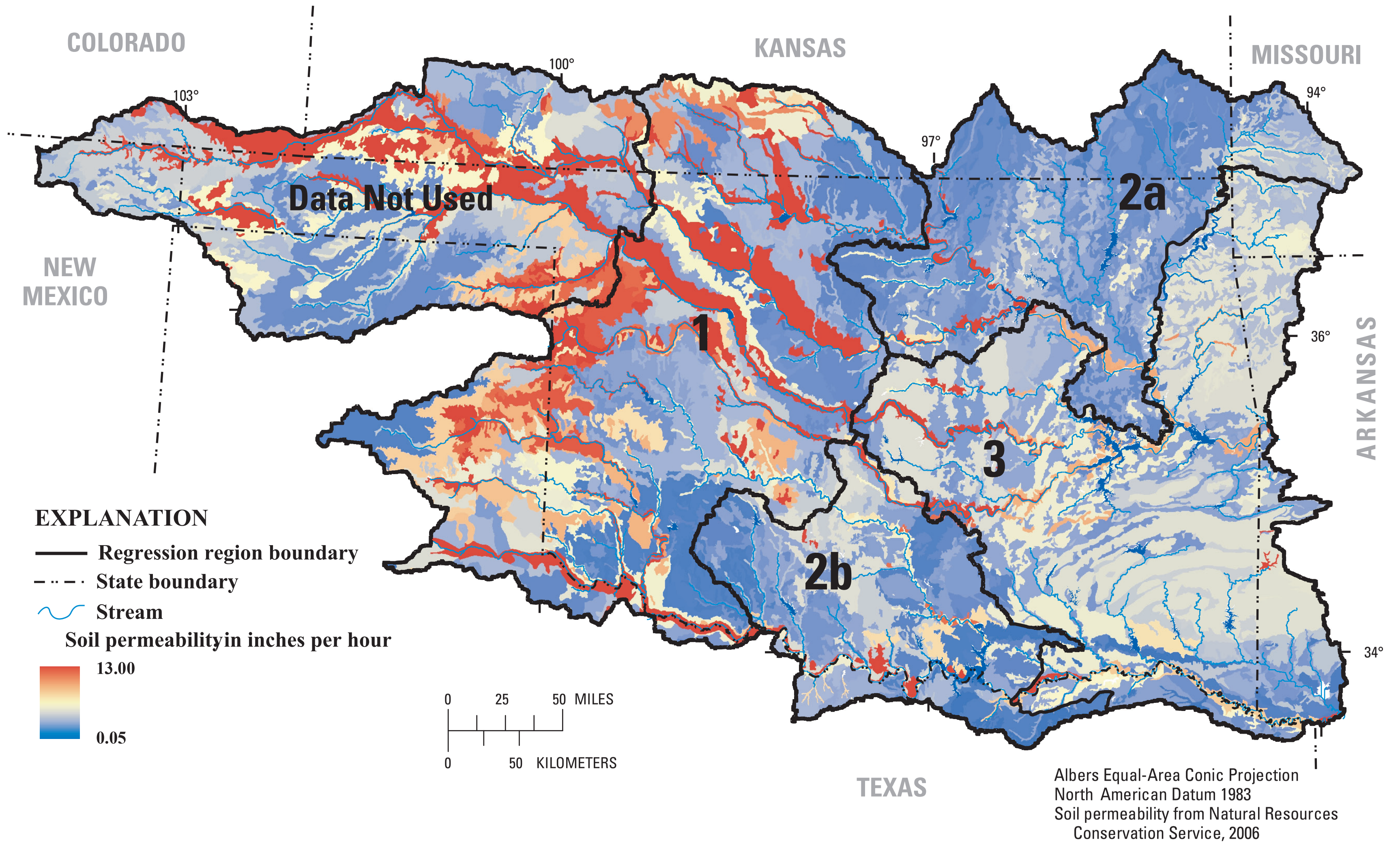

Figure 3. Areas of equal average soil permeability in Oklahoma and parts of adjacent states relative to three regions used in regression analysis, and three regions used for developing regression equations.

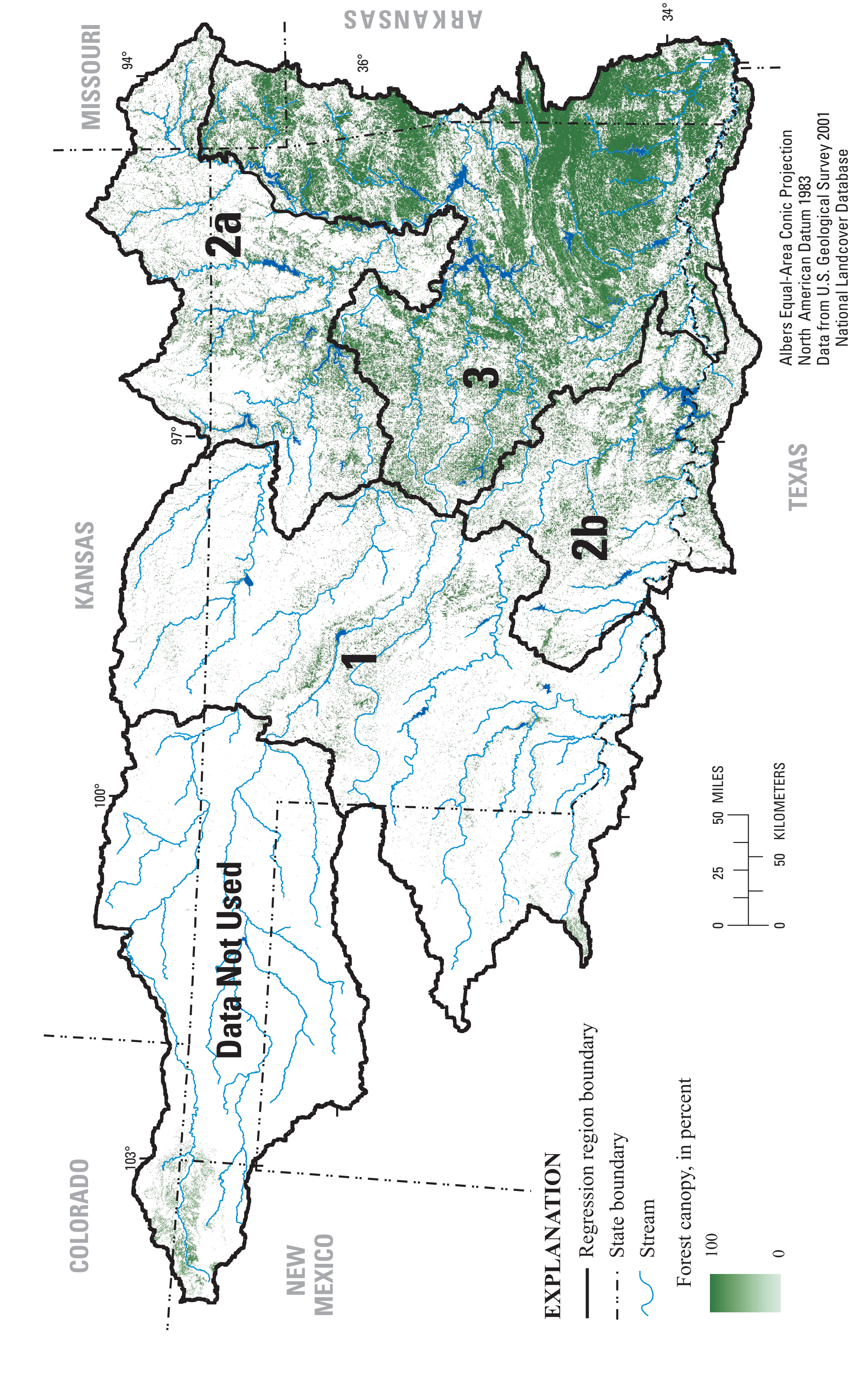

Figure 4. Percent forest canopy in Oklahoma and parts of adjacent states relative to three regions used in regression analysis, and three regions used for developing regression equations.

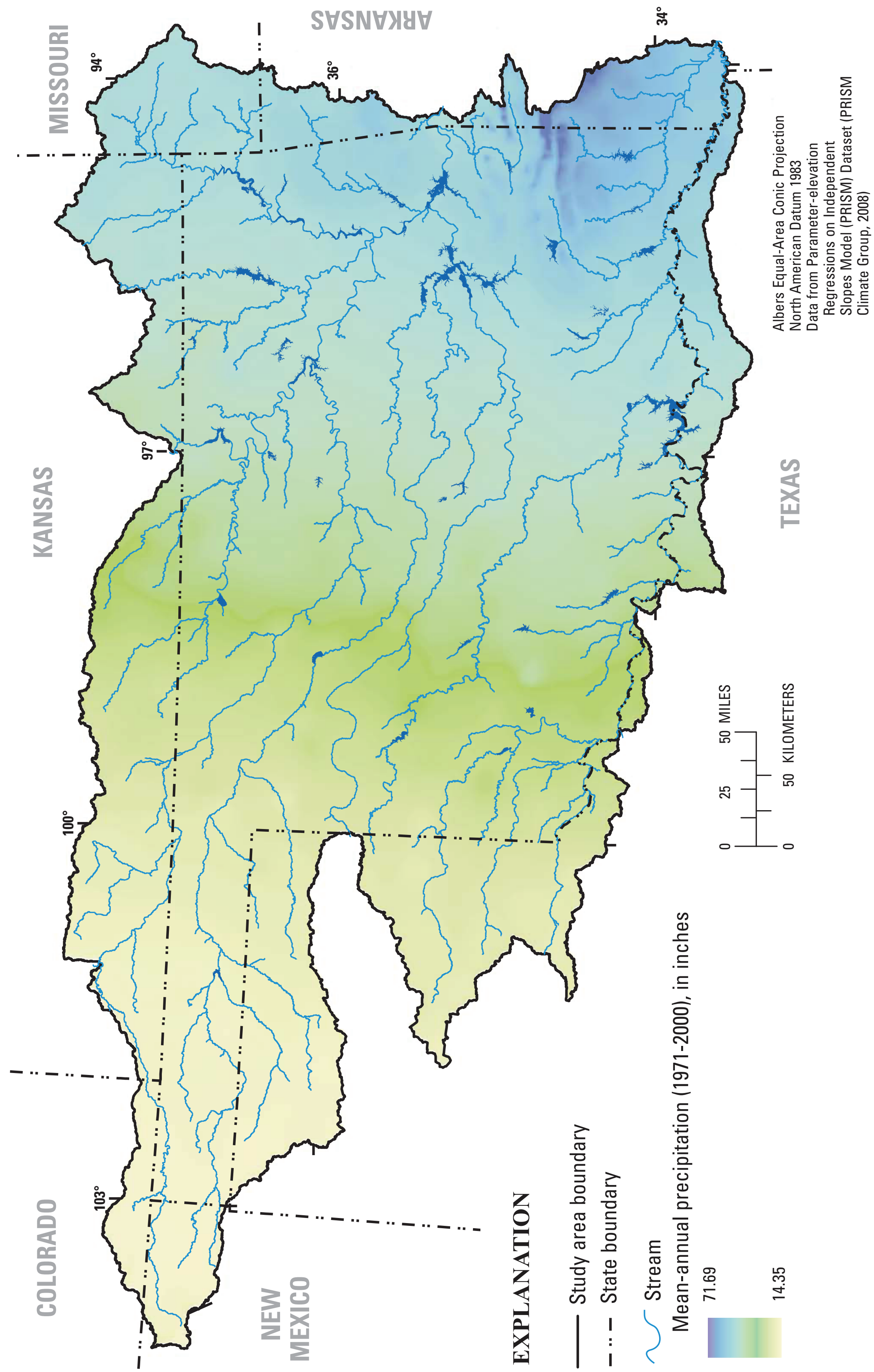

Figure 5. Mean-annual precipitation in Oklahoma and parts of adjacent states.

a strong effect on annual mean-flow or median flow-duration statistics. These structures may, however, have an effect on low flow because of an increased potential for infiltration because runoff is held behind the retention dam (R.L. Tortorelli, oral and written commun., August 2008).

Irrigation water uses vary across Oklahoma and are more pronounced in the western part of the state (Tortorelli, 2009). Irrigation water use, whether water is derived from groundwater or surface-water sources, can have a substantial effect on the variability of low flow because of nearby withdrawals and irrigation returns. Streamflow in the Upper Beaver/North Canadian Basin and Upper Cimarron Basin (fig. 1), are substantially affected by irrigation withdrawals (Wahl and Tortorelli, 1997 and R.L. Tortorelli and D. Boyle, oral and written commun., June 2008).

Drainage basins affected by urban change can have a substantial effect on the flow regime. Construction of roads and buildings involves removing vegetation, soil, and depressions from the land surface. The permeable soil is replaced by impermeable surfaces such as roads, roofs, parking lots, and sidewalks that store little water, reduce infiltration of water into the ground, and accelerate runoff to ditches and streams (Konrad, 2003).

Calculation of Flow-Duration and Annual Mean-flow Statistics at Gaging Stations

Streamflow Data Used for Calculation of Statistics

Daily mean discharge data collected from 235 continuous streamflow-gaging stations were used to calculate flow-duration and annual mean-streamflow statistics. Daily mean flows for USGS gaging stations in Oklahoma and adjacent states are available on the World Wide Web (URL *http://waterdata.usgs.gov/ok/nwis/ and http://waterdata.usgs.gov/us/nwis*). Daily mean flow is the mean of instantaneous discharges for a day (Buchanan and Somers, 1976). Instantaneous discharge data from gaging stations are collected as stage data, and instantaneous discharge is estimated from the rating curve, which is a relation between stage and discharge at a stream cross section (Rantz and others, 1982). Each gaging station selected for computation of flow-duration and annual mean-flow statistics had at least 10 complete water years of daily streamflow record as of water year 2007[1]. Gaps in the continuous record were accepted as long as the total record equaled or exceeded 10 complete water years of record.

[1] A water year is the 12-month period October 1 through September 30 and is designated by the calendar year in which it ends.

Data from gaging stations were not used in the regression analysis if the (1) streamflow is regulated by water-supply reservoirs, (2) withdrawals for irrigation and other water use substantially affect discharge, or (3) streamflow is likely affected by urban change. However, flow-duration and annual mean-streamflow statistics for periods of record affected by these circumstances were still calculated and are presented in this report. These statistics also can be used to estimate flow statistics at ungaged locations by using the drainage-area ratio method if the ungaged location is near a gaging station affected by these circumstances (see section titled "Methods of Estimating Flow-Duration and Annual Mean-Flow Statistics at Ungaged Stream Locations"). Separate periods of record for these sites were defined as the period when the effects of regulation, regional irrigation, or urban change were suspected to substantially affect streamflow at the gaging station.

A gaging station was considered substantially affected by regulation if 20 percent or more of the drainage basin upstream from the gage was regulated by major water-supply reservoirs (Tortorelli, 2002; Lewis and Esralew, 2009). For larger water-supply reservoirs, the year of construction marked the end of the unregulated period of record and beginning of the regulated period of record for a gaging station. However, streamflow in drainage-basins affected by FWR structures was not considered regulated for this study. Observations in this study indicated that most gaging stations affected by FWR structures had no substantial difference in either flow-duration or annual mean-flow statistics between the period before construction and the period after construction. In addition, had periods affected by FWR structures been included as regulated periods, a large percentage of data from many gaging stations would have been eliminated.

Periods of record for gaging stations that were substantially affected by withdrawals for irrigation and other water use were determined by hydrographer remarks (R.L. Tortorelli, D. Boyle, oral and written commun., June–July 2008) and analysis notes from previous publications (Wahl and Tortorelli, 1997; Smith and Wahl, 2003; Tortorelli, 2002; Tortorelli and others, 2005; Lewis and Esralew, 2009). Visual inspection of the annual hydrographs determined the irrigated period of record for sites with downward trends for peak flow and annual mean flow as a result of irrigation activities (Tortorelli and others, 2005). The year that annual peak flows substantially dropped was the starting year of the irrigation period (table 1).

Hydrographer and analysis notes from previous publications revealed that many gaging stations may be affected by minor anthropogenic activities such as localized irrigation, sewage effluent, or other minor diversions. For this study, mention of these activities in historical notes did not result in a split period of record because the period when these activities started could not be quantified by hydrograph inspection.

Periods of record affected by urbanization also were identified. Gaging stations with drainage-basins that had an impervious surface of 10 percent or greater from the USGS 2001

National Land Cover Dataset (NLCD) (*http:// landcover.usgs.gov/ natllandcover.php*, accessed July 2008) were considered to be affected by urban change (Tortorelli, 2002; Lewis and Esralew, 2009). Analysis of historic impervious surface prior to 2001 was not performed for this study; therefore, if this threshold was met by using the 2001 NLCD, the entire period of record was assumed to be affected by urban change.

Each separate period of record at a gaging station (unregulated, irrigated, regulated, or urban) required a minimum of 10 complete water years in order for statistics to be calculated for that period. For this report, if a period of record was not substantially affected by regulation, irrigation, or urban change, the site was referred to as “unregulated”. Periods of record that may be affected by minor anthropogenic activities are still referred to as “unregulated” in this report. If a period was substantially affected by irrigation activity but was not affected by regulation, that period is referred to as “unregulated irrigated” . If a period was affected by regulation and irrigation, or regulation and urban change, that period is referred to as “regulated irrigated” or “regulated urban,” respectively. Table 1 includes a list of gaging stations where flow-duration and annual mean-flow statistics were calculated, the period of record for which these statistics were calculated, and the kind of period of record (unregulated, regulated, irrigated, or urban). Table 1 also indicates whether the streamflow data from that period of record was included in regression analysis (described in the section titled “Selection of Data for Use in Regression Analysis”). Flow-duration and annual mean-flow statistics were computed for 235 gaging stations. Flow statistics for gaging stations with more than one kind of period of record were computed for 45 gaging stations. One hundred and seventy-seven gaging stations had flow statistics calculated for an unregulated period, 89 gaging stations had flow statistics computed for a regulated period of record (including 5 gaging stations that also were affected by irrigation for the same period), 6 gaging stations had flow statistics computed for an unregulated irrigated period, and 8 gaging stations had flow statistics computed for an unregulated urban period.

Calculation of Statistics

The USGS has established standard methods for estimating flow-duration and annual mean-flow statistics for gaging stations (Searcy, 1959). The computer software programs IOWDM, ANNIE, and SWSTAT were used to format input data and calculate flow-duration and annual mean-flow statistics (Lumb and others, 1990; Flynn and others, 1995). These programs are available on the World Wide Web (URL *http://water.usgs.gov/software/surface_water.html*). Daily mean flows for all complete water years of record for periods identified in table 1 were used to determine flow-duration curves that were used to derive flow-duration statistics. Flow-duration curves (fig. 6) are graphical representations of the percentage of the time that streamflow for a given time step (for example, a daily time step) is equaled or exceeded during a specified period.

Flow-duration statistics are points along a flow-duration curve and represent the discharge that is exceeded for a given percentage of time. For this report, flow-duration statistics are referred to as “D” followed by the exceedance probability. For example, the 95-percent flow-duration statistic or D_{95} represents the streamflow that is equaled or exceeded 95 percent of the time; whereas, the 50-percent flow-duration statistic (median, or D_{50}) is the streamflow that is equaled or exceeded 50 percent of the time.

Flow-duration statistics reflect only the period for which these statistics are calculated and flow-duration statistics that are calculated or estimated by using past record should not be considered a forecast of future streamflow (Leopold, 1959). The period of record used for flow-duration curve calculation can be for the complete period of record, or daily flows during a specified period in the period of record, such as a month or group of months. For example, flow-duration statistics can be calculated by using only those daily flows during the month of October, when at least 10 complete water years of data of daily flow data are available.

Flow-duration curves were constructed for daily flow data in SWSTAT for annual (all daily flow during the period of record), seasonal (daily flow from June 1st through October 31st, which is referred to as the summer-autumn period, and daily flow from November 1st through May 31st, which is referred to as the winter-spring period), and monthly time periods (daily flow data during each of 12 months). Summer-autumn and winter-spring periods correspond to the regulatory seasons used by OWRB for water-supply permits. The procedure in SWSTAT used to compute flow-duration statistics is similar to that in Lewis and Esralew (2009).

Flow-duration curves for D_{20}, D_{50}, D_{80}, D_{90}, and D_{95} were used to compute the one annual, two seasonal, and twelve monthly time periods (a total of 75 flow-duration statistics). Flow-duration statistics for individual gaging stations were computed separately for each kind of period of record (table 1). Flow-duration and annual mean-flow statistics for each station are presented in tables 2 through 6 (back of report).

Abbreviations of flow statistics for tables in this report follow the naming conventions used by USGS StreamStats (*http://water.usgs.gov/osw/streamstats/StatisticsDefinitions.html* accessed November 2009). Summer-autumn and winter-spring flow-duration statistics are referred to as the flow-duration statistic followed by *SUM* and *WSP*, respectively. For example, the D_{20} for the summer-autumn period is referred to as $D_{20}SUM$ and the D_{95} for the winter-spring period is referred to as $D_{95}WSP$. Monthly flow-duration statistics are referred to by the first three letters of the month followed by the flow-duration statistic. For example, $OCTD_{20}$ refers to the D_{20} for daily flows during October, and $SEPD_{95}$ refers to the D_{95} for daily flows during September.

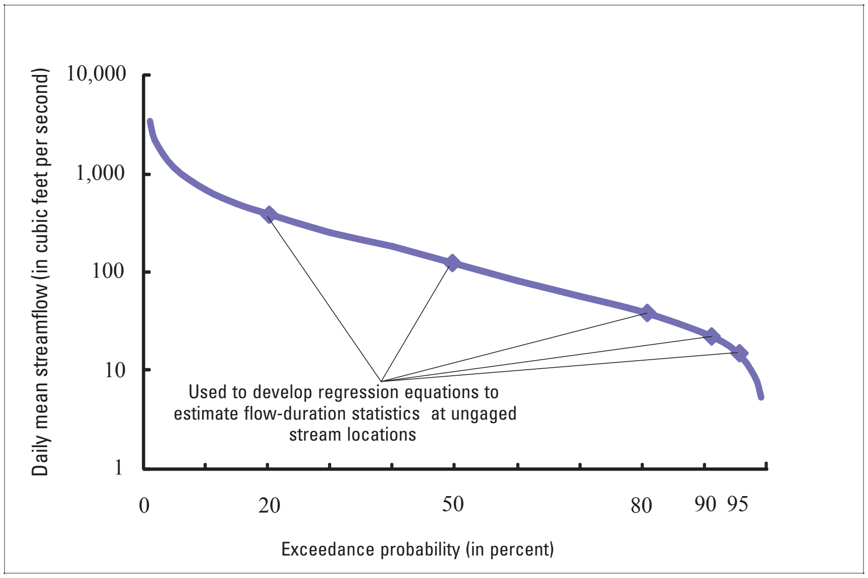

Figure 6. Example of a flow-duration curve for Baron Fork at Eldon, Oklahoma (U.S. Geological Survey station identifier 07197000, map number 99 on figure 1), by using daily streamflow data for the entire period of record, 1949–2007.

Methods of Estimating Flow-Duration and Annual Mean-Flow Statistics at Ungaged Stream Locations

Flow-duration and annual mean-flow statistics can be estimated at ungaged stream sites by using a drainage-area ratio relation and a regional regression equation. If an ungaged stream location is near a gaging station on the same stream reach, the drainage-area ratio method is the preferred method for estimating flow statistics. As an alternative, to estimate streamflow statistics at ungaged streams not near a gaging station on the same reach, a regression equation relating the streamflow statistic for gaging stations in a defined region to one or more drainage-basin characteristics can be created.

Drainage-Area Ratio Method

The drainage-area ratio method is based on the assumption that the unit area runoff of the ungaged drainage-basin is the same as that for the gaged site (and that no substantially large tributaries are between the location of the gaged and ungaged site). Streamflow statistics are computed for the gaged location, then the statistics are divided by the drainage area to determine streamflow per unit area at the gaged location. The equation used in this method (Ries and Friesz, 2000; Perry and others, 2004; Risley and others, 2008) follows:

$$Q_s = [DA_s / DA_g] * Q_g \quad (1)$$

where

Q_s is the low-flow statistic of the ungaged site, in cubic feet per second;

DA_s is the drainage area of the ungaged site, in square miles;

DA_g is the drainage area of the gaging station (upstream or downstream) in square miles; and

Q_g is the low-flow statistic of the gaging station (upstream or downstream) in cubic feet per second.

The drainage-area ratio method can be used by weighting the average ratios of drainage areas at the gaging stations to the ungaged site drainage area if the ungaged location is between two gaging stations by the following equation:

$$Q_s = [Q_{gu} (DA_{gd} - DA_s) + Q_{du} (DA_s - DA_{gu})] / (DA_{gd} - DA_{gu}) \quad (2)$$

where

Q_{gu} is the flow statistic at the upstream gaging station, in cubic feet per second;

Q_{du} is the flow statistic at the downstream gaging station, in cubic feet per second;

DA_{gu} is the drainage area of the upstream gaging station, in square miles;

DA_{gd} is the drainage area of the downstream gaging station, in square miles.

The method generally is reliable if the drainage-area ratio of the two sites is between 0.5 and 1.5 (Risley and others, 2008). Where an ungaged location meets this criteria for gaged streams with known effects from regulation, irrigation, and urban change, this method can be used to estimate flow statistics as long as the record from the gaging station used to compute the statistic also is affected by the same condition.

Regression Equation Method

Multiple-linear regression analysis (referred to as regression analysis in this report) is used to develop equations for estimating a variety of streamflow statistics at ungaged stream locations. An equation relating the streamflow statistic (dependent variable) to one or more drainage-basin characteristics (the independent variables) can be used to estimate the streamflow statistic for ungaged stream locations.

The multiple-linear regression equation takes the general form:

$$Y_i = b_o + b_1 X_1 + b_2 X_2 + \ldots + b_n X_n + e_i \tag{3}$$

where

Y_i is the value of the dependent variable, or streamflow statistic, for station 1;

b_o to b_n are the n+1 regression-model coefficients;

X_1 to X_n are the n independent variables, or series of drainage-basin characteristics used in the regression equation; and

e_i is the residual error (difference between the observed and estimated values of the dependent variables).

A least-squares method can be used in regression analysis to estimate the regression equation coefficients. This method in this report is referred to as Ordinary Least-Squares (OLS) regression analysis. The coefficients are determined after minimizing the sum of the squared differences, or errors, of the measured and estimated data points. In OLS regression, each data observation used in the analysis is assumed to provide equal information to the equation. All data observations are then given an equal weight in determining the equation coefficients through minimizing the sum of the squared errors.

For an optimal regression developed by using OLS procedures, four basic assumptions are needed: (1) the regression equation adequately describes the relation between the dependent and independent variables, (2) the variance of the residual error, e_i, is constant and independent of the values of X_1 to X_n, (3) the residual errors, e_i, are normally distributed, and (4) the e_i are independent of each other (Helsel and Hirsch, 1992).

Streamflow statistics and drainage-basin characteristics used in regression equations that estimate hydrologic conditions are typically log-normally distributed. Transformation of the variables to logarithms is usually necessary to satisfy the third assumption. All streamflow and drainage-basin characteristic data for use in the multiple-regression analysis can be transformed to base-10 logarithms to obtain a linear regression equation and to avoid inconsistent variance about the regression line. Transformation of variables results in the following equation:

$$\log Y_i = b_o + b_1 \log X_1 + b_2 \log X_2 + \ldots + b_n \log X_n + e_i \tag{4}$$

that can be retransformed to the original units by using an anti-logarithm:

$$Y_i = 10^{b_o} * (X_1^{b_1}) * (X_2^{b_2}) \ldots (X_n^{b_n}) * 10^{e_i} \tag{5}$$

The application of methods used to develop regression equations to estimate flow-duration and annual mean-flow statistics for ungaged stream locations are discussed in more detail in section, “Methods Used to Develop Regression Equations”

Development of Regression Equations to Estimate Flow-Duration and Annual Mean-Flow Statistics at Unregulated Ungaged Stream Locations in Oklahoma

The methods used to develop regression equations to estimate flow-duration and annual mean-flow statistics throughout Oklahoma involved (1) selection of gaging stations and drainage-basin characteristics for use in the regression analysis, (2) delineation of regression regions in the study area to increase regression accuracy, and (3) regression analysis including alternative techniques to handle flow-duration datasets where zero flow exceedances were observed.

Selection of Data for Use in Regression Analysis

Data selected for regression analysis included flow-duration and annual mean-flow statistics, and drainage-basin characteristics, from selected gaging stations in the study area. Gaging stations selected for regression analysis needed to have streamflow data from a period of record not affected by anthropogenic activities and drainage-basin characteristic data. Drainage-basin characteristic data selected for regression analysis included those characteristics that had a hydrologic and physical basis for use as independent variables for estimating flow statistics and could be easily applied to the StreamStats web application.

Selection of Sites and Periods of Record

Streams selected for regression analysis included only those streams where the drainage area was completely in 8-digit hydrologic unit (HU) boundaries that are in Oklahoma or adjacent to the Oklahoma state border (fig. 1). These criteria were required because drainage-basin characteristic data were not available for gaging stations that extended outside of this area (table 1). Of 235 gaging stations where flow statistics were calculated, 41 gaging stations had drainage areas that extended outside of the study area boundaries.

Flow statistics from gaging stations with drainage areas not completely in the study area, and flow statistics from periods of record that were affected by regulation, irrigation, or urban change, were not used in regression analysis. The effects of these circumstances on the hydrology of the area are highly variable and cannot be appropriately characterized by a regional regression approach. The earlier unregulated period was used in the regression for some gaging stations where statistics were calculated for more than one period because effects from regulation, irrigation, or urban change happened at a later point in the full period of record. The later period was not included in the analysis (table 1).

For this study, periods of record that may be affected by minor anthropogenic activities such as localized irrigation, sewage effluent, and small diversions were still included in the regression analysis. Removal of streamflow data from the regression analysis from periods of record that may be affected by minor anthropogenic activities would have resulted in a large amount of data being removed from the analysis.

Streamflow in the Upper Beaver/North Canadian Basin and Upper Cimarron Basin (fig. 1) are substantially affected by irrigation withdrawals (Wahl and Tortorelli, 1997 and R.L. Tortorelli and D. Boyle, oral and written commun., June 2008). Neither flow-duration or annual mean-flow statistics calculated for gaging stations in the Upper Beaver/North Canadian and Upper Cimarron Basins were included in the final regression analysis even if statistics from an unregulated period of record prior to known effects from irrigation were available (table 1). Estimated statistics in this region by using an unregulated period of record for these gaging stations would not reflect current circumstances and would not be useful for application of these regressions for effective water-resources management.

Of 194 gaging stations with drainage-basins completely in the study area, 137 gaging stations were initially used in the regression analysis (fig. 1). Twelve gaging stations in the Upper Cimarron and Upper Beaver/North Canadian Basins were not used in the regression analysis (table 1).

Selection and Computation of Drainage-Basin Characteristics

Physical and climatic characteristics of the drainage-basins upstream from the gaging stations were used as independent variables in the regression equations to predict streamflow statistics at ungaged sites. Using Geographic Information System (GIS) techniques, 23 drainage-basin characteristics were computed for the 137 gaging stations initially used in the regression analysis. Drainage-basin characteristics were selected only for the regression analysis if a feasible way was available to automatically compute them in the StreamStats web application (Alan H. Rhea, Peter A. Steeves, and Kernell G. Ries, U.S. Geological Survey, oral and written communication, January 2007).

Drainage-basin characteristics considered for use in the regression equations include contributing drainage area; 10-85 channel slope; mean drainage-basin hillslope; mean drainage-basin elevation and stream outlet elevation (at the gage); percentage of drainage-basin covered by forest canopy; mean drainage-basin soil permeability; mean-annual precipitation over the drainage basin; and mean annual, seasonal, and monthly precipitation at the gaging station. Definitions of drainage-basin characteristics are listed in table 7. Abbreviations for this report for drainage-basin characteristics follow the naming conventions used by USGS StreamStats (*http://water.usgs.gov/osw/streamstats/bcdefinitions1.html* accessed November 2009).

The final selection of 13 drainage-basin characteristics that were used in the regression equations are listed in table 8 (back of report). The computations of drainage-basin characteristics were made by using ArcGIS software version 9.2 (Environmental Systems Research Institute, 2007). Data sources for the digital datasets used to compute drainage-basin characteristics included the National Hydrography Dataset (NHD) (*http://nhd.usgs.gov*, accessed July 2008), Parameter-elevation Regressions on Independent Slopes Model (PRISM) (PRISM Climate Group, 2008), NRCS State Soil Geographic (STATSGO) dataset (Natural Resources Conservation Service, 2006), NRCS Watershed Boundary Dataset (WBD) (*http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/*, accessed June 2006), and USGS 2001 National Land Cover Dataset (NLCD) (U.S. Geological Survey, 2009).

Attempts were made to ensure that the selected drainage-basin characteristics had a physical and hydrologic basis to be used as independent variables to estimate flow statistics. However, no direct hydrologic explanation is indicated for inclusion of mean drainage-basin elevation or stream outlet elevation in the regression equations aside from the possibility that streams that are closer to one another may be similar in elevation. These parameters were included only as independent variables in the final regression equations if the standard error of the estimate was reduced by 20 percent or more compared to regression equations that did not include either of these parameters.

Table 7. Description of drainage-basin characteristics used in regression analysis in order to estimate flow-duration and annual mean-flow statistics in Oklahoma.

[NED, National Elevation Dataset; NHD, National Hydrography Dataset; WBD, Watershed Boundary Dataset; NAVD 1988, North American Vertical Datum of 1988; NLCD, National Land Cover Dataset; STATSGO, State Soil Geographic Database; PRISM, Parameter-Elevation Regressions on Independent Slopes Model

Basin characteristic (identifier)	Description	Data source
Contributing drainage area (*CONTDA*)	Contributing drainage basin area, in square miles	NED 10-meter resolution elevation data (*http://seamless.usgs.gov/index.php*), NHD (*http://nhdgeo.usgs.gov/viewer.htm*, accessed July 2006) and WBD (source: *http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/*, accessed July 2006)
10-85 Channel Slope (*CSL10_85fm*)	Channel slope between points 10 and 85 percent of the stream length starting from the gage location and along the longest flow path, in feet per mile	NED 10-meter resolution elevation data (*http://seamless.usgs.gov/index.php*), and NHD (*http://nhdgeo.usgs.gov/viewer.htm*, accessed July 2006)
Mean Hillslope (*BSLDEM10M*)	Mean drainage-basin hillslope, in percent	NED 10-meter resolution elevation data (*http://seamless.usgs.gov/index.php*)
Mean elevation (*ELEV*)	Mean drainage-basin elevation, in feet above NAVD 1988	NED 10-meter resolution elevation data (http://seamless.usgs.gov/index.php), and NHD (*http://nhdgeo.usgs.gov/viewer.htm*, accessed July 2006)
Stream Outlet Elevation (*OUTLETELEV*)	Elevation at the gage, in feet above datum	NED 10-meter resolution elevation data (*http://seamless.usgs.gov/index.php*), and NHD (*http://nhdgeo. usgs.gov/viewer.htm*, accessed July 2006)
Percent Forest Canopy (*CANOPY_PCT*)	Percent drainage-basin surface area containing forest cover	30-meter resolution data layers from the NLCD (2001); forest categories included: deciduous, evergreen, and mixed. Source: *http://landcover.usgs.gov/natllandcover.php*, accessed July 2008.
Soil permeability (*SOILPERM*)	Mean drainge-basin soil permeability in inches per hour	1:250,000 STATSGO map. Source: *http://www.soils.usda.gov/survey/geography/statsgo/*, accessed July 2008.
Mean annual precipitation (*PRECIPOUT*)	Mean annual precipitation (1971-2000) at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean annual precipitation (*PRECIP*)	Mean annual precipitation (1971-2000) over the drainage-basin area, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean summer-autumn precipitation (*PREG_06_10*)	Mean summer-autumn precipitation (June through October, 1971-2000) at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean winter-spring precipitation (*PREG_11_05*)	Mean winter-spring precipitation (November through May, 1971-2000) at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean January precipitation (*JANAVPRE*)	Mean February precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean February precipitation (*FEBAVPRE*)	Mean February precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean March precipitation (*MARAVPRE*)	Mean March precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008

Table 7. Description of drainage-basin characteristics used in regression analysis in order to estimate flow-duration and annual mean-flow statistics in Oklahoma. —Continued

[NED, National Elevation Dataset; NHD, National Hydrography Dataset; WBD, Watershed Boundary Dataset; NAVD 1988, North American Vertical Datum of 1988; NLCD, National Land Cover Dataset; STATSGO, State Soil Geographic Database; PRISM, Parameter-Elevation Regressions on Independent Slopes Model

Basin characteristic (identifier)	Description	Data source
Mean April precipitation (*APRAVPRE*)	Mean April precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean May precipitation (*MAYAVPRE*)	Mean May precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean June precipitation (*JUNAVPRE*)	Mean June precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean July precipitation (*JULAVPRE*)	Mean July precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean August precipitation (*AUGAVPRE*)	Mean August precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean September precipitation (*SEPAVPRE*)	Mean September precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean October precipitation (*OCTAVPRE*)	Mean October precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean November precipitation (*NOVAVPRE*)	Mean November precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008
Mean December precipitation (*DECAVPRE*)	Mean December precipitation at the gage, in inches	800-meter resolution data layer created from PRISM dataset. Source: *http://www.prism.oregonstate.edu/*, accessed July 2008

Determination of Regression Regions

Attempts are made to define regions in regional streamflow analyses that are hydrologically similar in terms of physical characteristics being studied (Haan, 1977). The study area includes all gaging stations in which the drainage-basin area is completely in 8-digit HU boundaries that are in Oklahoma or adjacent to the Oklahoma state border. However, Oklahoma has diverse physical and climatic characteristics that can affect streamflow, and this regional variability can pose challenges to selecting independent variables for use in regression equations. Preliminary analysis indicated that grouping gaging stations in the study area into regions with similar physical drainage-basin characteristics increased the accuracy of regression estimates as opposed to originating one set of regression equations for the entire study area (Esralew, 2009). Use of regression regions in this preliminary analysis helped to substantially increase regression estimates of flow-duration statistics for median flow and lower flow exceedances (D_{50}, D_{80}, D_{90}, and D_{95}).

A k-means cluster analysis was performed to group gaging stations with similar physical drainage-basin characteristics. The cluster analysis was performed in S-Plus (Insightful Corporation, 2007) by using selected drainage-basin characteristics obtained for 137 gaging stations initially used in the regression analysis. Variables used in the cluster analysis were derived from continuous spatial drainage-basin characteristics, and included forested canopy, soil permeability, and annual mean precipitation to facilitate grouping of gaging stations into regions with similar physical drainage-basin characteristics. Drainage-basin characteristics that were related to drainage size or were specific to gage location (such as channel slope, mean drainage-basin hillslope, or mean and outlet elevation) were not included in the cluster analysis.

The results of the cluster analysis indicated that gaging stations could be divided into three groups that could be separated into distinct spatial regions. On the basis of the cluster analysis, spatial regions were defined by using manual delineation. Delineated boundaries were determined on the basis of five factors: (1) grouping gaging stations with similar drainage-basin characteristics as a result of the cluster analysis; (2) major watershed boundaries; (3) geographic features, such as mountains, geologically heterogeneous areas, or other distinct geologic divides; (4) U.S. Environmental Protection Agency (USEPA) ecoregion boundaries (Woods and others, 2005); and (5) general knowledge of the area. Ecoregions, which summarize areas with similar climatic and geologic characteristics, were used to guide manual delineation of region boundaries (fig. 7). Where ecoregion boundaries do not line up with region boundaries, other hydrologic, climatic, or geologic characteristics were used to guide manual delineation. Hydrologic boundaries, such as the 8-digit HU and smaller sub-catchments, were used, where possible, to delineate regions. This procedure was done to avoid arbitrary boundaries that cut across natural drainages.

Gaging stations in the Upper Beaver/North Canadian and Upper Cimarron Basins were not included in the cluster analysis. These drainage basins were not included in the final region delineation because flow-duration and annual mean-flow statistics computed for all periods of record for the gaging stations in this region were not used in regression analysis (see section titled “Selection of Data for Use in Regression Analysis”).

Drainage basins for the gaging stations in Region 1, the western region, had little to no forested area and areas of higher average soil permeability than Regions 2 and 3 (figs. 3 and 4). Region 1, which is in western Oklahoma excluding the Upper Beaver/North Canadian Basin and Upper Cimarron Basin, contains most of the Central Great Plains ecoregion, the western slopes of the Wichita Mountains, and eastern edges of the Southwestern Tablelands ecoregion (fig. 7).

Region 2, consisted of two parts (Region 2a and Region 2b, fig. 8). Region 2a, is in north central and northeast Oklahoma and is mostly in the Arkansas River Basin. Region 2a is separated on the eastern border by the Neosho River (fig. 7) and contains the Central Irregular Plains and the Flint Hills ecoregions, and a part of the Cross Timbers ecoregion (fig. 7). Region 2b is in south-central Oklahoma and is mostly in the Red River Basin. Region 2b contains the Arbuckle Mountains and the eastern slopes of the Wichita Mountains (fig. 7). The drainage basins for the gaging stations in Region 2 had lower average soil permeability than drainage basins in Region 1 or Region 3 (fig. 3), and the drainage basins for the gaging stations in Region 2 also had greater forested area (fig. 4) and greater annual precipitation than gaging stations in Region 1.

Region 3 is in eastern and central Oklahoma. Region 3 includes the Ozark Highlands ecoregion east of the Neosho River and the Ouachita Mountains to the south (fig. 7). The drainage basins for the gaging stations in Region 3 contained greater forested canopy (fig. 4) than other regions. Drainage basins in Region 3 commonly have greater annual precipitation, and greater spatial variability of annual precipitation, particularly in the southeastern mountains (figs. 5).

Separate regressions were developed by using gaging stations in each region. Estimates of annual mean and flow-duration statistics at ungaged sites are made by using the regression equation for the region where the ungaged stream site is located. An area-weighted average between the estimates from regression equations for each region can be used to estimate flow statistics at ungaged drainage-basins where the stream location is in one region but the contributing drainage-basin area crosses into another region (Risley and others, 2008; Hortness and Berenbrock, 2001). Even though hydrologic boundaries were used as part of the delineation process, four gaging stations that were used to develop regional regression equations had drainage areas that crossed a region boundary. Preliminary observations indicated that use of the area-weighted average typically helped to reduce the error of annual mean and flow-duration estimates at these gaging stations especially at lower exceedance probabilities (higher flows). Use of an area-weighted average also helps

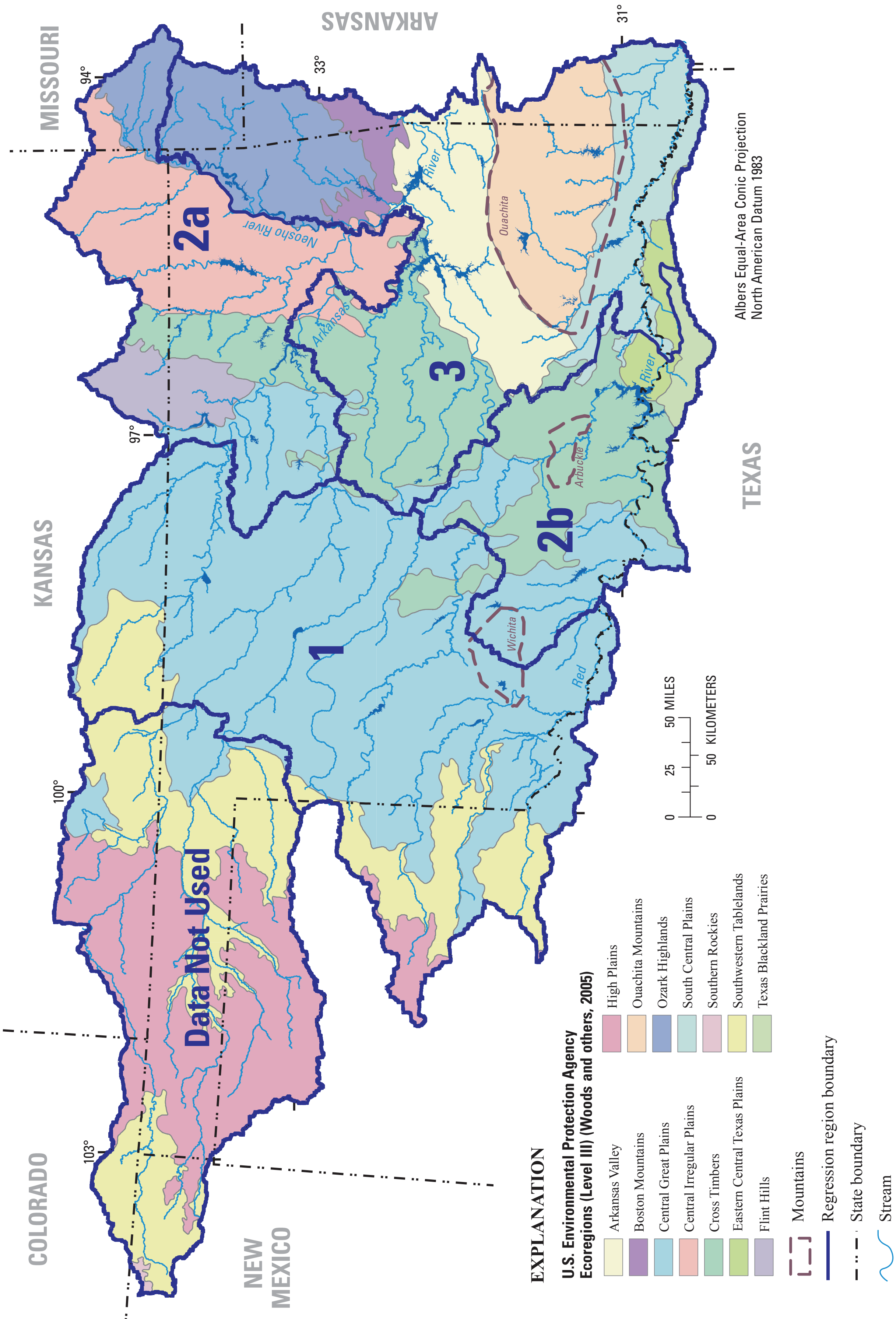

Figure 7. Three regions used for developing regression equations relative to boundaries of level III ecoregions of Oklahoma and parts of adjacent states.

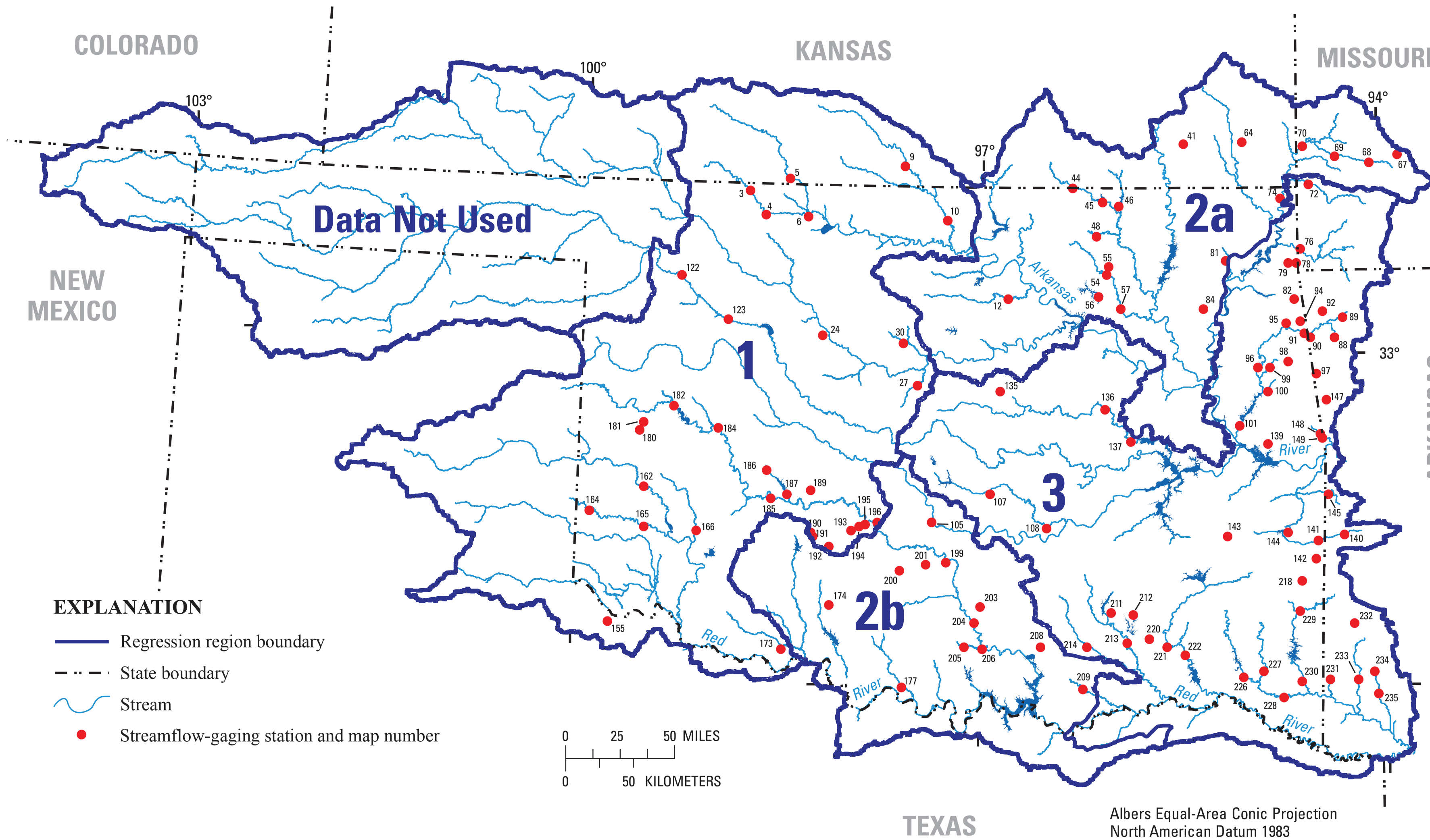

Figure 8. Three regions used for developing regression equations and selected streamflow-gaging stations used to develop final regression equations after outliers were removed.

to avoid an unnatural jump in estimates for ungaged locations along streams that cross region boundaries, and may help avoid an illogical progression of flow estimates downstream (for example, an estimate of the annual mean that is lower for a downstream site than an upstream site in another region). More information on the application of regression equations to estimate statistics at ungaged stream locations where the drainage area extends into another region is documented in the section titled "Example Computations".

Methods Used to Develop Regression Equations

S-PLUS (Insightful Corporation, 2007) was used to derive equations that were used to estimate flow-duration and annual mean-flow statistics by using one or more drainage-basin characteristics. Separate regression equations were developed for each region by using gaging stations in those regions and for each of the five flow-duration statistics on the annual, summer-autumn, and winter-spring flow-duration curves, and for annual mean flow. This step resulted in 76 regression equations for each region, a total of 228 regression equations. An overview of the methods used to develop the final regression equations for each region is detailed in figure 9.

Independent Variable Selection

The parameters b_n and b_o (equation 4) for each regression equation were estimated from each dataset by using OLS procedures (Helsel and Hirsch, 1992). To select optimal independent variables for the regression equations, a forward and backward step-wise procedure (Ott, 1993, p. 656) and an overall method (Helsel and Hirsch, 1992, p. 312–314) were used. Twenty-three drainage-basin characteristics were considered as possible independent variables. Drainage-basin characteristics selected as final independent variables are listed in tables 7 and 8. Regression equations developed with flow statistics and drainage-basin characteristics in the original units occasionally resulted in extremely large intercepts that were larger than the coefficients of the independent variables. An equation with these inconsistencies can be cumbersome to compute manually and may result in a loss of accuracy if a large exponent on the intercept is rounded. The magnitude of the independent variable data was adjusted to make the intercept more balanced in magnitude with the regression coefficients. Drainage-basin characteristics were divided by a constant before being transformed into log space and used to develop the regression equations in each region (tables 9–11, back of report). The constant selected for each equation was the median for each drainage-basin characteristic used in the regression, based on drainage-basin characteristics for stations in the region used for regression analysis. This adjustment only changes the magnitude of the intercept and does not change the regression coefficients or the estimates of flow statistics.

During the creation of the regression equations, the two main regression diagnostics that were used to select a regression equation that produced the lowest error included the mean standard error of the estimate and adjusted coefficient of determination. The mean standard error of the estimate (referred to in this report as "standard error") measures the deviation between the measured and predicted data points. A low standard error and high coefficient of determination (R^2) are generally desirable in a regression analysis. The adjusted coefficient of determination (referred to in this report as adjusted R^2) is a measure of the percentage of the variation explained by the independent variables of the regression. The adjusted R^2 is adjusted on the basis of the degrees of freedom in the regression that is reduced by decreasing the number of independent variables in the regression equation (Helsel and Hirsch, 2002, p. 312–314).

In addition to selecting regression equations with a low standard error and high adjusted R^2, common diagnostic statistics were used to evaluate and select independent variables for the final regression equations. These diagnostic statistics include the Predicted Residual Sum of Squares (PRESS), Mallow's Cp, variance inflation factor (VIF), probability plot correlation coefficient (PPCC) test, and results of partial t-tests. Further documentation on use and definitions of these diagnostics can be found in Helsel and Hirsch (1992, p. 312–314). A p-value was calculated from the partial t-test, which presents the probably that the independent variable describes a statistically significant amount of variation of the dependent variable in the presence of other independent variables, with the critical p-value set at 0.05 (Helsel and Hirsch, p. 298–299).

Results from forward and backward step-wise procedures and the overall method produced possible regression equations by using drainage-basin characteristics to estimate each flow statistic. Regressions with the lowest standard errors and the highest adjusted R^2 values were selected for further evaluation. If several acceptable equations were available, the one with the lowest PRESS statistic (Helsel and Hirsch, 1992, p. 248) and a low Mallow's Cp value was selected (close to the number of parameters in the regression, Draper and Smith, 1998, p. 332). In addition to these procedures, assurance was made that the error terms, e_i, from the model were normally distributed (by using a PPCC test) and monotonic (from visual examination of a plot of fitted values compared to the square of residuals) (Helsel and Hirsch, 1992, p. 228–234).

Attempts were made to use the least number of variables possible to explain the most variation of the dependent variables. Occasionally, the regression equation with the lowest PRESS statistic and Mallow's Cp contained a large number of independent variables. The use of too many independent variables with a small number of stations can create an equation that "over-fits" the data (Julie Kiang, U.S. Geological Survey, oral commun., October 2008; Risley and others, 2008) and can result in large equations that are impractical to compute. For this study, no more than four independent variables were selected for a final regression equation. If the preliminary regression equation contained more than four independent

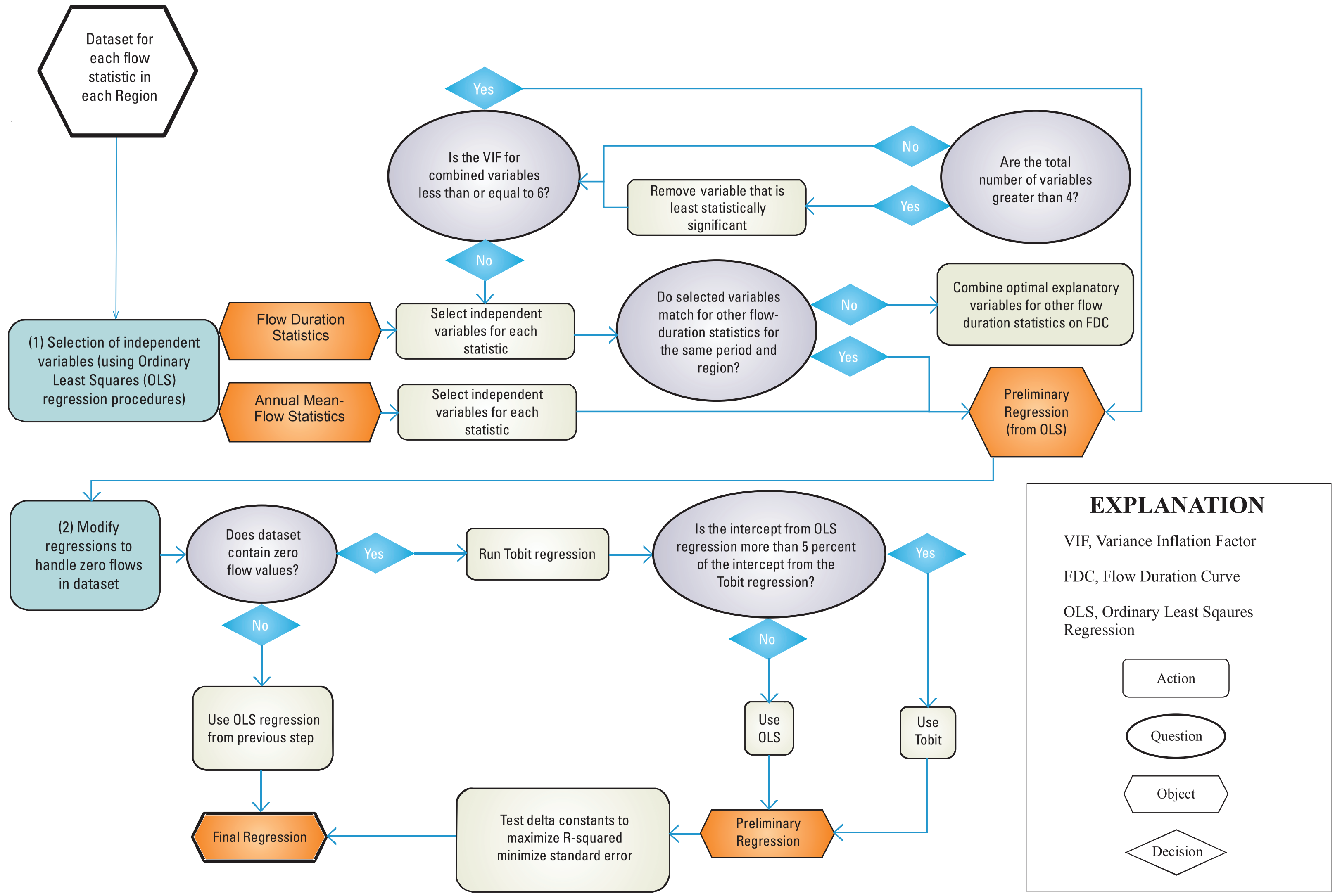

Figure 9. Process used to develop regressions to estimate flow-duration and annual mean-flow statistics at ungaged stream locations in Oklahoma.

variables, the variables that were the least statistically significant (had the highest p-value as a result of a partial t-test) were removed from the final regression.

The VIF, which is a measure of correlation between independent variables (Marquardt, 1970; Helsel and Hirsch, 1992, p. 305–306), was minimized for any possible combination of independent variables to avoid multi-collinearity in the regression. Multi-collinearity can result in unreasonable slope coefficients. Helsel and Hirsch (1992) describe a rule that a VIF greater than 10 indicates a strong dependence between variables. A more conservative approach was taken for the regression analysis for this study, and combinations of independent variables were not accepted if the VIF was greater than 6.

An effort was made to use the same independent variables in the regression equations for estimating flow-duration statistics for the same period (annual, seasonal, or monthly) in each region. If the statistically significant independent variables were different between flow-duration regression equations for the same period, the independent variables were combined in the final equation as long as the VIF did not exceed 6. For example, for regression estimates of annual flow-duration statistics in Region 1, contributing drainage area, mean-annual precipitation at the gaging station, and outlet elevation, were the most significant independent variables (partial t-test resulted with the lowest p-value) to estimate the D_{20}, D_{50}, and D_{80}, but mean June precipitation and channel slope were the most significant independent variables to estimate the D_{90} and D_{95}. The total variables were greater than 4, so one of the variables needed to be removed from the final regression. As a result of a partial t-test, outlet elevation was the least statistically significant independent variable to estimate the D_{20}, D_{50}, and D_{80}, so this variable was removed from the regression. The VIF for the combined remaining variables did not exceed 6, and so the variables were combined for the final regression equation. This procedure generally resulted in streamflow estimates that consistently decreased with increasing exceedance probability along the same flow-duration curve (see section titled “Limitations”). However, some variables in the final regression equations may not account for a statistically significant amount of variation of the dependent variable (with p-values greater than 0.05 as a result of the partial t-test) because optimal regression coefficients were combined for flow-duration statistics along the same flow-duration curve.

Flow statistics from gaging stations that were outliers were observed in the dataset during the regression equation creation process. These outliers had high influence on the slope coefficients of the independent variables. An outlier with high influence can occasionally produce a coefficient of determination that is substantially lower and a standard error that is substantially higher than would result from a dataset that did not contain an outlier (Helsel and Hirsch, 1992, p. 245–246). As a rule, if any one outlier with high influence was observed for any given dataset that lowered the coefficient of determination by 15 percent, the outlier was removed from the dataset. Gaging stations that were removed from datasets are noted in the footnotes of table 1. Occasionally more than one outlier was removed from a dataset. Most outlier gaging stations had documentation of minor effects from anthropogenic activities.

Selection of Regression Procedures to Handle Datasets with Zero Flow

Daily flows of zero cubic foot per second are frequently observed in Oklahoma. Intermittent flow also can be observed in small headwater drainage basins throughout the state. For flow-duration statistics, higher frequency of days with zero flow increase the probability that the D_{80}, D_{90}, or D_{95} flow exceedance will be equal to zero. Logarithmic transformation of zero is not possible; whereas, logarithmic transformation of flow-duration statistics is needed in order to create a best-fit linear regression equation. Alternative methods to simple OLS regression procedures were considered to account for flow exceedances equal to zero in a logarithmic transformation.

Many approaches can be used to treat the zero values in a regression analysis depending on the number of gaging stations with dependent variables equal to zero. One approach involves treating zero flow exceedances as “censored” at or less than zero flow. At times the streamflow may actually be zero, although at other times, flows may be non-zero but too small to be estimated by a rating curve and, therefore, reported as zero (Kroll and Stedinger, 1999).

If a sufficient number of dependent variables are censored (for example, a sufficient number of flow exceedances equal to zero), a Tobit regression (Ludwig and Tasker, 1993) can be used instead of an OLS regression. A Tobit regression is a model in which the dependent variable is censored, and a latent (that is unobservable) variable less than the censor is assumed. The Tobit procedure uses maximum likelihood estimation (MLE) to assume a distribution of data observations less than the lowest censored dependent variable (Tobin, 1958). Kroll and Stedinger (1999) found that use of an OLS regression with left-censored data (data where observations are less than a minimum threshold and are considered latent variables), were not as accurate as a Tobit regression. The error residuals for an OLS regression derived by using left-censored data will be biased higher than error residuals for a Tobit regression, especially at the lower end of the range of the dependent variable. However, OLS is an acceptable regression approach for small amounts of censoring (Kroll and Stedinger, 1999).

Tobit regression procedures will result in the same coefficients as an OLS if the dataset contains no censored values. As more observations are censored, or equal to zero, the resulting regression coefficients and intercept will start to differ between OLS and Tobit procedures. A Tobit regression is more computationally intensive than an OLS regression. For ease of reporting and data processing, a Tobit regression was applied only if the dataset contained flow exceedances equal to zero and the regression determination procedure resulted in an intercept that was 5 percent different from the regression that was developed by using OLS procedures.

In addition to the use of a Tobit regression, a delta constant also can be added prior to log transformation to avoid undefined logarithms (Perry and others, 2004). In preliminary observations, addition of a delta constant to regression datasets that had flow exceedances equal to zero increased the adjusted R^2 and decreased the standard error compared to estimates without a delta constant. To apply this method, the delta constant is subtracted from the final regression equation. The following modification was made to equation (2):

$$\log (Y_i - D) = b_o + b_1 \log X_1 + b_2 \log X_2 + \ldots + b_n \log X_n + e_i \quad (6)$$

where

D is a delta constant added to the dependent variable prior to log transformation.

The anti-log of the above is:

$$Y_i = [10^{b_o} * (X_1^{b_1}) * (X_2^{b_2}) \ldots (X_n^{b_n}) * 10^{e_i}] - D \quad (7)$$

Delta constants were used for OLS and Tobit regressions, but only for regression datasets that contained flow exceedances equal to zero (tables 2–6). For the Tobit regressions, the censor was set at the delta constant determined for each regression. Delta constants ranging from 0.01 to 10 were evaluated separately in the regression equations to determine an optimal delta constant for a regression. The value that produced a regression with the highest adjusted R^2 and the lowest standard error was selected. This approach was similar to that used by Perry and others (2004) and Risley and others (2008). Standard errors used to compare estimates to determine an optimal delta for each regression equation were computed by using error residuals from equation (6) for observations greater than zero only because error residuals may be excessively high for the log of observations less than 0.01 cubic foot per second after delta-subtraction. The use of a modified standard error to test regressions with censoring was similar to the approach used by Kroll and Stedinger (1999).

Bias Correction Factors

A linear regression equation provides an estimate of the mean response of the dependent variable. Estimates provided by equation 4 are in log units, and equations in tables 9–11 (back of report) are presented in the original units. Linear regressions that use log-transformed variables predict the median, instead of the mean, response of the dependent variable. An estimated streamflow statistic based on a median response is biased because the estimated statistic tends to be lower than the mean (Ries and Friesz, 2000). Bias correction factors (BCFs) were used to correct the bias in retransformed logarithmic regression equations. Duan's (1983) smearing estimate technique was selected as the appropriate BCF to use for the regression equations. This BCF is determined by computing the mean of the error residuals from a logarithmic regression equation after the error residuals have been converted to the original units, and multiplying the final estimate, once converted back to the original units, by the BCF. The BCF using Duan's smearing estimate technique is computed from the following equation:

$$BCF_{Duan} = \frac{\sum_{i=1}^{n} 10^{e_i}}{n} \quad (8)$$

where,

BCF_{Duan} is the bias correction factor,
e_i is the regression residual and
n is the number of gaging stations in the regression.

The following equations show how the BCF is applied to regressions without and with a delta constant. For regressions without a delta constant, equation (9) was used to incorporate the BCF into the final regression equation. For equations where a delta constant was applied, BCFs were applied to regressions prior to the subtraction of the delta constant, and equation (10) was used.

$$Y_i = BCF_{Duan} * 10^{b_o} * (X_1^{b_1}) * (X_2^{b_2}) \ldots (X_n^{b_n}) * 10^{e_i} \quad (9)$$

$$Y_i = [BCF_{Duan} * 10^{b_o} * (X_1^{b_1}) * (X_2^{b_2}) \ldots (X_n^{b_n}) * 10^{e_i}] - D \quad (10)$$

An assumption for proper use of a BCF is that residuals are normally distributed. Non-normally distributed residuals may pose an issue for Tobit regressions. No constraints on the MLE were used to determine the lowest possible estimate less than the censor for Tobit regressions. For the final Tobit regression in log-space, this use of no constraints may result in non-normal error residuals for observations less than the censor that can be large and substantially skew the BCF. Only the error residuals (e_i) for observations of flow exceedances greater than the censor value were considered in equation (8), and the number of observations (n) was reduced accordingly to apply the BCF to Tobit regressions. For example, for the regression estimate for $D_{95}WSP$ in Region 2, out of 30 observations 3 observations were equal to the censor (equal to zero cubic foot per second prior to addition of the delta constant and equal to 0.1 cubic foot per second after addition of the delta constant). The large error residuals from these 3 observations would have substantially skewed the BCF. If error residuals from all 30 observations were used in equation (8) the BCF would have been equal to 2.35. Only the error residuals for 27 observations greater than the censor were used in equation (8) (n was changed from 30 to 27) that resulted in a BCF of 1.73.

Results of Regression Analysis to Estimate Flow-Duration and Annual Mean-Flow Statistics for Unregulated Ungaged Stream Locations in Oklahoma

Final regression equations for Regions 1–3 are listed in tables 9–11 (back of report) along with the adjusted R^2, standard error, and the median flow statistic (median of the dependent variable) for each dataset used to develop each regression equation. The regression equations include delta constants that ranged from 0.01 to 1.0 cubic foot per second. All final regression equations in tables 9–11 also incorporate the BCF.

Out of 137 gaging stations where flow-duration and annual mean-flow statistics were initially used in the regression analysis, statistics from only 113 gaging stations were used to develop the final regression equations (fig. 8). Region 1 included 32 gaging stations, Region 2 included 30 gaging stations, and Region 3 included 51 gaging stations. Flow statistics from 24 gaging stations were statistical outliers in all regressions and were omitted from use in the regression analysis.

Independent Variables in Regression Equations

From 23 drainage-basin characteristics used in the regression analyses (table 7), 13 drainage-basin characteristics were selected as independent variables for the final regression equations. Drainage-basin characteristics that were significant independent variables in the regression analyses were contributing drainage area (*CONTDA*); 10-85 channel slope (*CSL10_85fm*); mean hillslope (*BSLDEM10M*), mean elevation and stream outlet elevation (*ELEV* and *OUTLETELEV*, respectively); percent forest canopy (*CANOPY_PCT*); soil permeability (*SOILPERM*); mean annual, summer-autumn, winter-spring, April, June, and December precipitation (*PRECIPOUT*, *PREG_06_10*, *PREG_11_05*, *APRAVPRE*, *JUNAVPRE*, and *DECAVPRE*, respectively). The final independent variables selected for each regression differed between flow statistics and regions.

The only independent variable that was included in every regression equation was drainage area. Contributing drainage area almost always had a positive relation with flow, especially annual mean flow and higher flow exceedances. Occasionally, drainage area was not related to some flow-duration statistics. Because optimal independent variables may have been different for estimating high-flow and low-flow exceedances for the same period, and those variables were combined in the final regressions, drainage area may not account for a statistically significant amount of variation of low-flow exceedances for these regressions that resulted in coefficients that are close or equal to zero. Non-significance of drainage area occurred for several equations in Region 1 for estimated low-flows (exceedance probability of 80 percent or greater) for the July through November monthly regressions. Drainage area was still included for several final equations where drainage area was not a statistically significant independent variable, but had a coefficient equal to zero (table 9).

For many regression equations in Regions 1 and 2, 10-85 channel slope was included as an independent variable. In Region 3, 10-85 channel slope was also a statistically significant variable for many regressions but had a significant negative correlation with drainage area and produced a VIF of greater than 6; therefore, channel slope could not be included in the final regression equations (fig. 9). In Region 1, 10-85 channel slope typically had a negative relation to flow exceedance; whereas, in Region 2, 10-85 channel slope typically had a positive relation to flow exceedance. A possible explanation for the negative relation of slope to flow in Region 1 may be higher soil permeability in this region. Region 1 generally had higher soil permeability than Region 2 (fig. 3). Where soil permeability is greater, lower slopes can increase infiltration of runoff to groundwater, especially in high-permeability alluvial sediments that are more commonly near streams in Region 1.

Drainage-basin hillslope was only included as an independent variable for the winter-spring, January, February, and July flow-duration regression equations in Region 1, and was not selected as an independent variable for regression equations in Regions 2 and 3. This variable was positively correlated to flow exceedance in most cases. A possible explanation may be because of increased runoff as a result of facilitated drainage from greater hillside slopes.

Soil permeability was selected only as an independent variable in the final regression equations to estimate October flow-duration statistics in Region 1, and was not statistically significant in any regression equations in Regions 2 or 3. Regional separation of regressions may have reduced the statistical significance of this variable by reducing the variability of soil permeability in each regional regression dataset.

Percent forest canopy was not included in most regression equations for Regions 1 or 2, where gaging stations in both regions contained less forested canopy than Region 3 (fig. 4). Percent forest canopy was included in all regression equations in Region 3 except those used to estimate annual mean-flow and the April flow-duration statistics. Percent forest canopy almost always had a negative correlation to flow-duration statistics for Region 3 except for those used to estimate 20th percentile flow-duration statistics for winter-spring, December, February, March, and May ($D_{20}WSP$, $DECD_{20}$, $FEBD_{20}$, $MARD_{20}$, and $MAYD_{20}$, respectively). The negative correlation found in most flow-duration regressions may be the result of increased evapotranspiration from vegetation that can lower base flow during the growing season and may reduce recharge which can lower base flow during the non-growing season. All annual mean-flow regression equations, and flow-duration regression equations in Regions 2 and 3, incorporated a precipitation parameter (which included annual, seasonal, or monthly mean precipitation at the gage). Precipitation parameters for Region 1 were not selected as independent variables for any of the December, January, February, March, or September flow-duration regressions. The type of precipitation parameter (annual, seasonal, or monthly) that were most significant for Region 1 regressions varied between regression equations. Either annual or winter-spring precipitation for Region 2 was the most significant precipitation variable. Typically annual or summer-autumn precipitation for flow-duration regressions for Region 3 was found to be the most significant precipitation variable. However, December precipitation was the most significant precipitation variable for the December and January flow-duration regressions, which are some of the driest months of the year. Precipitation coefficients were positive for most regressions that included a precipitation variable, indicating that flow increases with precipitation. For the June D_{95} ($JUND_{95}$) estimate for Region 1, precipitation had a negative coefficient. The negative relation is not explainable, but could indicate that precipitation is a surrogate for another variable that had an effect on the $JUND_{95}$ but was not included in the regression analysis.

Regression Accuracy

Regression accuracy can be assessed by looking at the adjusted R^2 and standard error (tables 9–11, back of report). Regressions with higher adjusted R^2 and lower standard errors are likely to produce more accurate estimates than regressions with lower adjusted R^2 and higher standard errors. The flow-duration regression with the highest accuracy was the annual D_{20} in Region 3 with a standard error of 26.9 percent and an adjusted R^2 of 97.3 percent. The flow-duration regression with the lowest accuracy was the August D_{95} ($AUGD_{95}$) in Region 1 with a standard error of 293 percent and an adjusted R^2 of 29.3 percent. The regression estimating annual mean-flow (AVE_DV) with the highest accuracy was in Region 3 with a standard error of 18 percent and an adjusted R^2 of 98.8 percent. The regression estimating annual mean-flow with the lowest accuracy was in Region 1 with a standard error of 33.8 percent and an adjusted R^2 of 95.0 percent.

The accuracy of flow-duration regressions was generally observed to decrease from high-flow (low exceedance probability) to low-flow (high exceedance probability). A comparison of observed and regression estimated annual-flow statistics in Region 2 shows how regression uncertainty varies depending on the flow statistic (fig. 10). Uncertainty of a regression estimate can be seen graphically as a greater scatter of observed in relation to estimated points along a 1:1 line. For this example, a greater uncertainty exists for low-flow exceedances (D_{80}, D_{90} and D_{95}) than for annual mean flow and high-flow exceedances (AVE_DV, D_{20}, and D_{50}). Accuracy generally decreased with a decrease in the median-flow exceedance (median of the dependent variable) used in regression datasets (fig. 11b).

This decrease indicates a greater uncertainty is likely associated with low-flow estimates. Flow-duration statistics for high exceedance probabilities (low-flow exceedances) may be more uncertain than for lower exceedance probabilities because of an increased uncertainty in low-flow discharge computations from the rating curve (Dymond and Christian, 1982; Rantz and others, 1983, p. 544–592). In addition, low-flow estimates from regression equations may be less accurate than high-flow estimates because base flow and low flow are largely affected by localized geological factors that cannot be easily quantified by using a regression approach (Riggs, 1972).

For the 225 flow-duration regression equations used to estimate flow-duration statistics in all regions and for all periods (annual, seasonal, and monthly), the D_{20} regression equations had a median standard error of 44.7 percent and a median adjusted R^2 of 91.6 percent, the D_{50} regression equations had a median standard error of 59.5 percent and a median adjusted R^2 of 87.6 percent, the D_{80} regression equations had a median standard error of 79.9 percent and a median adjusted R^2 of 102 percent, the D_{90} regression equations had a median standard error of 150 percent and a median adjusted R^2 of 76.9 percent, and the D_{95} regression equations had a median standard error of 183 percent and a median adjusted R^2 of 71.9 percent.

Monthly flow-duration regressions for February through June were generally more accurate than regressions for July through January (lower adjusted R^2 and higher standard error), especially for regressions that estimated low-flow exceedances (D_{80}, D_{90}, and D_{95}). A possible explanation for the less accurate flow-duration regression equations for July through January could be low flows and an increase in water-use and evapotranspiration demands during summer months. November, December, and January have low precipitation, and the median values of most flow exceedances for gaging stations in each regional dataset were typically lower during these months as compared to regression datasets for February through June (fig. 11). Irrigation and other water use demands may be highest during July through September because of increased temperatures that may affect the variability of streamflow, especially low-flows, depending on antecedent soil-moisture and the extent of agricultural activities in the drainage basin. Evapotranspiration losses also are higher during this time of year because of increased temperatures, which can affect low flow.

Similar to the results from the monthly flow-duration regression analysis, summer-autumn flow-duration regressions tended to have a lower accuracy (lower adjusted R^2 and higher standard error) than annual or winter-spring flow-duration regressions. For flow-duration regression equations, winter-spring regressions tended to perform better than annual flow-duration regressions. The winter-spring period contained the wettest and driest periods of the year, but was less subject to high evapotranspiration demands and summer irrigation activities.

Little difference was found in the adjusted R^2 for high-flow estimates but large differences were found in the low-flow estimates when comparing accuracy of flow-duration regressions in each region. Low-flow estimates (D_{80}, D_{90}, and D_{95}) for annual, summer-autumn, and winter-spring flow-duration regressions were substantially less accurate in Region 1

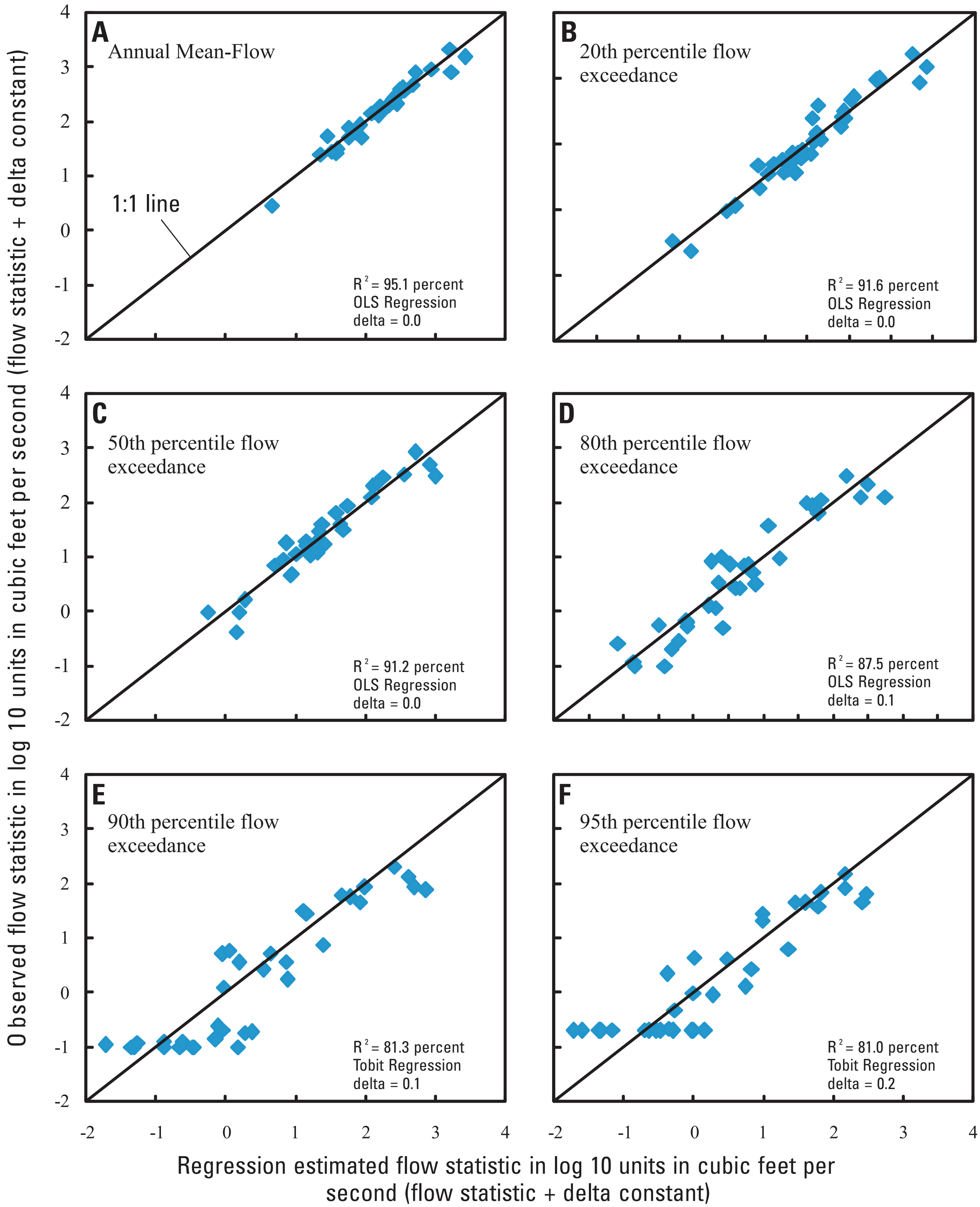

Figure 10. Comparison of the regression estimated and observed (A) annual mean flow and annual (B) 20th, (C) 50th, (D) 80th, (E) 90th, and (F) 95th percentile flow exceedances for streamflow-gaging stations in Region 2. (OLS, Ordinary Least Squares)

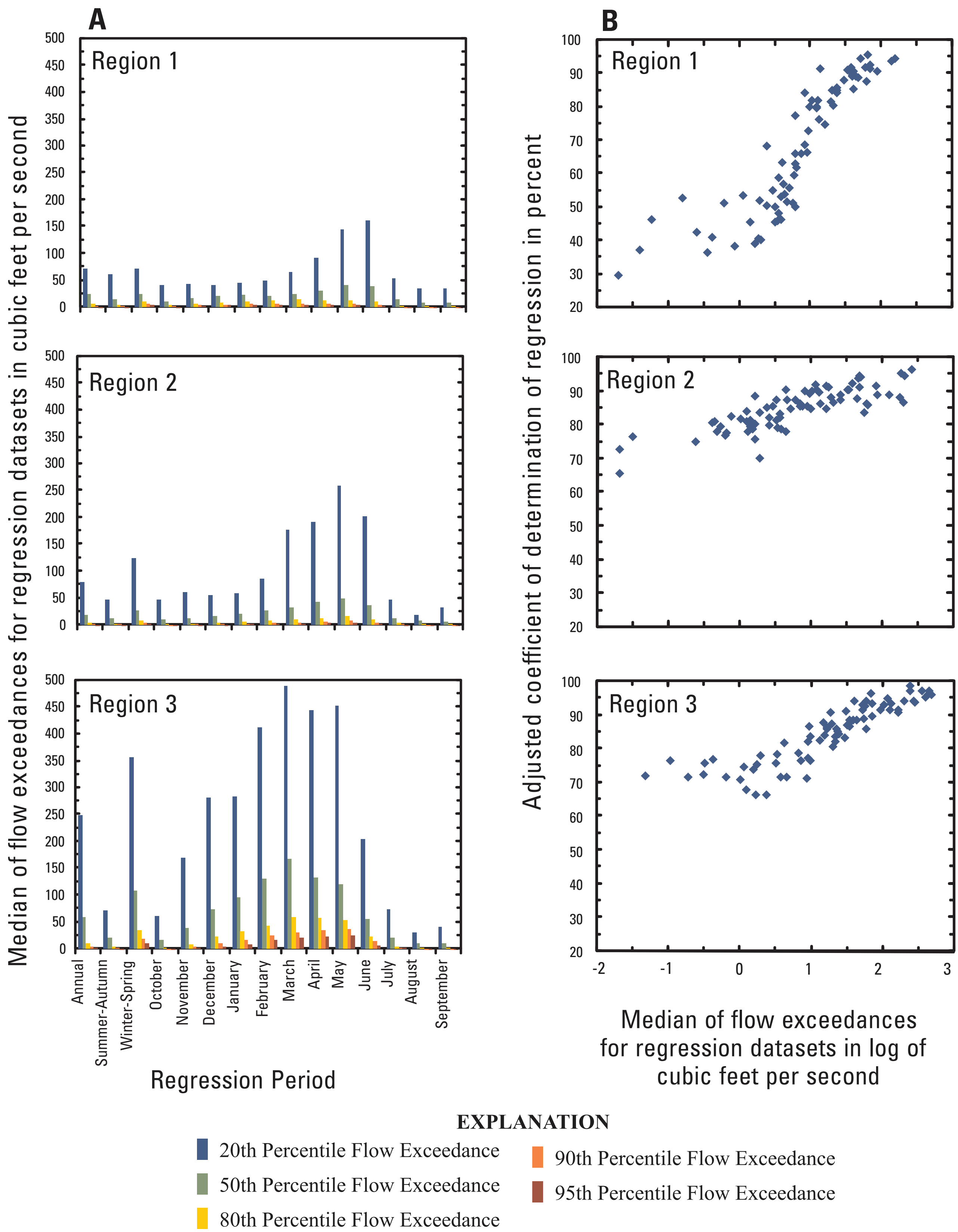

Figure 11. For each regression region in Oklahoma, (A) plots of median flow exceedances for datasets used to develop regression equations to estimate annual, seasonal, and monthly flow-duration statistics at ungaged streams and (B) plots of the adjusted coefficient of determination in relation to the log of median flow exceedances for regression datasets. The median of flow exceedances for regression datasets is the median observation (dependent variable) used in each regional regression.

than estimates for the same flow exceedances in Regions 2 and 3, where the adjusted R^2 typically was 60 percent or less for Region 1. Based on equations for Region 1 for all flow-duration curves, the median of the standard error of the estimate of the D_{20} and D_{95} was 46.2 and 208 percent, respectively. All flow-duration curves in Region 2 had a median of the standard error of the estimates of the D_{20} and D_{95} of 51.3 and 152 percent, respectively. All flow-duration curves in Region 3, had a median of the standard error for the D_{20} and D_{95} of 36.5 percent and 119 percent, respectively. The adjusted R^2 of the D_{20} and D_{95} for all regions had a median of 91.6 percent and 71.9 percent, respectively; whereas, the D_{95} for Region 1 had a median adjusted R^2 of 45.9 percent, Region 2 had a median adjusted R^2 of 80.4 percent and Region 3 had a median adjusted R^2 of 76.5 percent.

The accuracy of Region 1 low-flow estimates generally were less than the accuracy of low-flow estimates for Regions 2 and 3. The reduced accuracy indicated a greater uncertainty associated with low-flow estimates in Region 1 and indicated the drainage-basin characteristics selected for regression analysis do not adequately describe the variability in low-flow estimates in Region 1. A possible source of variability in low-flow estimates in this region could be regional alteration from agricultural water-use activities, such as irrigation or withdrawals for livestock. Irrigation water uses vary across Oklahoma (Tortorelli, 2009) and are greater in the western part of the state. Although an attempt was made to eliminate gaging stations that were affected by local or regional irrigation and other water-use activities, these activities may not be sufficiently documented or may be difficult to detect from hydrograph inspection if these activities happened during the entire period of record used for analysis.

The large study area was divided into smaller more homogeneous regions that increased the accuracy of many regression equations. The differences in the accuracy of the regressions between Region 1 compared to Regions 2 and 3 indicated that use of the regression regions substantially increased the accuracy of estimates for the latter regions, especially for low-flow estimates, compared to development of one set of regressions for the entire study area. Previous analysis indicated that development of flow-duration regressions by using gaging stations from the entire study area produced many median and low-flow regressions (D_{50}, D_{80}, D_{90}, and D_{95}) with similar if not higher uncertainty to the flow-duration regressions in Region 1 (Esralew, 2009). Regionalization done by using a cluster analysis of gaging stations with similar drainage-basin characteristics most likely increased the accuracy of the estimates because of the physical diversity of the study area and because the influence that each independent variable has on streamflow likely varies across Oklahoma.

Limitations

Use of the resultant regression equations should be limited to ungaged drainage basins in Oklahoma when the independent variables fall in the range of those sites used to develop the regression equations. The minimum and maximum values of all independent variables considered for each equation are shown in table 12. Accuracy of regression estimates can be improved when GIS datasets identical to those datasets used in the study are used to compute independent variables at ungaged sites. StreamStats is populated with the same GIS datasets used to develop the regression equations in this report.

Data precision is decreased with regression equations that contain drainage-basin characteristics created from GIS datasets. Computer-generated GIS data typically are presented with arbitrary fixed decimal points. The precision of these data cannot always be assumed. Final flow statistics estimated from regression equations that were created from measured flow data and GIS data cannot be presented with a level of precision greater than 3 significant figures.

Users are cautioned about using the regression equations to estimate flow at ungaged sites. If these equations are used at ungaged stream sites that are substantially regulated for water supply, if the stream or drainage basin is affected by substantial diversions or withdrawals from either surface water or groundwater, or if the drainage basin is affected by urban change, the regression equations will produce estimates that are more likely to be characteristic of unregulated flow as opposed to actual flow at those sites.

The regression equations reported in tables 9–11 (back of report) can be used to estimate flow-duration and annual mean-flow statistics. However, the true value of the estimated flow statistic is unknown. Prediction intervals are a measure of uncertainty associated with the prediction made by the regression equation. The interval is the predicted value plus or minus a margin of error. A prediction interval is defined as the probability that the true value of the estimated statistic will fall in this margin of error (Hirsch and others, 1993). For example, a prediction interval at the 90-percent confidence level means a 90-percent chance that the true value of the characteristic will be in the margin of error. The margin of error includes the uncertainty in the independent variable estimate and the unexplained variability of the dependent variables. Prediction intervals are automatically calculated at the 90-percent confidence level in the StreamStats program for all 228 regression equations that were developed from this study. Equations used to compute prediction intervals and correct for bias in StreamStats can be found in Tasker and Driver (1988).

Regressions that were developed to estimate flow-duration statistics for the same period (annually, seasonally, and monthly) can be used to construct an estimated flow-duration curve from the 20 percent to 95 percent exceedance probability by connecting a line from estimated flow-duration statistics. However, a possibility exists that for some combinations of drainage-basin characteristics used to estimate flow-duration statistics, an illogical progression of flow exceedances can happen. For example, an illogical progression of flow values for estimated summer-autumn flow-duration curve would be a higher estimated flow exceedance at the D_{95} than the D_{90}.

Table 12. Ranges of validity for basin characteristics used as independent variables in development of regressions to estimate flow-duration and annual mean-flow statistics for three regions in Oklahoma.

[CONTDA, contributing drainage area, in square miles; CSL10_85fm, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; BSLDEM10M, mean drainage-basin slope, in feet per foot; ELEV, mean basin elevation, in feet above North American Vertical Datum of 1988; OUTLETELEV, gage elevation, in feet above North American Vertical Datum of 1988; CANOPY_PCT, percentage of drainage-basin that is forested; SOILPERM, mean drainage-basin soil permeability in inches per year; PRECIPOUT, mean annual precipitation at the gage; PREG_06_10, summer-autumn precipitation, defined as the mean monthly precipitation for June through October at the gage, in inches; PREG_11_05, winter-spring precipitation, defined as the mean monthly precipitation for November through May at the gage, in inches; APRAVPRE, mean April precipitation at the gage, in inches; JUNAVPRE, mean June precipitation at the gage, in inches; DECAVPRE, mean December precipitation at the gage, in inches]

Region		Basin characteristic (abbreviation)												
		CONTDA	CSL 10_85fm	BSLDEM10M	ELEV	OUTLE-TELEV	CANOPY_ PCT	SOIL-PERM	PRECIPOUT	PREG_ 06_10	PREG_ 11_05	APRAVPRE	JUNAVPRE	DECAVPRE
Region 1	Minimum	3.65	3.73	1.76	1,121	923	0.28	0.26	26.1	13.0	12.5	2.16	3.36	1.00
	Maximum	9,056	39.3	8.26	3,188	1,866	15.5	3.44	35.8	17.9	19.2	3.64	4.44	1.96
Region 2	Minimum	4.02	2.07	1.79	729	518	4.02	0.46	33.7	15.7	18.0	2.77	3.67	1.65
	Maximum	7,159	27.0	7.95	1,640	1,190	23.3	1.66	45.6	21.7	24.8	4.35	5.36	3.03
Region 3	Minimum	8.00	1.98	2.85	625	305	8.41	0.96	38.0	17.1	20.7	3.49	4.35	1.96
	Maximum	2,296	54.9	28.1	1,527	1,181	83.5	1.99	58.0	22.8	35.2	5.15	5.33	5.32

Although an attempt was made to reduce the probability of an illogical progression of flow values along the same flow-duration curve by using the same drainage-basin characteristics in each of the regressions for that flow-duration curve, a possibility exists that an illogical progression of flow values can occur. This illogical progression of flow estimates may occur because each regression equation used to estimate each flow-duration statistic along the same flow-duration curve was developed separately, and has variable prediction intervals depending on the size and variability of the dataset used to construct the regression. An illogical progression is more likely to occur for an estimated flow-duration curve where the regressions have a high uncertainty (low adjusted R^2 and high standard error).

Illogical progressions can be corrected by using graphical methods. The exceedances for lower exceedance probabilities (D_{20}, D_{50}, and D_{80}) can be plotted and a flow-duration curve can be manually extrapolated to recompute the D_{90} and D_{95} flow exceedances as long as the recomputed values are in the prediction interval (fig. 12).

Example Computations

The following example computation is the estimate of the 20-percent flow exceedance in March ($MARD_{20}$) for an ungaged stream location in Region 3, but 20 percent of the contributing drainage area is in Region 2. The method for handling sites with parts of the drainage area in two regions has the following steps: (1) Calculate flow statistics for the entire drainage basin by using equations from the region where the stream site is located, (2) calculate flow statistics for the entire drainage basin by using equations from the upstream region, and (3) average the two values on the basis of the proportion of drainage area in each region (Hortness and Berenbrock, 2001).

Assume that an ungaged stream location has a contributing drainage-basin area (*CONTDA*) of 850 mi², a forested canopy (*CANOPY_PCT*) of 40 percent, a channel slope (*CSL10_85fm*) of 10.0 ft/ft, an outlet elevation (*OUTLETELEV*) of 800 feet above NAVD 88, a mean-annual precipitation (*PRECIPOUT*) of 45.0 inches per year, and a mean winter-spring precipitation (*PREG_11_05*) of 23.5 inches per year.

From table 11:

$$MARD_{20} = 377*(CONTDA/203)^{1.02}*(CANOPY\_PCT/40.8)^{0.14}*(PRECIPOUT/47.8)^{5.80} \quad (12)$$

Applying drainage-basin characteristics to equation variables:

$$MARD_{20} = 377*(850/203)^{1.02}(40/40.8)^{0.14}(45/47.8)^{5.80} \quad (13)$$

Therefore,

$$MARD_{20} = 1{,}142 \text{ ft}^3/\text{s}$$

From table 10:

$$MARD_{20}=253*(CONTDA/323)^{1.05}*(CSL10\_85fm/6.04)^{0.10}*(OUTLETELEV/783)^{0.27}*(PREG\_11\_05/22.0)^{5.82} \quad (14)$$

Applying drainage-basin characteristics to equation variables:

$$MARD_{20} = 253*(850/323)^{1.05}(10/6.04)^{0.10}(800/783)^{0.27}(23.5/22.0)^{5.82} \quad (15)$$

Therefore,

$$MARD_{20} = 1{,}085 \text{ ft}^3/\text{s}$$

The computed $MARD_{20}$ is then averaged between the two regions on the basis of drainage area:

$$MARD_{20} = 1{,}142 \text{ ft}^3/\text{s}*(0.80) + 1{,}085 \text{ ft}^3/\text{s}(0.20) \quad (16)$$

Therefore,

$$MARD_{20} = 1{,}130 \text{ ft}^3/\text{s}$$

Summary

Methods are presented for estimating flow-duration and annual mean-flow statistics for ungaged streams in Oklahoma in a cooperative study between the USGS and the Oklahoma Water Resources Board in order to provide flow statistics at sites of interest where measured flow data may not be available. Major components of the study included calculation of flow statistics at 235 gaging stations, calculation of physical and climatic drainage-basin characteristics at these stations, and development of regression equations to predict flow-duration and annual mean-flow statistics at ungaged stream locations based on drainage-basin characteristics. The statistics analyzed in this report are flow-duration statistics that included the (1) annual (period of record), (2) seasonal (summer-autumn and winter-spring), and (3) 12 monthly duration statistics, including the 20th, 50th, 80th, 90th, and 95th percentile flow exceedances, and the annual mean-flow (mean of daily flows for the period of record).

Daily mean discharge data from 235 continuous gaging stations were used to calculate flow-duration and annual mean-flow statistics. Flow statistics were calculated for unregulated and anthropogenically affected periods of record of 10 or more years. Anthropogenic activities in this study included water-supply regulation, irrigation activity, and urban change.

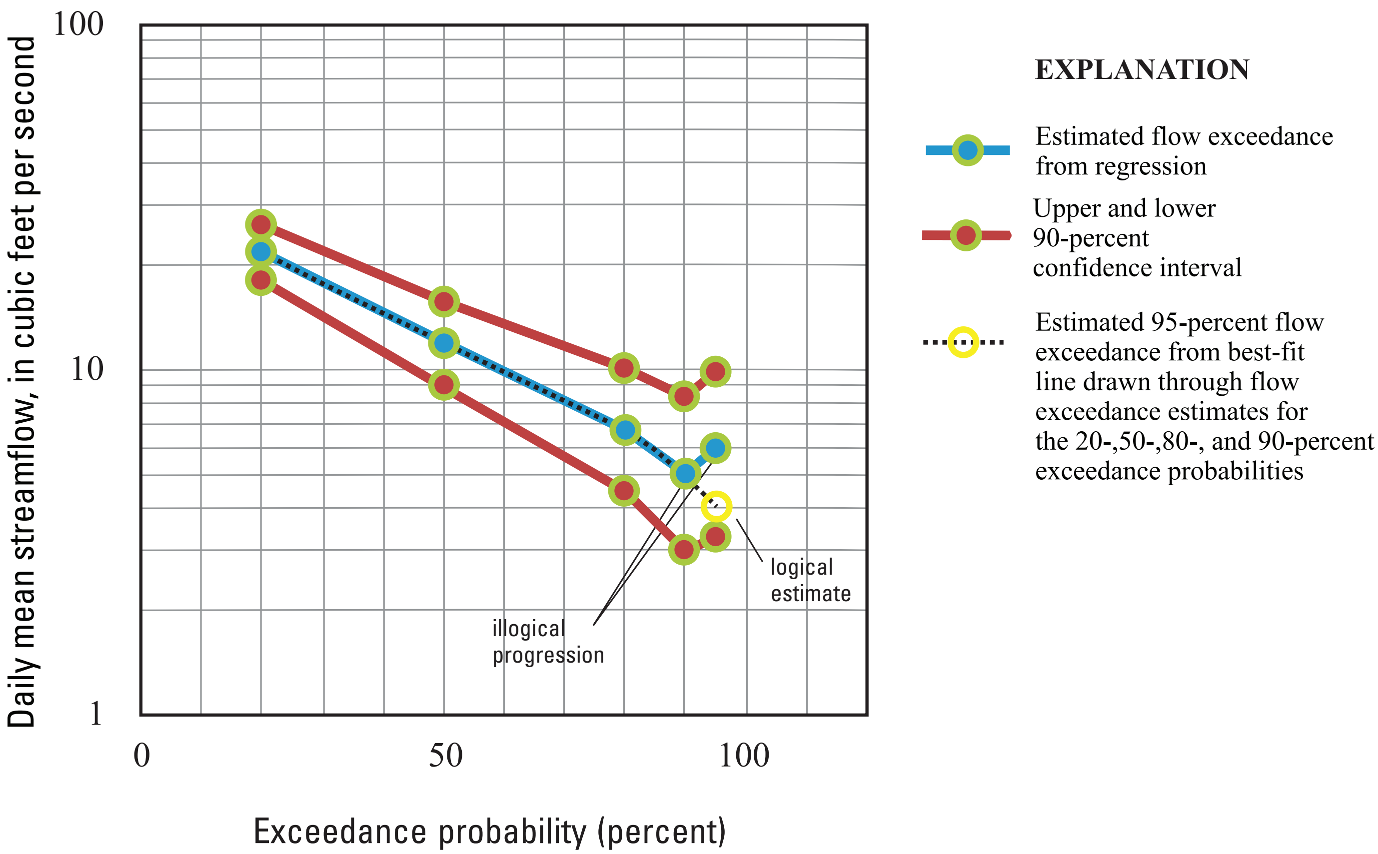

Figure 12. Example of a flow-duration curve with manual correction for an illogical progression of flow-duration statistics estimated from regression equations. An illogical progression occurs when a flow exceedance estimated at a higher exceedance probability is higher than an estimated flow exceedance at a lower exceedance probability.

A drainage-area ratio method is the preferred method for estimating flow statistics at an ungaged location that is on a stream near a gage. Streamflow statistics are computed for the index station, and the statistics are divided by the drainage area to determine streamflow per unit area at the gaging station. The method generally is reliable if the drainage-area ratio of the two sites is between 0.5 and 1.5. Where an ungaged location meets this criteria for gaging stations with known effects from regulation, irrigation activity, and urban change, this method can be used to estimate flow statistics during these circumstances as long as the statistics from the record at the gaging station used in the method also are affected by the same condition.

Regression equations that relate flow statistics to drainage-basin characteristics were developed for the purpose of estimating selected flow-duration and annual mean-flow statistics for ungaged streams that are not near gaging stations on the same stream. Regression equations were developed from flow statistics and drainage-basin characteristics for 113 unregulated gaging stations.

Separate regression equations were developed by using U.S. Geological Survey streamflow-gaging stations in regions with similar drainage-basin characteristics. These equations can increase the accuracy of regression equations used for estimating flow-duration and annual mean-flow statistics at ungaged stream locations in Oklahoma. Streamflow-gaging stations were grouped by selected drainage-basin characteristics by using a k-means cluster analysis. Three regions were identified for Oklahoma on basis of the clustering of gaging stations and a manual delineation of distinguishable hydrologic and geologic boundaries: Region 1 (western Oklahoma excluding the Oklahoma and Texas Panhandles), Region 2 (north- and south-central Oklahoma), and Region 3 (eastern and central Oklahoma).

A total of 228 regression equations (225 flow-duration regressions and three annual mean-flow regressions) were developed using ordinary least-squares and left-censored (Tobit) multiple-regression techniques. Equations were developed using logarithmic dependent variables. Because the log of zero cannot be taken, a small delta constant was added to all flow exceedances prior to log transformation for only those datasets that contained flow exceedances equal to zero. Tobit equations were used to estimate flow-duration statistics for datasets that had a substantial number of flow exceedances equal to zero. The Tobit procedure uses maximum likelihood estimation to assume a distribution of values less than the lowest censored value. For Tobit equations, the censor was set to the delta constant.

Drainage-basin characteristics that were statistically significant independent variables in the regression analyses were (1) contributing drainage area; (2) elevation at the gage; (3) mean drainage-basin elevation; (4) channel slope; (5) percentage of drainage-basin covered by forest canopy; (6) mean drainage-basin hillslope; (7) mean drainage-basin soil permeability; and (8) mean annual, seasonal, and monthly precipitation at the gage.

Flow-duration equations were more accurate for estimating flow at lower exceedance probabilities (D_{20} and D_{50}) than for estimating flow at higher exceedance probabilities (D_{80}, D_{90}, and D_{95}. This decrease in accuracy may have occurred because there was a greater uncertainty for low-flow estimates. Low-flow is largely affected by localized geology that was not quantified by the drainage-basin characteristics selected for use in the regression analysis.

Regression estimates of flow-duration statistics for February through June were generally more accurate than regression estimates of flow-duration statistics for July through January (lower adjusted coefficient of determination and higher standard error), especially for regressions estimating lower flow exceedances (D_{80}, D_{90}, and D_{95}). A possible explanation for the less accurate flow-duration regression estimates for July through January could be lower flows and an increase in water-use and evapotranspiration demands during summer months.

The standard errors of estimate of regression equations for Region 1 (western Oklahoma) were generally larger than those standard errors for other regions, especially for low-flow exceedances. These errors may be a result of greater variability in low flow because of increased irrigation activities in this region.

Regression equations may not be reliable for sites where the drainage-basin characteristics are outside the range of values of independent variables that were used to develop the regression equations. The equations are not accurate for streams regulated by water-supply reservoirs, streams that are substantially affected by local irrigation withdrawals from groundwater or surface water, or streams that are affected by urban change.

Regressions that were developed to estimate flow-duration statistics for the same period (annually, seasonally, and monthly) can be used to construct an estimated flow-duration curve from the 20 percent to 95 percent exceedance probability by connecting a line from estimated flow-duration statistics. However, a possibility exists that for some combinations of drainage-basin characteristics used to estimate flow-duration statistics, an illogical progression of flow exceedances along a flow-duration curve can happen. Illogical progressions can be corrected by using graphical methods. The exceedances for lower exceedance probabilities (D_{20}, D_{50}, and D_{80}) can be plotted and a flow-duration curve can be manually extrapolated to recompute the D_{90} and D_{95} flow exceedances as long as the recomputed values are in the prediction interval.

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Tables

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record.

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
1	07146500	U	1,350	1,490	587	279	180	113	2,180	667	238	155	107	1,230	558	304	208	130
		R	2,160	2,550	1,050	484	351	265	3,070	1,070	422	285	206	2,260	1,040	521	405	324
2	07148140	R	3,180	5,020	1,420	333	181	141	5,380	1,340	177	140	122	4,720	1,470	257	166	134
3	07148350	U	96.0	95.7	34.7	3.00	0.35	0.09	88.2	11.3	0.35	0.07	0.00	98.6	44.2	18.5	7.78	1.14
4	07148400	U	142	151	51.2	11.9	2.58	0.70	145	30.6	3.36	1.08	0.05	154	61.9	27.5	13.0	2.84
5	07149000	U	153	172	88.1	35.7	14.1	1.66	150	51.1	11.9	1.23	0.00	180	104	64.9	51.4	36.6
6	07149500	U	393	322	126	31.7	2.37	0.03	333	65.8	1.10	0.03	0.01	316	147	74.6	48.2	29.0
7	07150500	R	407	486	146	15.7	5.27	2.62	523	83.0	12.5	6.06	3.90	468	174	29.6	4.04	1.67
8	07151000	R	937	987	273	69.1	36.7	19.8	1,050	224	58.8	34.0	19.5	963	305	87.2	39.3	20.1
9	07151500	U	262	243	103	42.4	21.2	9.63	234	71.2	21.2	8.83	2.31	247	118	63.1	44.1	30.6
10	07152000	U	604	438	154	55.5	26.0	8.31	408	117	29.7	8.91	3.77	451	173	81.1	49.8	30.3
11	07152500	U	4,830	5,450	1,930	741	463	302	6,570	2,130	704	403	239	4,700	1,840	765	506	358
		R	6,410	9,910	3,060	868	490	347	10,200	2,980	726	433	296	9,690	3,110	997	551	390
12	07153000	U	215	119	17.3	3.38	1.13	0.27	98.6	13.1	2.02	0.49	0.03	139	20.2	4.51	1.99	0.75
13	07153100	R	10.3	0.87	0.04	0.01	0.01	0.00	0.22	0.03	0.01	0.01	0.00	1.46	0.04	0.02	0.01	0.00
14	07154500	U	28.5	4.37	1.59	0.20	0.03	0.02	11.2	1.76	0.05	0.02	0.01	3.01	1.55	0.36	0.04	0.02
		UI	9.84	2.26	0.27	0.00	0.00	0.00	2.48	0.02	0.00	0.00	0.00	2.20	0.54	0.03	0.00	0.00
15	07155000	U	40.8	21.2	2.02	0.03	0.01	0.01	46.9	0.86	0.02	0.01	0.01	13.8	2.61	0.03	0.01	0.01
16	07155590	U	19.9	0.17	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00
		UI	3.46	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
17	07156900	U	86.0	88.0	65.8	48.5	40.4	34.0	80.0	55.6	40.6	34.2	29.5	90.3	71.4	56.7	49.8	44.0
		UI	36.8	44.9	35.5	27.1	22.7	19.9	35.1	28.6	22.1	19.5	17.7	48.1	40.6	33.4	30.5	28.3
18	07157000	U	101	98.9	60.4	37.6	27.3	19.7	97.9	50.0	28.0	19.4	14.0	99.3	66.7	46.3	37.3	30.2
19	07157500	U	51.7	26.9	14.5	6.00	0.21	0.03	39.1	9.53	0.05	0.02	0.01	25.5	16.3	10.0	7.25	5.51
		UI	10.7	14.0	8.35	4.57	2.95	1.62	11.6	5.30	2.59	1.39	0.72	14.7	9.81	6.90	5.62	4.84

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
20	07157900	U	3.45	2.40	1.53	0.89	0.63	0.49	1.98	1.15	0.64	0.48	0.32	2.57	1.72	1.18	0.97	0.71
21	07157950	U	118	143	51.4	3.83	0.08	0.00	107	11.4	0.02	0.00	0.00	156	74.1	27.1	13.2	4.82
22	07157960	U	13.3	12.6	2.18	0.10	0.00	0.00	9.76	0.52	0.00	0.00	0.00	14.0	3.60	0.95	0.25	0.00
23	07158000	U	291	271	90.1	11.7	0.77	0.00	267	42.6	0.44	0.00	0.00	273	114	38.1	15.5	4.43
24	07158400	U	41.1	20.8	8.29	4.46	2.83	1.93	16.7	6.92	3.13	1.90	1.30	24.6	9.51	5.40	3.97	2.90
25	07159000	U	48.9	12.1	2.08	0.22	0.00	0.00	13.7	1.23	0.00	0.00	0.00	11.3	2.55	0.44	0.20	0.08
26	07159100	U	889	908	286	102	59.0	40.8	852	211	61.7	40.0	27.8	939	333	148	95.5	67.2
27	07159750	U	183	153	59.6	28.6	20.1	16.5	130	47.0	23.6	17.2	13.7	171	68.0	36.7	23.0	18.7
28	07160000	U	1,170	1,620	579	246	153	98.7	1,460	428	154	99.4	73.0	1,720	667	328	241	186
29	07160350	U	38.0	24.5	12.7	6.73	5.14	4.04	21.7	10.2	5.45	4.10	3.33	25.7	14.2	7.87	6.19	5.35
30	07160500	U	142	70.7	17.2	6.49	4.02	2.83	65.4	14.8	5.10	3.13	1.63	73.9	18.6	7.68	4.98	3.57
31	07163000	U	12.8	3.56	0.50	0.00	0.00	0.00	1.68	0.01	0.00	0.00	0.00	4.94	1.08	0.12	0.00	0.00
32	07163500	U	1,240	1,240	325	103	58.5	29.5	1,700	448	120	58.2	21.0	872	265	96.5	58.7	35.6
33	07164000	U	1,740	1,840	534	206	109	63.8	2,310	670	172	89.1	62.6	1,450	493	224	135	65.4
34	07164500	U	6,550	7,490	2,560	981	610	380	10,000	3,140	988	535	320	5,940	2,350	978	656	455
		R	8,750	13,200	4,310	1,270	638	313	13,000	4,540	1,450	738	348	13,400	4,140	1,140	585	295
35	07164600	UUrb	21.4	10.3	2.88	1.40	1.03	0.83	8.21	2.22	1.17	0.89	0.76	11.6	3.39	1.65	1.20	0.95
36	07165500	R	48.4	31.0	1.92	0.00	0.00	0.00	22.7	0.77	0.00	0.00	0.00	37.8	4.03	0.00	0.00	0.00
37	07165562	UUrb	22.1	10.3	2.24	0.37	0.00	0.00	6.63	0.81	0.00	0.00	0.00	12.5	3.17	0.95	0.49	0.23
38	07165565	UUrb	7.29	4.61	0.88	0.13	0.01	0.00	3.25	0.41	0.02	0.00	0.00	5.34	1.20	0.31	0.14	0.02
39	07165570	R	10,700	16,900	5,670	1,640	891	615	15,600	5,560	1,610	934	648	17,700	5,770	1,660	858	594
40	07170500	U	1,530	1,130	238	28.3	10.4	3.80	998	131	19.2	7.41	2.32	1,190	318	44.0	13.0	6.05
		R	2,150	3,490	421	57.4	33.1	23.5	2,520	182	45.2	29.2	21.0	3,960	650	79.3	37.2	25.8

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
41	07170700	U	26.5	11.6	1.64	0.02	0.00	0.00	4.34	0.31	0.00	0.00	0.00	16.3	3.48	0.39	0.08	0.00
		R	26.9	24.0	0.52	0.00	0.00	0.00	11.3	0.09	0.00	0.00	0.00	33.0	2.35	0.01	0.00	0.00
42	07171000	U	2,080	1,620	249	22.5	8.11	3.59	1,560	171	17.9	6.07	2.29	1,650	318	27.5	9.49	5.34
		R	2,770	4,230	601	74.2	38.9	24.4	3,020	259	53.7	31.5	20.0	4,850	903	123	48.8	29.6
43	07171400	R	2,840	4,910	511	28.9	9.71	2.71	3,840	146	26.5	9.15	3.70	5,840	811	31.0	10.3	2.17
44	07172000	U	283	248	41.6	2.64	0.08	0.00	116	16.3	1.01	0.00	0.00	321	73.9	5.71	0.54	0.00
45	07173000	U	406	397	29.8	10.1	5.07	2.01	175	20.0	9.45	4.32	1.83	540	57.4	10.7	5.66	2.26
46	07174200	U	254	152	17.6	1.06	0.11	0.00	78.4	7.83	0.38	0.00	0.00	199	27.9	2.70	0.30	0.09
47	07174400	R	1,190	2,220	105	28.1	18.3	10.4	1,560	48.0	26.7	19.4	14.5	2,560	291	30.1	16.2	7.12
48	07174600	U	86.1	50.9	9.07	0.44	0.00	0.00	19.3	2.27	0.00	0.00	0.00	78.0	18.9	3.25	0.57	0.00
49	07174700	R	985	1,150	103	24.7	16.0	11.3	554	54.4	20.3	14.1	10.4	1,550	179	31.3	18.5	12.6
50	07175000	U	1.42	1.05	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	1.35	0.14	0.00	0.00	0.00
51	07175500	R	1,660	3,060	266	52.2	36.5	26.0	2,030	96.5	42.7	34.0	26.3	3,650	506	71.7	42.7	25.4
52	07176000	U	3,720	3,850	577	56.3	18.6	6.23	3,750	379	43.0	11.8	2.26	3,890	764	75.8	25.2	11.0
		R	4,500	8,650	919	91.6	55.5	37.8	6,290	330	81.6	54.5	37.3	10,100	1,530	117	56.5	38.1
53	07176465	R	45.5	21.1	5.63	2.27	1.37	0.84	15.3	6.24	3.31	1.68	1.18	43.2	5.30	1.97	1.18	0.23
54	07176500	U	200	110	12.1	0.41	0.00	0.00	72.8	5.27	0.00	0.00	0.00	140	18.7	1.45	0.00	0.00
		R	304	265	43.3	14.0	7.39	5.14	123	26.8	11.1	6.19	4.62	400	67.9	16.0	8.59	5.83
55	07176800	U	25.5	9.69	1.00	0.00	0.00	0.00	2.96	0.14	0.00	0.00	0.00	15.1	2.42	0.23	0.00	0.00
56	07177000	U	181	72.7	10.9	1.20	0.14	0.00	46.0	5.81	0.37	0.00	0.00	93.3	15.7	2.36	0.54	0.08
57	07177500	U	483	248	40.1	7.09	2.55	0.70	159	24.8	4.50	1.48	0.14	325	55.6	10.6	3.91	1.20
		R	748	831	178	80.9	61.3	50.4	407	180	127	65.8	31.3	1,100	172	73.7	60.4	52.7
58	07177650	UUrb	6.59	3.33	0.59	0.08	0.02	0.00	0.92	0.21	0.02	0.00	0.00	5.04	1.19	0.23	0.07	0.02
59	07177800	UUrb	8.77	6.33	2.33	0.79	0.39	0.22	4.84	1.34	0.41	0.22	0.14	7.35	2.88	1.32	0.88	0.53
60	07178000	R	812	880	201	115	84.8	73.2	492	202	160	130	79.1	1,190	199	95.5	79.8	71.8

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
61	07178040	UUrb	87.1	55.4	14.4	3.90	2.52	1.90	36.6	6.64	2.58	1.94	1.51	70.0	20.6	7.13	4.13	2.99
62	07178200	R	991	1,160	291	177	137	113	795	276	197	172	155	1,400	312	154	123	106
63	07178600	U	4,480	5,240	687	98.4	50.8	33.8	5,240	508	73.7	39.5	20.5	5,240	873	133	61.0	41.7
64	07184000	U	166	75.4	11.5	0.56	0.00	0.00	43.1	3.31	0.09	0.00	0.00	98.8	19.4	2.84	0.11	0.00
65	07185000	U	3,650	3,860	788	135	21.9	6.90	4,360	718	123	20.0	0.96	3,550	845	144	22.7	10.4
		R	3,880	5,950	1,030	144	69.1	43.1	5,930	710	119	60.9	38.7	5,970	1,260	192	74.8	48.1
66	07185095	UUrb	58.7	36.8	10.2	2.83	1.54	0.82	16.6	4.19	1.83	1.16	0.56	57.8	16.7	5.93	3.40	1.17
67	07185500	U	2.88	2.42	0.42	0.00	0.00	0.00	0.90	0.13	0.00	0.00	0.00	3.24	1.05	0.12	0.00	0.00
68	07185700	U	238	314	130	63.5	46.6	37.6	232	113	61.6	44.6	35.9	362	153	65.0	47.9	39.2
69	07185765	U	381	490	200	86.6	56.9	44.7	294	141	68.6	50.1	40.8	599	292	106	66.0	49.7
70	07186000	U	939	941	301	99.9	63.1	45.6	624	191	84.0	56.3	39.7	1,100	422	125	70.5	49.9
71	07186400	U	205	250	97.4	42.3	32.7	26.5	138	65.3	37.6	29.5	22.9	324	145	50.1	36.2	29.7
72	07187000	U	417	524	235	114	86.0	68.5	373	183	104	81.3	64.2	628	291	125	91.5	71.9
73	07187500	U	400	483	236	115	82.8	65.0	484	204	101	71.3	54.2	482	259	129	92.9	74.3
74	07188000	U	2,170	2,430	848	310	207	151	1,610	572	264	181	133	2,890	1,150	366	232	171
75	07188500	U	28.1	35.9	12.7	5.14	3.63	2.57	31.1	12.2	4.76	2.28	1.34	39.1	13.2	5.31	3.99	3.41
76	07189000	U	808	1,000	339	127	86.0	66.4	499	193	95.0	69.9	53.5	1,310	523	190	117	83.1
77	07189500	U	6,070	6,380	2,250	848	544	370	5,640	1,530	644	376	239	6,880	2,850	1,080	741	514
78	07189540	U	5.28	5.06	3.16	2.25	1.95	1.71	3.89	2.62	1.99	1.75	1.61	5.92	3.63	2.57	2.23	1.98
79	07189542	U	31.2	37.4	17.7	9.45	7.46	6.26	20.2	12.1	7.36	5.90	4.81	46.8	24.9	13.7	10.2	8.60
80	07190500	R	7,510	11,900	3,930	588	90.7	31.6	11,200	3,650	649	84.2	30.2	12,300	4,220	552	96.6	35.3
81	07191000	U	343	187	32.1	3.07	1.65	1.09	72.3	8.19	1.86	1.11	0.76	267	65.0	9.19	2.70	1.68
82	07191220	U	117	135	54.1	22.5	14.6	10.9	69.2	33.1	16.3	11.7	7.75	180	79.7	33.0	21.1	13.9
83	07191500	R	8,830	14,000	4,890	403	212	162	12,200	3,790	369	208	164	15,900	6,220	449	216	160

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
84	07192000	U	131	61.0	4.71	0.11	0.03	0.01	30.0	1.91	0.04	0.02	0.01	78.4	8.62	0.21	0.04	0.02
85	07192500	R	10,400	12,100	4,430	1,860	596	301	12,300	4,020	1,820	454	186	12,000	4,790	1,870	632	379
86	07193500	R	8,450	13,200	4,270	724	153	27.4	11,600	3,850	782	129	19.3	14,100	4,870	691	174	39.7
87	07194500	U	21,600	26,300	8,690	3,490	2,230	1,340	29,600	8,160	3,040	2,010	1,150	25,000	9,060	3,950	2,440	1,450
		R	20,300	33,400	10,800	3,520	1,990	1,340	33,400	11,300	4,140	2,660	1,650	33,500	10,400	2,950	1,750	1,190
88	07194800	U	145	158	36.9	12.6	9.18	7.37	49.8	16.7	9.54	7.39	5.74	226	78.3	23.2	13.5	10.1
89	07195000	U	124	150	79.2	41.4	28.7	23.4	112	68.3	37.6	26.4	20.4	177	93.2	45.1	31.0	25.1
90	07195430	U	531	584	281	160	126	109	332	188	135	114	100	742	380	217	161	118
91	07195500	U	621	739	293	139	103	76.6	394	190	113	85.5	66.3	976	427	183	129	96.3
92	07195800	U	14.9	18.1	8.32	4.54	3.29	2.55	11.6	6.04	3.56	2.59	1.95	22.5	11.0	6.03	4.31	3.31
93	07195855	R	46.0	61.1	25.3	11.1	6.77	4.72	32.7	14.8	7.44	5.30	3.54	77.6	36.1	17.3	11.3	6.48
94	07195865	U	21.5	22.2	11.7	6.91	5.63	4.78	15.5	8.33	5.84	4.84	4.13	26.4	14.3	8.55	6.82	5.75
95	07196000	U	115	134	55.5	25.5	18.6	14.4	77.2	34.6	20.6	15.3	12.1	175	77.1	35.0	23.8	17.7
96	07196500	U	929	1,150	422	180	123	90.2	609	264	137	94.7	65.2	1,520	635	248	168	121
97	07196900	U	44.9	47.9	12.8	2.10	0.92	0.43	14.7	3.24	0.89	0.40	0.24	67.7	25.6	7.18	3.42	1.80
98	07196973	U	24.8	35.2	11.3	2.45	0.25	0.00	13.1	3.68	0.07	0.00	0.00	49.2	19.3	7.73	3.81	2.50
99	07197000	U	325	390	125	40.0	24.2	16.0	168	60.5	26.8	16.5	9.64	538	210	67.5	38.6	25.3
100	07197360	U	83.1	93.6	37.2	14.9	11.0	8.37	44.6	19.3	12.0	8.83	6.91	127	56.4	25.5	14.7	10.2
101	07198000	U	1,960	2,310	749	297	211	172	1,400	474	233	176	143	2,970	1,110	368	259	208
		R	1,500	2,320	868	125	72.9	52.4	1,550	621	118	79.3	54.8	3,030	1,150	139	68.0	51.5
102	07228500	U	469	268	47.0	15.1	7.50	2.45	497	44.8	5.93	1.00	0.03	205	47.9	19.5	14.8	11.9
		R	317	359	130	26.7	13.4	6.80	237	41.1	11.9	5.79	2.72	410	189	73.8	40.5	24.4
103	07229100	R	359	331	90.7	14.8	6.25	4.78	213	40.3	6.06	4.54	3.10	406	135	39.2	18.3	10.3
104	07229200	R	765	850	341	105	40.0	17.0	654	184	42.1	16.6	5.97	967	420	203	125	62.6

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
105	07229300	U	84.8	68.1	24.0	5.94	2.24	0.58	48.7	16.1	1.97	0.51	0.28	81.0	30.2	11.6	6.16	4.12
106	07230000	U	58.9	32.8	7.61	1.81	0.55	0.18	23.2	5.18	0.54	0.16	0.05	37.3	8.84	2.79	1.76	1.07
		R	55.7	1.19	0.65	0.41	0.24	0.18	1.12	0.67	0.41	0.25	0.19	1.31	0.64	0.41	0.24	0.18
107	07230500	U	149	82.0	23.1	5.41	2.00	0.05	66.3	13.9	2.33	0.04	0.02	97.4	29.7	9.36	4.57	2.86
		R	146	151	19.1	4.78	2.13	0.54	67.7	9.93	1.96	0.28	0.00	207	27.3	8.39	4.49	2.96
108	07231000	U	453	277	59.9	16.0	7.40	3.26	223	41.1	7.93	2.85	0.23	313	74.0	25.1	13.6	9.38
		R	357	421	55.6	8.80	1.92	0.26	228	24.6	2.68	0.29	0.00	550	87.5	21.9	7.49	2.29
109	07231500	U	1,840	1,680	319	61.2	21.8	6.81	2,270	316	31.7	6.84	0.66	1,330	320	90.3	39.1	20.3
		R	1,740	2,100	505	105	33.4	12.1	1,510	245	37.1	12.3	3.80	2,440	705	222	101	43.1
110	07232000	U	564	342	43.0	2.89	0.47	0.04	97.4	9.55	0.58	0.04	0.02	615	98.7	17.5	5.05	0.93
111	07232500	U	27.9	11.3	5.88	1.35	0.53	0.00	10.4	2.10	0.40	0.00	0.00	11.4	7.12	4.38	2.78	1.91
		UI	2.61	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.10	0.00	0.00	0.00	0.00
112	07232900	UI	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	07233000	U	15.5	7.09	2.87	0.03	0.02	0.01	5.45	0.04	0.02	0.01	0.00	7.42	4.25	1.62	0.04	0.02
114	07233500	U	21.2	3.21	0.74	0.01	0.00	0.00	8.09	1.09	0.00	0.00	0.00	1.98	0.63	0.14	0.00	0.00
115	07233650	R	0.90	1.45	0.79	0.11	0.00	0.00	0.64	0.13	0.00	0.00	0.00	1.77	1.14	0.71	0.49	0.40
116	07234000	RI	13.2	13.6	0.57	0.01	0.00	0.00	7.73	0.15	0.00	0.00	0.00	15.7	3.27	0.11	0.01	0.00
		U	115	54.0	14.1	0.00	0.00	0.00	92.3	3.12	0.00	0.00	0.00	46.4	18.5	1.16	0.00	0.00
117	07234100	U	6.54	3.04	2.17	1.46	1.13	0.87	2.56	1.65	1.08	0.84	0.64	3.21	2.42	1.85	1.61	1.48
118	07234500	U	186	135	29.1	0.05	0.02	0.01	202	16.6	0.03	0.02	0.01	115	34.6	3.72	0.03	0.02
119	07235000	R	13.9	8.79	4.82	1.43	0.49	0.19	10.1	2.66	0.45	0.14	0.00	8.36	5.56	3.26	2.07	1.17
		RI	8.36	5.29	2.13	0.79	0.54	0.41	4.33	1.30	0.55	0.40	0.30	5.87	2.59	1.24	0.82	0.62
120	07236000	U	95.0	68.3	33.3	5.61	0.05	0.02	73.3	13.0	0.04	0.02	0.01	66.9	41.0	21.3	13.4	4.70
121	07237000	R	64.5	52.0	4.97	0.95	0.50	0.16	28.4	1.74	0.59	0.27	0.04	54.8	22.8	1.43	0.83	0.41
		RI	41.6	58.7	18.9	1.51	1.05	0.81	33.2	2.83	1.05	0.80	0.68	68.2	31.7	2.09	1.43	1.23

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
122	07237500	U	216	170	44.3	1.30	0.00	0.00	246	20.4	0.00	0.00	0.00	152	56.6	5.05	0.77	0.00
		RI	107	160	59.1	14.0	7.14	4.34	120	31.8	7.52	3.99	2.58	176	79.7	27.6	13.2	8.59
123	07238000	U	237	205	58.8	0.49	0.00	0.00	287	30.2	0.00	0.00	0.00	182	76.4	5.78	0.00	0.00
		RI	164	241	93.7	31.4	13.2	5.73	186	50.7	11.6	4.27	0.94	262	121	54.9	36.9	25.2
124	07239000	U	273	277	60.1	0.05	0.02	0.01	336	27.7	0.03	0.01	0.01	248	77.0	9.66	0.04	0.02
		R	154	160	13.5	4.00	2.81	2.08	159	14.9	4.70	2.93	1.90	160	12.5	3.73	2.76	2.15
125	07239300	R	197	350	53.4	20.4	13.4	9.21	327	43.7	17.9	10.9	7.37	359	65.7	22.2	16.3	10.8
126	07239450	R	269	448	91.7	31.8	21.6	13.6	478	67.6	26.8	15.3	9.54	432	106	35.6	27.1	19.8
127	07239500	U	273	349	107	10.9	0.04	0.02	385	82.0	2.77	0.03	0.02	335	117	24.3	1.17	0.03
		R	234	306	59.6	13.5	3.53	0.00	376	48.5	7.98	0.57	0.00	284	70.0	17.2	8.61	1.91
128	07241000	R	187	226	22.8	2.23	0.98	0.09	209	14.1	2.04	0.82	0.00	234	32.5	2.37	1.08	0.10
129	07241500	R	383	398	70.6	34.5	27.8	23.5	523	64.6	34.7	29.4	25.4	344	77.1	34.3	26.3	22.5
130	07241520	R	472	616	197	71.1	44.4	29.6	644	171	59.5	42.3	29.1	600	214	83.2	48.1	29.9
131	07241550	R	491	639	222	106	75.7	63.8	614	199	99.7	71.4	59.9	651	239	112	78.9	67.2
132	07242000	R	825	1,020	324	113	73.4	52.0	974	285	102	61.3	39.7	1,060	350	120	82.3	61.7
133	07242350	UUrb	66.3	51.7	29.0	20.2	14.1	9.40	51.4	28.3	16.5	9.24	6.96	51.9	29.6	21.1	17.1	14.1
134	07242380	R	260	294	72.5	29.8	22.3	17.2	267	49.3	22.8	16.8	13.1	310	84.7	41.3	29.0	23.7
135	07243000	U	26.2	12.3	2.79	0.12	0.00	0.00	6.25	1.16	0.00	0.00	0.00	16.9	4.53	0.71	0.11	0.00
136	07243500	U	935	1,020	174	43.2	21.1	11.1	695	117	27.4	13.2	5.92	1,290	229	62.1	31.8	19.0
137	07244000	U	1,340	1,570	181	42.5	21.4	13.0	1,280	145	32.4	17.6	11.5	1,860	207	56.9	26.0	14.5
138	07245000	U	6,000	7,100	1,620	397	196	106	6,650	1,460	304	138	59.5	7,440	1,720	477	239	149
		R	6,130	9,580	3,080	427	120	73.2	6,440	2,750	423	128	82.3	12,100	3,490	431	116	67.1
139	07245500	U	202	215	48.4	6.46	1.67	0.40	70.4	14.8	2.23	0.61	0.20	317	101	21.6	6.32	1.84
140	07247000	U	227	225	36.5	3.13	0.89	0.11	38.7	4.86	0.85	0.18	0.00	372	95.8	21.5	7.83	3.05
141	07247015	U	277	298	49.2	5.91	2.86	1.67	51.6	8.38	2.58	1.50	0.87	524	128	33.5	17.3	8.03

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
142	07247250	U	149	166	38.1	1.39	0.05	0.00	30.1	3.35	0.00	0.00	0.00	245	84.7	29.2	12.8	1.31
143	07247500	U	135	116	18.4	1.75	0.26	0.00	28.4	3.78	0.29	0.00	0.00	187	43.5	8.49	2.74	0.72
144	07248500	U	1,310	1,130	215	27.5	4.62	0.65	256	46.2	3.41	0.44	0.04	1,990	512	137	51.3	27.2
		R	1,050	1,750	163	11.6	6.36	1.73	316	19.8	7.81	4.18	1.35	3,020	515	71.7	11.8	3.70
145	07249400	U	144	139	29.4	3.78	1.48	0.56	29.5	6.51	1.69	0.68	0.20	218	69.1	18.7	6.09	2.07
146	07249413	R	2,150	4,050	485	49.0	23.8	15.8	1,040	86.8	28.5	18.7	13.8	6,110	1,640	157	57.4	20.9
147	07249500	U	38.4	39.4	6.73	0.78	0.12	0.10	8.05	1.53	0.19	0.10	0.03	59.2	18.9	3.65	1.20	0.30
148	07249985	U	540	654	135	9.96	2.15	0.36	123	19.8	2.16	0.35	0.00	987	331	80.6	27.7	5.38
149	07250000	U	541	635	133	9.68	2.12	0.29	131	19.3	1.99	0.28	0.00	944	316	76.0	26.3	6.33
150	07250550	U	31,600	43,900	13,600	4,980	3,010	1,910	42,100	11,700	4,320	2,560	1,400	0.00	14,900	5,610	3,470	2,320
		R	38,800	64,200	22,900	7,130	3,310	1,480	44,300	16,600	5,790	2,540	1,150	77,300	30,400	8,630	4,000	1,860
151	07299200	U	77.4	11.7	1.22	0.25	0.07	0.00	41.9	1.57	0.12	0.03	0.00	3.28	1.14	0.38	0.14	0.05
152	07299300	U	11.3	1.20	0.20	0.08	0.05	0.01	2.86	0.26	0.07	0.01	0.00	0.57	0.18	0.09	0.06	0.04
153	07299540	U	121	68.3	10.2	2.45	1.14	0.52	105	7.95	1.48	0.62	0.25	51.1	11.4	3.47	1.88	1.08
154	07299570	U	149	59.0	8.76	1.66	0.37	0.05	102	6.72	0.38	0.03	0.00	44.2	9.59	2.93	1.51	0.68
155	07299670	U	24.1	19.5	8.26	3.19	1.88	1.07	20.8	8.35	2.76	1.04	0.37	18.7	8.21	3.54	2.26	1.66
156	07299890	U	2.80	3.91	1.86	0.67	0.33	0.03	1.71	0.77	0.25	0.01	0.00	4.55	2.92	1.67	1.28	0.99
157	07300500	U	84.4	68.9	19.2	0.00	0.00	0.00	49.6	3.51	0.00	0.00	0.00	75.1	28.1	6.53	0.07	0.00
158	07301110	U	225	198	74.4	26.8	13.9	8.10	198	71.9	20.3	9.21	6.05	198	75.7	32.9	17.9	11.6
159	07301300	U	36.3	32.3	2.54	0.00	0.00	0.00	5.40	0.00	0.00	0.00	0.00	44.4	11.5	0.16	0.00	0.00
160	07301410	U	13.5	18.0	10.1	2.39	0.80	0.36	10.7	3.00	0.64	0.30	0.14	21.0	13.6	8.49	5.97	4.18
161	07301420	U	24.0	34.3	19.5	5.42	1.74	0.70	22.3	7.38	1.23	0.61	0.30	39.7	24.9	16.4	12.2	8.27
162	07301500	U	130	140	39.3	0.09	0.00	0.00	99.5	8.16	0.00	0.00	0.00	158	60.5	13.2	0.32	0.00
163	07303000	R	57.4	2.57	0.53	0.04	0.00	0.00	1.88	0.36	0.00	0.00	0.00	4.17	0.69	0.11	0.00	0.00

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
164	07303400	U	42.0	35.8	17.0	8.84	5.04	2.30	33.7	13.1	4.69	1.96	0.61	37.7	19.8	12.3	9.11	7.00
165	07303500	U	105	71.9	23.7	7.60	3.70	1.38	79.5	20.3	3.91	1.24	0.17	67.5	25.4	11.3	6.53	4.55
166	07304500	U	69.5	42.2	9.84	1.21	0.08	0.00	43.8	8.83	0.22	0.00	0.00	41.4	10.6	2.76	0.56	0.10
		R	97.0	48.7	16.4	4.54	1.72	0.62	53.4	13.1	2.18	0.80	0.29	46.7	17.9	7.21	3.87	1.58
167	07305000	R	324	244	64.9	21.3	7.68	2.07	272	64.6	13.1	3.47	0.19	221	65.0	26.1	13.8	5.33
168	07305500	R	11.8	0.12	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
169	07307028	R	540	479	141	63.1	42.0	29.5	553	148	52.1	31.1	18.5	433	138	70.6	51.9	39.2
170	07308500	U	1,190	1,110	317	105	53.5	23.4	1,440	321	81.4	32.0	12.2	950	316	120	71.0	42.4
171	07311000	U	183	103	26.2	10.5	6.17	2.43	97.6	23.2	8.17	3.65	0.88	107	29.2	12.5	7.83	4.88
		R	246	183	42.3	22.7	17.3	13.7	135	33.0	18.0	13.6	10.6	222	47.5	27.4	21.7	18.0
172	07311200	R	13.4	10.8	1.11	0.00	0.00	0.00	2.95	0.09	0.00	0.00	0.00	15.7	2.77	0.34	0.02	0.00
173	07311500	U	169	42.1	4.91	0.55	0.00	0.00	37.4	3.56	0.07	0.00	0.00	45.1	5.55	1.04	0.25	0.00
174	07313000	U	52.3	21.9	7.22	0.20	0.03	0.01	16.2	2.35	0.03	0.02	0.01	24.4	10.9	2.88	0.78	0.03
175	07313500	U	107	55.4	12.9	0.47	0.00	0.00	39.3	4.49	0.00	0.00	0.00	65.3	20.6	2.88	0.11	0.00
		R	199	116	1.19	0.00	0.00	0.00	13.7	1.93	0.00	0.00	0.00	213	0.71	0.00	0.00	0.00
176	07315500	R	2,510	2,530	620	276	186	140	2,840	686	264	185	143	2,290	584	285	188	138
177	07315700	U	197	76.4	8.70	0.47	0.02	0.00	44.1	4.35	0.14	0.00	0.00	106	13.9	1.24	0.18	0.00
178	07316000	R	3,170	3,260	842	337	219	168	3,490	898	314	207	154	3,060	811	356	229	176
179	07316500	U	27.9	30.8	8.32	0.00	0.00	0.00	18.8	1.15	0.00	0.00	0.00	35.1	15.1	2.70	0.00	0.00
180	07319500	U	3.67	3.37	1.28	0.36	0.00	0.00	2.54	0.80	0.14	0.00	0.00	3.83	1.50	0.66	0.20	0.00
181	07323000	U	6.31	6.19	1.94	0.27	0.00	0.00	5.33	1.02	0.07	0.00	0.00	6.67	2.45	0.68	0.20	0.00
182	07324200	U	64.4	79.0	24.5	2.83	0.19	0.00	62.9	13.4	0.76	0.04	0.00	88.2	32.4	8.06	0.56	0.00
183	07324400	R	58.4	23.9	7.61	4.21	2.53	1.06	27.3	7.58	4.26	2.27	0.61	22.3	7.63	4.17	2.68	1.25
184	07325000	U	146	111	25.0	5.88	2.27	0.68	140	27.2	4.58	0.95	0.10	94.9	24.1	7.01	2.92	1.55
		R	123	128	33.0	14.6	8.90	5.63	133	28.4	11.4	6.91	4.01	125	35.1	17.4	11.3	7.18

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
185	07325500	U	361	377	118	47.3	29.4	19.2	426	110	39.5	24.0	14.2	341	122	53.5	34.7	23.1
186	07325800	U	30.1	27.7	15.7	8.36	5.31	3.68	23.6	10.6	4.94	3.44	2.44	29.7	18.8	12.2	9.74	7.76
187	07326000	U	50.2	43.2	26.2	13.1	8.52	5.68	32.8	15.1	7.76	5.15	2.74	45.6	31.8	21.8	17.4	14.2
		R	35.6	5.86	3.18	2.29	1.89	1.65	5.39	2.92	2.10	1.71	1.43	6.18	3.34	2.42	2.09	1.79
188	07326500	R	493	609	185	82.1	56.2	41.1	742	157	64.2	42.6	28.8	552	201	98.6	69.8	54.4
189	07327000	U	14.7	16.3	5.32	0.21	0.03	0.02	10.3	1.19	0.03	0.02	0.01	18.3	7.86	2.85	1.01	0.09
190	073274406	U	1.89	1.69	0.60	0.19	0.08	0.03	1.49	0.36	0.08	0.03	0.00	1.79	0.75	0.28	0.18	0.12
191	07327442	U	4.97	6.23	2.51	0.62	0.37	0.13	5.23	1.18	0.35	0.08	0.02	6.97	3.15	1.18	0.59	0.48
192	07327447	U	23.3	27.4	12.7	4.82	2.89	1.38	23.6	7.67	2.73	1.20	0.69	31.5	14.9	7.71	5.42	4.29
193	07327490	U	38.3	36.0	16.4	5.93	2.50	0.12	27.8	8.45	1.65	0.05	0.02	40.2	21.1	11.3	8.08	5.93
194	07327550	U	60.7	71.0	32.4	10.9	6.28	3.37	58.6	19.6	5.71	2.81	1.58	78.3	40.3	17.7	11.4	9.11
195	07328000	U	670	642	252	126	76.2	51.0	855	255	100	60.1	39.5	552	251	149	96.6	60.2
196	07328070	U	10.8	11.0	4.23	1.61	0.80	0.35	8.12	2.30	0.62	0.29	0.06	11.8	5.56	2.57	1.98	1.48
197	07328100	R	683	894	302	123	79.8	55.7	1,030	249	90.2	56.1	35.1	813	323	147	105	81.8
198	07328180	U	2.70	3.34	0.98	0.16	0.01	0.00	2.41	0.55	0.03	0.00	0.00	3.88	1.31	0.38	0.10	0.02
199	07328500	U	828	874	306	130	76.7	45.6	1,020	325	111	54.1	22.9	763	298	140	91.7	63.6
		R	954	1,210	414	154	94.4	60.7	1,270	350	112	61.1	29.3	1,180	445	190	128	94.8
200	07329000	U	80.0	59.3	20.2	7.30	3.51	0.78	42.4	12.8	4.08	1.82	0.34	69.4	25.7	12.4	7.23	4.02
201	07329500	U	51.6	36.9	13.6	2.68	0.09	0.00	31.2	7.73	0.00	0.00	0.00	40.3	17.9	6.08	2.74	1.19
202	07329700	R	265	245	47.6	10.7	4.00	1.74	139	26.5	4.41	1.49	0.53	300	71.8	19.1	9.39	5.06
203	07329852	U	55.4	47.4	18.2	8.13	5.80	4.18	26.7	12.9	6.94	5.03	2.72	60.0	25.3	10.0	6.85	4.87
204	07329900	U	63.6	52.4	18.3	7.40	5.16	3.89	25.6	11.4	5.15	3.68	2.33	66.8	27.8	9.86	7.35	6.00
205	07330500	U	154	83.3	15.9	1.20	0.04	0.02	47.6	4.48	0.13	0.03	0.01	110	25.8	4.68	0.91	0.04

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
206	07331000	U	1,540	1,530	509	218	138	84.6	1,640	486	180	104	51.7	1,480	519	247	165	115
		R	1,900	2,360	705	237	142	84.9	2,090	535	162	83.6	41.7	2,550	815	304	209	148
207	07331600	U	5,680	6,380	2,100	816	553	393	7,090	2,120	739	504	359	5,920	2,090	859	595	434
		R	4,880	5,790	2,770	756	188	96.1	5,740	2,990	1,080	220	108	5,840	2,600	642	162	91.0
208	07332400	U	142	145	66.4	38.4	31.4	28.2	102	50.8	35.3	30.4	28.0	171	85.3	44.4	32.6	28.4
209	07332500	U	322	258	89.4	38.2	28.0	20.6	153	57.7	29.9	20.9	12.8	339	120	50.8	35.3	28.5
210	07332600	U	54.8	28.4	4.78	0.03	0.00	0.00	7.07	0.31	0.00	0.00	0.00	40.9	11.5	1.72	0.12	0.01
211	07333500	U	30.4	11.7	1.23	0.00	0.00	0.00	2.50	0.24	0.00	0.00	0.00	20.3	3.63	0.24	0.00	0.00
212	07333800	U	86.7	41.3	4.75	0.09	0.00	0.00	10.3	1.13	0.00	0.00	0.00	71.5	11.8	1.50	0.18	0.00
213	07334000	U	880	594	73.0	9.04	2.16	0.49	198	23.9	2.58	0.54	0.00	964	152	27.6	10.6	3.57
		R	947	1,250	109	26.6	18.7	15.1	356	39.2	18.4	14.7	12.7	1,840	275	45.5	29.3	23.3
214	07335000	U	488	401	80.9	18.8	10.3	5.47	180	36.1	11.8	5.57	1.40	571	132	37.2	17.1	11.0
215	07335300	R	2,130	2,930	433	106	59.3	35.0	1,020	176	62.4	34.9	22.1	4,510	845	200	112	73.9
216	07335400	R	134	220	25.2	0.00	0.00	0.00	103	0.00	0.00	0.00	0.00	283	74.4	0.00	0.00	0.00
217	07335500	R	9,190	13,000	4,230	2,040	1,320	894	9,500	3,790	2,010	1,320	848	14,800	4,800	2,060	1,330	924
218	07335700	U	82.9	101	26.0	1.23	0.01	0.00	20.8	1.98	0.00	0.00	0.00	140	52.7	19.1	9.36	3.46
219	07335790	R	1,030	1,720	218	11.5	2.82	0.44	346	21.1	2.77	0.62	0.00	2,460	584	117	44.5	10.6
220	07336000	U	76.4	44.8	5.67	0.08	0.00	0.00	9.25	0.68	0.00	0.00	0.00	74.3	15.5	2.01	0.35	0.00
221	07336200	U	1,480	1,610	332	45.8	13.7	1.97	447	65.8	10.8	1.21	0.00	2,360	677	200	110	69.8
		R	1,610	2,510	345	26.4	6.44	1.88	538	51.2	6.76	2.18	0.00	3,690	877	191	72.6	12.2
222	07336500	U	1,700	1,670	343	39.3	9.38	1.40	436	70.3	8.48	0.93	0.04	2,580	727	206	86.3	32.7
223	07336750	U	77.3	29.6	1.58	0.00	0.00	0.00	1.39	0.00	0.00	0.00	0.00	64.0	8.12	0.37	0.00	0.00
224	07336800	U	82.1	31.8	1.31	0.00	0.00	0.00	1.76	0.00	0.00	0.00	0.00	81.1	8.81	0.29	0.00	0.00
225	07336820	R	14,400	23,600	6,740	2,930	2,000	1,470	14,500	4,720	2,480	1,750	1,280	27,800	9,260	3,510	2,330	1,650

Table 2. Annual, summer-autumn, and winter-spring flow-duration statistics and annual mean-flow statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map no.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; Annual Mean, mean of daily flows; *Dxx*, annual flow exceedance which is the daily mean discharge that is equaled or exceeded xx percent of the time during the specified time period, in cubic feet per second; *DxxSUM*, daily mean discharge for the summer-autumn period (June 1 to October 31) exceeded xx percent of the time, in cubic feet per second; *DxxWSP*, daily mean discharge for the winter-spring period (November 1 to May 31) exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Annual mean	Flow-duration statistics														
				D_{20}	D_{50}	D_{80}	D_{90}	D_{95}	$D_{20}SUM$	$D_{50}SUM$	$D_{80}SUM$	$D_{90}SUM$	$D_{95}SUM$	$D_{20}WSP$	$D_{50}WSP$	$D_{80}WSP$	$D_{90}WSP$	$D_{95}WSP$
226	07337500	U	907	947	203	21.5	3.52	0.90	211	37.7	3.03	0.78	0.05	1,500	448	131	55.1	18.0
		R	902	1,320	182	26.6	16.9	11.8	274	41.5	17.3	12.1	8.49	2,090	430	61.3	30.5	20.0
227	07337900	U	492	526	122	11.6	3.29	1.11	144	18.6	3.15	0.99	0.19	752	253	76.4	35.6	15.0
228	07338500	U	1,630	1,860	398	52.2	18.0	7.65	388	81.1	16.5	6.92	3.12	3,120	894	271	126	51.5
		R	1,810	3,530	530	81.6	44.0	31.7	873	123	43.1	31.2	23.3	4,860	1,290	269	129	75.2
229	07338750	U	556	650	186	19.8	7.43	3.86	184	30.1	6.53	3.13	1.89	907	355	139	81.4	39.7
230	07339000	U	1,290	1,490	343	43.8	11.7	1.94	325	67.5	9.97	1.53	0.04	2,360	732	236	115	55.1
		R	1,400	2,290	615	209	150	121	1,240	480	217	169	141	3,140	863	201	136	113
231	07339500	U	288	286	60.0	6.70	2.48	0.87	58.1	9.75	2.45	0.88	0.33	475	139	39.4	17.3	7.19
232	07340300	U	185	193	62.5	20.1	14.3	11.9	59.7	22.5	13.8	11.4	9.84	281	109	51.1	33.7	24.2
233	07340500	U	619	674	153	28.7	15.8	9.62	150	37.1	14.4	8.84	5.81	1,040	330	109	59.4	35.7
234	07341000	U	194	215	44.1	4.16	0.89	0.19	40.0	6.50	0.65	0.18	0.08	342	106	29.2	12.6	6.01
235	07341200	U	374	322	61.6	5.43	2.03	1.03	70.3	9.93	1.91	1.00	0.72	514	151	35.6	13.3	4.75

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record.

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
1	07146500	U	976	343	189	140	93.3	1,050	491	231	169	134	856	443	260	196	82.2
		R	2,080	877	330	240	184	1,670	890	438	340	262	1,460	848	449	345	278
2	07148140	R	1,820	346	148	125	48.4	4,270	682	154	133	122	2,450	752	292	159	138
3	07148350	U	51.1	7.29	0.22	0.04	0.00	68.3	30.8	0.84	0.29	0.13	66.5	37.4	11.6	2.88	0.39
4	07148400	U	95.3	17.4	2.24	0.71	0.03	105	36.5	8.53	0.95	0.03	95.7	44.5	19.8	3.96	1.22
5	07149000	U	132	60.1	19.4	6.33	0.00	141	89.0	56.7	40.9	23.5	134	96.0	61.7	44.0	30.8
6	07149500	U	320	53.4	4.26	0.03	0.01	218	107	33.0	14.6	0.04	211	123	51.1	42.8	37.0
7	07150500	R	360	28.6	7.74	4.08	3.11	373	102	4.66	2.14	1.30	298	120	11.3	1.65	1.11
8	07151000	R	717	119	43.9	24.4	17.3	773	214	45.1	26.4	17.6	580	223	62.4	31.9	17.4
9	07151500	U	161	66.1	27.8	10.9	0.92	209	96.3	49.2	35.3	17.9	163	99.9	53.2	37.7	19.1
10	07152000	U	273	95.9	27.0	7.66	4.12	327	142	56.8	30.5	9.37	297	143	69.6	44.6	22.9
11	07152500	U	4,330	1,440	489	317	213	4,030	1,680	521	339	232	3,140	1,510	667	415	247
		R	5,140	1,090	409	261	177	7,000	1,720	532	392	218	5,380	1,630	584	404	325
12	07153000	U	46.4	7.31	0.98	0.14	0.00	61.9	12.1	1.95	0.62	0.00	47.7	12.6	3.08	1.12	0.00
13	07153100	R	0.05	0.03	0.01	0.01	0.00	0.05	0.03	0.01	0.01	0.00	0.10	0.03	0.01	0.01	0.00
14	07154500	U	3.28	1.13	0.11	0.03	0.01	3.33	1.73	0.88	0.33	0.03	3.37	1.80	0.88	0.61	0.04
		UI	1.04	0.00	0.00	0.00	0.00	1.99	0.28	0.00	0.00	0.00	2.54	0.75	0.00	0.00	0.00
15	07155000	U	1.64	0.03	0.01	0.01	0.00	13.1	0.05	0.02	0.01	0.00	10.9	5.30	0.03	0.01	0.01
16	07155590	U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
17	07156900	U	88.8	65.9	50.0	43.6	39.2	89.9	71.7	58.2	53.7	49.6	90.8	70.4	59.3	53.5	48.9
		UI	36.3	31.7	28.1	26.3	25.1	42.9	37.1	31.7	29.7	28.6	45.5	39.0	32.9	29.8	27.2
18	07157000	U	78.9	55.0	40.9	36.3	32.1	96.7	66.4	48.6	41.6	37.3	98.6	65.6	44.1	36.2	25.6
19	07157500	U	19.9	9.69	3.73	0.31	0.03	19.8	13.4	8.95	6.91	4.79	23.3	15.8	10.1	7.64	6.32
		UI	9.61	5.81	4.01	3.13	2.26	12.1	7.99	5.59	4.73	4.15	12.2	8.69	6.56	5.54	5.04

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
20	07157900	U	1.94	1.22	0.67	0.49	0.36	2.28	1.60	1.07	0.74	0.58	2.58	1.70	1.11	0.79	0.59
21	07157950	U	75.5	5.56	0.01	0.00	0.00	110	51.0	6.10	0.63	0.30	122	63.8	25.3	12.3	5.98
22	07157960	U	8.47	0.15	0.00	0.00	0.00	11.2	1.27	0.04	0.00	0.00	8.93	1.82	0.74	0.13	0.00
23	07158000	U	156	17.4	0.18	0.00	0.00	180	70.0	7.33	1.06	0.00	189	94.6	31.0	12.2	3.10
24	07158400	U	12.7	6.73	3.11	1.80	1.51	33.2	7.40	5.05	3.47	2.07	19.5	8.15	5.14	3.65	2.90
25	07159000	U	5.47	0.79	0.00	0.00	0.00	7.87	1.31	0.24	0.00	0.00	7.28	2.03	0.41	0.23	0.09
26	07159100	U	574	130	51.9	39.8	30.6	636	195	79.1	55.6	43.0	552	259	115	78.7	60.4
27	07159750	U	81.4	42.6	23.7	15.2	12.8	118	57.4	29.1	18.4	15.2	109	61.5	27.0	20.0	17.9
28	07160000	U	1,100	368	151	102	75.0	1,270	508	218	151	85.3	1,010	571	297	199	141
29	07160350	U	18.3	10.0	5.08	3.99	3.18	19.6	13.2	7.10	5.71	4.84	18.6	13.2	7.21	5.49	4.30
30	07160500	U	37.9	11.2	4.50	2.90	1.07	44.3	14.2	6.33	3.66	2.26	43.2	14.3	7.06	4.93	3.64
31	07163000	U	1.44	0.00	0.00	0.00	0.00	2.62	0.25	0.00	0.00	0.00	2.43	0.39	0.00	0.00	0.00
32	07163500	U	1,250	253	91.3	54.5	15.6	744	190	61.0	30.5	14.2	564	215	76.1	48.2	15.4
33	07164000	U	1,860	478	96.4	59.5	32.5	1,170	405	124	48.0	21.3	872	391	195	79.2	25.6
34	07164500	U	5,950	2,160	692	391	287	4,460	2,130	654	430	283	3,670	1,930	808	557	293
		R	7,880	2,370	623	292	178	9,780	2,660	920	408	206	7,950	2,650	847	354	183
35	07164600	UUrb	4.23	1.82	1.05	0.83	0.71	7.07	2.63	1.47	1.14	0.92	8.52	3.13	1.43	1.11	0.91
36	07165500	R	8.83	0.29	0.00	0.00	0.00	11.6	0.37	0.00	0.00	0.00	12.0	0.39	0.00	0.00	0.00
37	07165562	UUrb	3.55	0.29	0.00	0.00	0.00	9.68	1.74	0.51	0.16	0.00	9.04	2.44	0.96	0.47	0.22
38	07165565	UUrb	2.14	0.22	0.01	0.00	0.00	4.49	0.76	0.20	0.07	0.02	3.90	0.95	0.31	0.17	0.09
39	07165570	R	10,100	2,420	801	574	435	12,700	3,290	1,010	635	449	10,400	3,150	1,130	708	505
40	07170500	U	474	47.5	12.8	6.28	2.88	589	77.5	9.61	2.34	0.31	634	125	20.2	10.3	6.03
		R	1,150	107	31.3	22.3	17.5	3,160	168	40.6	29.4	23.8	2,170	446	54.3	35.4	26.6
41	07170700	U	3.72	0.27	0.00	0.00	0.00	12.0	1.42	0.00	0.00	0.00	9.36	1.72	0.10	0.00	0.00
		R	6.09	0.03	0.00	0.00	0.00	16.2	0.12	0.00	0.00	0.00	21.4	0.51	0.01	0.00	0.00

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
42	07171000	U	886	60.7	9.18	4.79	0.05	609	79.8	11.4	6.30	1.81	543	115	15.7	7.43	2.40
		R	1,470	147	37.0	21.1	13.5	3,730	273	50.1	30.1	21.1	2,760	603	67.5	40.8	29.9
43	07171400	R	1,900	72.8	8.43	4.43	2.18	4,380	94.1	9.03	4.57	2.77	3,880	510	14.8	6.81	1.66
44	07172000	U	110	6.74	0.00	0.00	0.00	174	26.5	0.24	0.00	0.00	186	32.9	2.67	0.20	0.00
45	07173000	U	145	17.3	7.35	2.24	0.61	220	18.3	8.52	3.49	1.52	304	25.4	9.53	4.88	2.18
46	07174200	U	56.6	3.54	0.08	0.00	0.00	96.6	6.51	0.34	0.07	0.00	80.0	12.3	0.56	0.11	0.07
47	07174400	R	386	37.9	22.7	15.1	11.0	1,510	49.6	26.8	15.8	10.2	1,570	112	22.7	8.38	4.74
48	07174600	U	18.8	1.78	0.00	0.00	0.00	47.9	7.28	0.18	0.00	0.00	47.1	10.3	2.31	0.00	0.00
49	07174700	R	480	46.6	14.5	10.8	6.96	1,330	65.0	20.3	13.9	11.4	1,180	114	22.0	14.9	11.1
50	07175000	U	0.24	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00
51	07175500	R	1,000	71.6	36.6	26.8	20.9	2,060	131	44.0	29.2	18.2	2,020	282	52.2	26.5	15.8
52	07176000	U	2,520	209	15.7	5.49	0.03	2,240	244	20.9	6.60	0.04	1,460	236	35.7	15.1	8.80
		R	2,460	148	54.6	34.2	20.7	8,300	289	60.4	36.2	20.6	6,970	782	69.7	45.2	36.0
53	07176465	R	13.5	5.08	2.46	1.53	0.99	7.74	3.92	1.67	1.04	0.06	17.9	3.65	1.46	0.99	0.11
54	07176500	U	54.1	2.87	0.00	0.00	0.00	72.1	5.30	0.00	0.00	0.00	83.1	6.93	0.18	0.00	0.00
		R	62.5	23.2	7.90	5.11	3.87	194	25.3	10.3	6.30	4.46	139	33.6	9.61	6.00	4.48
55	07176800	U	5.27	0.49	0.00	0.00	0.00	10.5	0.73	0.00	0.00	0.00	8.72	0.74	0.10	0.00	0.00
56	07177000	U	26.8	2.38	0.24	0.00	0.00	40.6	4.92	0.40	0.09	0.00	31.8	5.08	1.06	0.11	0.00
57	07177500	U	112	11.6	2.13	0.65	0.04	155	23.2	3.67	1.10	0.48	140	26.3	5.66	2.22	0.47
		R	249	157	64.9	50.9	26.3	669	84.7	57.7	50.9	42.0	417	103	67.7	57.2	51.7
58	07177650	UUrb	0.88	0.20	0.04	0.01	0.00	2.51	0.57	0.07	0.02	0.00	3.47	1.01	0.13	0.06	0.03
59	07177800	UUrb	3.74	1.23	0.42	0.29	0.19	6.02	2.25	0.70	0.36	0.22	6.79	2.82	1.28	0.75	0.47
60	07178000	R	269	174	87.5	72.8	67.4	576	119	78.8	71.0	67.2	459	130	84.0	73.9	69.3
61	07178040	UUrb	21.8	4.49	2.32	1.74	1.40	65.2	14.6	4.05	3.05	2.38	55.3	19.9	6.57	3.44	2.60
62	07178200	R	430	236	139	109	96.6	828	192	113	99.5	91.9	589	220	137	114	101

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
63	07178600	U	2,720	245	54.6	30.4	18.1	1,500	322	62.5	40.8	34.0	1,400	264	83.0	44.0	33.0
64	07184000	U	32.3	2.65	0.00	0.00	0.00	72.6	7.75	0.00	0.00	0.00	62.1	13.8	1.25	0.00	0.00
65	07185000	U	2,840	420	37.5	2.13	0.22	1,850	306	15.4	3.91	1.61	1,440	318	29.4	10.4	6.37
		R	2,500	207	50.5	27.5	18.2	4,880	453	64.2	38.2	27.4	3,500	776	86.6	58.0	42.1
66	07185095	UUrb	14.6	4.27	1.70	1.02	0.48	64.2	12.8	3.46	1.47	0.83	44.8	14.6	4.45	2.42	0.97
67	07185500	U	1.85	0.22	0.00	0.00	0.00	2.57	0.28	0.00	0.00	0.00	2.94	0.43	0.00	0.00	0.00
68	07185700	U	190	89.2	54.0	35.6	31.6	305	81.3	53.9	43.9	37.4	285	109	51.5	44.5	34.8
69	07185765	U	230	112	60.2	40.4	29.9	512	128	64.0	55.1	45.8	528	213	81.6	56.7	47.4
70	07186000	U	490	144	64.4	44.8	34.5	811	172	74.9	55.5	46.0	824	257	80.9	58.0	47.8
71	07186400	U	141	53.2	34.0	27.5	20.3	268	71.8	36.9	30.9	27.6	303	112	37.5	30.3	25.9
72	07187000	U	316	141	86.5	68.4	54.5	455	151	94.7	76.0	64.9	454	203	102	76.9	67.9
73	07187500	U	348	161	82.5	65.1	57.6	342	176	93.6	74.1	62.6	404	183	98.1	80.1	69.7
74	07188000	U	1,310	420	208	143	107	2,270	496	248	184	138	2,090	720	266	196	150
75	07188500	U	18.8	9.69	4.86	3.18	1.46	15.2	8.15	5.44	3.30	2.77	12.7	6.99	4.79	4.01	3.55
76	07189000	U	396	137	77.4	59.8	48.4	829	227	100	78.3	67.2	878	362	133	88.5	68.7
77	07189500	U	3,660	1,300	684	450	348	4,220	1,580	650	463	411	4,690	2,030	699	474	381
78	07189540	U	3.62	2.82	2.18	1.95	1.73	4.09	3.07	2.39	2.03	1.70	4.29	3.24	2.55	2.33	2.12
79	07189542	U	16.3	11.7	7.35	6.04	5.37	25.6	14.1	10.2	8.10	7.30	36.8	19.7	12.8	9.86	8.81
80	07190500	R	8,020	1,890	89.0	30.9	26.1	11,400	2,400	154	50.2	27.5	9,680	2,750	331	73.6	28.9
81	07191000	U	64.4	5.34	1.50	0.95	0.61	184	15.6	2.43	1.61	1.07	175	34.4	2.90	1.83	1.51
82	07191220	U	62.0	26.2	14.3	10.1	6.78	120	41.7	20.0	13.8	10.8	141	66.1	24.4	15.5	11.7
83	07191500	R	8,700	1,100	211	163	134	14,600	2,430	287	187	152	12,800	4,330	360	212	170
84	07192000	U	24.6	0.30	0.03	0.01	0.01	17.8	0.74	0.03	0.02	0.01	20.7	0.98	0.03	0.02	0.01
85	07192500	R	7,930	3,230	380	188	116	6,520	3,040	1,250	338	258	5,710	2,420	1,100	468	354

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
86	07193500	R	11,500	1,800	181	30.7	15.6	14,100	3,050	362	56.6	16.6	12,600	3,580	479	89.2	32.0
87	07194500	U	17,900	5,670	2,440	1,450	896	16,000	5,930	2,280	1,260	892	13,200	5,850	2,730	1,460	1,040
		R	14,400	4,900	2,030	1,030	643	19,800	5,900	1,870	1,020	301	17,000	6,910	2,280	1,640	820
88	07194800	U	48.7	16.3	9.54	6.96	5.75	178	36.8	14.5	11.3	9.98	196	68.3	18.3	10.4	8.70
89	07195000	U	89.7	60.9	31.0	24.3	19.7	135	69.4	33.5	25.9	22.8	137	74.0	34.9	26.0	22.8
90	07195430	U	240	172	134	115	107	497	226	155	125	112	632	342	216	136	112
91	07195500	U	338	167	106	73.7	54.5	725	238	125	92.0	68.1	773	334	140	103	75.9
92	07195800	U	12.2	6.37	3.74	2.76	2.26	21.0	9.13	5.47	3.67	3.06	20.7	10.0	5.30	3.85	3.23
93	07195855	R	25.0	13.2	7.60	5.83	3.83	61.9	23.8	12.6	8.59	6.07	65.6	32.7	14.2	11.3	8.01
94	07195865	U	9.20	6.66	5.33	4.66	4.32	19.8	9.48	6.03	5.12	4.62	22.4	14.0	8.47	6.51	5.69
95	07196000	U	73.2	30.4	19.9	14.5	11.4	135	49.8	23.0	17.2	13.3	133	63.0	29.2	21.2	15.8
96	07196500	U	541	216	117	85.5	64.1	1,080	304	161	109	87.6	1,080	424	179	127	101
97	07196900	U	17.5	2.90	0.80	0.41	0.28	53.7	13.2	2.54	1.08	0.73	61.9	20.8	4.14	2.43	1.14
98	07196973	U	9.43	2.98	0.18	0.00	0.00	43.7	8.46	2.59	1.20	0.81	41.1	19.3	7.16	3.33	2.51
99	07197000	U	124	48.9	21.1	12.1	6.68	355	82.5	33.9	19.9	14.8	405	140	38.8	26.3	18.9
100	07197360	U	32.6	15.5	10.5	8.23	7.41	75.0	34.6	15.7	11.4	9.85	107	57.5	26.0	11.0	8.23
101	07198000	U	760	332	185	137	87.3	1,940	386	235	193	169	1,480	467	256	215	185
		R	1,050	239	79.9	52.2	38.0	1,920	416	77.5	55.6	46.4	2,610	813	123	63.1	50.8
102	07228500	U	205	32.8	7.66	3.55	2.29	118	32.6	14.0	9.95	8.04	114	34.7	19.7	14.4	11.1
		R	178	32.9	15.9	10.4	7.04	251	88.5	29.6	19.4	16.1	326	122	61.8	32.2	22.9
103	07229100	R	142	41.8	6.50	5.33	4.74	332	65.0	27.8	15.3	5.82	270	105	36.4	20.5	13.8
104	07229200	R	447	137	36.1	12.5	3.18	654	239	101	43.0	21.4	778	334	152	94.2	62.7
105	07229300	U	44.4	14.8	3.78	0.61	0.34	54.5	22.7	7.15	3.52	1.89	57.0	20.7	7.58	4.75	4.00
106	07230000	U	20.0	5.32	0.68	0.15	0.03	27.4	5.67	1.11	0.44	0.34	27.4	7.38	2.05	1.07	0.64
		R	0.93	0.61	0.40	0.20	0.15	0.94	0.59	0.35	0.20	0.16	0.93	0.60	0.39	0.23	0.16

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
107	07230500	U	36.7	8.32	2.41	0.05	0.02	48.8	16.0	4.52	1.36	0.42	52.1	21.3	7.42	3.18	1.80
		R	33.5	8.62	1.98	0.45	0.00	72.0	16.1	4.28	2.53	1.84	55.1	19.8	6.13	3.44	2.64
108	07231000	U	112	20.2	5.11	1.62	0.13	112	37.0	10.7	5.29	3.49	108	44.8	17.4	10.9	5.90
		R	111	18.7	0.62	0.09	0.00	286	36.0	5.58	0.67	0.02	196	47.3	11.5	2.58	0.33
109	07231500	U	831	141	14.4	1.19	0.25	644	184	37.3	11.4	4.65	867	206	53.0	23.2	12.8
		R	845	209	27.0	9.88	4.38	1,540	414	76.8	36.9	15.1	1,370	486	138	56.0	32.5
110	07232000	U	56.8	6.97	0.13	0.03	0.01	115	9.04	0.89	0.04	0.02	160	30.1	7.37	1.31	0.13
111	07232500	U	6.81	2.50	1.07	0.69	0.23	9.46	5.84	2.68	1.44	1.07	10.3	6.92	4.58	3.40	2.35
		UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
112	07232900	UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	07233000	U	2.24	0.04	0.01	0.01	0.00	5.16	2.34	0.03	0.01	0.01	5.72	3.62	0.52	0.03	0.01
114	07233500	U	3.29	0.44	0.00	0.00	0.00	2.70	1.03	0.21	0.00	0.00	2.23	0.89	0.33	0.20	0.00
115	07233650	R	0.76	0.28	0.04	0.00	0.00	1.12	0.77	0.46	0.35	0.21	1.26	0.99	0.69	0.52	0.45
116	07234000	RI	2.72	0.05	0.00	0.00	0.00	5.65	0.19	0.00	0.00	0.00	5.51	0.24	0.02	0.00	0.00
		U	19.7	0.01	0.00	0.00	0.00	25.6	2.16	0.00	0.00	0.00	32.2	13.4	0.00	0.00	0.00
117	07234100	U	2.52	1.79	1.25	1.02	0.88	3.20	2.34	1.80	1.60	1.49	3.20	2.47	1.94	1.70	1.58
118	07234500	U	120	4.12	0.03	0.01	0.01	71.4	4.83	0.02	0.01	0.01	87.0	10.5	0.04	0.02	0.01
119	07235000	R	5.11	2.71	0.66	0.31	0.10	12.2	4.34	2.38	1.01	0.00	9.12	5.55	3.55	2.88	2.33
		RI	1.99	0.96	0.52	0.41	0.35	2.62	1.34	0.71	0.57	0.48	3.51	2.19	0.90	0.69	0.56
120	07236000	U	63.9	15.3	0.04	0.02	0.01	49.1	29.7	3.55	0.64	0.03	55.3	33.4	16.7	7.27	2.68
121	07237000	R	18.4	1.34	0.56	0.14	0.03	32.4	2.35	1.03	0.72	0.18	48.7	21.8	1.02	0.54	0.35
		RI	29.8	1.70	0.80	0.68	0.60	46.8	2.67	1.27	0.99	0.85	51.5	15.5	1.41	1.22	0.99
122	07237500	U	105	5.62	0.00	0.00	0.00	76.7	14.4	0.00	0.00	0.00	101	30.8	1.09	0.00	0.00
		RI	69.6	13.2	4.77	3.33	2.52	108	30.9	8.27	5.81	4.84	105	41.7	12.3	8.27	6.34
123	07238000	U	86.3	10.2	0.00	0.00	0.00	97.0	26.5	0.00	0.00	0.00	113	48.1	0.00	0.00	0.00
		RI	134	35.4	7.56	2.69	0.89	172	57.6	23.0	15.6	11.0	171	74.8	37.5	27.6	21.9

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
124	07239000	U	549	39.0	0.03	0.02	0.01	256	16.2	0.04	0.02	0.01	213	22.2	0.04	0.02	0.01
		R	29.9	9.39	3.58	2.14	1.16	75.2	9.27	3.80	2.60	1.93	92.8	9.48	3.72	2.74	2.15
125	07239300	R	85.3	28.8	15.1	10.5	6.94	161	35.3	18.2	9.49	7.74	222	40.7	18.4	11.5	9.42
126	07239450	R	162	40.9	23.7	15.1	5.05	211	54.3	28.4	19.3	6.56	243	79.6	31.1	18.4	13.1
127	07239500	U	376	47.5	0.50	0.03	0.01	276	41.9	1.64	0.04	0.02	254	73.3	2.12	0.04	0.02
		R	150	36.0	4.14	0.00	0.00	160	42.3	12.8	3.40	0.33	160	41.4	13.7	7.01	1.35
128	07241000	R	107	13.9	2.17	1.10	0.00	119	23.4	2.38	1.17	0.00	156	24.8	2.24	1.18	0.07
129	07241500	R	619	52.8	30.0	25.0	21.4	182	51.9	29.3	24.9	22.5	271	48.1	30.2	22.7	19.3
130	07241520	R	389	98.0	60.4	42.5	36.0	354	132	74.7	45.2	31.1	420	178	74.4	54.1	33.8
131	07241550	R	430	178	86.9	65.0	55.3	481	192	99.1	72.4	61.1	433	197	98.7	75.6	67.3
132	07242000	R	691	220	78.6	48.4	23.6	722	245	96.4	64.4	43.9	671	236	95.7	70.7	56.2
133	07242350	UUrb	40.1	25.3	18.1	11.4	8.56	43.4	25.7	20.4	15.4	9.63	37.5	25.6	20.2	16.0	11.3
134	07242380	R	140	44.2	23.2	18.1	15.1	254	69.0	31.0	25.0	22.2	184	72.7	37.3	24.5	20.0
135	07243000	U	4.81	0.41	0.00	0.00	0.00	7.57	1.95	0.11	0.00	0.00	11.7	2.53	0.38	0.00	0.00
136	07243500	U	401	78.1	16.5	7.12	1.20	665	107	25.5	15.3	4.52	520	120	39.5	23.6	12.3
137	07244000	U	555	65.6	14.7	9.32	5.88	372	80.6	22.4	14.9	11.1	324	89.1	35.9	12.0	7.49
138	07245000	U	4,040	789	188	71.9	22.6	3,010	734	226	110	52.2	3,040	808	262	160	101
		R	3,890	931	107	66.9	48.7	8,760	2,070	214	86.0	53.2	9,620	1,970	282	90.4	64.2
139	07245500	U	54.7	10.1	1.08	0.28	0.11	159	22.5	1.91	0.46	0.04	164	41.4	6.78	1.98	1.17
140	07247000	U	31.2	3.37	0.34	0.00	0.00	154	20.6	3.33	0.77	0.00	343	68.9	10.3	3.12	1.60
141	07247015	U	50.5	9.52	2.34	1.35	0.64	397	50.1	11.0	4.58	3.15	646	170	34.4	7.62	4.51
142	07247250	U	24.8	1.95	0.00	0.00	0.00	198	34.1	1.08	0.27	0.00	276	101	23.8	1.07	0.51
143	07247500	U	26.6	2.55	0.09	0.00	0.00	96.0	10.7	0.89	0.11	0.00	127	23.9	3.19	0.67	0.19
144	07248500	U	210	8.15	0.05	0.03	0.01	641	154	20.1	8.53	1.70	905	248	53.0	29.8	21.6
		R	235	13.5	5.74	1.92	0.52	845	50.9	5.82	1.93	0.56	2,350	412	26.0	1.35	0.31

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
145	07249400	U	26.4	4.72	1.20	0.61	0.09	116	23.2	3.51	1.79	0.50	199	54.1	11.9	3.17	0.58
146	07249413	R	485	53.5	20.8	13.7	10.7	2,520	154	41.3	20.0	13.7	6,630	1,860	63.7	14.1	9.33
147	07249500	U	6.05	1.68	0.10	0.04	0.02	19.2	2.63	0.11	0.09	0.03	23.5	6.17	1.28	0.35	0.12
148	07249985	U	135	21.6	0.89	0.08	0.00	576	85.6	5.64	0.63	0.04	664	203	34.6	9.12	3.01
149	07250000	U	175	20.6	0.83	0.02	0.00	502	76.9	5.50	0.44	0.05	610	173	32.5	9.92	3.74
150	07250550	U	44,900	13,800	4,940	2,960	1,870	26,300	7,800	3,100	1,810	1,410	22,600	8,570	3,610	2,370	1,560
		R	31,700	9,650	2,550	1,130	283	59,300	16,700	4,080	1,620	330	57,800	18,800	5,660	2,760	1,440
151	07299200	U	3.60	0.88	0.19	0.05	0.01	3.70	1.13	0.27	0.09	0.04	2.39	1.18	0.51	0.29	0.19
152	07299300	U	1.19	0.18	0.07	0.04	0.03	0.56	0.18	0.10	0.07	0.06	0.47	0.20	0.12	0.09	0.06
153	07299540	U	50.3	7.03	2.23	1.33	0.83	40.9	10.2	3.30	1.75	0.82	38.7	9.19	4.05	2.40	1.52
154	07299570	U	36.8	4.49	1.01	0.38	0.13	42.4	9.30	2.33	1.18	0.61	33.5	9.53	4.97	3.20	1.47
155	07299670	U	21.0	9.31	3.21	1.93	0.95	19.3	9.08	3.67	2.65	1.72	16.7	8.23	3.41	2.35	1.79
156	07299890	U	1.96	1.09	0.75	0.62	0.49	3.53	1.82	1.30	1.17	1.08	4.20	2.86	1.79	1.58	1.40
157	07300500	U	32.6	4.27	0.00	0.00	0.00	46.3	16.2	0.26	0.00	0.00	56.6	24.0	8.02	0.56	0.00
158	07301110	U	138	29.8	8.84	6.65	4.41	139	52.2	14.8	8.32	6.75	140	60.1	24.0	16.4	13.3
159	07301300	U	5.95	0.00	0.00	0.00	0.00	20.6	3.37	0.00	0.00	0.00	32.7	12.0	1.26	0.00	0.00
160	07301410	U	10.5	3.45	0.99	0.56	0.34	14.7	9.15	3.87	2.20	1.43	16.6	11.7	6.88	4.80	3.88
161	07301420	U	23.2	7.62	2.50	0.69	0.32	31.1	17.7	7.95	5.30	3.96	33.0	21.9	14.3	9.13	6.87
162	07301500	U	55.1	5.01	0.00	0.00	0.00	96.2	23.4	0.22	0.00	0.00	116	42.9	3.62	0.00	0.00
163	07303000	R	1.18	0.25	0.00	0.00	0.00	1.95	0.56	0.12	0.00	0.00	2.74	0.74	0.14	0.05	0.00
164	07303400	U	29.3	14.2	7.02	4.60	3.41	38.9	18.5	10.9	8.23	6.50	30.7	18.5	12.2	9.48	8.00
165	07303500	U	79.2	20.2	6.08	1.94	0.28	68.6	23.3	8.60	4.64	3.75	50.4	23.6	11.1	7.21	5.97
166	07304500	U	42.6	7.11	0.29	0.00	0.00	40.2	6.59	1.02	0.18	0.00	38.3	9.91	2.01	0.46	0.00
		R	41.2	10.6	2.02	0.91	0.45	44.7	16.0	4.11	1.50	0.40	30.5	15.4	6.62	2.41	1.38
167	07305000	R	166	52.9	12.6	2.62	0.08	150	50.9	21.3	8.36	1.21	115	54.3	22.9	11.4	3.53

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
168	07305500	R	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
169	07307028	R	352	99.5	35.0	20.0	13.9	333	128	56.0	38.5	28.4	318	125	72.8	46.8	31.8
170	07308500	U	842	221	53.9	22.4	12.1	842	295	97.6	49.5	21.5	601	271	103	61.2	39.7
171	07311000	U	101	16.3	6.67	2.35	0.04	69.0	17.8	8.81	4.35	0.29	56.9	21.4	10.2	7.08	4.62
		R	73.1	29.1	17.6	13.7	11.0	88.6	36.7	21.3	17.0	14.4	90.2	38.7	24.9	21.0	18.3
172	07311200	R	3.49	0.08	0.00	0.00	0.00	8.07	1.14	0.00	0.00	0.00	7.70	1.54	0.04	0.00	0.00
173	07311500	U	24.0	3.22	0.00	0.00	0.00	26.8	3.65	0.32	0.00	0.00	17.3	4.01	0.40	0.12	0.00
174	07313000	U	11.4	0.57	0.02	0.01	0.01	19.0	5.03	0.04	0.02	0.01	18.1	7.58	1.36	0.04	0.02
175	07313500	U	27.3	3.66	0.00	0.00	0.00	60.3	9.49	0.09	0.00	0.00	44.8	15.6	0.25	0.00	0.00
		R	6.90	0.23	0.00	0.00	0.00	27.8	0.65	0.00	0.00	0.00	28.7	0.74	0.00	0.00	0.00
176	07315500	R	2,050	598	219	140	106	1,630	558	243	142	114	1,030	458	239	161	123
177	07315700	U	25.3	3.00	0.15	0.00	0.00	36.5	4.85	0.20	0.00	0.00	53.1	7.13	0.51	0.07	0.00
178	07316000	R	2,570	703	257	167	123	2,330	740	280	193	148	1,580	613	290	193	156
179	07316500	U	10.2	0.48	0.00	0.00	0.00	16.8	4.93	0.00	0.00	0.00	23.2	9.41	0.00	0.00	0.00
180	07319500	U	2.20	0.77	0.19	0.00	0.00	3.30	1.26	0.51	0.00	0.00	3.50	1.36	0.58	0.01	0.00
181	07323000	U	5.49	0.99	0.03	0.00	0.00	5.90	1.64	0.27	0.00	0.00	6.35	2.30	0.41	0.18	0.00
182	07324200	U	33.5	8.18	0.50	0.02	0.00	51.2	14.6	0.93	0.21	0.00	58.9	21.4	2.48	0.25	0.03
183	07324400	R	11.6	6.35	3.61	0.58	0.25	14.2	7.27	4.16	2.39	0.82	12.1	7.23	4.26	2.86	1.20
184	07325000	U	59.3	12.1	2.32	0.31	0.12	37.3	14.1	4.90	1.87	0.84	38.1	14.8	5.43	2.77	1.59
		R	63.7	23.6	11.6	5.69	3.02	72.5	31.4	13.1	8.11	5.35	62.5	31.3	15.7	8.90	6.29
185	07325500	U	277	85.3	31.3	20.2	12.6	260	99.7	41.9	28.7	19.2	210	98.4	45.2	31.2	21.4
186	07325800	U	22.0	11.9	6.35	4.35	3.48	28.5	16.7	11.0	7.89	6.26	27.9	17.6	12.1	9.06	7.24
187	07326000	U	31.4	14.3	8.78	6.74	4.82	36.3	23.1	15.1	11.9	9.06	40.1	28.3	20.7	15.0	12.9
		R	3.72	2.71	2.13	1.76	1.55	4.78	3.12	2.35	1.99	1.68	4.88	3.13	2.26	1.87	1.66

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
188	07326500	R	387	125	58.3	43.8	34.3	421	165	76.4	54.9	44.6	336	175	81.1	61.3	50.4
189	07327000	U	13.2	2.36	0.04	0.02	0.01	12.0	4.89	0.81	0.04	0.02	16.9	6.83	2.27	0.87	0.05
190	073274406	U	1.30	0.26	0.13	0.07	0.04	1.56	0.70	0.21	0.15	0.05	1.40	0.73	0.24	0.18	0.08
191	07327442	U	4.95	0.82	0.49	0.31	0.22	5.64	2.99	0.77	0.54	0.46	5.53	3.27	1.19	0.56	0.47
192	07327447	U	18.7	7.38	3.37	2.60	1.70	21.4	12.3	6.26	4.84	4.03	22.5	14.3	8.20	5.87	4.86
193	07327490	U	28.2	8.83	3.31	1.20	0.04	35.4	16.6	7.15	4.42	3.42	34.3	18.3	9.57	7.20	5.71
194	07327550	U	45.7	16.9	6.33	4.82	4.18	60.5	37.0	13.4	8.56	6.96	64.9	37.5	16.6	10.3	9.20
195	07328000	U	455	142	54.2	38.5	33.7	396	174	94.8	47.3	29.9	352	197	114	83.7	55.4
196	07328070	U	9.06	2.65	0.90	0.53	0.37	12.8	4.18	2.05	1.38	1.09	10.1	4.80	2.38	1.89	1.48
197	07328100	R	590	209	83.4	59.5	45.8	664	290	117	76.8	60.8	514	271	124	92.5	75.1
198	07328180	U	1.43	0.58	0.08	0.00	0.00	2.57	1.00	0.34	0.04	0.00	2.80	1.07	0.24	0.08	0.05
199	07328500	U	680	161	61.8	31.0	11.0	464	210	90.8	42.7	31.4	430	211	120	70.7	54.1
		R	855	302	105	66.1	48.1	1,030	395	147	96.3	69.4	730	368	155	113	91.1
200	07329000	U	32.9	11.5	3.23	0.62	0.00	45.4	19.7	7.60	4.61	0.33	46.1	20.3	10.8	6.53	3.66
201	07329500	U	25.8	9.91	0.90	0.00	0.00	35.7	11.9	2.62	0.96	0.50	30.2	12.7	4.12	1.97	1.18
202	07329700	R	171	26.7	3.85	1.53	1.07	176	50.7	7.47	3.34	2.51	190	47.2	13.6	5.13	2.21
203	07329852	U	23.1	12.8	6.71	4.81	2.60	38.2	15.1	8.01	5.92	3.97	47.1	17.3	8.63	5.61	4.36
204	07329900	U	28.5	11.6	5.39	3.22	1.95	39.6	18.1	8.16	5.93	4.89	56.7	25.4	8.48	6.77	5.35
205	07330500	U	47.2	2.22	0.03	0.02	0.01	34.6	5.06	0.05	0.02	0.01	47.6	9.26	1.81	0.03	0.02
206	07331000	U	982	300	121	77.5	15.9	845	352	170	80.9	51.2	785	379	191	133	86.5
		R	1,590	493	161	91.9	69.8	1,980	658	223	150	93.0	1,700	684	235	185	126
207	07331600	U	8,360	1,900	578	397	273	3,940	1,410	713	552	414	4,460	1,480	649	466	318
		R	4,770	2,170	217	90.9	70.9	4,730	2,140	348	98.1	64.5	5,070	2,470	644	148	84.1
208	07332400	U	97.7	44.2	32.8	30.2	28.8	131	55.6	36.8	31.9	29.5	133	64.1	34.8	30.3	28.1

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
209	07332500	U	117	49.3	29.1	21.9	13.9	197	63.2	36.1	28.9	21.8	248	87.9	37.4	30.0	25.3
210	07332600	U	13.3	0.26	0.00	0.00	0.00	25.0	4.62	0.04	0.00	0.00	37.4	8.17	0.12	0.02	0.00
211	07333500	U	3.69	0.43	0.00	0.00	0.00	5.20	0.25	0.02	0.01	0.00	11.6	0.99	0.00	0.00	0.00
212	07333800	U	7.26	1.35	0.00	0.00	0.00	19.1	2.34	0.00	0.00	0.00	44.9	4.96	0.00	0.00	0.00
213	07334000	U	208	16.8	1.22	0.10	0.00	335	40.8	4.14	0.85	0.00	412	61.6	11.8	3.93	1.66
		R	89.4	30.9	16.5	13.6	12.2	1,410	44.9	24.5	19.7	17.2	1,730	208	32.3	24.7	19.8
214	07335000	U	176	30.4	10.3	4.98	2.11	288	50.2	15.6	9.22	5.22	288	75.7	18.3	12.0	9.04
215	07335300	R	398	139	54.5	30.1	21.6	3,100	188	91.8	56.3	35.7	3,830	637	112	77.1	44.2
216	07335400	R	69.3	0.00	0.00	0.00	0.00	153	3.11	0.00	0.00	0.00	273	38.3	0.00	0.00	0.00
217	07335500	R	6,960	2,890	1,320	723	392	9,850	3,030	1,480	934	573	11,000	3,830	1,590	1,000	730
218	07335700	U	28.0	2.28	0.00	0.00	0.00	104	26.7	4.06	0.29	0.00	150	51.3	19.2	5.98	0.73
219	07335790	R	205	12.2	0.85	0.00	0.00	2,180	223	6.78	1.60	0.11	2,690	544	109	28.0	5.77
220	07336000	U	14.7	1.49	0.00	0.00	0.00	23.1	2.83	0.00	0.00	0.00	55.3	7.19	0.44	0.00	0.00
221	07336200	U	471	33.5	6.92	2.45	0.00	1,760	295	73.4	43.3	6.30	1,190	367	150	87.1	60.0
		R	306	34.2	4.40	1.38	0.03	3,190	332	18.5	4.94	1.75	3,860	805	166	10.6	5.74
222	07336500	U	658	83.6	7.59	0.35	0.03	1,030	221	23.2	7.88	1.43	1,640	385	84.1	36.8	22.7
223	07336750	U	1.93	0.00	0.00	0.00	0.00	31.2	0.29	0.00	0.00	0.00	44.9	3.17	0.00	0.00	0.00
224	07336800	U	2.56	0.08	0.00	0.00	0.00	21.9	0.72	0.00	0.00	0.00	46.2	4.89	0.00	0.00	0.00
225	07336820	R	10,700	3,830	2,080	1,360	937	26,500	5,130	2,530	1,730	1,310	23,000	7,310	3,070	1,790	1,300
226	07337500	U	259	44.4	1.22	0.31	0.05	602	137	15.4	3.68	2.18	925	257	69.3	29.7	5.69
		R	460	40.5	18.5	14.0	11.9	1,570	106	26.6	19.1	12.9	2,000	371	47.9	34.9	22.0
227	07337900	U	190	20.4	2.48	0.68	0.25	606	140	17.8	4.08	0.94	819	243	60.4	13.3	4.64
228	07338500	U	393	80.9	10.5	5.00	2.69	1,130	257	34.5	15.5	7.37	2,100	537	151	76.6	34.6
		R	1,220	98.4	39.1	28.5	24.2	4,590	508	85.1	51.4	35.9	5,180	1,320	197	93.8	45.3
229	07338750	U	243	45.9	5.91	3.41	1.72	973	245	43.7	16.9	8.58	1,130	456	143	39.1	9.71
230	07339000	U	390	76.2	5.23	0.31	0.03	1,080	225	42.9	13.1	0.25	1,710	499	138	72.5	44.3
		R	673	275	156	126	111	1,450	310	143	120	102	3,500	801	182	129	111

Table 3. October, November, and December flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1. Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *OCTDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$OCTD_{20}$	$OCTD_{50}$	$OCTD_{80}$	$OCTD_{90}$	$OCTD_{95}$	$NOVD_{20}$	$NOVD_{50}$	$NOVD_{80}$	$NOVD_{90}$	$NOVD_{95}$	$DECD_{20}$	$DECD_{50}$	$DECD_{80}$	$DECD_{90}$	$DECD_{95}$
231	07339500	U	80.8	11.5	0.94	0.31	0.04	162	37.7	6.47	0.93	0.54	353	94.1	20.6	10.3	4.00
232	07340300	U	62.8	21.6	13.8	12.1	10.2	230	67.3	25.3	19.1	15.8	330	114	50.9	32.1	21.1
233	07340500	U	162	34.2	12.1	8.08	5.76	489	111	33.7	22.5	17.0	848	233	61.9	40.1	29.0
234	07341000	U	44.8	5.83	0.21	0.09	0.07	150	27.1	5.83	1.04	0.10	268	73.3	13.4	6.56	3.40
235	07341200	U	51.2	6.58	1.05	0.69	0.51	228	25.8	3.95	2.22	1.22	463	106	15.2	7.39	2.74

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record.

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
1	07146500	U	719	420	231	142	58.8	906	503	293	170	50.2	1,170	614	382	306	249
		R	1,400	818	471	375	293	1,800	923	523	408	331	3,030	1,270	568	440	384
2	07148140	R	3,240	1,250	482	341	277	2,620	1,350	504	366	299	6,640	1,860	414	192	157
3	07148350	U	74.1	39.5	17.8	5.04	1.82	81.1	47.0	25.1	16.5	10.7	133	50.2	26.1	17.8	13.5
4	07148400	U	103	52.4	26.4	13.2	4.52	127	61.3	30.2	17.2	7.59	192	72.1	36.1	28.3	20.1
5	07149000	U	147	97.4	61.3	43.7	30.9	166	103	67.8	56.0	47.3	220	114	74.5	60.0	52.7
6	07149500	U	230	120	65.5	34.3	24.9	253	125	75.9	58.0	43.7	380	173	114	92.0	78.5
7	07150500	R	289	141	20.9	2.37	1.24	343	155	42.7	3.72	1.70	618	208	65.7	16.1	4.11
8	07151000	R	570	228	76.0	28.9	14.9	690	278	90.3	35.3	18.7	1,300	350	128	58.7	21.6
9	07151500	U	163	99.2	57.0	38.4	25.9	204	110	65.2	51.4	40.9	347	139	74.3	55.0	42.1
10	07152000	U	286	146	69.5	42.8	22.7	362	164	87.9	62.8	40.9	591	201	96.5	60.6	43.6
11	07152500	U	2,890	1,470	671	475	293	3,110	1,600	704	510	388	4,760	1,860	786	566	455
		R	5,850	2,200	922	529	357	6,950	2,870	1,170	814	567	14,700	4,900	1,030	595	468
12	07153000	U	48.5	12.6	3.85	2.08	1.12	76.8	15.3	4.58	2.42	1.17	237	27.5	6.13	2.59	0.63
13	07153100	R	0.35	0.03	0.01	0.01	0.00	1.50	0.03	0.01	0.01	0.00	4.51	0.05	0.02	0.01	0.00
14	07154500	U	2.89	1.57	0.63	0.34	0.04	3.07	1.74	0.68	0.20	0.10	2.61	1.57	0.32	0.10	0.03
		UI	2.42	1.00	0.08	0.02	0.00	2.28	1.00	0.09	0.02	0.01	1.86	0.55	0.07	0.01	0.00
15	07155000	U	18.0	3.63	0.04	0.02	0.01	16.1	4.5	0.04	0.02	0.01	12.9	3.20	0.10	0.03	0.01
16	07155590	U	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		UI	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
17	07156900	U	91.1	71.6	54.3	45.0	33.4	86.7	71.9	55.1	46.5	39.4	85.5	70.2	55.8	48.5	42.4
		UI	46.2	40.9	33.9	31.1	29.1	49.0	42.7	34.9	32.4	30.3	52.7	44.5	38.0	34.5	32.7
18	07157000	U	104	65.7	42.2	30.3	23.0	103	70.3	48.3	38.8	32.7	95.6	68.8	50.1	41.2	33.7
19	07157500	U	24.8	16.8	9.48	6.55	5.06	25.4	17.6	12.0	9.59	8.15	27.9	19.2	13.1	10.5	8.48
		UI	13.6	9.66	7.14	5.98	5.18	14.1	10.4	7.46	6.20	5.23	15.2	10.7	7.78	6.86	5.40
20	07157900	U	2.71	1.72	1.18	1.01	0.79	2.52	1.69	1.19	1.00	0.85	2.56	1.80	1.39	1.11	0.97
21	07157950	U	134	74.2	36.4	23.1	16.0	164	97.9	58.4	41.9	29.8	174	94.6	52.4	33.6	24.4
22	07157960	U	10.1	2.53	1.03	0.66	0.10	11.4	3.4	1.23	0.92	0.62	15.5	5.52	1.67	1.08	0.84

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record.

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
23	07158000	U	219	108	45.5	26.7	10.3	266	131	68.4	49.4	35.3	308	136	63.5	44.0	33.1
24	07158400	U	16.3	8.00	5.07	4.03	3.53	21.3	9.6	6.37	4.76	3.08	20.4	9.75	5.47	4.00	2.54
25	07159000	U	7.43	2.09	0.41	0.20	0.10	8.65	2.61	0.55	0.30	0.22	11.1	3.16	0.53	0.25	0.09
26	07159100	U	558	283	144	98.0	68.8	684	299	182	129	97.6	1,420	411	183	142	97.2
27	07159750	U	115	55.6	26.2	20.5	17.8	142	62.0	35.7	24.6	19.7	190	77.4	39.0	29.8	23.3
28	07160000	U	1,070	578	353	280	236	1,370	526	332	275	242	2,580	874	328	250	202
29	07160350	U	18.6	12.8	7.25	5.64	4.75	23.6	14.3	8.37	6.51	5.67	28.6	16.6	8.36	6.27	5.49
30	07160500	U	45.0	14.6	7.17	4.39	3.39	50.8	17.9	7.99	5.11	3.81	94.3	19.0	8.08	5.49	3.95
31	07163000	U	2.45	0.59	0.12	0.00	0.00	3.72	1.14	0.21	0.09	0.00	7.43	1.66	0.27	0.09	0.00
32	07163500	U	360	189	80.6	34.3	16.0	426	227	99.2	61.7	44.7	682	222	103	66.2	49.9
33	07164000	U	681	360	177	111	24.1	952	436	215	155	128	1,360	563	247	152	106
34	07164500	U	3,490	1,680	848	581	316	3,740	2,010	858	620	495	5,680	2,240	1,030	750	613
		R	8,050	3,120	957	402	223	9,370	3,420	1,010	481	287	20,800	5,350	1,210	707	438
35	07164600	UUrb	8.49	2.94	1.42	1.09	0.87	8.69	3.05	1.46	1.00	0.81	13.3	4.00	1.83	1.38	0.93
36	07165500	R	15.6	0.79	0.00	0.00	0.00	21.8	2.8	0.00	0.00	0.00	52.3	7.01	0.00	0.00	0.00
37	07165562	UUrb	7.16	2.47	0.61	0.31	0.08	9.39	2.76	1.11	0.53	0.37	18.7	4.87	1.87	0.80	0.50
38	07165565	UUrb	3.33	0.92	0.20	0.11	0.03	3.69	1.13	0.30	0.12	0.03	7.86	2.17	0.61	0.20	0.01
39	07165570	R	10,800	3,790	1,350	741	558	13,000	4,360	1,760	843	557	26,100	9,210	2,130	964	672
40	07170500	U	672	208	23.0	11.4	6.92	757	259	40.4	10.5	5.53	1,470	387	78.8	29.6	9.11
		R	1,890	386	61.4	31.0	20.4	2,740	623	106	40.5	26.3	6,350	1,070	93.3	35.5	25.7
41	07170700	U	9.02	2.09	0.27	0.06	0.00	14.3	3.2	0.52	0.24	0.07	29.2	6.13	1.60	0.49	0.13
		R	21.3	0.82	0.01	0.00	0.00	23.0	0.7	0.01	0.00	0.00	57.7	2.23	0.02	0.00	0.00
42	07171000	U	759	164	20.1	8.20	4.34	1,020	250	20.1	10.2	6.81	2,420	557	32.5	8.97	4.29
		R	2,260	517	99.6	40.5	21.0	3,150	804	152	58.7	35.7	8,150	1,420	154	50.7	29.4
43	07171400	R	4,240	526	26.8	8.48	1.25	3,820	607	38.0	1.87	0.88	7,500	1,460	95.6	18.1	1.61
44	07172000	U	165	44.1	4.64	0.51	0.00	235	58.0	4.44	0.73	0.00	473	114	6.78	0.37	0.00
45	07173000	U	280	34.1	9.35	4.99	1.40	271	47.9	10.8	6.05	2.64	686	100	11.9	6.34	1.38

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
46	07174200	U	94.1	14.8	1.30	0.22	0.07	130	20.0	2.76	0.41	0.19	330	61.8	7.83	0.54	0.11
47	07174400	R	1,110	99.4	27.7	8.51	4.37	1,440	199	24.6	7.46	4.74	4,330	630	28.9	16.8	8.47
48	07174600	U	43.3	13.1	2.85	0.50	0.00	68.8	18.5	3.58	1.44	0.00	135	29.4	5.26	1.79	0.25
49	07174700	R	802	109	27.9	18.0	10.0	590	119	31.9	19.0	12.1	2,250	300	47.7	22.6	16.4
50	07175000	U	1.29	0.00	0.00	0.00	0.00	0.80	0.14	0.00	0.00	0.00	1.92	0.41	0.00	0.00	0.00
51	07175500	R	1,740	220	68.6	29.7	17.2	1,840	331	74.0	47.0	30.4	5,680	1,460	94.0	43.0	32.5
52	07176000	U	1,660	417	43.6	23.0	10.7	2,390	647	62.4	28.2	18.8	4,560	1,110	118	31.9	9.17
		R	5,990	676	100	43.6	34.5	6,600	1,040	112	51.3	36.7	13,100	3,140	210	67.2	42.5
53	07176465	R	16.2	3.48	1.57	1.09	0.17	28.0	4.8	1.71	0.86	0.19	114	8.17	2.44	0.51	0.21
54	07176500	U	71.0	10.1	1.46	0.17	0.00	101	14.2	1.86	0.33	0.00	196	29.7	3.29	0.47	0.00
		R	126	33.9	10.8	6.93	4.53	273	51.8	17.2	10.6	6.03	704	133	23.3	14.1	8.52
55	07176800	U	7.13	1.03	0.10	0.00	0.00	13.0	2.3	0.39	0.06	0.00	37.6	5.30	0.59	0.24	0.00
56	07177000	U	44.0	7.76	1.57	0.25	0.00	55.8	12.4	2.54	1.27	0.00	166	29.7	5.24	1.73	0.08
57	07177500	U	125	32.1	7.33	2.86	0.78	214	47.4	11.3	5.22	1.49	512	87.1	18.8	5.96	2.16
		R	401	92.1	66.6	57.5	52.8	683	106	70.3	58.8	49.3	2,410	309	79.5	65.8	56.1
58	07177650	UUrb	4.36	0.92	0.20	0.08	0.02	5.06	1.19	0.25	0.04	0.02	7.77	2.93	0.55	0.15	0.02
59	07177800	UUrb	5.47	2.45	1.27	0.88	0.52	5.54	2.86	1.28	0.92	0.64	9.26	3.79	1.94	1.28	0.89
60	07178000	R	454	119	81.6	72.9	68.5	686	149	88.7	80.3	72.1	2,410	314	110	90.1	82.5
61	07178040	UUrb	50.8	20.8	8.17	5.12	3.93	43.3	16.7	7.82	5.17	2.62	99.4	29.7	11.1	6.81	4.52
62	07178200	R	662	213	138	119	106	957	247	140	121	106	2,810	440	175	133	112
63	07178600	U	1,750	384	89.7	52.1	34.5	3,020	542	106	64.3	51.0	8,490	1,720	203	72.2	42.7
64	07184000	U	64.4	16.1	2.49	0.04	0.00	94.1	20.0	3.21	0.66	0.00	132	29.2	5.01	0.89	0.04
65	07185000	U	1,650	508	91.6	18.5	10.4	2,290	737	108	38.0	23.3	5,130	1,310	196	31.9	15.9
		R	2,800	664	131	70.1	48.3	4,270	947	248	99.1	70.6	7,710	1,950	276	89.9	63.1
66	07185095	UUrb	41.2	14.9	7.40	3.87	1.47	59.1	17.6	9.45	5.62	0.75	75.6	20.8	7.74	4.21	1.33
67	07185500	U	2.28	0.73	0.10	0.00	0.00	3.18	1.08	0.13	0.00	0.00	4.76	2.04	0.45	0.11	0.00
68	07185700	U	255	97.0	51.4	39.1	30.7	339	104	58.9	42.5	31.2	371	214	80.4	65.5	46.5

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
69	07185765	U	512	209	85.8	53.1	46.6	580	275	111	86.3	42.3	780	373	140	100	66.0
70	07186000	U	893	332	103	55.4	40.6	1,040	424	127	71.9	46.0	1,370	549	222	106	53.5
71	07186400	U	248	118	41.9	31.4	22.5	295	152	47.9	36.4	25.2	470	179	88.4	45.0	37.0
72	07187000	U	466	221	109	81.6	64.1	528	274	120	92.1	71.7	795	367	201	107	81.4
73	07187500	U	451	264	126	79.8	65.6	435	281	143	109	68.5	404	270	155	110	83.3
74	07188000	U	2,090	818	298	198	151	2,630	1,090	355	226	167	3,650	1,540	636	285	187
75	07188500	U	24.0	8.12	4.31	3.49	3.00	35.8	10.4	5.13	4.19	3.74	55.7	26.4	9.64	3.82	3.26
76	07189000	U	941	355	159	106	70.8	1,080	506	187	130	86.5	1,780	760	316	180	126
77	07189500	U	6,350	2,970	1,020	640	377	5,650	3,070	1,270	942	779	5,430	2,400	1,410	1,030	872
78	07189540	U	6.54	3.34	2.49	2.21	1.94	5.95	4.29	2.67	2.15	1.95	6.65	4.45	3.14	2.56	2.14
79	07189542	U	57.1	21.9	12.5	10.1	8.94	41.7	30.1	13.9	9.60	8.11	56.8	30.8	20.0	12.0	8.91
80	07190500	R	8,210	2,820	408	85.8	37.2	10,900	3,900	581	124	36.9	13,100	5,870	1,110	265	65.5
81	07191000	U	169	47.8	5.48	2.16	1.51	228	70.9	14.2	3.12	1.72	441	114	31.4	10.7	2.55
82	07191220	U	144	62.7	30.0	18.1	11.5	146	81.1	33.4	23.0	14.1	255	104	47.2	28.4	16.0
83	07191500	R	12,100	3,470	377	217	169	12,800	5,600	454	196	137	19,800	9,030	1,400	255	155
84	07192000	U	42.4	3.31	0.13	0.03	0.02	57.8	6.8	0.65	0.16	0.10	149	43.7	2.54	0.10	0.03
85	07192500	R	6,680	3,430	1,830	500	335	11,300	5,030	2,130	723	492	12,300	5,490	2,490	695	538
86	07193500	R	11,600	3,040	627	61.6	18.0	12,700	3,490	566	155	41.4	17,300	6,710	1,250	361	147
87	07194500	U	14,400	7,560	3,950	2,120	1,390	18,500	8,850	3,710	2,700	2,140	23,800	9,470	4,350	2,960	2,190
		R	21,400	6,600	2,850	1,600	1,180	25,700	8,570	3,100	1,610	1,200	29,700	9,180	2,500	1,810	1,430
88	07194800	U	205	73.3	20.5	8.66	7.21	232	99.7	26.3	13.4	10.9	251	104	30.9	18.7	13.7
89	07195000	U	144	75.5	37.7	28.4	23.6	171	92.7	44.5	32.5	27.2	223	116	58.3	40.6	26.6
90	07195430	U	707	356	226	168	118	695	435	219	168	115	941	481	271	176	143
91	07195500	U	748	339	144	110	71.1	797	442	197	142	105	1,290	536	267	171	136
92	07195800	U	18.1	10.0	5.52	4.02	3.19	18.1	10.3	6.48	4.11	3.33	28.4	12.5	6.72	4.74	3.34
93	07195855	R	77.4	31.8	16.0	7.61	4.91	66.6	39.2	20.5	6.37	4.42	99.1	43.9	21.2	13.6	7.31

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
94	07195865	U	24.7	12.5	8.34	6.70	5.72	22.3	15.2	8.34	6.93	5.99	32.1	17.6	11.3	7.93	6.95
95	07196000	U	137	61.8	30.1	20.3	16.2	136	72.5	36.8	22.9	18.2	234	98.9	47.8	30.6	22.3
96	07196500	U	1,160	485	205	150	101	1,270	631	267	183	135	1,970	810	373	248	179
97	07196900	U	53.5	21.1	6.10	2.67	1.65	60.3	28.0	8.86	4.34	2.74	87.2	36.7	14.8	7.38	4.49
98	07196973	U	37.3	13.3	6.28	4.28	2.91	39.6	16.0	6.16	3.40	2.63	62.2	31.2	13.4	7.65	2.71
99	07197000	U	393	150	50.8	29.6	19.9	442	208	77.6	41.4	31.3	694	293	128	71.6	46.8
100	07197360	U	150	55.2	24.5	12.0	8.95	101	65.5	23.6	10.8	9.17	200	71.5	37.5	20.0	13.0
101	07198000	U	2,070	800	339	282	197	3,060	1,100	420	310	214	3,490	1,470	574	392	252
		R	2,740	1,080	121	59.2	46.3	2,730	1,220	163	70.5	50.2	3,180	1,360	182	79.7	53.4
102	07228500	U	181	54.3	22.1	16.5	13.8	232	77.2	30.8	18.7	15.8	267	54.4	22.2	16.9	14.9
		R	379	186	80.2	41.9	26.9	410	235	111	64.1	43.5	486	253	131	85.5	60.7
103	07229100	R	248	133	62.9	38.1	16.0	310	145	78.5	39.4	17.7	681	184	54.3	32.2	9.39
104	07229200	R	864	393	219	157	114	890	457	270	207	151	1,140	521	278	196	154
105	07229300	U	61.6	25.7	11.5	6.80	4.93	63.4	31.6	13.7	9.50	6.58	107	36.6	13.1	8.09	5.92
106	07230000	U	28.0	7.13	2.57	1.98	1.53	26.9	8.6	3.44	2.14	1.73	40.2	9.07	3.35	1.80	1.45
		R	0.95	0.60	0.41	0.28	0.18	2.06	0.62	0.39	0.22	0.17	121	0.69	0.42	0.26	0.19
107	07230500	U	51.4	23.4	7.55	4.43	3.09	75.1	31.2	11.4	4.86	3.43	135	37.0	10.8	4.92	3.39
		R	68.0	23.3	7.58	4.26	3.04	151	27.6	10.2	6.11	3.52	334	40.0	11.2	6.76	4.45
108	07231000	U	130	53.1	22.6	13.9	10.2	195	62.8	27.6	17.4	12.0	358	98.7	34.2	18.6	12.4
		R	278	61.5	15.1	3.26	1.81	389	90.4	28.9	10.2	3.88	746	134	34.6	17.1	9.69
109	07231500	U	696	263	74.1	30.3	18.9	910	328	135	67.9	39.4	1,210	374	103	51.4	29.9
		R	1,540	552	219	110	40.7	1,810	695	280	159	83.7	3,150	925	299	169	107
110	07232000	U	319	61.7	14.0	2.49	0.80	791	132	29.5	20.2	15.1	1,130	211	64.6	27.5	18.0
111	07232500	U	11.3	7.25	4.64	3.53	2.53	12.1	8.6	6.03	4.66	3.18	11.9	8.04	6.08	5.05	4.05
		UI	1.54	0.00	0.00	0.00	0.00	3.38	0.00	0.00	0.00	0.00	4.10	1.02	0.00	0.00	0.00
112	07232900	UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	07233000	U	6.60	3.97	1.72	0.05	0.02	7.82	5.11	3.07	2.28	1.78	7.92	5.25	3.18	2.48	1.96

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
114	07233500	U	1.75	0.55	0.14	0.00	0.00	1.34	0.55	0.22	0.10	0.00	1.26	0.62	0.25	0.00	0.00
115	07233650	R	1.72	1.17	0.74	0.55	0.46	1.83	1.27	0.75	0.61	0.52	2.10	1.39	1.04	0.73	0.47
116	07234000	RI	9.20	0.38	0.10	0.00	0.00	14.1	2.5	0.15	0.02	0.00	19.8	6.41	0.46	0.07	0.04
		U	41.4	18.1	5.89	0.00	0.00	47.5	25.4	11.2	5.76	0.00	47.4	24.6	10.3	4.89	0.39
117	07234100	U	3.16	2.45	1.92	1.69	1.57	3.19	2.45	1.85	1.67	1.58	3.29	2.50	1.93	1.68	1.56
118	07234500	U	87.0	22.4	3.46	0.03	0.02	101	37.6	7.59	3.61	0.03	112	48.4	19.3	10.4	0.03
119	07235000	R	8.33	6.31	2.59	1.67	1.32	10.2	7.0	4.89	4.18	3.66	7.98	6.51	4.93	4.34	4.04
		RI	4.28	2.49	1.30	0.94	0.67	5.70	3.00	1.59	1.18	0.72	7.97	3.44	1.85	1.39	1.15
120	07236000	U	53.9	41.3	22.1	13.8	9.69	62.2	42.6	27.2	19.0	14.4	71.6	47.4	29.6	23.2	19.7
121	07237000	R	53.8	28.2	1.40	0.84	0.36	60.0	37.2	4.68	0.68	0.13	63.3	29.2	2.52	0.82	0.34
		RI	62.6	30.0	1.75	1.40	1.27	67.9	42.2	20.0	5.32	1.49	96.1	47.5	13.5	3.08	1.95
122	07237500	U	115	47.2	4.23	0.71	0.00	142	76.9	23.7	1.88	0.66	171	75.9	25.6	4.24	0.93
		RI	136	67.1	19.7	13.8	11.3	161	82.5	39.4	21.6	15.7	203	106	54.2	40.9	29.5
123	07238000	U	135	58.3	1.98	0.00	0.00	180	96.4	22.6	0.00	0.00	242	102	32.5	3.40	0.00
		RI	206	103	51.1	37.8	29.7	237	124	68.7	50.2	39.3	289	156	90.1	72.4	59.6
124	07239000	U	188	49.6	3.98	0.04	0.02	156	75.9	32.6	0.05	0.02	205	88.5	46.6	0.05	0.03
		R	112	6.79	3.08	2.34	1.84	166	7.4	3.20	2.44	2.00	224	13.3	3.73	2.86	2.21
125	07239300	R	295	57.7	20.2	12.5	9.23	319	93.4	21.0	16.7	13.7	450	106	25.5	19.0	16.7
126	07239450	R	336	92.8	34.0	22.5	14.2	374	114	39.4	30.5	25.4	548	140	36.3	28.2	23.7
127	07239500	U	180	81.6	14.5	0.04	0.02	178	103	34.9	22.3	0.03	313	116	48.0	30.6	0.04
		R	179	48.3	12.6	7.01	0.95	245	62.7	17.2	8.07	1.18	385	99.0	23.6	10.9	2.26
128	07241000	R	178	20.4	2.47	1.17	0.08	241	34.3	2.26	1.02	0.09	310	53.8	2.44	0.80	0.20
129	07241500	R	225	51.5	30.8	25.2	21.4	218	70.0	32.9	27.1	24.5	341	106	38.5	23.8	20.6
130	07241520	R	466	188	94.2	66.5	48.3	513	233	84.5	33.1	22.6	658	316	104	54.1	23.3
131	07241550	R	476	201	103	74.4	64.2	555	218	102	79.5	67.9	779	296	131	84.8	70.7
132	07242000	R	656	270	95.7	69.7	57.5	851	311	113	82.1	64.5	1,160	389	149	84.5	59.7
133	07242350	UUrb	40.7	26.9	19.2	15.9	13.4	45.7	27.0	20.0	16.6	14.7	54.2	31.8	22.1	18.5	15.4

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
134	07242380	R	197	68.1	40.8	27.9	24.0	208	64.7	40.1	28.9	23.2	376	107	50.0	38.0	26.3
135	07243000	U	11.9	3.78	0.45	0.03	0.00	14.4	4.6	0.98	0.32	0.00	24.8	6.30	1.14	0.56	0.00
136	07243500	U	481	150	46.0	28.5	17.9	781	191	63.7	41.5	26.9	1,680	295	89.8	46.5	22.0
137	07244000	U	322	123	39.1	23.5	14.0	1,280	195	75.7	36.9	25.9	1,460	241	89.8	30.4	16.7
138	07245000	U	2,840	1,190	356	173	132	4,840	1,470	576	379	247	8,110	2,240	665	300	208
		R	9,040	2,870	429	127	69.3	9,730	3,520	512	129	68.4	15,200	3,530	330	110	66.3
139	07245500	U	175	74.0	24.0	5.00	2.04	269	99.0	29.3	15.1	7.81	487	162	51.5	23.9	13.8
140	07247000	U	307	99.6	26.2	10.0	2.85	402	126	42.6	20.3	11.3	494	163	51.4	28.1	17.5
141	07247015	U	647	165	44.3	24.3	7.51	545	160	48.6	26.4	13.2	578	183	60.3	34.2	22.2
142	07247250	U	280	99.1	33.3	22.7	4.95	254	103	42.8	24.2	11.2	261	112	43.5	27.9	21.7
143	07247500	U	129	32.2	6.45	2.03	0.75	188	54.9	15.4	7.77	4.24	271	76.5	21.0	10.7	6.78
144	07248500	U	1,060	438	153	48.3	33.2	3,600	837	154	114	97.4	2,880	775	210	110	82.3
		R	1,910	390	87.0	12.9	1.09	2,190	552	164	62.1	10.2	3,290	939	238	89.8	32.4
145	07249400	U	184	68.4	20.5	2.80	0.63	241	88.4	32.7	15.0	4.22	295	115	44.1	23.7	12.3
146	07249413	R	6,660	2,070	277	73.5	15.1	6,030	2,180	277	109	32.3	6,440	2,010	458	165	101
147	07249500	U	38.4	14.0	1.72	0.66	0.37	47.7	20.3	5.99	3.92	2.87	83.9	34.4	13.5	5.85	3.23
148	07249985	U	716	242	64.3	21.2	5.03	866	350	127	63.3	29.7	1,410	572	228	122	55.1
149	07250000	U	631	225	56.7	17.3	5.52	750	322	125	65.5	38.3	1,400	560	236	127	57.4
150	07250550	U	28,900	10,900	5,300	2,930	1,920	32,400	14,200	5,810	4,440	3,790	44,500	18,200	7,620	4,750	3,200
		R	53,500	19,600	7,230	3,560	1,200	55,900	25,100	8,500	4,350	2,340	108,500	39,400	12,200	6,540	3,290
151	07299200	U	2.11	1.25	0.53	0.28	0.19	2.21	1.05	0.50	0.22	0.12	2.13	0.91	0.32	0.09	0.03
152	07299300	U	0.26	0.15	0.10	0.07	0.05	0.27	0.15	0.07	0.06	0.04	0.66	0.17	0.08	0.06	0.05
153	07299540	U	41.9	11.8	4.25	2.75	1.83	50.7	12.8	4.08	2.68	1.79	48.8	10.1	3.14	1.77	1.01
154	07299570	U	32.1	10.4	4.32	2.85	2.06	41.2	12.5	3.95	2.75	2.11	32.7	9.34	3.33	1.94	1.06
155	07299670	U	17.1	7.95	3.37	2.19	1.62	16.8	7.9	3.70	2.24	1.73	18.1	7.95	3.70	2.40	1.83
156	07299890	U	4.10	2.87	1.73	1.40	0.84	4.31	2.96	2.09	1.64	1.27	5.50	3.80	2.21	1.63	0.66
157	07300500	U	69.4	31.8	12.9	5.21	0.00	74.9	34.9	16.5	9.56	3.07	81.1	31.4	8.83	1.60	0.00

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
158	07301110	U	165	72.3	36.9	23.1	16.3	173	79.3	43.4	27.9	17.7	219	91.7	42.1	29.1	18.8
159	07301300	U	44.5	16.3	3.45	0.94	0.00	51.1	20.3	6.14	2.42	0.27	53.0	19.7	1.84	0.01	0.00
160	07301410	U	18.3	13.1	8.32	6.47	5.44	21.8	15.2	10.6	8.43	7.06	23.2	16.0	11.5	9.67	8.74
161	07301420	U	35.4	26.3	17.7	13.6	11.2	36.0	27.9	19.4	16.3	14.0	47.2	30.0	20.7	17.9	15.8
162	07301500	U	137	59.8	15.8	0.00	0.00	153	73.2	27.1	6.98	0.00	166	73.6	24.6	6.31	0.00
163	07303000	R	3.59	0.72	0.13	0.04	0.00	5.35	0.94	0.13	0.08	0.00	15.4	0.80	0.13	0.03	0.00
164	07303400	U	30.6	17.5	12.4	10.0	8.72	33.4	20.1	13.3	10.9	9.13	38.5	20.7	13.4	10.5	8.05
165	07303500	U	46.1	25.1	13.4	8.39	6.62	46.5	21.0	12.8	8.64	6.94	54.7	23.5	8.87	5.26	4.28
166	07304500	U	40.4	8.84	2.61	0.63	0.24	38.7	10.4	3.88	0.68	0.42	34.2	10.4	2.99	0.69	0.34
		R	29.9	16.1	6.65	4.53	3.39	32.2	18.2	9.09	4.82	3.90	49.6	18.6	8.69	4.07	1.61
167	07305000	R	116	52.7	23.7	12.0	4.87	158	60.6	27.7	17.5	8.13	221	64.2	27.6	16.0	5.69
168	07305500	R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00
169	07307028	R	351	118	68.7	53.6	43.1	309	114	67.6	47.3	40.4	544	165	65.7	55.4	50.2
170	07308500	U	733	268	107	69.1	48.4	814	310	137	90.4	57.3	990	323	138	79.5	50.9
171	07311000	U	61.8	23.0	11.8	8.26	5.67	71.7	29.4	13.3	7.92	6.22	103	28.6	14.8	8.12	5.97
		R	117	42.0	26.4	22.0	19.0	192	46.7	28.5	23.4	20.0	437	61.6	32.3	25.0	20.0
172	07311200	R	11.0	1.52	0.12	0.00	0.00	15.3	1.8	0.48	0.06	0.00	24.1	5.34	0.70	0.09	0.00
173	07311500	U	18.1	4.34	0.94	0.22	0.00	31.9	5.4	1.30	0.51	0.25	51.2	7.01	1.23	0.49	0.18
174	07313000	U	16.8	9.05	2.54	0.09	0.03	20.6	11.0	3.93	2.05	1.21	22.1	10.9	4.35	2.74	1.59
175	07313500	U	44.6	16.1	1.72	0.08	0.00	44.8	21.1	5.10	2.31	0.52	67.6	21.8	5.66	3.19	0.48
		R	33.8	0.29	0.00	0.00	0.00	47.4	0.4	0.00	0.00	0.00	414	1.21	0.00	0.00	0.00
176	07315500	R	1,090	448	231	166	127	1,400	515	294	218	163	2,790	639	284	193	148
177	07315700	U	48.1	7.39	1.06	0.13	0.04	76.2	12.9	0.99	0.23	0.11	189	28.7	2.23	0.51	0.06
178	07316000	R	1,600	557	290	199	163	1,910	691	347	238	187	4,060	886	368	239	182
179	07316500	U	24.9	13.0	2.38	0.00	0.00	32.2	17.9	4.43	1.89	0.00	40.3	20.1	6.30	2.82	1.10
180	07319500	U	3.58	1.40	0.61	0.18	0.00	4.28	1.48	0.72	0.17	0.03	3.39	1.69	0.68	0.28	0.01

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
181	07323000	U	6.03	2.24	0.58	0.20	0.10	6.49	2.53	0.77	0.23	0.14	6.08	2.35	0.80	0.45	0.22
182	07324200	U	69.7	28.4	4.43	0.32	0.00	77.6	33.6	9.48	0.72	0.00	102	43.0	15.6	0.52	0.00
183	07324400	R	15.7	7.26	3.92	2.49	1.42	20.3	7.0	3.77	2.29	1.15	34.0	7.40	4.04	2.38	1.20
184	07325000	U	51.4	17.8	4.69	2.87	2.13	55.0	20.4	8.06	2.55	1.81	75.3	24.5	5.82	2.72	1.66
		R	95.1	31.3	16.3	10.8	6.58	134	32.7	17.5	13.1	9.02	143	35.5	20.6	13.4	9.25
185	07325500	U	231	100	49.9	31.8	21.4	256	108	56.3	36.0	24.4	336	120	53.1	34.2	23.5
186	07325800	U	26.7	19.3	12.7	10.3	8.83	27.9	19.2	13.1	11.2	9.58	30.8	20.0	13.2	11.1	9.46
187	07326000	U	43.7	32.0	22.9	19.2	15.9	48.3	35.1	24.2	21.0	18.5	45.5	35.7	26.8	22.2	19.7
		R	4.82	2.95	2.27	1.95	1.75	18.5	3.4	2.47	2.24	1.96	32.1	3.56	2.54	2.28	2.00
188	07326500	R	382	162	91.6	69.4	57.6	470	182	97.4	75.8	63.3	624	204	110	77.0	57.8
189	07327000	U	16.3	6.01	3.38	1.84	0.04	17.8	9.5	4.67	3.00	1.25	20.5	10.3	4.11	1.97	0.63
190	073274406	U	1.21	0.59	0.26	0.18	0.14	1.57	0.60	0.37	0.20	0.15	2.00	1.04	0.43	0.22	0.15
191	07327442	U	5.69	2.86	1.22	0.59	0.52	8.35	2.76	1.22	0.59	0.52	10.2	3.38	1.41	1.12	0.53
192	07327447	U	25.0	12.2	8.46	5.43	4.30	31.2	15.3	8.48	5.33	4.05	40.8	17.0	9.59	6.85	5.52
193	07327490	U	34.0	18.5	10.0	7.70	6.41	36.3	22.2	12.7	10.1	8.31	42.8	23.6	14.0	11.3	9.04
194	07327550	U	60.2	32.6	17.3	10.5	8.84	94.5	40.9	18.9	10.8	8.27	91.3	48.2	21.8	16.8	12.3
195	07328000	U	377	223	129	86.8	55.4	406	243	165	112	73.9	465	277	175	99.4	55.4
196	07328070	U	10.2	4.83	2.35	1.96	1.56	10.7	6.2	2.78	2.12	1.76	11.0	5.68	3.14	2.41	2.01
197	07328100	R	587	267	134	104	87.5	663	292	146	116	93.2	952	332	154	121	90.4
198	07328180	U	2.69	1.20	0.24	0.10	0.05	3.69	1.39	0.41	0.11	0.07	5.27	1.74	0.58	0.16	0.06
199	07328500	U	444	241	125	86.4	64.2	607	281	141	105	83.7	643	306	140	96.3	72.7
		R	782	359	183	119	97.5	938	412	193	141	112	1,350	463	195	141	111
200	07329000	U	57.5	21.7	11.5	5.67	3.65	56.6	26.5	15.3	9.40	5.42	76.8	27.9	14.6	9.32	5.66
201	07329500	U	32.1	17.8	6.23	2.66	1.30	32.7	18.1	8.26	5.73	2.71	39.7	18.3	7.62	5.17	2.86
202	07329700	R	216	50.0	16.2	9.08	5.55	239	58.3	18.4	10.5	7.63	442	105	24.0	14.5	10.1
203	07329852	U	61.9	23.1	8.63	6.05	5.03	45.8	25.3	9.73	6.38	5.02	86.6	35.2	14.9	8.76	6.86
204	07329900	U	56.9	27.5	8.06	6.20	5.17	59.6	25.6	9.52	7.80	7.04	63.2	32.0	10.7	8.70	7.65

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
205	07330500	U	54.8	19.4	2.88	0.29	0.04	115	26.1	12.3	2.45	1.51	137	42.3	11.0	2.04	1.36
206	07331000	U	858	427	221	147	100	1,140	467	253	189	149	1,350	604	269	171	135
		R	1,670	632	278	190	128	1,970	694	314	228	188	3,130	920	356	245	177
207	07331600	U	3,250	1,490	815	574	280	3,730	1,470	774	603	521	4,470	1,940	812	432	302
		R	5,470	2,680	645	156	96.2	5,220	2,450	694	217	117	5,800	2,160	470	119	81.9
208	07332400	U	128	79.3	35.9	30.6	28.2	159	82.1	42.7	30.2	25.9	228	99.3	54.2	37.9	25.7
209	07332500	U	247	108	43.9	31.3	25.1	332	136	57.1	39.1	31.4	413	152	67.3	43.7	31.8
210	07332600	U	29.9	8.68	1.17	0.09	0.00	47.5	16.8	2.54	0.68	0.01	53.2	18.2	5.55	1.83	0.40
211	07333500	U	12.1	1.75	0.00	0.00	0.00	15.0	3.5	0.42	0.13	0.00	32.2	8.26	1.33	0.63	0.19
212	07333800	U	42.8	5.61	0.87	0.28	0.00	42.1	8.4	1.40	0.19	0.00	112	29.0	8.05	2.81	0.58
213	07334000	U	407	89.2	15.0	6.43	2.10	1,030	184	42.4	23.2	13.8	1,400	253	58.4	28.8	15.0
		R	1,740	259	51.5	33.0	27.4	1,300	260	72.6	41.2	28.3	2,220	530	79.8	48.6	35.5
214	07335000	U	277	93.8	24.6	13.5	9.85	518	138	44.6	22.1	15.3	879	202	68.5	36.5	19.6
215	07335300	R	3,860	703	213	113	77.8	3,330	881	315	194	108	6,060	1,310	325	217	166
216	07335400	R	147	30.8	0.00	0.00	0.00	289	108	0.00	0.00	0.00	504	128	15.1	0.00	0.00
217	07335500	R	10,600	4,430	1,900	1,210	804	13,300	5,070	2,160	1,430	1,080	17,800	5,140	2,150	1,440	1,000
218	07335700	U	116	50.1	20.2	11.3	4.93	136	61.7	29.0	18.5	9.57	172	71.3	33.1	21.1	13.3
219	07335790	R	2,390	561	107	61.5	29.2	2,220	633	188	98.1	49.7	2,640	913	226	117	74.6
220	07336000	U	47.2	9.60	1.22	0.24	0.00	82.3	19.4	4.17	1.35	0.57	84.9	27.7	9.36	4.20	2.12
221	07336200	U	1,420	461	118	87.7	47.3	2,500	860	326	228	113	4,070	1,280	458	236	149
		R	3,400	796	194	104	19.9	3,150	936	296	155	84.1	4,050	1,300	359	200	121
222	07336500	U	2,390	680	200	87.9	49.6	2,700	880	349	200	125	2,900	1,080	447	265	175
223	07336750	U	47.3	9.82	0.40	0.00	0.00	89.1	15.6	3.77	0.00	0.00	129	11.9	2.88	1.72	0.32
224	07336800	U	48.3	6.63	0.09	0.00	0.00	113	19.3	0.48	0.00	0.00	156	25.7	2.60	1.42	0.63
225	07336820	R	21,400	8,270	3,200	1,900	1,370	22,300	9,520	3,990	2,590	1,890	33,500	12,500	3,930	2,480	1,760
226	07337500	U	1,220	414	126	43.1	21.8	1,790	624	218	127	94.0	1,790	649	318	211	120
		R	1,310	375	66.5	27.8	21.1	1,660	637	197	79.4	20.7	2,770	616	110	51.8	32.8

Table 4. January, February, and March flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JANDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JAND_{20}$	$JAND_{50}$	$JAND_{80}$	$JAND_{90}$	$JAND_{95}$	$FEBD_{20}$	$FEBD_{50}$	$FEBD_{80}$	$FEBD_{90}$	$FEBD_{95}$	$MARD_{20}$	$MARD_{50}$	$MARD_{80}$	$MARD_{90}$	$MARD_{95}$
227	07337900	U	653	240	65.2	36.8	18.9	743	289	120	59.5	33.7	937	338	139	82.0	57.0
228	07338500	U	2,790	878	301	137	72.6	3,290	1,100	418	286	206	3,450	1,260	600	365	239
		R	4,200	1,240	252	149	96.7	4,260	1,630	525	259	90.6	5,570	1,880	439	241	159
229	07338750	U	949	450	176	118	80.3	923	404	173	112	73.1	922	441	217	144	108
230	07339000	U	2,240	735	262	130	65.6	2,710	921	345	218	169	2,890	1,120	538	337	226
		R	3,190	994	189	123	92.7	3,060	1,240	299	169	121	3,440	1,320	308	168	125
231	07339500	U	452	144	51.1	18.9	9.75	524	211	91.2	56.3	39.2	645	229	93.5	57.1	41.0
232	07340300	U	232	104	49.7	35.9	26.9	273	128	67.0	53.1	42.4	362	144	73.2	54.4	43.8
233	07340500	U	822	325	138	69.5	38.7	1,210	468	190	126	96.9	1,460	518	216	139	96.8
234	07341000	U	288	111	39.9	17.1	7.39	420	154	57.6	39.4	29.9	490	172	64.6	38.1	24.3
235	07341200	U	479	161	47.0	14.4	4.73	509	216	87.5	57.0	39.6	702	215	94.6	66.0	44.8

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record.

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
1	07146500	U	1,620	707	358	272	211	3,610	1,190	509	365	282	5,500	1,790	574	314	232
		R	3,330	1,380	656	472	415	4,130	1,720	748	548	400	5,490	1,900	930	637	448
2	07148140	R	8,730	2,760	637	510	154	6,120	2,770	959	386	175	8,750	4,290	1,580	856	660
3	07148350	U	146	55.1	22.9	14.9	10.5	179	67.0	15.6	5.33	1.57	196	65.0	13.0	3.23	0.45
4	07148400	U	269	89.2	34.7	23.8	15.6	324	114	35.2	17.5	8.59	307	107	29.4	10.2	3.46
5	07149000	U	272	117	71.4	58.9	52.6	293	129	61.6	42.1	30.6	289	114	46.0	26.7	16.0
6	07149500	U	831	175	103	80.0	65.0	925	242	87.9	59.4	39.7	581	137	37.9	11.0	4.83
7	07150500	R	750	246	62.0	22.0	6.10	1,100	354	88.9	16.6	7.51	1,240	346	69.7	17.5	7.50
8	07151000	R	1,790	461	119	58.4	36.6	2,060	632	177	90.5	45.8	2,500	642	185	74.1	29.1
9	07151500	U	355	159	83.0	56.4	37.1	417	186	80.4	50.8	31.8	505	158	62.3	37.9	19.0
10	07152000	U	685	237	99.3	59.7	42.6	874	303	106	62.5	33.4	1,080	290	100	52.3	30.8
11	07152500	U	7,360	2,640	1,050	604	454	11,200	3,760	1,330	913	577	13,300	4,370	1,680	950	601
		R	15,400	5,390	1,510	804	495	13,300	6,370	2,730	1,690	1,120	18,600	7,810	3,200	2,100	1,450
12	07153000	U	229	45.1	8.43	3.43	1.65	586	65.3	14.3	6.16	2.57	362	44.4	9.15	3.24	1.44
13	07153100	R	3.05	0.05	0.02	0.01	0.00	11.4	0.22	0.02	0.01	0.01	1.80	0.04	0.02	0.01	0.00
14	07154500	U	2.07	0.75	0.03	0.02	0.01	4.39	1.07	0.04	0.02	0.01	13.2	1.16	0.03	0.02	0.01
		UI	1.56	0.27	0.05	0.02	0.00	2.88	0.22	0.01	0.00	0.00	2.58	0.08	0.00	0.00	0.00
15	07155000	U	5.68	0.11	0.02	0.01	0.01	24.5	0.05	0.02	0.01	0.00	58.1	1.36	0.03	0.01	0.01
16	07155590	U	2.10	0.00	0.00	0.00	0.00	7.13	0.91	0.00	0.00	0.00	7.62	0.00	0.00	0.00	0.00
		UI	0.10	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
17	07156900	U	97.4	75.3	61.7	55.2	50.3	95.7	68.6	53.5	46.6	41.6	85.0	57.6	43.9	40.2	35.3
		UI	50.8	42.4	35.4	32.2	30.7	45.9	37.0	29.0	25.2	22.9	41.3	31.2	23.6	20.0	17.9
18	07157000	U	93.8	66.5	48.2	40.4	36.0	106	61.6	40.4	32.9	27.3	123	49.0	28.8	21.2	15.8
19	07157500	U	26.9	16.9	11.3	7.65	6.21	53.6	13.7	7.01	4.40	2.31	82.5	13.4	1.67	0.04	0.02
		UI	16.8	11.7	7.86	6.76	5.60	16.7	10.3	6.31	5.23	4.44	18.2	8.60	4.67	3.15	2.32
20	07157900	U	2.48	1.73	1.18	0.86	0.62	2.75	1.78	1.18	0.98	0.78	2.66	1.60	0.82	0.62	0.53
21	07157950	U	176	59.2	22.3	14.9	9.89	236	68.3	13.0	4.05	0.97	248	64.5	8.28	1.26	0.07

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
22	07157960	U	21.6	6.11	1.12	0.36	0.16	29.6	7.95	1.06	0.01	0.00	20.7	5.58	0.65	0.00	0.00
23	07158000	U	382	123	35.4	18.8	9.42	579	168	27.2	9.02	3.26	614	155	26.9	5.70	0.77
24	07158400	U	29.0	10.9	5.55	4.10	3.45	46.6	13.0	5.90	3.62	2.69	36.4	13.5	6.10	3.30	1.98
25	07159000	U	14.6	4.24	0.51	0.23	0.08	45.3	5.20	0.53	0.20	0.09	65.0	5.03	0.29	0.00	0.00
26	07159100	U	1,250	462	174	127	89.6	2,140	649	216	133	102	2,000	685	228	142	93.0
27	07159750	U	222	87.0	41.9	28.0	21.2	445	117	51.5	35.4	25.3	343	108	46.1	33.1	25.4
28	07160000	U	2,250	949	407	277	215	2,980	948	399	262	223	3,330	1,110	387	282	223
29	07160350	U	37.7	14.7	8.47	7.24	6.66	41.4	17.4	8.30	6.52	5.69	47.2	14.6	10.0	7.60	5.19
30	07160500	U	112	26.9	9.01	5.65	4.29	192	36.3	11.1	5.96	3.99	187	34.9	11.2	5.36	3.43
31	07163000	U	7.55	2.50	0.40	0.13	0.00	9.81	2.41	0.39	0.04	0.00	5.41	1.20	0.00	0.00	0.00
32	07163500	U	2,520	479	154	62.7	44.5	3,690	1,070	206	127	85.2	4,120	1,530	523	342	285
33	07164000	U	2,790	742	299	182	144	4,050	1,210	381	241	173	4,690	1,380	469	301	175
34	07164500	U	10,300	3,530	1,360	791	582	17,500	5,680	1,840	1,290	1,060	19,800	6,460	2,500	1,300	811
		R	21,000	7,330	1,490	785	521	23,600	8,850	2,710	1,310	735	24,100	10,500	3,860	2,260	1,250
35	07164600	UUrb	15.0	3.87	1.94	1.52	1.21	24.2	4.56	2.32	1.49	1.14	24.1	3.87	1.65	1.10	0.88
36	07165500	R	91.0	15.5	0.32	0.00	0.00	110	21.9	4.01	0.31	0.00	68.4	10.8	0.28	0.00	0.00
37	07165562	UUrb	15.1	3.74	1.38	0.74	0.45	25.5	4.62	1.43	0.74	0.33	20.3	3.28	0.70	0.32	0.05
38	07165565	UUrb	5.91	1.59	0.51	0.22	0.07	11.6	1.58	0.44	0.15	0.00	9.19	1.04	0.14	0.03	0.00
39	07165570	R	26,000	10,500	2,650	1,380	773	27,800	12,100	4,650	2,510	1,460	28,000	11,900	5,300	3,320	2,330
40	07170500	U	2,890	726	149	49.8	26.8	3,240	823	286	158	92.7	3,930	634	128	49.5	19.7
		R	5,490	1,220	165	50.7	29.5	6,050	1,650	297	148	76.7	7,840	2,010	206	89.9	49.5
41	07170700	U	23.1	6.81	1.32	0.69	0.32	22.1	4.94	1.11	0.39	0.25	20.7	2.73	0.42	0.13	0.05
		R	37.0	7.39	0.06	0.00	0.00	77.8	11.8	0.48	0.03	0.00	55.6	11.2	0.13	0.02	0.00
42	07171000	U	4,850	786	146	35.8	10.7	4,430	1,010	333	136	50.9	4,930	655	138	57.0	25.5
		R	6,910	1,640	240	83.2	41.6	7,820	2,160	471	234	141	9,460	2,500	285	131	67.5
43	07171400	R	10,400	3,110	82.6	30.0	18.2	6,530	1,670	130	35.4	23.5	9,770	3,150	168	31.6	20.1
44	07172000	U	521	177	27.2	3.76	0.26	582	166	48.6	23.2	11.9	446	91.6	24.2	10.9	4.88

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
45	07173000	U	1,030	169	13.0	7.34	2.25	1,060	174	19.8	9.59	4.52	1,090	99.0	14.5	9.36	6.25
46	07174200	U	430	72.5	11.1	3.91	0.36	420	73.6	17.2	7.42	2.75	319	40.2	7.93	2.91	1.12
47	07174400	R	3,230	654	78.3	25.1	15.3	4,420	1,410	91.7	36.2	26.5	5,000	1,500	48.3	31.1	24.4
48	07174600	U	120	34.2	8.00	1.98	0.61	126	29.9	7.29	3.49	2.19	65.8	16.0	3.06	1.13	0.40
49	07174700	R	2,940	413	45.5	26.9	17.5	3,490	378	60.0	27.5	16.3	2,440	231	47.4	26.8	17.4
50	07175000	U	2.35	0.72	0.00	0.00	0.00	1.85	0.27	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00
51	07175500	R	4,810	1,270	275	89.8	50.4	5,500	2,050	267	91.9	66.1	5,710	1,910	115	57.6	43.3
52	07176000	U	9,060	1,740	338	77.7	35.7	11,600	2,400	613	324	125	9,580	1,490	371	130	75.0
		R	13,300	4,750	308	105	67.7	13,800	5,090	660	220	105	14,800	6,230	457	162	86.3
53	07176465	R	88.1	11.6	3.63	2.12	0.40	178	15.4	4.21	2.37	1.94	103	11.9	3.82	1.64	0.97
54	07176500	U	221	54.0	5.58	1.42	0.40	279	55.6	11.4	4.77	2.44	162	27.7	2.68	0.60	0.12
		R	547	141	46.1	17.9	8.30	783	204	47.8	24.8	15.4	606	95.9	30.5	13.0	8.69
55	07176800	U	19.2	3.87	0.45	0.12	0.00	21.7	3.84	1.04	0.50	0.23	8.47	1.30	0.29	0.00	0.00
56	07177000	U	172	40.0	7.48	2.33	1.11	268	44.4	12.2	6.17	3.18	144	23.9	4.14	1.23	0.52
57	07177500	U	637	145	21.8	10.4	6.55	1,100	175	48.8	22.8	12.2	471	92.1	22.8	9.14	5.89
		R	1,620	272	152	128	117	2,570	336	161	128	109	2,080	270	166	146	120
58	07177650	UUrb	5.98	1.67	0.42	0.18	0.09	5.13	1.14	0.28	0.11	0.00	3.27	0.57	0.10	0.02	0.00
59	07177800	UUrb	9.10	3.14	1.51	1.03	0.77	12.2	3.12	1.40	1.04	0.85	10.8	2.67	1.02	0.55	0.27
60	07178000	R	2,090	312	182	156	138	2,820	406	178	155	132	2,220	325	188	164	152
61	07178040	UUrb	106	23.7	8.85	5.99	4.53	96.4	18.5	5.56	3.70	2.96	77.3	13.3	3.96	2.85	2.00
62	07178200	R	1,970	457	253	211	184	3,250	720	278	214	187	2,820	573	265	226	195
63	07178600	U	10,000	2,400	441	168	59.0	16,700	3,050	805	314	172	9,430	1,470	374	146	90.3
64	07184000	U	123	25.8	6.51	1.71	0.21	176	28.0	6.75	3.28	1.70	196	24.9	3.65	1.49	0.51
65	07185000	U	7,100	1,820	453	206	63.5	9,180	2,210	609	327	170	10,300	2,110	547	274	176
		R	8,630	2,490	376	126	75.5	10,500	2,830	802	458	284	12,700	4,650	971	427	262
66	07185095	UUrb	59.4	21.4	8.98	6.33	0.96	62.7	14.2	5.30	4.11	3.56	36.7	11.0	4.12	2.75	2.02
67	07185500	U	4.00	1.73	0.59	0.20	0.00	2.48	0.91	0.28	0.13	0.06	2.00	0.45	0.14	0.10	0.00

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
68	07185700	U	503	229	126	71.6	55.3	457	248	121	95.0	79.5	463	203	111	72.7	55.2
69	07185765	U	642	394	195	106	70.3	637	325	217	158	128	583	260	140	89.1	59.5
70	07186000	U	1,450	596	259	136	74.1	1,490	530	263	180	129	1,580	498	204	134	92.2
71	07186400	U	411	216	93.2	64.1	43.2	311	150	93.1	63.0	47.7	259	128	68.2	53.0	37.0
72	07187000	U	797	404	222	154	91.9	852	398	242	178	134	755	333	188	147	108
73	07187500	U	780	299	169	128	98.4	727	366	156	120	102	965	388	165	102	81.7
74	07188000	U	3,690	1,670	721	432	237	3,890	1,480	836	586	412	3,540	1,310	597	416	303
75	07188500	U	52.0	30.1	12.6	4.05	3.51	59.3	27.5	10.7	6.25	4.38	47.6	18.7	10.6	6.66	4.43
76	07189000	U	1,890	840	397	278	174	1,740	738	383	280	218	1,090	458	242	162	124
77	07189500	U	12,300	4,490	1,760	1,060	811	15,100	4,330	1,910	1,310	982	28,700	4,890	1,720	997	609
78	07189540	U	5.21	3.59	2.68	2.21	1.95	7.66	4.03	2.50	2.19	1.99	5.58	3.29	2.29	2.01	1.83
79	07189542	U	43.0	27.1	17.2	12.6	8.67	79.5	31.1	19.3	16.8	15.5	34.1	19.0	14.0	10.9	8.80
80	07190500	R	14,400	7,100	924	197	56.0	15,900	7,030	1,570	284	51.1	17,300	7,710	2,330	698	90.3
81	07191000	U	336	97.4	31.1	13.5	6.40	426	80.2	23.5	13.8	8.73	250	44.0	9.83	4.18	2.56
82	07191220	U	242	116	54.3	40.1	23.4	193	95.4	52.4	36.7	25.5	148	65.9	38.0	24.0	15.9
83	07191500	R	20,200	10,400	1,420	241	152	20,600	9,620	1,470	327	186	21,500	10,300	2,370	570	232
84	07192000	U	110	31.8	4.92	1.25	0.05	215	30.8	4.86	2.92	1.16	87.1	7.06	1.45	0.40	0.11
85	07192500	R	38,400	7,420	3,960	870	448	26,800	9,290	3,380	2,350	580	26,700	11,400	3,670	870	313
86	07193500	R	20,200	10,200	1,050	330	105	16,500	7,240	1,140	317	86.4	17,600	8,500	2,120	715	147
87	07194500	U	55,100	14,200	6,010	3,740	2,310	57,500	21,800	8,220	5,380	4,200	67,000	23,200	7,830	5,080	3,110
		R	51,100	27,600	4,800	2,060	1,270	62,900	20,300	8,620	5,480	3,520	63,100	31,900	8,180	4,620	3,580
88	07194800	U	257	94.4	34.2	22.9	15.8	240	86.7	32.1	23.1	18.6	133	40.2	19.7	14.0	10.7
89	07195000	U	207	124	62.5	45.0	27.7	215	116	71.4	45.2	36.3	176	96.8	53.4	37.1	29.0
90	07195430	U	810	417	258	204	158	780	407	269	224	193	564	300	202	156	110
91	07195500	U	1,260	600	271	202	153	1,140	520	285	202	156	746	348	197	138	110
92	07195800	U	26.7	13.8	6.97	4.98	3.91	23.7	11.5	6.65	5.29	3.89	19.2	8.30	4.77	3.49	2.76

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
93	07195855	R	85.6	43.0	21.3	15.1	8.99	83.8	38.6	22.9	17.9	13.4	71.4	26.9	14.8	9.27	7.09
94	07195865	U	26.0	14.9	9.80	8.15	6.99	38.5	15.4	10.6	8.88	8.15	35.9	14.0	8.54	6.97	5.95
95	07196000	U	225	106	54.7	37.8	24.4	200	92.9	52.5	41.0	33.6	154	64.2	36.1	27.3	22.6
96	07196500	U	1,980	929	419	302	214	1,910	853	417	302	234	1,280	578	281	191	144
97	07196900	U	80.8	35.4	13.9	8.68	5.43	68.3	24.5	10.2	6.21	4.39	34.4	11.0	3.89	2.02	0.79
98	07196973	U	52.0	27.6	13.4	9.76	7.61	55.3	22.3	10.8	8.05	6.75	34.7	13.3	6.27	3.50	2.40
99	07197000	U	693	319	145	94.1	57.8	685	274	144	106	86.5	392	158	73.0	52.1	38.6
100	07197360	U	151	56.8	28.6	17.6	15.0	138	58.1	31.7	27.0	19.3	76.2	41.1	23.7	20.1	15.6
101	07198000	U	3,790	1,680	904	673	457	4,920	2,200	885	574	481	3,100	1,430	604	390	304
		R	4,090	2,010	277	89.2	63.8	3,460	1,540	179	87.0	62.4	2,660	1,200	179	107	80.3
102	07228500	U	178	33.0	17.0	14.4	13.1	1,220	65.3	18.4	13.8	10.4	1,050	102	21.1	8.34	3.09
		R	458	230	105	60.8	38.3	648	225	77.8	45.6	21.0	616	230	45.2	24.9	16.0
103	07229100	R	550	173	25.4	14.2	10.6	824	168	23.7	9.82	6.21	1,010	169	27.0	9.30	5.20
104	07229200	R	1,110	535	238	148	70.7	1,550	544	237	132	84.1	1,550	643	258	139	77.6
105	07229300	U	116	39.1	13.2	8.39	5.12	141	45.8	16.3	8.40	4.26	106	40.4	8.06	2.59	1.26
106	07230000	U	48.1	12.9	3.55	2.29	1.72	106	22.2	6.36	3.45	2.26	64.2	9.72	2.47	1.18	0.43
		R	120	0.73	0.43	0.30	0.19	195	0.69	0.42	0.22	0.19	245	0.77	0.44	0.25	0.19
107	07230500	U	147	45.6	14.9	7.43	5.03	352	78.4	22.6	13.7	7.61	198	48.2	8.77	4.08	1.63
		R	359	43.8	12.8	5.79	3.91	551	52.1	12.4	7.01	4.33	502	44.6	9.41	4.94	1.50
108	07231000	U	476	124	45.0	29.9	16.5	1,710	326	89.2	42.8	25.5	702	137	40.6	20.6	10.2
		R	762	160	40.7	19.1	7.64	1,100	230	51.1	26.8	16.7	928	178	30.3	14.2	7.53
109	07231500	U	2,240	459	123	67.6	42.5	6,590	1,150	218	95.3	54.2	4,600	992	193	90.2	31.5
		R	3,280	1,080	312	135	85.5	4,670	1,410	345	200	122	4,350	1,400	297	138	67.3
110	07232000	U	1,170	188	48.3	22.5	15.9	1,650	188	58.3	32.2	17.0	246	37.3	7.75	2.97	1.72
111	07232500	U	11.2	6.82	4.54	3.62	2.90	15.1	5.48	2.40	1.22	0.69	18.7	3.62	0.93	0.41	0.11
		UI	3.30	0.48	0.00	0.00	0.00	2.99	0.00	0.00	0.00	0.00	1.86	0.03	0.01	0.00	0.00
112	07232900	UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
113	07233000	U	7.84	4.90	2.49	1.68	1.21	12.8	3.87	0.90	0.04	0.02	13.3	2.39	0.03	0.01	0.01
114	07233500	U	1.47	0.49	0.00	0.00	0.00	4.76	0.55	0.00	0.00	0.00	15.4	2.15	0.00	0.00	0.00
115	07233650	R	1.93	1.30	0.98	0.79	0.40	1.82	1.15	0.61	0.38	0.27	1.31	0.55	0.05	0.00	0.00
116	07234000	RI	23.5	7.79	2.35	0.11	0.05	31.7	11.4	0.56	0.06	0.01	31.3	5.86	0.06	0.00	0.00
		U	52.2	20.4	4.38	0.45	0.00	127	19.5	0.49	0.00	0.00	248	39.7	0.37	0.00	0.00
117	07234100	U	3.05	2.36	1.82	1.51	1.27	3.38	2.38	1.66	1.34	1.17	3.31	2.18	1.39	1.11	0.85
118	07234500	U	164	51.0	16.7	9.13	0.03	347	67.8	11.7	3.33	0.83	402	96.4	8.90	2.45	0.14
119	07235000	R	7.93	5.53	3.81	2.47	2.00	8.62	3.56	1.07	0.39	0.28	23.7	7.30	2.80	1.07	0.62
		RI	11.2	3.46	1.94	1.54	1.25	15.0	3.42	1.31	0.78	0.56	14.2	4.01	0.99	0.48	0.33
120	07236000	U	78.1	43.7	25.2	18.5	14.5	187	52.3	22.7	15.8	11.8	170	33.2	5.09	2.06	0.52
121	07237000	R	63.0	25.8	2.61	1.24	0.67	99.4	13.2	1.90	1.23	0.99	141	6.06	1.32	0.75	0.54
		RI	88.5	43.2	20.2	2.97	1.89	119	39.4	17.5	2.40	1.54	122	32.1	3.67	2.01	1.27
122	07237500	U	191	76.5	21.9	4.27	1.59	437	79.7	12.0	3.39	1.23	727	125	15.3	3.53	0.00
		RI	274	112	57.2	46.5	32.9	323	116	47.8	32.3	22.6	348	116	40.5	16.6	11.2
123	07238000	U	251	103	35.8	4.84	1.13	582	113	19.2	6.77	1.34	922	172	20.8	4.03	0.00
		RI	373	170	86.8	66.4	56.3	517	181	81.6	54.8	39.9	492	184	64.4	35.5	16.3
124	07239000	U	520	148	41.7	0.05	0.03	861	211	46.1	10.5	2.23	738	254	43.9	14.7	1.18
		R	285	21.9	4.64	3.17	2.38	324	23.1	6.12	4.15	3.10	744	35.1	6.53	4.64	3.69
125	07239300	R	586	145	32.1	24.1	20.3	600	129	26.5	18.0	11.4	762	202	40.4	20.3	12.0
126	07239450	R	736	152	48.9	33.7	28.4	830	215	48.7	31.4	24.5	941	326	82.4	40.1	24.4
127	07239500	U	499	213	65.3	28.9	1.70	930	302	122	26.6	5.62	726	278	106	44.4	23.5
		R	494	118	27.9	12.2	5.32	699	132	34.7	13.4	5.09	879	212	32.5	9.67	2.72
128	07241000	R	272	38.3	2.55	1.18	0.43	468	50.7	2.36	1.10	0.22	698	109	2.30	0.83	0.10
129	07241500	R	621	131	48.8	36.6	26.2	1,190	288	56.7	41.7	30.4	1,560	236	52.3	40.8	31.3
130	07241520	R	862	268	89.2	43.0	21.0	1,080	331	80.1	41.1	31.4	1,300	480	107	49.9	32.8
131	07241550	R	871	314	124	79.8	68.1	1,180	379	145	98.2	76.6	1,200	503	175	113	84.6
132	07242000	R	1,430	530	173	123	91.3	2,280	745	250	152	114	2,230	777	221	127	88.2

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
133	07242350	UUrb	54.7	31.8	23.6	20.9	18.3	126	46.8	26.0	19.8	15.1	95.1	46.5	25.4	17.9	12.4
134	07242380	R	493	114	47.0	36.4	30.4	722	144	48.4	34.3	25.8	705	159	43.9	29.2	23.6
135	07243000	U	24.1	7.48	1.57	0.79	0.09	30.8	8.96	2.39	0.83	0.22	24.8	5.92	1.31	0.28	0.00
136	07243500	U	2,080	445	120	65.5	41.0	3,340	761	200	107	64.2	2,800	491	117	71.6	44.2
137	07244000	U	3,610	517	137	85.5	47.4	5,390	1,990	302	117	56.2	4,300	752	174	73.7	30.5
138	07245000	U	11,900	3,310	1,090	520	263	23,400	7,400	1,640	829	529	15,700	4,180	1,060	549	311
		R	13,800	4,880	671	142	70.0	18,600	6,260	1,060	258	98.5	16,600	5,680	1,560	567	181
139	07245500	U	485	172	72.9	27.4	18.3	480	166	68.3	42.3	30.4	211	56.5	19.9	10.1	6.32
140	07247000	U	410	119	39.6	24.5	15.9	427	94.0	21.6	11.9	8.03	173	25.4	5.50	2.26	1.15
141	07247015	U	409	115	42.3	28.4	22.7	404	79.0	27.0	18.0	12.5	237	46.9	14.1	8.36	6.23
142	07247250	U	208	91.2	44.5	33.2	21.0	184	56.1	26.0	17.2	11.6	139	30.8	8.37	3.70	1.50
143	07247500	U	286	71.6	22.1	11.3	6.91	287	49.0	14.0	7.41	4.83	98.5	16.9	3.97	1.54	0.50
144	07248500	U	3,900	1,020	385	250	182	3,250	834	217	157	123	812	244	107	73.1	53.7
		R	3,350	682	150	73.8	31.5	4,910	980	89.0	34.5	21.4	3,230	85.5	11.8	7.90	5.00
145	07249400	U	243	83.2	34.9	20.5	11.1	223	56.4	19.0	12.5	8.75	84.4	23.3	7.11	3.45	1.97
146	07249413	R	6,140	1,930	375	167	102	6,290	1,960	298	121	80.6	4,260	894	135	75.3	57.0
147	07249500	U	96.8	44.2	17.8	8.20	4.83	88.8	28.0	8.78	5.24	3.84	18.1	4.83	1.53	1.00	0.63
148	07249985	U	1,370	578	228	141	98.0	1,090	375	123	69.3	45.9	395	109	34.0	17.6	8.95
149	07250000	U	1,350	580	239	149	104	1,100	396	135	74.6	46.9	395	109	30.1	14.7	6.79
150	07250550	U	67,600	25,000	9,100	4,410	3,280	110,900	39,300	12,400	7,480	5,550	90,800	29,900	9,400	6,150	4,350
		R	94,100	47,500	14,300	6,830	3,100	110,200	48,400	21,000	11,600	6,720	103,300	46,000	19,600	9,760	5,300
151	07299200	U	8.41	0.83	0.11	0.00	0.00	76.0	2.27	0.46	0.25	0.07	151	7.82	0.37	0.09	0.03
152	07299300	U	1.67	0.19	0.08	0.04	0.01	4.54	0.35	0.09	0.03	0.01	5.14	0.50	0.11	0.05	0.02
153	07299540	U	55.6	12.0	2.80	1.49	1.00	165	17.7	2.29	1.11	0.55	281	32.2	2.63	0.97	0.31
154	07299570	U	48.5	5.48	1.70	0.99	0.25	142	11.7	1.14	0.46	0.21	324	46.9	2.66	0.39	0.05
155	07299670	U	20.2	7.85	3.12	1.95	1.38	23.4	9.24	3.97	2.24	1.68	25.8	10.8	3.81	1.71	1.13

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
156	07299890	U	5.92	3.70	2.07	1.70	1.52	4.49	2.53	1.16	0.84	0.65	3.57	1.15	0.40	0.07	0.00
157	07300500	U	93.0	26.5	2.99	0.00	0.00	174	34.0	2.48	0.00	0.00	161	35.9	2.59	0.00	0.00
158	07301110	U	238	89.0	39.8	22.9	15.3	477	106	37.9	16.2	7.98	505	124	48.5	24.9	14.3
159	07301300	U	45.8	5.18	0.00	0.00	0.00	67.6	3.78	0.00	0.00	0.00	56.2	1.11	0.00	0.00	0.00
160	07301410	U	23.7	15.5	11.1	9.25	8.32	26.6	13.7	7.35	5.42	4.29	24.0	10.3	4.47	2.67	1.91
161	07301420	U	47.0	27.0	19.1	16.5	13.5	50.6	24.5	14.4	11.0	8.36	45.3	22.0	11.8	4.99	2.75
162	07301500	U	189	69.0	20.0	5.03	0.00	333	92.6	19.7	5.37	0.00	340	84.7	12.5	0.98	0.00
163	07303000	R	18.7	0.58	0.07	0.00	0.00	24.6	0.78	0.00	0.00	0.00	219	1.11	0.00	0.00	0.00
164	07303400	U	47.1	21.4	12.0	8.67	6.15	72.9	23.4	10.0	6.32	3.91	72.1	24.3	9.24	4.57	2.03
165	07303500	U	82.6	26.8	10.2	5.07	3.01	184	44.1	12.3	6.88	3.50	189	42.7	10.7	4.25	2.22
166	07304500	U	36.5	10.5	2.72	0.61	0.23	116	18.7	4.42	2.43	0.08	140	23.5	2.68	0.63	0.09
		R	58.7	18.8	8.21	6.04	1.88	178	34.8	7.50	3.97	1.66	166	41.3	11.4	4.95	1.84
167	07305000	R	289	78.0	29.1	13.8	6.33	689	142	41.1	22.3	8.72	944	204	52.4	23.9	8.52
168	07305500	R	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	2.46	0.00	0.00	0.00	0.00
169	07307028	R	604	177	88.1	58.0	45.7	1,010	225	82.8	61.4	49.1	1,580	437	123	75.8	51.5
170	07308500	U	983	337	129	73.9	40.9	2,420	542	146	83.7	51.7	3,790	1,050	304	162	78.9
171	07311000	U	181	45.4	15.5	10.6	7.68	575	89.5	25.7	11.7	5.59	339	80.1	28.6	15.6	6.84
		R	297	62.9	31.5	24.2	19.9	426	80.6	34.8	24.3	18.3	603	69.7	28.1	21.2	16.5
172	07311200	R	19.5	5.44	1.29	0.49	0.12	24.5	5.37	1.19	0.57	0.26	18.6	2.87	0.32	0.03	0.00
173	07311500	U	58.1	6.43	1.70	0.33	0.03	250	19.0	2.98	0.99	0.11	251	18.7	2.60	0.81	0.00
174	07313000	U	23.1	11.8	4.50	2.58	1.60	106	24.1	8.08	2.70	0.37	63.1	14.1	4.07	1.20	0.36
175	07313500	U	84.6	27.1	5.10	1.87	0.38	233	41.5	6.13	1.66	0.45	138	24.9	3.03	0.23	0.00
		R	253	1.17	0.00	0.00	0.00	435	3.60	0.00	0.00	0.00	1,250	23.3	0.00	0.00	0.00
176	07315500	R	2,580	675	294	211	159	7,680	1,630	481	342	256	7,780	2,240	638	392	292
177	07315700	U	147	27.2	3.63	0.85	0.09	281	36.0	4.18	1.37	0.39	269	38.2	4.48	1.17	0.00
178	07316000	R	3,480	1,050	407	276	207	9,270	2,090	643	460	327	10,100	2,820	962	567	373
179	07316500	U	47.8	21.4	7.35	3.09	0.54	77.4	25.4	5.34	1.12	0.00	71.5	20.1	1.32	0.00	0.00

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
180	07319500	U	3.73	1.72	0.83	0.25	0.11	6.02	2.01	0.92	0.25	0.00	6.83	2.16	0.63	0.14	0.04
181	07323000	U	6.55	2.98	0.95	0.28	0.11	11.2	3.59	1.11	0.12	0.00	10.6	3.48	0.63	0.25	0.00
182	07324200	U	114	43.2	17.6	6.73	0.19	214	49.5	18.5	5.43	0.34	201	64.9	8.53	1.95	0.01
183	07324400	R	115	8.92	4.34	2.91	1.99	193	10.3	4.97	3.13	1.68	295	12.4	5.70	4.06	1.76
184	07325000	U	146	35.8	11.6	2.63	1.10	520	107	25.9	16.6	9.77	417	132	18.5	5.10	1.39
		R	196	42.8	20.6	12.9	8.89	372	50.9	20.7	13.3	7.98	432	74.2	21.0	12.9	8.20
185	07325500	U	472	146	66.6	42.4	24.1	990	224	90.1	57.1	38.4	1,190	327	93.4	49.3	33.0
186	07325800	U	27.9	18.9	12.1	9.72	7.74	43.9	19.6	11.5	8.79	6.78	42.5	18.3	9.11	6.46	4.62
187	07326000	U	57.5	34.2	25.1	21.8	20.1	79.0	33.8	21.0	16.4	13.4	63.7	29.5	15.3	9.80	6.55
		R	5.45	3.50	2.64	2.31	2.02	13.2	3.67	2.59	2.08	1.77	159	3.98	2.59	2.00	1.68
188	07326500	R	678	244	121	82.3	56.0	1,190	305	143	98.5	68.2	1,780	474	148	87.6	57.8
189	07327000	U	23.8	11.3	4.50	1.57	0.33	24.2	7.48	2.44	0.94	0.12	24.8	7.08	1.29	0.05	0.03
190	073274406	U	2.00	0.90	0.44	0.21	0.15	2.25	0.87	0.28	0.16	0.04	2.60	0.79	0.19	0.00	0.00
191	07327442	U	9.04	3.91	1.40	0.96	0.45	7.88	4.16	0.92	0.50	0.31	8.83	2.75	0.65	0.35	0.05
192	07327447	U	40.7	16.6	8.38	5.86	4.25	43.0	19.1	6.39	4.44	3.14	43.3	18.4	5.11	2.96	0.51
193	07327490	U	43.4	24.0	13.2	10.5	8.41	74.9	26.7	13.4	8.44	5.55	60.8	21.0	7.88	4.00	2.20
194	07327550	U	101	45.4	26.0	15.9	11.5	114	45.4	17.3	12.0	8.91	124	47.2	15.6	6.34	3.00
195	07328000	U	1,070	337	185	146	107	2,660	633	269	192	160	2,730	967	243	154	113
196	07328070	U	14.6	6.14	2.90	2.15	1.73	23.0	8.10	3.22	2.00	1.17	21.8	6.88	1.89	0.95	0.56
197	07328100	R	1,020	411	180	123	84.9	1,790	541	221	150	103	2,230	790	275	123	90.3
198	07328180	U	5.60	1.42	0.43	0.21	0.05	5.46	1.84	0.46	0.00	0.00	5.14	1.51	0.22	0.00	0.00
199	07328500	U	1,050	423	189	130	93.3	4,050	988	340	178	127	3,110	987	355	194	123
		R	1,490	567	224	135	80.5	2,240	722	295	188	134	2,990	1,000	358	190	118
200	07329000	U	76.7	28.8	13.4	9.52	6.17	157	40.8	16.0	9.20	5.68	117	36.2	12.9	6.48	3.29
201	07329500	U	51.0	22.5	7.52	4.82	2.94	98.8	26.7	7.34	2.47	1.11	84.0	19.9	5.01	1.25	0.00
202	07329700	R	386	102	23.2	9.04	6.24	661	143	48.0	24.4	14.5	657	116	37.5	19.9	8.07
203	07329852	U	79.0	34.8	17.7	9.85	6.28	70.0	29.4	12.6	8.38	5.36	58.9	21.8	9.85	6.89	5.07

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
204	07329900	U	82.5	42.2	10.0	7.12	5.66	121	34.1	16.1	11.9	9.01	55.2	20.5	6.49	4.40	3.84
205	07330500	U	256	49.5	16.0	8.70	6.60	241	58.3	19.0	7.78	2.30	165	38.0	8.64	4.56	2.22
206	07331000	U	2,040	773	363	241	173	6,540	1,770	598	355	221	4,760	1,460	537	355	224
		R	2,980	1,160	410	253	163	5,040	1,480	505	314	232	5,280	1,780	548	296	185
207	07331600	U	8,500	2,970	1,300	863	648	21,000	5,730	2,420	1,680	1,290	15,200	5,140	2,050	1,330	1,040
		R	7,350	2,900	888	283	105	9,810	3,390	1,130	294	132	16,500	4,610	1,950	985	217
208	07332400	U	216	103	56.4	43.9	29.8	250	108	60.4	49.0	42.5	208	107	50.5	39.5	34.2
209	07332500	U	469	162	82.0	56.6	39.7	524	173	78.1	57.2	44.0	356	133	55.5	41.2	31.6
210	07332600	U	38.2	12.7	4.01	2.01	0.88	49.3	12.5	4.32	2.33	0.91	20.3	4.76	0.71	0.07	0.00
211	07333500	U	46.0	10.7	2.84	1.10	0.56	31.7	4.48	1.15	0.45	0.31	5.60	1.11	0.13	0.00	0.00
212	07333800	U	136	26.5	6.14	2.75	1.26	96.9	16.4	3.91	1.99	0.99	25.9	4.51	0.40	0.00	0.00
213	07334000	U	2,220	322	70.9	35.7	22.7	2,590	367	78.7	46.0	29.0	826	104	27.3	13.0	7.02
		R	2,100	512	96.3	50.0	34.8	1,970	436	55.0	37.5	29.8	1,490	240	42.2	28.5	21.6
214	07335000	U	905	207	77.3	45.3	23.8	1,350	266	79.1	51.3	36.3	707	138	41.2	24.1	15.7
215	07335300	R	5,200	1,330	383	228	159	5,570	1,350	259	180	142	3,700	815	198	121	93.5
216	07335400	R	291	122	1.50	0.00	0.00	361	138	5.64	0.00	0.00	454	122	1.24	0.00	0.00
217	07335500	R	17,500	6,670	2,680	1,710	1,270	26,500	7,870	3,090	2,150	1,530	33,300	7,890	2,950	2,140	1,640
218	07335700	U	151	62.8	26.4	17.0	11.7	147	46.1	14.3	7.78	4.60	70.8	13.9	2.79	1.18	0.33
219	07335790	R	2,470	764	200	133	89.3	2,520	473	97.8	56.7	38.5	1,640	233	41.3	19.6	11.2
220	07336000	U	149	29.3	7.15	3.88	2.03	98.7	19.3	4.10	1.64	0.91	21.0	3.29	0.45	0.01	0.00
221	07336200	U	2,320	822	350	265	223	3,840	949	293	173	117	2,160	477	133	58.7	24.0
		R	3,840	1,170	291	186	136	3,950	903	159	84.0	54.4	2,240	469	94.2	45.8	25.3
222	07336500	U	4,110	1,160	360	226	163	4,090	943	313	196	134	1,010	259	72.0	35.4	20.5
223	07336750	U	49.6	11.4	1.70	0.52	0.31	65.2	5.86	0.68	0.10	0.01	13.7	1.06	0.10	0.00	0.00
224	07336800	U	127	13.2	1.13	0.39	0.18	57.0	9.46	0.71	0.04	0.00	14.4	1.10	0.00	0.00	0.00
225	07336820	R	28,500	12,400	4,670	2,870	2,080	38,100	13,300	4,880	3,600	2,960	47,700	16,000	3,950	2,580	2,090

Table 5. April, May, and June flow-duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *APRDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$APRD_{20}$	$APRD_{50}$	$APRD_{80}$	$APRD_{90}$	$APRD_{95}$	$MAYD_{20}$	$MAYD_{50}$	$MAYD_{80}$	$MAYD_{90}$	$MAYD_{95}$	$JUND_{20}$	$JUND_{50}$	$JUND_{80}$	$JUND_{90}$	$JUND_{95}$
226	07337500	U	1,990	596	208	133	92.2	2,560	597	197	122	85.4	320	91.8	33.5	17.4	11.1
		R	2,410	410	113	40.9	27.0	2,880	508	72.0	27.7	19.1	2,400	166	25.8	17.8	13.4
227	07337900	U	711	249	105	71.1	54.6	880	254	73.4	40.1	24.2	418	86.6	23.4	10.5	5.70
228	07338500	U	4,620	1,290	462	289	177	5,930	1,140	368	228	154	888	249	86.1	50.4	31.4
		R	4,400	1,030	331	213	160	5,310	1,630	276	148	108	3,630	433	108	69.1	52.0
229	07338750	U	685	324	166	126	106	628	206	102	74.8	52.9	475	130	44.4	23.1	16.4
230	07339000	U	2,920	1,020	401	259	174	2,970	739	258	156	110	666	196	57.3	30.4	19.9
		R	3,270	1,030	213	141	113	3,330	819	236	168	134	2,310	720	284	197	164
231	07339500	U	689	179	62.2	39.9	26.1	497	124	37.5	21.9	15.3	116	28.0	6.59	3.98	3.15
232	07340300	U	274	125	68.2	51.2	39.4	267	85.4	41.7	31.0	24.8	138	45.1	22.2	16.6	13.5
233	07340500	U	1,370	455	172	118	87.9	1,090	291	105	71.2	52.5	325	90.3	32.2	20.9	14.9
234	07341000	U	416	140	49.1	31.8	21.4	342	95.1	30.0	18.1	12.6	100	22.2	5.65	2.83	1.52
235	07341200	U	750	170	54.7	34.2	19.8	497	157	50.9	29.5	21.2	276	52.8	8.25	3.45	2.47

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record.

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
1	07146500	U	2,500	975	279	149	106	1,490	669	224	118	73.2	1,370	464	208	146	111
		R	3,760	1,190	526	365	265	2,400	842	373	264	148	2,250	758	326	233	148
2	07148140	R	7,860	2,950	752	305	199	3,050	762	281	200	163	2,810	504	177	140	122
3	07148350	U	83.8	12.1	0.71	0.21	0.00	43.4	2.35	0.19	0.00	0.00	55.6	3.28	0.20	0.00	0.00
4	07148400	U	149	39.0	4.68	1.36	0.04	94.5	23.2	2.35	0.65	0.04	75.3	11.0	1.83	0.79	0.04
5	07149000	U	126	43.3	13.2	3.71	0.24	105	23.2	1.59	0.00	0.00	95.5	31.1	4.91	0.00	0.00
6	07149500	U	388	53.2	3.29	0.05	0.02	305	24.7	0.03	0.02	0.01	186	28.5	0.03	0.01	0.01
7	07150500	R	612	114	18.5	7.98	4.86	255	29.8	8.87	5.78	4.32	347	43.4	10.5	5.38	3.09
8	07151000	R	1,230	273	83.3	54.7	26.2	622	129	50.9	32.5	21.1	644	133	46.0	28.2	15.3
9	07151500	U	255	69.4	25.3	11.5	1.66	147	39.1	13.1	6.41	0.78	169	57.1	12.6	4.88	0.05
10	07152000	U	419	131	37.6	12.3	4.57	242	65.5	19.6	6.46	2.51	253	86.1	13.5	5.04	2.09
11	07152500	U	7,310	2,570	903	455	294	3,990	1,570	605	314	143	5,180	1,610	608	321	164
		R	12,700	4,700	1,600	1,070	762	7,470	2,380	620	375	295	4,930	1,700	499	361	231
12	07153000	U	108	16.7	3.68	0.92	0.36	46.5	8.03	1.27	0.22	0.01	65.0	8.00	1.33	0.17	0.00
13	07153100	R	0.69	0.03	0.01	0.01	0.00	0.04	0.03	0.01	0.01	0.00	0.05	0.03	0.01	0.01	0.00
14	07154500	U	24.4	2.72	0.05	0.02	0.01	31.5	4.32	0.56	0.03	0.02	6.61	1.35	0.04	0.02	0.01
		UI	2.98	0.00	0.00	0.00	0.00	5.52	0.17	0.00	0.00	0.00	2.41	0.00	0.00	0.00	0.00
15	07155000	U	66.3	5.38	0.04	0.02	0.01	111	14.1	0.05	0.02	0.01	13.2	0.04	0.02	0.01	0.00
16	07155590	U	0.02	0.00	0.00	0.00	0.00	6.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	07156900	U	72.2	44.5	35.7	31.3	28.2	75.2	54.0	38.0	31.6	27.9	73.0	54.4	40.2	30.2	26.3
		UI	33.8	25.8	19.8	17.7	16.5	32.4	25.2	20.4	18.2	17.0	32.0	26.9	22.2	20.3	19.2
18	07157000	U	108	44.7	24.0	17.4	13.2	108	45.1	21.9	15.0	8.87	78.7	47.8	24.8	17.4	12.4
19	07157500	U	53.6	9.89	0.04	0.02	0.01	35.5	7.54	0.04	0.02	0.01	28.2	5.98	0.03	0.01	0.01
		UI	11.5	4.92	2.16	1.05	0.46	11.9	4.13	1.45	0.64	0.22	8.27	4.07	1.80	0.96	0.56
20	07157900	U	1.84	0.96	0.51	0.37	0.27	1.70	0.98	0.54	0.29	0.16	1.89	1.05	0.74	0.60	0.42
21	07157950	U	93.1	8.72	0.00	0.00	0.00	54.6	4.57	0.00	0.00	0.00	84.3	2.47	0.00	0.00	0.00
22	07157960	U	4.99	0.79	0.00	0.00	0.00	5.79	0.22	0.00	0.00	0.00	5.34	0.18	0.00	0.00	0.00

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
23	07158000	U	280	51.4	0.71	0.00	0.00	176	26.8	0.00	0.00	0.00	169	15.7	0.00	0.00	0.00
24	07158400	U	13.1	6.24	2.44	1.14	0.55	12.4	4.89	2.67	1.75	1.18	15.3	6.49	3.36	2.52	1.85
25	07159000	U	14.3	1.51	0.00	0.00	0.00	8.00	0.83	0.00	0.00	0.00	9.47	0.42	0.00	0.00	0.00
26	07159100	U	714	211	79.5	55.0	42.0	509	162	48.1	30.5	21.1	518	129	41.5	27.7	16.9
27	07159750	U	90.2	46.7	25.3	19.0	15.2	71.7	33.5	18.3	14.4	12.1	111	37.7	20.4	15.8	12.9
28	07160000	U	1,300	380	168	120	89.1	917	328	111	71.4	49.4	1,000	311	109	80.6	64.2
29	07160350	U	26.9	10.8	6.20	4.37	3.60	16.1	7.83	4.65	3.67	3.04	13.2	7.54	4.69	3.47	2.87
30	07160500	U	64.5	15.7	5.48	2.80	1.35	37.3	11.0	4.38	3.03	1.86	51.0	11.4	4.38	2.59	1.08
31	07163000	U	1.26	0.11	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00
32	07163500	U	1,350	451	180	120	75.2	700	292	70.5	23.2	10.1	1,500	256	59.1	22.5	11.5
33	07164000	U	2,700	906	373	254	172	1,440	421	145	78.0	59.8	1,720	424	103	68.1	39.5
34	07164500	U	12,200	4,190	1,210	627	389	6,370	2,360	824	380	190	7,590	2,340	794	454	208
		R	16,200	6,810	2,790	1,560	1030	8,980	3,400	1,400	876	444	7,990	2,940	1,060	475	239
35	07164600	UUrb	9.19	2.48	1.36	1.04	0.82	4.80	1.78	1.16	0.95	0.83	6.87	1.79	0.94	0.73	0.56
36	07165500	R	18.6	0.87	0.00	0.00	0.00	9.03	0.24	0.00	0.00	0.00	20.2	0.38	0.00	0.00	0.00
37	07165562	UUrb	6.07	0.96	0.02	0.00	0.00	2.82	0.41	0.00	0.00	0.00	5.08	0.65	0.00	0.00	0.00
38	07165565	UUrb	3.38	0.66	0.05	0.00	0.00	1.26	0.21	0.00	0.00	0.00	2.63	0.41	0.00	0.00	0.00
39	07165570	R	18,500	7,770	3,230	2,000	1390	11,500	4,270	1,430	958	685	9,150	3,190	1,180	774	574
40	07170500	U	1,240	266	26.9	7.88	2.14	398	69.5	15.0	3.95	0.90	617	67.2	15.5	4.25	0.77
		R	3,320	335	75.0	41.5	26.1	624	99.2	39.1	26.8	20.2	897	86.9	37.2	26.1	17.5
41	07170700	U	3.26	0.35	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	3.23	0.01	0.00	0.00	0.00
		R	9.82	0.20	0.00	0.00	0.00	0.42	0.02	0.00	0.00	0.00	0.59	0.02	0.00	0.00	0.00
42	07171000	U	2,950	312	34.1	15.5	7.95	545	91.4	8.26	3.30	2.06	968	78.4	10.1	1.10	0.10
		R	3,880	444	91.1	51.8	26.3	838	120	42.4	28.3	19.2	1,240	115	38.3	25.8	17.1
43	07171400	R	4,420	723	59.6	32.4	12.1	888	92.0	31.2	10.5	3.15	1,420	77.9	13.2	5.17	1.59
44	07172000	U	105	23.4	3.87	0.51	0.00	33.0	6.37	0.26	0.00	0.00	49.7	5.82	0.12	0.00	0.00
45	07173000	U	172	22.9	10.9	5.57	2.84	38.0	16.9	7.92	3.90	1.37	52.7	14.8	8.06	3.34	1.90

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
46	07174200	U	81.8	10.7	1.42	0.10	0.00	18.7	2.57	0.09	0.00	0.00	50.6	2.97	0.17	0.00	0.00
47	07174400	R	2,580	96.6	32.7	25.6	21.7	81.8	38.2	26.0	19.5	14.6	78.3	32.6	19.0	14.3	11.5
48	07174600	U	10.7	2.44	0.09	0.00	0.00	3.89	0.28	0.00	0.00	0.00	15.3	0.64	0.00	0.00	0.00
49	07174700	R	609	54.6	24.7	17.0	12.5	84.5	31.7	18.2	14.6	10.8	343	49.5	18.6	12.8	7.88
50	07175000	U	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	07175500	R	2,870	231	48.9	36.6	29.1	196	64.5	41.3	34.8	28.5	223	58.2	36.9	29.3	23.3
52	07176000	U	4,990	474	83.1	29.7	16.1	1,170	147	19.9	6.39	0.04	2,360	150	25.6	3.54	0.03
		R	8,270	1,540	127	78.0	60.0	1,440	164	76.5	56.3	40.9	1,750	157	63.7	46.4	34.3
53	07176465	R	18.1	8.02	4.52	3.71	1.32	9.36	5.48	3.12	1.59	1.24	8.54	5.15	3.27	1.63	1.27
54	07176500	U	73.7	6.39	0.12	0.00	0.00	24.6	1.20	0.00	0.00	0.00	62.3	3.34	0.00	0.00	0.00
		R	148	32.7	15.7	10.2	5.79	49.4	21.2	8.37	5.65	4.44	50.4	21.0	7.76	5.10	4.00
55	07176800	U	0.68	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	3.90	0.02	0.00	0.00	0.00
56	07177000	U	49.9	8.15	1.06	0.00	0.00	17.1	2.76	0.10	0.00	0.00	33.5	3.38	0.18	0.00	0.00
57	07177500	U	148	31.5	8.17	2.57	0.75	61.0	13.5	3.34	1.12	0.04	115	15.0	2.97	0.55	0.04
		R	513	189	154	118	60.6	222	172	129	34.6	17.4	214	170	128	66.0	19.0
58	07177650	UUrb	0.88	0.20	0.02	0.00	0.00	0.38	0.09	0.00	0.00	0.00	0.62	0.22	0.01	0.00	0.00
59	07177800	UUrb	4.72	1.27	0.41	0.23	0.14	3.33	1.12	0.26	0.12	0.00	3.71	0.82	0.33	0.19	0.13
60	07178000	R	785	216	171	159	153	257	184	159	151	124	276	194	162	151	125
61	07178040	UUrb	35.6	7.21	2.77	2.10	1.55	18.9	3.92	2.13	1.69	1.46	45.2	8.34	2.65	2.02	1.51
62	07178200	R	1,200	281	205	182	171	406	252	195	178	169	464	265	202	181	170
63	07178600	U	11,700	870	131	53.3	35.3	1,850	251	50.7	26.2	15.4	2,590	208	54.7	24.1	13.1
64	07184000	U	33.9	4.62	0.39	0.03	0.00	8.79	0.97	0.02	0.00	0.00	21.6	0.83	0.00	0.00	0.00
65	07185000	U	6,510	992	218	73.7	29.3	1,710	409	90.6	9.49	0.05	3,880	342	48.4	1.61	0.03
		R	7,610	1,510	286	146	85.9	2,180	386	101	64.7	45.3	2,330	353	77.8	49.0	37.1
66	07185095	UUrb	14.7	4.21	2.21	0.71	0.45	5.55	2.42	1.51	1.12	0.41	11.8	3.24	1.58	0.90	0.62
67	07185500	U	0.61	0.14	0.00	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.43	0.04	0.00	0.00	0.00
68	07185700	U	267	145	76.6	58.4	42.8	159	95.1	53.9	44.0	37.2	155	92.2	49.1	38.4	32.8

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
69	07185765	U	330	177	84.3	61.2	49.3	183	118	56.5	47.0	41.0	204	115	60.7	45.7	38.9
70	07186000	U	642	247	111	72.6	53.0	295	143	72.9	49.9	33.2	328	128	69.3	46.7	33.3
71	07186400	U	134	77.3	45.6	36.3	30.8	82.1	50.6	33.8	26.0	21.7	92.5	49.5	31.6	24.2	20.1
72	07187000	U	413	229	134	108	82.6	247	154	96.0	76.9	63.7	230	138	89.7	71.0	56.7
73	07187500	U	484	213	116	71.4	54.1	407	170	102	46.6	35.0	367	168	87.8	71.1	57.1
74	07188000	U	1,760	729	347	241	178	769	431	224	162	123	1,000	409	214	153	106
75	07188500	U	45.6	20.2	6.44	2.38	1.57	21.3	10.1	3.76	1.70	1.40	18.9	7.58	3.14	1.03	0.69
76	07189000	U	513	248	131	99.8	80.0	275	149	81.9	64.5	51.6	259	131	73.8	53.6	39.6
77	07189500	U	4,910	1,600	717	361	240	3,250	1,000	487	209	74.9	3,500	1,080	426	289	165
78	07189540	U	4.48	2.87	1.90	1.68	1.57	3.08	2.30	1.83	1.65	1.56	2.98	2.32	1.92	1.71	1.59
79	07189542	U	31.0	13.4	8.56	6.87	5.80	16.0	9.20	6.76	5.35	4.17	13.1	8.37	5.62	4.69	4.33
80	07190500	R	12,700	5,000	1,600	422	79.8	6,580	3,250	880	115	39.2	7,010	2,600	344	63.3	29.0
81	07191000	U	71.5	9.72	2.59	1.57	1.11	18.3	3.95	1.47	0.93	0.72	31.3	3.41	1.21	0.79	0.50
82	07191220	U	68.5	39.6	21.0	14.1	8.80	46.2	26.5	14.0	8.90	6.41	43.7	23.9	13.4	9.93	6.45
83	07191500	R	14,600	5,670	1,130	322	221	7,930	3,350	480	239	183	7,690	2,150	289	181	147
84	07192000	U	35.5	2.64	0.04	0.02	0.01	15.3	1.38	0.04	0.02	0.01	15.1	0.31	0.03	0.01	0.01
85	07192500	R	10,800	5,090	2,370	1,370	273	5,840	3,440	2,110	1,100	87.1	5,750	3,010	1,320	954	280
86	07193500	R	12,300	5,310	1,980	733	182	5,970	3,110	813	125	16.8	7,600	3,120	508	71.0	16.4
87	07194500	U	27,400	9,370	3,510	2,250	1230	16,100	5,420	2,610	1,660	499	20,600	5,810	2,660	1,700	1,190
		R	49,000	19,300	5,490	3,780	2900	19,400	8,840	4,300	2,890	2,240	21,000	9,740	4,320	2,500	1,860
88	07194800	U	61.5	20.4	11.0	7.61	5.77	24.7	13.2	8.12	6.11	2.79	21.0	12.5	8.36	7.19	5.30
89	07195000	U	135	72.6	43.4	28.7	20.2	94.4	61.4	36.1	24.8	16.8	93.5	60.5	32.8	23.9	18.3
90	07195430	U	430	228	142	120	63.5	250	170	126	109	82.4	227	166	125	106	92.3
91	07195500	U	376	210	125	91.3	70.1	264	162	103	77.5	56.7	272	150	97.2	76.3	60.1
92	07195800	U	10.6	6.20	3.92	2.64	1.91	8.78	4.91	3.09	2.25	1.69	9.12	5.17	3.07	2.16	1.76
93	07195855	R	38.1	16.4	7.95	5.43	3.58	24.2	13.1	6.06	4.11	1.45	20.0	10.3	6.11	4.32	2.75

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
94	07195865	U	20.3	9.72	6.61	5.02	4.16	11.7	7.70	5.31	4.41	3.69	10.8	7.61	5.67	4.49	3.62
95	07196000	U	76.2	37.8	22.3	17.1	12.6	52.6	29.3	16.9	12.7	10.0	53.1	27.7	17.3	13.7	11.8
96	07196500	U	586	293	158	118	81.3	380	210	119	83.5	46.7	386	193	109	74.2	46.2
97	07196900	U	12.0	3.67	1.22	0.70	0.38	5.13	1.99	0.53	0.27	0.12	7.29	1.64	0.51	0.26	0.05
98	07196973	U	16.3	6.29	0.48	0.01	0.00	5.45	1.84	0.00	0.00	0.00	4.51	0.79	0.00	0.00	0.00
99	07197000	U	167	72.6	35.9	23.1	16.3	87.6	44.6	22.4	13.2	7.13	85.8	39.4	18.3	11.3	5.14
100	07197360	U	61.0	20.0	13.8	11.5	9.22	26.4	14.5	8.48	5.48	4.24	24.4	16.9	11.1	8.57	6.60
101	07198000	U	1,460	653	337	253	189	689	350	206	168	138	708	337	190	155	136
		R	1,680	868	136	97.9	76.0	1,380	719	137	93.4	69.6	1,100	354	106	70.1	41.3
102	07228500	U	698	45.9	6.75	0.05	0.02	499	36.7	3.87	0.04	0.02	266	22.7	2.72	0.04	0.02
		R	177	41.5	11.1	5.45	2.29	101	19.1	5.31	2.60	0.00	130	27.5	9.02	4.53	1.30
103	07229100	R	98.4	12.7	5.06	3.68	1.87	88.6	9.14	4.55	2.87	2.39	189	61.2	7.50	5.22	4.29
104	07229200	R	545	203	59.8	34.7	8.57	362	83.5	19.7	9.98	2.45	420	131	28.5	12.0	3.86
105	07229300	U	44.1	15.8	1.16	0.51	0.32	30.5	9.46	0.79	0.30	0.17	37.3	10.4	1.18	0.37	0.20
106	07230000	U	28.6	7.80	0.48	0.19	0.13	12.1	3.60	0.33	0.11	0.03	12.2	3.04	0.20	0.11	0.03
		R	1.14	0.70	0.41	0.26	0.19	1.01	0.67	0.39	0.29	0.20	0.97	0.65	0.39	0.25	0.18
107	07230500	U	90.1	22.6	1.88	0.03	0.02	29.1	9.94	1.22	0.03	0.02	27.8	7.50	0.54	0.03	0.02
		R	56.0	11.4	2.70	0.38	0.00	18.2	5.20	0.61	0.00	0.00	27.9	6.38	0.98	0.00	0.00
108	07231000	U	395	64.6	17.0	6.33	3.31	102	26.5	5.45	1.18	0.04	84.9	19.5	4.32	0.12	0.03
		R	165	29.7	4.47	1.28	0.17	45.2	10.0	0.86	0.01	0.00	98.3	12.6	0.84	0.07	0.00
109	07231500	U	3,190	472	57.0	14.7	5.88	1,670	275	28.0	4.40	0.29	1,500	155	12.6	0.29	0.03
		R	1,010	214	41.4	18.0	6.26	468	113	17.6	4.23	0.00	949	174	28.6	9.86	1.78
110	07232000	U	130	9.86	1.39	0.28	0.04	45.3	4.00	0.13	0.03	0.01	72.9	3.21	0.14	0.03	0.02
111	07232500	U	16.7	2.81	0.32	0.00	0.00	10.7	1.42	0.00	0.00	0.00	5.60	1.11	0.11	0.00	0.00
		UI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	07232900	UI	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.02	0.01	0.01	0.08	0.05	0.02	0.01	0.01
113	07233000	U	9.44	0.19	0.02	0.01	0.01	2.42	0.04	0.01	0.01	0.00	0.05	0.03	0.01	0.01	0.00

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
114	07233500	U	19.9	2.16	0.00	0.00	0.00	7.75	1.44	0.00	0.00	0.00	5.38	0.49	0.00	0.00	0.00
115	07233650	R	0.45	0.05	0.00	0.00	0.00	0.25	0.03	0.00	0.00	0.00	0.36	0.07	0.00	0.00	0.00
116	07234000	RI	13.2	0.30	0.00	0.00	0.00	1.86	0.05	0.00	0.00	0.00	0.39	0.01	0.00	0.00	0.00
		U	130	17.7	0.00	0.00	0.00	67.2	1.42	0.00	0.00	0.00	23.9	0.00	0.00	0.00	0.00
117	07234100	U	2.47	1.46	1.02	0.71	0.39	2.22	1.33	0.90	0.71	0.48	2.45	1.57	1.02	0.76	0.55
118	07234500	U	244	41.7	0.05	0.02	0.01	121	8.38	0.03	0.01	0.01	95.6	0.05	0.02	0.01	0.00
119	07235000	R	7.65	1.66	0.34	0.03	0.00	6.49	0.65	0.14	0.08	0.00	9.92	2.50	0.72	0.34	0.00
		RI	6.22	2.28	0.70	0.46	0.28	2.59	1.06	0.53	0.38	0.26	1.77	0.78	0.47	0.36	0.27
120	07236000	U	92.1	24.1	1.09	0.04	0.02	35.6	5.72	0.03	0.02	0.01	22.1	2.83	0.02	0.01	0.01
121	07237000	R	31.2	2.05	0.59	0.35	0.15	5.16	1.27	0.45	0.14	0.03	3.75	1.19	0.48	0.05	0.02
		RI	34.5	5.18	1.50	1.20	0.94	7.24	1.83	0.99	0.81	0.73	6.42	1.88	0.82	0.65	0.55
122	07237500	U	363	55.1	0.40	0.00	0.00	116	12.5	0.00	0.00	0.00	84.6	3.66	0.00	0.00	0.00
		RI	148	50.0	14.2	5.71	3.70	58.6	22.0	8.87	3.21	1.97	43.9	13.6	4.44	2.68	1.49
123	07238000	U	449	81.5	0.59	0.00	0.00	145	14.9	0.00	0.00	0.00	103	11.3	0.00	0.00	0.00
		RI	206	75.0	22.1	8.60	4.12	82.1	36.7	8.58	1.91	0.68	64.1	21.1	6.30	0.86	0.13
124	07239000	U	274	40.1	0.05	0.02	0.01	71.9	1.07	0.02	0.01	0.01	93.4	0.04	0.02	0.01	0.00
		R	297	22.4	5.52	3.00	1.90	48.9	14.1	4.28	2.74	1.90	47.9	12.0	4.30	2.64	1.79
125	07239300	R	472	46.4	19.7	11.9	8.79	215	37.7	20.8	11.7	6.85	127	32.5	12.3	7.90	5.37
126	07239450	R	573	72.8	32.3	16.5	10.5	316	49.9	25.5	13.3	6.52	231	40.8	17.2	10.8	5.70
127	07239500	U	429	116	25.2	6.52	0.71	267	34.9	1.02	0.03	0.01	138	11.8	0.03	0.01	0.01
		R	456	67.0	15.2	4.63	0.64	168	32.2	4.09	0.00	0.00	185	30.2	2.96	0.00	0.00
128	07241000	R	238	14.2	2.50	1.14	0.33	102	7.57	1.58	0.55	0.00	89.8	11.0	1.81	0.45	0.00
129	07241500	R	650	119	47.2	37.6	32.3	145	51.8	35.2	30.6	28.3	96.0	41.0	30.0	26.4	23.9
130	07241520	R	740	215	62.0	41.3	29.9	431	139	56.0	35.0	24.0	396	132	51.8	41.6	28.9
131	07241550	R	621	207	104	80.5	70.2	338	149	79.7	62.0	54.7	375	162	88.7	66.0	57.9
132	07242000	R	1,050	360	150	84.3	50.7	485	202	87.8	52.3	34.9	555	200	75.8	46.9	27.2
133	07242350	UUrb	43.1	28.5	14.4	9.72	8.00	41.9	25.8	11.6	7.33	5.86	38.0	26.0	11.4	6.68	3.26

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
134	07242380	R	310	47.1	24.6	19.4	16.0	171	29.3	18.9	14.4	12.3	192	43.3	17.5	12.1	10.4
135	07243000	U	5.67	2.08	0.00	0.00	0.00	2.03	0.36	0.00	0.00	0.00	4.00	0.26	0.00	0.00	0.00
136	07243500	U	729	152	46.0	28.6	18.7	247	66.6	21.1	10.5	5.50	364	67.4	15.7	7.02	3.19
137	07244000	U	1,790	276	83.4	57.2	47.1	344	80.1	29.8	18.9	13.9	372	56.3	22.3	12.6	7.61
138	07245000	U	9,360	2,670	610	238	122	3,370	1,040	272	148	57.0	4,110	671	164	56.8	12.7
		R	7,580	3,920	1,020	306	134	5,510	3,100	768	228	113	3,750	1,250	215	108	80.0
139	07245500	U	73.3	17.9	3.92	1.22	0.32	26.0	7.45	1.23	0.27	0.19	31.6	5.81	1.03	0.21	0.15
140	07247000	U	32.8	5.28	1.44	0.54	0.10	12.7	2.89	0.46	0.07	0.00	14.8	2.86	0.41	0.00	0.00
141	07247015	U	46.4	13.0	3.21	1.78	0.95	7.70	3.89	2.19	1.44	0.50	27.5	4.36	1.51	0.98	0.56
142	07247250	U	28.5	5.88	0.93	0.28	0.00	3.91	0.77	0.00	0.00	0.00	5.35	0.25	0.00	0.00	0.00
143	07247500	U	20.6	3.26	0.45	0.10	0.00	8.26	1.85	0.08	0.00	0.00	19.4	2.62	0.08	0.00	0.00
144	07248500	U	136	47.4	18.9	8.93	4.71	126	21.1	2.07	0.61	0.04	88.0	18.8	0.86	0.30	0.03
		R	250	24.5	8.61	4.11	1.66	106	17.6	8.00	4.55	1.14	105	15.0	7.19	4.07	0.85
145	07249400	U	28.9	7.98	2.48	1.04	0.55	11.0	3.96	1.00	0.24	0.04	14.8	3.89	0.97	0.31	0.00
146	07249413	R	668	97.8	32.4	23.1	15.8	181	41.8	21.3	16.9	12.4	336	70.1	23.3	17.9	13.8
147	07249500	U	8.32	1.38	0.40	0.12	0.10	3.46	0.82	0.11	0.04	0.02	4.65	0.92	0.11	0.04	0.02
148	07249985	U	91.6	19.9	5.18	2.10	0.94	32.8	6.70	1.26	0.04	0.00	44.5	5.77	0.41	0.00	0.00
149	07250000	U	77.9	18.3	4.17	1.50	0.69	34.4	6.72	1.10	0.00	0.00	50.3	6.07	0.41	0.00	0.00
150	07250550	U	53,700	14,800	5,470	3,190	2330	20,700	8,260	3,930	2,390	1,060	25,600	8,020	3,350	1,590	962
		R	50,600	23,800	10,900	6,310	2970	25,100	12,900	6,070	3,560	1,580	25,000	9,850	3,560	1,550	460
151	07299200	U	27.5	1.07	0.09	0.00	0.00	44.0	1.54	0.04	0.00	0.00	50.3	2.57	0.14	0.03	0.00
152	07299300	U	1.15	0.17	0.05	0.00	0.00	2.84	0.22	0.01	0.00	0.00	9.78	0.58	0.10	0.02	0.00
153	07299540	U	59.5	4.83	0.79	0.32	0.11	87.2	5.15	0.97	0.36	0.11	113	9.98	1.72	0.82	0.38
154	07299570	U	68.1	3.61	0.10	0.00	0.00	52.5	2.24	0.06	0.00	0.00	98.9	10.1	0.63	0.04	0.00
155	07299670	U	17.6	7.51	2.36	0.60	0.02	18.0	6.98	1.77	0.26	0.00	21.1	8.05	2.51	0.93	0.37
156	07299890	U	1.28	0.59	0.03	0.00	0.00	1.06	0.43	0.03	0.00	0.00	1.18	0.64	0.31	0.14	0.00
157	07300500	U	43.5	3.38	0.00	0.00	0.00	17.9	0.00	0.00	0.00	0.00	28.7	0.42	0.00	0.00	0.00

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
158	07301110	U	184	81.1	29.5	11.7	7.45	177	84.7	31.3	13.3	6.92	138	54.2	16.9	9.09	3.30
159	07301300	U	0.82	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	2.70	0.00	0.00	0.00	0.00
160	07301410	U	7.95	2.74	0.75	0.36	0.21	4.08	1.05	0.29	0.14	0.05	6.67	1.35	0.38	0.15	0.03
161	07301420	U	17.2	8.56	2.47	1.06	0.62	10.0	2.38	0.72	0.36	0.15	13.3	2.95	0.62	0.33	0.16
162	07301500	U	89.6	12.8	0.00	0.00	0.00	35.2	0.01	0.00	0.00	0.00	40.5	0.61	0.00	0.00	0.00
163	07303000	R	2.17	0.44	0.00	0.00	0.00	1.22	0.24	0.00	0.00	0.00	1.19	0.24	0.00	0.00	0.00
164	07303400	U	25.5	11.1	2.23	0.65	0.35	23.3	9.16	2.17	0.70	0.27	31.2	11.4	5.41	2.91	0.75
165	07303500	U	64.5	16.1	2.73	0.51	0.07	51.3	10.3	2.17	0.94	0.00	66.9	22.3	3.64	0.54	0.00
166	07304500	U	43.8	11.5	0.26	0.00	0.00	23.0	5.37	0.00	0.00	0.00	24.2	5.41	0.00	0.00	0.00
		R	37.2	13.2	2.48	0.62	0.31	29.7	6.91	1.34	0.40	0.00	42.8	8.41	1.68	0.50	0.20
167	07305000	R	225	71.5	17.7	4.91	0.55	136	37.2	7.43	0.79	0.00	216	44.0	6.66	1.05	0.00
168	07305500	R	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00
169	07307028	R	454	163	68.3	47.2	38.3	346	111	42.9	29.7	21.0	417	134	34.9	18.7	8.30
170	07308500	U	987	284	87.4	29.4	6.00	748	201	57.2	20.7	0.62	1,200	290	70.5	30.2	10.3
171	07311000	U	93.6	33.4	13.8	8.26	5.09	33.5	16.2	5.66	3.20	1.72	32.5	13.3	4.71	1.84	0.04
		R	101	32.2	17.1	12.3	9.49	71.3	26.0	15.6	12.0	8.54	94.3	29.8	17.1	13.4	10.9
172	07311200	R	1.62	0.19	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00
173	07311500	U	23.2	3.01	0.16	0.00	0.00	14.5	1.49	0.00	0.00	0.00	32.0	2.31	0.00	0.00	0.00
174	07313000	U	17.0	4.23	0.11	0.03	0.01	5.37	0.37	0.03	0.01	0.01	6.48	0.04	0.02	0.01	0.00
175	07313500	U	37.8	4.50	0.00	0.00	0.00	13.7	1.11	0.00	0.00	0.00	28.8	1.52	0.00	0.00	0.00
		R	12.6	2.52	0.00	0.00	0.00	8.23	2.92	0.00	0.00	0.00	8.76	3.48	0.00	0.00	0.00
176	07315500	R	2,060	688	304	217	179	1,280	462	224	179	154	2,630	511	205	149	119
177	07315700	U	24.1	4.17	0.33	0.00	0.00	11.8	1.01	0.00	0.00	0.00	46.9	2.92	0.00	0.00	0.00
178	07316000	R	2,940	952	386	265	210	1,460	533	245	184	153	2,740	667	242	167	130
179	07316500	U	19.3	2.82	0.00	0.00	0.00	5.10	0.00	0.00	0.00	0.00	4.79	0.00	0.00	0.00	0.00
180	07319500	U	2.47	0.79	0.21	0.00	0.00	1.80	0.57	0.00	0.00	0.00	1.59	0.60	0.00	0.00	0.00

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
181	07323000	U	5.13	0.95	0.12	0.00	0.00	2.81	0.50	0.00	0.00	0.00	3.54	0.62	0.00	0.00	0.00
182	07324200	U	56.8	19.3	1.31	0.05	0.00	34.1	8.15	0.25	0.00	0.00	27.4	8.20	0.31	0.00	0.00
183	07324400	R	31.7	7.78	4.29	2.45	1.48	26.7	7.45	4.27	2.83	0.94	13.5	6.57	4.06	1.07	0.41
184	07325000	U	142	48.9	14.9	5.07	0.55	68.8	18.5	5.76	0.79	0.04	71.9	12.6	2.12	0.04	0.02
		R	112	29.9	11.7	6.54	3.26	79.6	23.6	9.46	5.58	3.91	78.4	23.8	9.94	6.75	3.97
185	07325500	U	368	130	54.3	26.4	15.2	226	78.9	35.0	20.7	10.5	262	76.2	31.5	20.2	10.6
186	07325800	U	19.3	9.19	4.64	3.27	1.17	17.3	7.58	3.63	2.76	1.64	18.5	8.98	4.26	3.06	2.33
187	07326000	U	30.2	17.9	11.0	7.23	5.40	20.0	11.3	5.46	2.75	1.81	21.0	10.4	5.35	2.18	1.27
		R	4.85	2.78	1.93	1.50	1.01	4.75	2.80	1.99	1.60	1.34	4.04	2.69	2.03	1.76	1.62
188	07326500	R	654	158	63.8	34.1	18.5	398	111	52.8	35.3	20.0	477	118	59.0	39.3	29.8
189	07327000	U	4.43	0.45	0.03	0.02	0.01	1.59	0.10	0.02	0.01	0.01	11.0	0.56	0.03	0.01	0.01
190	073274406	U	1.43	0.55	0.08	0.03	0.00	1.20	0.29	0.06	0.01	0.00	0.97	0.24	0.06	0.03	0.00
191	07327442	U	5.40	1.74	0.34	0.09	0.00	3.83	0.95	0.10	0.02	0.00	3.55	0.69	0.24	0.03	0.02
192	07327447	U	24.2	7.93	2.54	0.88	0.07	18.4	5.14	1.37	0.78	0.13	17.8	5.01	2.09	1.10	0.81
193	07327490	U	24.5	8.20	1.54	0.04	0.02	14.9	4.96	0.05	0.02	0.01	19.9	5.64	0.37	0.04	0.02
194	07327550	U	49.8	20.4	5.24	1.93	0.65	45.5	11.9	3.06	1.64	0.00	47.0	12.9	5.03	2.87	1.77
195	07328000	U	784	399	222	136	74.7	441	200	103	66.9	38.0	394	148	69.9	47.5	10.4
196	07328070	U	7.18	2.06	0.45	0.13	0.00	3.85	1.45	0.32	0.03	0.00	4.59	1.62	0.44	0.22	0.06
197	07328100	R	926	256	89.4	43.0	22.9	567	157	66.5	38.9	14.0	718	186	82.7	50.6	36.2
198	07328180	U	2.40	0.51	0.06	0.00	0.00	1.45	0.30	0.00	0.00	0.00	1.96	0.35	0.00	0.00	0.00
199	07328500	U	1,030	489	255	132	73.3	513	249	127	52.1	15.0	414	160	65.8	19.4	3.55
		R	1,100	354	113	44.4	17.5	663	195	79.7	27.2	2.69	959	264	82.8	55.2	29.3
200	07329000	U	39.2	15.4	7.45	3.84	1.69	18.2	7.76	3.00	1.38	0.11	24.0	7.34	2.36	0.30	0.00
201	07329500	U	27.5	5.25	0.00	0.00	0.00	15.0	2.53	0.00	0.00	0.00	26.6	6.49	0.00	0.00	0.00
202	07329700	R	76.0	22.3	6.44	1.55	0.80	38.0	11.3	2.53	0.47	0.21	90.9	18.0	2.07	0.88	0.10
203	07329852	U	23.8	12.3	7.46	5.82	3.54	18.9	10.7	6.67	4.19	2.54	23.7	10.6	5.66	2.69	2.01
204	07329900	U	25.0	10.8	5.00	3.11	2.17	17.4	8.70	4.70	2.97	1.77	17.2	10.2	5.05	3.88	2.38

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
205	07330500	U	34.3	6.25	1.89	0.85	0.29	16.3	1.08	0.04	0.02	0.01	11.8	1.40	0.03	0.02	0.01
206	07331000	U	1,400	640	274	168	107	734	339	172	86.7	38.4	1,000	292	124	45.1	14.0
		R	1,760	500	162	72.0	40.8	1,080	268	106	26.8	12.6	1,660	425	127	70.9	41.9
207	07331600	U	5,480	2,070	922	549	429	3,610	1,410	587	444	298	5,450	1,750	632	418	284
		R	6,260	3,820	1,880	486	160	4,580	3,030	1,580	379	181	3,840	2,270	530	181	99.0
208	07332400	U	98.2	60.1	38.8	31.4	28.1	60.5	45.4	34.5	28.6	19.8	63.4	41.6	32.3	28.5	22.8
209	07332500	U	145	70.5	33.1	22.2	15.1	85.7	46.1	25.1	15.8	4.15	98.1	41.8	23.7	15.0	3.67
210	07332600	U	3.40	0.38	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	4.20	0.00	0.00	0.00	0.00
211	07333500	U	2.11	0.13	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	2.83	0.08	0.00	0.00	0.00
212	07333800	U	7.23	0.69	0.00	0.00	0.00	5.08	0.11	0.00	0.00	0.00	12.9	0.61	0.00	0.00	0.00
213	07334000	U	117	24.1	3.87	1.22	0.40	62.4	10.1	1.04	0.10	0.00	106	11.4	1.62	0.00	0.00
		R	261	42.7	20.6	17.3	15.1	88.4	24.6	16.6	13.8	12.2	208	29.0	14.9	12.8	11.7
214	07335000	U	136	40.6	14.8	6.77	1.84	50.8	20.3	7.95	3.19	0.08	104	23.9	7.68	2.17	0.00
215	07335300	R	812	185	78.0	48.8	35.4	375	102	40.4	26.1	15.7	670	130	46.0	22.1	15.6
216	07335400	R	112	23.4	0.00	0.00	0.00	9.19	0.00	0.00	0.00	0.00	6.27	0.00	0.00	0.00	0.00
217	07335500	R	8,980	4,670	2,620	1,890	1360	5,650	3,560	2,200	1,580	1,100	6,190	2,920	1,490	1,020	657
218	07335700	U	14.2	2.14	0.13	0.00	0.00	3.38	0.46	0.00	0.00	0.00	5.49	0.54	0.00	0.00	0.00
219	07335790	R	152	21.5	5.51	2.38	1.32	55.3	6.73	1.76	0.26	0.00	126	8.49	1.38	0.11	0.00
220	07336000	U	5.48	0.33	0.00	0.00	0.00	2.24	0.00	0.00	0.00	0.00	11.1	0.10	0.00	0.00	0.00
221	07336200	U	177	57.6	22.3	12.1	6.09	156	32.1	0.79	0.00	0.00	308	28.3	1.11	0.00	0.00
		R	319	57.2	17.9	7.80	2.90	114	15.4	3.63	0.69	0.00	203	22.9	2.78	0.00	0.00
222	07336500	U	302	55.0	11.3	4.00	1.05	151	26.3	1.05	0.04	0.02	244	36.9	3.71	0.04	0.02
223	07336750	U	0.51	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00
224	07336800	U	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00
225	07336820	R	11,600	5,170	3,070	2,290	1800	7,750	4,230	2,580	1,960	1,520	8,230	3,430	1,770	1,260	846
226	07337500	U	177	27.0	4.44	1.84	1.01	99.2	15.2	1.07	0.10	0.03	190	23.0	1.09	0.04	0.02
		R	216	48.4	15.0	10.2	7.44	107	26.3	12.7	8.57	5.08	247	32.8	17.1	12.6	8.97

Table 6. July, August, and September flow duration statistics for selected streamflow-gaging stations and periods of record. —Continued

[Map No.: See figure 1; USGS, U.S. Geological Survey; ID, identifier; Type of record, period of record type where flow statistics were computed, years are listed for each station and type of record in table 1; U, unregulated; UI, unregulated irrigated; R, regulated; RI, regulated irrigated; UUrb, unregulated urban; *JULDxx*, first three letters indicate the month where daily mean discharge is equaled or exceeded xx percent of the time, in cubic feet per second]

Map no.	USGS station ID	Type of record	Monthly flow-duration statistics														
			$JULD_{20}$	$JULD_{50}$	$JULD_{80}$	$JULD_{90}$	$JULD_{95}$	$AUGD_{20}$	$AUGD_{50}$	$AUGD_{80}$	$AUGD_{90}$	$AUGD_{95}$	$SEPD_{20}$	$SEPD_{50}$	$SEPD_{80}$	$SEPD_{90}$	$SEPD_{95}$
227	07337900	U	71.0	15.3	3.99	1.77	0.73	33.2	8.19	1.86	0.27	0.00	90.2	8.52	1.53	0.17	0.00
228	07338500	U	302	75.8	23.7	13.7	8.74	152	39.6	10.5	4.74	1.18	282	47.5	8.72	3.39	1.97
		R	500	143	49.9	31.9	23.6	257	69.5	37.4	24.3	17.2	522	75.1	36.6	27.5	21.1
229	07338750	U	177	33.9	9.05	4.73	3.02	31.5	10.6	3.88	2.31	1.79	92.1	14.5	3.27	1.85	1.24
230	07339000	U	281	59.0	12.8	4.86	1.02	166	30.8	3.71	0.05	0.02	198	39.3	4.73	0.09	0.03
		R	1,580	617	280	192	159	1,250	568	289	198	169	794	404	215	173	152
231	07339500	U	51.2	9.80	2.52	1.73	1.34	25.5	6.81	1.77	0.64	0.34	31.0	6.10	1.61	0.33	0.10
232	07340300	U	59.1	24.7	15.3	12.4	10.5	29.7	17.6	12.3	10.4	9.37	36.7	18.2	12.1	9.95	8.35
233	07340500	U	142	40.3	16.1	10.9	8.08	75.5	26.0	12.3	6.66	4.07	91.9	23.4	10.5	5.92	3.44
234	07341000	U	34.4	6.12	0.72	0.26	0.18	13.4	3.20	0.45	0.10	0.00	28.2	3.38	0.31	0.07	0.00
235	07341200	U	53.0	13.6	2.71	1.11	0.74	18.8	5.47	1.67	0.82	0.67	39.0	5.22	1.60	1.13	0.89

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (*http://water.usgs.gov/osw/streamstats/bcdefinitions1*, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no. (fig. 1)	USGS station ID	Regression region[1]	Contributing drainage area, in square miles *(CONTDA)*	10-85 channel slope, in percent *(CSL10_85fm)*	Drainage basin hillslope, in percent *(BSLDEM10M)*	Soil permeability in inches per hour *(SOILPERM)*	Percent forest canopy *(CANOPY_PCT)*	Outlet elevation, in feet above NAVD 1988 *(OUTLETELEV)*
3	07148350	1	827	9.40	5.97	2.63	0.64	1,410
4	07148400	1	982	8.43	6.07	2.63	0.71	1,300
5	07149000	1	885	7.96	5.95	2.42	1.68	1,290
6	07149500	1	2,360	7.99	5.32	2.52	1.18	1,160
9	07151500	1	813	7.67	2.21	2.60	2.50	1,110
10	07152000	1	1,870	6.58	2.13	1.66	2.39	964
12	07153000	2	538	3.39	3.68	0.78	6.12	821
24	07158400	1	181	8.45	4.52	1.66	5.50	1,100
27	07159750	1	320	4.77	3.06	0.65	7.89	950
30	07160500	1	412	5.67	2.08	1.09	2.07	923
41	07170700	2	36.8	8.80	3.35	0.51	7.72	801
44	07172000	2	429	7.02	6.43	0.47	4.25	767
45	07173000	2	711	5.45	6.70	0.61	8.09	710
46	07174200	2	503	4.92	5.65	0.70	10.6	692
48	07174600	2	138	9.67	7.35	1.07	18.8	697
54	07176500	2	369	6.05	6.96	0.99	15.8	652
55	07176800	2	31.4	15.2	7.95	1.10	20.7	682
56	07177000	2	340	4.50	7.27	1.05	17.3	714
57	07177500	2	907	4.09	6.95	0.99	17.6	583
64	07184000	2	196	3.43	1.79	0.46	5.97	821
67	07185500	2	4.02	27.0	3.35	1.43	8.25	1,190
68	07185700	2	306	6.04	3.97	1.28	12.9	1,020
69	07185765	2	448	5.18	3.78	1.28	15.6	930
70	07186000	2	1,160	2.51	2.64	1.09	10.8	839
72	07187000	3	427	5.83	5.47	1.31	24.8	890
74	07188000	2	2,520	2.07	3.22	1.11	15.4	746
76	07189000	3	851	6.81	14.2	1.59	45.1	760
78	07189540	3	8.00	28.5	2.85	1.00	8.41	930
79	07189542	3	48.6	23.2	6.12	1.34	20.8	800
81	07191000	2	450	4.45	3.02	0.76	7.99	632
82	07191220	3	132	14.2	9.61	1.53	35.6	878
84	07192000	2	227	3.71	3.91	1.00	15.0	589
88	07194800	3	167	13.4	8.18	1.40	31.7	1,030
89	07195000	3	130	15.8	4.22	1.28	12.4	1,060
90	07195430	3	568	7.08	7.58	1.39	26.1	933

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (*http://water.usgs.gov/osw/streamstats/bcdefinitions1*, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no.	Mean drainage-basin elevation, in feet above NAVD 1988 *(ELEV)*	Mean annual precipitation[2] in inches *(PRECIPOUT)*	Mean winter-spring precipitation[2], in inches *(PREG_11_05)*	Mean summer-autumn precipitation[2], in inches *(PREG_06_10)*	Mean April precipitation[2] in inches *(APRAVPRE)*	Mean June precipitation[2] in inches *(JUNAVPRE)*	Mean December precipitation[2] in inches *(DECAVPRE)*
3	1,870	27.6	13.4	14.2	2.48	3.62	1.00
4	1,820	28.9	14.6	14.3	2.63	3.62	1.07
5	1,820	29.5	14.5	15.0	2.64	3.95	1.07
6	1,730	30.5	15.3	15.1	2.71	3.75	1.22
9	1,520	32.5	16.3	16.2	2.99	4.25	1.29
10	1,360	35.8	17.9	17.9	3.64	4.40	1.49
12	1,040	39.5	20.7	18.7	3.73	4.12	1.83
24	1,300	31.7	16.3	15.4	2.87	4.04	1.38
27	1,130	35.6	19.2	16.4	3.21	4.44	1.92
30	1,120	34.0	17.7	16.3	3.27	4.42	1.59
41	945	43.7	22.1	21.7	3.89	5.33	2.16
44	1,130	39.9	20.3	19.6	3.53	4.65	1.88
45	1,050	37.4	19.5	17.9	3.58	4.07	1.75
46	906	39.2	20.8	18.5	3.74	4.40	1.97
48	952	40.1	21.1	19.0	3.87	4.60	2.03
54	922	41.2	21.9	19.4	3.91	4.66	2.13
55	885	41.3	21.9	19.4	3.91	4.67	2.12
56	878	40.9	21.7	19.2	3.89	4.58	2.12
57	870	41.3	22.2	19.1	3.83	4.57	2.29
64	928	43.7	22.4	21.3	4.10	4.96	2.21
67	1,280	45.0	24.0	21.0	4.17	5.18	2.95
68	1,280	45.1	24.0	21.1	4.25	5.26	2.86
69	1,230	45.0	23.6	21.4	4.35	5.36	2.73
70	1,080	45.2	23.6	21.6	4.19	5.19	2.61
72	1,230	45.4	24.2	21.2	4.29	5.22	2.79
74	1,070	45.6	24.7	20.9	4.19	4.67	2.64
76	1,200	44.7	24.6	20.1	4.17	4.88	2.99
78	1,020	45.6	25.3	20.3	4.23	4.92	3.11
79	1,050	45.5	25.2	20.3	4.20	4.89	3.07
81	781	44.6	24.3	20.3	4.03	4.63	2.79
82	1,210	47.1	26.4	20.7	4.31	5.02	3.34
84	729	43.4	23.5	20.0	4.06	4.83	2.45
88	1,300	47.2	27.0	20.2	4.38	5.06	3.42
89	1,280	46.9	26.7	20.1	4.31	5.09	3.41
90	1,250	47.7	26.9	20.8	4.39	5.04	3.48

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (*http://water.usgs.gov/osw/streamstats/bcdefinitions1*, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no. (fig. 1)	USGS station ID	Regression region[1]	Contributing drainage area, in square miles *(CONTDA)*	10-85 channel slope, in percent *(CSL10_85fm)*	Drainage-basin hillslope, in percent *(BSLDEM10M)*	Soil permeability in inches per hour *(SOILPERM)*	Percent forest canopy (*CANOPY_PCT*)	Outlet elevation, in feet above NAVD 1988 (*OUTLETELEV*)
91	07195500	3	630	6.59	7.61	1.39	26.4	901
92	07195800	3	14.7	38.2	6.49	1.58	26.3	1,180
94	07195865	3	19.1	22.4	3.32	1.27	11.8	980
95	07196000	3	116	15.3	6.79	1.42	25.2	861
96	07196500	3	950	4.54	9.59	1.51	32.2	680
97	07196900	3	41.1	39.0	11.2	1.52	39.7	1,000
98	07196973	3	24.9	32.8	10.5	1.49	32.3	814
99	07197000	3	312	10.3	12.4	1.62	42.3	720
100	07197360	3	90.2	21.9	10.5	1.54	38.8	640
101	07198000	3	1,610	3.83	10.4	1.55	36.9	480
105	07229300	2	202	6.61	4.92	1.48	12.8	1,030
107	07230500	3	463	5.54	6.04	1.44	34.1	902
108	07231000	3	888	3.30	6.25	1.37	34.4	742
122	07237500	1	8,380	9.21	2.91	2.59	0.33	1,840
123	07238000	1	9,060	8.58	2.96	2.80	0.74	1,680
135	07243000	3	68.4	13.8	4.46	1.46	19.5	840
136	07243500	3	2,000	2.41	5.35	1.46	26.5	645
137	07244000	3	2,300	1.98	5.23	1.43	27.0	587
139	07245500	3	181	13.2	12.0	1.59	48.5	475
140	07247000	3	204	8.89	11.0	1.18	56.0	570
141	07247015	3	268	5.77	11.7	1.19	58.4	520
142	07247250	3	94.3	41.2	19.2	1.86	81.0	687
143	07247500	3	120	14.7	10.8	1.37	48.6	552
144	07248500	3	994	3.47	12.4	1.40	61.9	460
145	07249400	3	147	16.2	8.23	1.08	39.5	460
147	07249500	3	34.8	34.0	19.2	1.52	70.0	860
148	07249985	3	434	15.7	16.0	1.59	66.6	429
149	07250000	3	438	15.1	16.0	1.59	66.5	402
155	07299670	1	320	7.10	1.76	0.83	0.73	1,440
162	07301500	1	2,100	9.57	3.91	3.44	1.40	1,680
164	07303400	1	438	15.8	5.79	2.17	1.17	1,710
165	07303500	1	846	10.9	5.67	2.03	1.18	1,530
166	07304500	1	549	6.33	2.40	1.39	1.38	1,430
173	07311500	1	604	5.92	1.99	0.26	0.64	932
174	07313000	2	157	9.11	3.53	1.49	7.85	1,010

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (http://water.usgs.gov/osw/streamstats/bcdefinitions1, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no.	Mean drainage-basin elevation, in feet above NAVD 1988 (*ELEV*)	Mean annual precipitation[2] in inches (*PRECIPOUT*)	Mean winter-spring precipitation[2], in inches (*PREG_11_05*)	Mean summer-autumn precipitation[2], in inches (*PREG_06_10*)	Mean April precipitation2 in inches (*APRAVPRE*)	Mean June precipitation[2] in inches (*JUNAVPRE*)	Mean December precipitation[2] in inches (*DECAVPRE*)
91	1,240	47.7	26.8	20.9	4.38	5.04	3.49
92	1,330	47.7	27.1	20.6	4.39	5.13	3.50
94	1,140	47.8	26.8	21.0	4.38	5.07	3.48
95	1,160	48.1	26.8	21.3	4.34	5.19	3.48
96	1,180	47.6	26.3	21.3	4.07	5.33	3.22
97	1,340	49.5	28.6	20.8	4.61	5.17	3.53
98	1,070	48.7	28.1	20.6	4.56	5.11	3.51
99	1,140	47.8	26.8	21.0	4.25	5.23	3.29
100	998	47.9	27.3	20.6	4.40	5.19	3.29
101	1,110	46.1	26.1	20.0	4.20	4.84	3.10
105	1,210	40.4	22.0	18.4	3.78	4.70	2.39
107	1,110	38.0	20.9	17.1	3.66	4.61	2.13
108	1,030	41.7	23.2	18.5	4.04	4.74	2.50
122	3,190	26.1	13.1	13.0	2.31	3.36	1.01
123	3,100	28.3	14.5	13.8	2.57	3.54	1.09
135	960	38.5	20.7	17.8	3.49	4.35	1.96
136	911	42.6	23.4	19.2	3.98	4.53	2.50
137	889	43.8	23.9	19.9	4.02	4.47	2.63
139	955	47.4	27.5	19.8	4.36	4.68	3.11
140	870	49.5	30.0	19.4	4.59	4.79	4.29
141	860	50.0	29.8	20.1	4.60	4.83	4.03
142	1,300	51.9	31.1	20.8	4.73	4.89	4.28
143	884	49.3	29.1	20.2	4.73	4.89	3.64
144	858	48.3	28.5	19.8	4.45	4.93	3.73
145	753	47.3	28.6	18.7	4.29	4.47	3.76
147	1,390	51.0	30.0	21.1	4.63	4.97	3.58
148	1,120	47.2	28.2	19.1	4.24	4.49	3.51
149	1,120	47.2	28.1	19.1	4.24	4.51	3.52
155	1,640	26.8	12.5	14.3	2.16	3.84	1.15
162	2,490	28.0	14.0	14.0	2.59	3.78	1.04
164	2,240	26.1	12.5	13.6	2.35	3.84	1.02
165	2,020	28.4	13.7	14.7	2.47	4.07	1.10
166	1,750	29.3	14.4	14.9	2.51	4.03	1.27
173	1,150	31.9	16.5	15.4	2.85	3.79	1.65
174	1,210	34.4	18.0	16.3	3.08	4.15	1.81

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (http://water.usgs.gov/osw/streamstats/bcdefinitions1, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no. (fig. 1)	USGS station ID	Regression region[1]	Contributing drainage area, in square miles (*CONTDA*)	10-85 channel slope, in percent (*CSL10_85fm*)	Drainage basin hillslope, in percent (*BSLDEM10M*)	Soil permeability in inches per hour (*SOILPERM*)	Percent forest canopy (*CANOPY_PCT*)	Outlet elevation, in feet above NAVD 1988 (*OUTLETELEV*)
177	07315700	2	574	3.89	3.19	0.92	9.54	747
180	07319500	1	45.2	37.0	7.23	1.83	1.15	1,870
181	07323000	1	86.1	28.7	7.88	1.54	1.23	1,800
182	07324200	1	1,350	8.12	5.90	2.28	0.72	1,660
184	07325000	1	1,950	6.79	5.83	1.93	0.90	1,480
185	07325500	1	3,100	4.94	5.13	1.54	1.10	1,250
186	07325800	1	132	14.6	4.41	1.58	1.39	1,380
187	07326000	1	311	7.23	3.81	2.19	2.26	1,270
189	07327000	1	206	12.8	8.26	2.95	15.5	1,200
190	073274406	1	3.65	37.7	3.20	0.89	0.28	1,340
191	07327442	1	13.3	39.2	3.83	0.91	1.20	1,270
192	07327447	1	62.3	16.4	4.58	1.15	6.94	1,200
193	07327490	1	208	8.52	5.26	1.66	10.6	1,080
194	07327550	1	232	6.73	5.17	1.62	10.1	1,050
195	07328000	1	4,670	3.73	5.14	1.69	3.16	1,040
196	07328070	1	33.1	20.5	5.04	1.50	12.5	1,050
199	07328500	2	5,290	3.24	5.06	1.66	4.02	866
200	07329000	2	140	9.97	4.90	1.54	15.8	1,000
201	07329500	2	202	8.78	5.11	1.37	15.8	922
203	07329852	2	44.1	14.0	5.24	0.54	18.3	912
204	07329900	2	137	13.7	6.08	0.47	23.3	757
205	07330500	2	296	5.81	5.29	1.00	15.0	724
206	07331000	2	7,160	2.90	5.10	1.50	7.31	654
208	07332400	2	203	10.3	3.22	0.76	16.5	668
209	07332500	2	477	6.98	3.51	0.82	17.2	518
211	07333500	3	32.6	25.4	11.6	1.52	47.5	560
212	07333800	3	88.8	6.10	7.89	1.33	40.1	635
213	07334000	3	1,090	3.18	6.52	1.49	36.8	451
214	07335000	3	713	3.37	4.88	0.96	24.7	492
218	07335700	3	39.6	54.9	22.9	1.62	83.5	895
220	07336000	3	68.3	12.2	8.19	1.25	41.4	480
221	07336200	3	1,130	3.71	12.7	1.44	56.3	436
222	07336500	3	1,420	3.35	11.9	1.48	54.5	391
226	07337500	3	648	9.74	12.8	1.66	59.6	364
227	07337900	3	320	13.5	12.8	1.61	64.5	387

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (http://water.usgs.gov/osw/streamstats/bcdefinitions1, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no.	Mean drainage-basin elevation, in feet above NAVD 1988 (*ELEV*)	Mean annual precipitation[2] in inches (*PRECIPOUT*)	Mean winter-spring precipitation[2], in inches (*PREG_11_05*)	Mean summer-autumn precipitation[2], in inches (*PREG_06_10*)	Mean April precipitation[2] in inches (*APRAVPRE*)	Mean June precipitation[2] in inches (*JUNAVPRE*)	Mean December precipitation[2] in inches (*DECAVPRE*)
177	937	33.7	18.0	15.7	2.77	3.67	1.94
180	2,160	26.9	13.3	13.6	2.39	3.80	1.00
181	2,100	27.0	13.4	13.6	2.39	3.80	1.02
182	2,260	27.9	14.0	13.9	2.44	3.78	1.09
184	2,110	30.9	15.4	15.6	2.51	4.06	1.34
185	1,900	31.3	16.2	15.1	2.75	4.24	1.44
186	1,590	31.3	16.0	15.3	2.82	4.24	1.42
187	1,530	31.9	16.5	15.4	2.83	4.21	1.50
189	1,460	32.7	16.9	15.7	2.91	4.16	1.62
190	1,430	33.6	17.4	16.1	3.06	4.18	1.71
191	1,410	33.7	17.5	16.1	3.07	4.18	1.72
192	1,370	34.4	18.1	16.3	3.16	4.17	1.81
193	1,300	35.0	18.6	16.4	3.33	4.12	1.90
194	1,290	35.1	18.7	16.4	3.37	4.10	1.92
195	1,710	35.3	18.8	16.4	3.38	4.10	1.93
196	1,200	35.5	19.1	16.5	3.40	4.11	1.96
199	1,640	38.6	21.3	17.3	3.61	4.62	2.21
200	1,240	37.3	20.4	16.9	3.56	4.18	2.14
201	1,180	38.1	20.7	17.4	3.62	4.49	2.16
203	1,110	41.5	22.7	18.7	3.68	4.48	2.50
204	1,050	40.5	22.2	18.3	3.62	4.50	2.45
205	979	38.9	21.2	17.7	3.35	4.35	2.39
206	1,480	40.1	22.0	18.2	3.52	4.52	2.51
208	1,070	43.5	24.2	19.3	3.91	4.94	2.91
209	852	44.7	24.8	19.9	3.75	5.14	3.03
211	810	44.3	25.4	18.9	4.26	4.67	3.05
212	848	47.0	27.5	19.5	4.53	4.74	3.39
213	725	46.1	27.3	18.8	4.50	4.52	3.40
214	731	44.6	25.4	19.2	4.10	4.80	3.05
218	1,530	55.5	33.3	22.1	4.96	4.91	4.84
220	697	47.1	27.6	19.4	4.48	4.69	3.55
221	906	46.8	27.1	19.7	4.33	4.69	3.68
222	863	47.9	28.0	19.9	4.27	4.60	3.84
226	923	51.5	30.7	20.8	4.29	4.38	4.58
227	911	52.5	31.3	21.2	4.47	4.43	4.78

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (http://water.usgs.gov/osw/streamstats/bcdefinitions1, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no. (fig. 1)	USGS station ID	Regression region[1]	Contributing drainage area, in square miles (*CONTDA*)	10-85 channel slope, in percent (*CSL10_85fm*)	Drainage basin hillslope, in percent (*BSLDEM10M*)	Soil permeability in inches per hour (*SOILPERM*)	Percent forest canopy (*CANOPY_PCT*)	Outlet elevation, in feet above NAVD 1988 (*OUTLETELEV*)
228	07338500	3	1,230	5.67	11.2	1.61	57.7	313
229	07338750	3	322	15.1	13.6	1.99	62.3	670
230	07339000	3	800	6.82	15.5	1.78	65.6	341
231	07339500	3	183	17.5	12.3	1.61	60.5	339
232	07340300	3	89.1	28.5	28.1	1.70	81.7	765
233	07340500	3	361	15.5	16.8	1.66	68.8	343
234	07341000	3	120	20.9	10.3	1.65	65.0	357
235	07341200	3	253	14.1	8.09	1.38	64.7	305

[1]Region 2 includes streamflow gaging stations in regions 2a and 2b (figure 7).

[2]Mean annual, seasonal, and monthly precipitation was computed from the period 1971–2000, and reflects the mean precipitation at the gage

Table 8. Selected drainage-basin characteristics for streamflow-gaging stations used in regression analysis.—Continued

[Map no.: see figure 1; USGS, U.S. Geological Survey; ID, identifier; Regression region, regions with similar basin characteristics used to develop regression equations to estimate flow-duration and annual mean-flow statistics at ungaged stream locations, see figure 7; abbreviations for basin characteristics follow naming conventions used by U.S. Geological Survey StreamStats Webpage (http://water.usgs.gov/osw/streamstats/bcdefinitions1, accessed September 2009); 10-85 channel slope, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; NAVD 1988, North American Vertical Datum of 1988]

Map no.	Mean drainage-basin elevation, in feet above NAVD 1988 (*ELEV*)	Mean annual precipitation[2] in inches (*PRECIPOUT*)	Mean winter-spring precipitation[2], in inches (*PREG_11_05*)	Mean summer-autumn precipitation[2], in inches (*PREG_06_10*)	Mean April precipitation[2] in inches (*APRAVPRE*)	Mean June precipitation[2] in inches (*JUNAVPRE*)	Mean December precipitation[2] in inches (*DECAVPRE*)
228	828	51.5	31.5	20.0	4.35	4.46	4.70
229	1,150	55.6	33.7	21.9	4.83	4.55	4.99
230	1,040	53.1	32.2	20.9	4.48	4.59	4.85
231	848	54.9	34.1	20.8	4.79	4.67	5.24
232	1,320	58.0	35.2	22.8	5.15	5.07	5.23
233	925	55.2	34.2	21.0	4.79	4.78	5.25
234	789	56.2	34.8	21.3	4.88	5.02	5.32
235	625	54.6	33.8	20.9	4.77	4.88	5.16

Table 9. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 32 streamflow gaging stations in Region 1.

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *JUNAVPRE*, mean June precipitation at the gage, in inches; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *BSLDEM10M*, mean drain-basin slope, in feet per foot; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *SOILPERM*, mean drainage-basin soil permeability in inches per year; *CANOPY_PCT*, percentage of drainage-basin that is forested; *APRAVPRE*, mean April precipitation at the gage, in inches; *PRE-CIPOUT*, mean annual precipitation at the gage, in inches]

Regression equation[1]	Method	Adjusted R^2 (%)	Standard Error of Estimate in log 10 units of ft^3/s	Standard Error of Estimate as percent (%)	Median Statistic (ft^3/s)
Annual Mean Flow					
$AVE\_DV = 65.7(CONTDA/424)^{0.83}(PREG\_06\_10/15.2)^{7.50}$	OLS	95.0	0.144	33.8	66.9
Flow Duration Statistics					
$D_{20} = 59.5(CONTDA/424)^{0.85}(ELEV/1721)^{-0.8}(PREG\_06\_10/15.2)^{4.81}$	OLS	92.1	0.178	42.4	70.8
$D_{50} = 23.0(CONTDA/424)^{0.83}(ELEV/1721)^{-1.15}(PREG\_06\_10/15.2)^{4.53}$	OLS	85.4	0.237	58.7	24.1
$D_{80} = 7.15(CONTDA/424)^{0.81}(ELEV/1721)^{-4.49}(PREG\_06\_10/15.2)^{2.78}$	OLS	50.8	0.564	202	5.91
$D_{90} = [2.61(CONTDA/424)^{0.75}(ELEV/1721)^{-5.28}(PREG\_06\_10/15.2)^{8.16}] - 0.1$	Tobit	50.2	0.677	282	2.55
$D_{95} = [1.54(CONTDA/424)^{0.63}(ELEV/1721)^{-4.97}(PREG\_06\_10/15.2)^{8.45}] - 0.1$	Tobit	37.9	0.754	351	0.88
$D_{20}SUM = 56.3(CONTDA/424)^{0.85}(CSL10\_85fm/8.56)\text{-}0.08(PREG\_06\_10/15.2)^{7.07}(JUNAVPRE/4.06)^{-0.85}$	OLS	91.3	0.192	46.2	60.7
$D_{50}SUM = 16.9(CONTDA/424)^{0.65}(CSL10\_85fm/8.56)^{-0.55}(PREG\_06\_10/15.2)^{5.43}(JUNAVPRE/4.06)^{2.32}$	OLS	81.7	0.285	73.6	13.3
$D_{80}SUM = [5.55(CONTDA/424)^{0.14}(CSL10\_85fm/8.56)^{-1.36}(PREG\_06\_10/15.2)^{0.56}(JUNAVPRE/4.06)^{16.7}] - 0.08$	OLS	54.6	0.582	214	3.02
$D_{90}SUM = [2.23(CONTDA/424)^{0.04}(CSL10\_85fm/8.56)^{-1.69}(PREG\_06\_10/15.2)^{-0.01}(JUNAVPRE/4.06)^{21.2}] - 0.08$	Tobit	53.2	0.664	272	1.14
$D_{95}SUM = [1.06(CONTDA/424)^{0.05}(CSL10\_85fm/8.56)^{-1.64}(PREG\_06\_10/15.2)^{-0.78}(JUNAVPRE/4.06)^{25.7}] - 0.08$	Tobit	52.6	0.673	280	0.16
$D_{20}WSP = 59.4(CONTDA/424)^{0.74}(OUTLETELEV/1294)^{-2.41}(BSLDEM10M/4.55)^{0.06}(PREG\_11\_05/15.7)^{0.49}$	OLS	91.0	0.183	43.2	70.6
$D_{50}WSP = 25.3(CONTDA/424)^{0.71}(OUTLETELEV/1294)^{-2.55}(BSLDEM10M/4.55)^{0.13}(PREG\_11\_05/15.7)^{0.52}$	OLS	84.6	0.240	59.5	24.7
$D_{80}WSP = 10.6(CONTDA/424)^{0.59}(OUTLETELEV/1294)^{-5.75}(BSLDEM10M/4.55)^{0.54}(PREG\_11\_05/15.7)^{-2.55}$	OLS	72.4	0.341	92.8	9.53
$D_{90}WSP = [5.46(CONTDA/424)^{0.31}(OUTLETELEV/1294)^{-10.0}(BSLDEM10M/4.55)^{0.95}(PREG\_11\_05/15.7)^{-6.71}] - 0.2$	OLS	59.2	0.477	153	5.99
$D_{95}WSP = [3.39(CONTDA/424)^{0.21}(OUTLETELEV/1294)^{-9.80}(BSLDEM10M/4.55)^{0.56}(PREG\_11\_05/15.7)^{-5.1}] - 0.5$	Tobit	48.0	0.552	194	3.72
$OCTD_{20} = 42.2(CONTDA/424)^{0.73}(CSL10\_85fm/8.56)^{-0.14}(SOILPERM/2.17)^{-0.07}(PREG\_06\_10/15.2)^{6.32}$	OLS	89.2	0.209	50.0	40.2
$OCTD_{50} = 15.5(CONTDA/424)^{0.42}(CSL10\_85fm/8.56)^{-0.92}(SOILPERM/2.17)^{0.03}(PREG\_06\_10/15.2)^{6.73}$	OLS	79.8	0.325	86.6	10.1
$OCTD_{80} = [4.64(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.32}(SOILPERM/2.17)^{-0.13}(PREG\_06\_10/15.2)^{13.4}] - 0.2$	Tobit	50.4	0.536	185	3.27

Table 9. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 32 streamflow gaging stations in Region 1. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *JUNAVPRE*, mean June precipitation at the gage, in inches; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *BSLDEM10M*, mean drain-basin slope, in feet per foot; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *SOILPERM*, mean drainage-basin soil permeability in inches per year; *CANOPY_PCT*, percentage of drainage-basin that is forested; *APRAVPRE*, mean April precipitation at the gage, in inches; *PRE-CIPOUT*, mean annual precipitation at the gage, in inches]

Regression equation[1]	Method	Adjusted R^2 (%)	Standard Error of Estimate in log 10 units of ft^3/s	Standard Error of Estimate as percent (%)	Median Statistic (ft^3/s)
$OCTD_{90} = [2.23(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.54}(SOILPERM/2.17)^{-0.55}(PREG\_06\_10/15.2)^{14.9}] - 0.2$	Tobit	45.7	0.572	206	1.48
$OCTD_{95} = [0.61(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.54}(SOILPERM/2.17)^{-1.81}(PREG\_06\_10/15.2)^{17.8}] - 0.08$	Tobit	42.3	0.717	333	0.26
$NOVD_{20} = 52.5(CONTDA/424)^{0.60}(CSL10\_85fm/8.56)^{-0.39}(BSLDEM10M/4.55)^{0.14}(PREG\_06\_10/15.2)^{5.57}$	OLS	85.0	0.221	53.6	42.2
$NOVD_{50} = 22.9(CONTDA/424)^{0.55}(CSL10\_85fm/8.56)^{-0.42}(BSLDEM10M/4.55)^{0.28}(PREG\_06\_10/15.2)^{7.63}$	OLS	74.5	0.297	77.3	16.6
$NOVD_{80} = [12.5(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.51}(BSLDEM10M/4.55)^{0.94}(PREG\_06\_10/15.2)^{12.0}] - 0.2$	OLS	51.4	0.534	190	6.3
$NOVD_{90} = [5.74(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.75}(BSLDEM10M/4.55)^{0.63}(PREG\_06\_10/15.2)^{18.0}] - 0.1$	Tobit	52.7	0.726	338	3.57
$NOVD_{95} = [1.34(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.62}(BSLDEM10M/4.55)^{0.73}(PREG\_06\_10/15.2)^{29.6}] - 0.01$	Tobit	46.6	0.97	622	1.9
$DECD_{20} = 47.3(CONTDA/424)^{0.69}(OUTLETELEV/1294)^{-2.34}$	OLS	90.4	0.176	41.7	41.6
$DECD_{50} = 24.6(CONTDA/424)^{0.66}(OUTLETELEV/1294)^{-2.80}$	OLS	81.4	0.255	63.9	19.9
$DECD_{80} = 11.3(CONTDA/424)^{0.56}(OUTLETELEV/1294)^{-4.60}$	OLS	65.5	0.400	117	7.7
$DECD_{90} = [7.94(CONTDA/424)^{0.38}(OUTLETELEV/1294)^{-5.26}] - 0.4$	OLS	53.7	0.471	150	4.43
$DECD_{95} = [6.39(CONTDA/424)^{0.35}(OUTLETELEV/1294)^{-6.29}] - 0.4$	Tobit	45.4	0.571	206	3.26
$JAND_{20} = 47.5(CONTDA/424)^{0.84}(CANOPY\_PCT/1.31)^{-0.03}(BSLDEM10M/4.55)^{0.12}(ELEV/1721)^{-2.18}$	OLS	88.7	0.197	46.9	45.6
$JAND_{50} = 24.8(CONTDA/424)^{0.86}(CANOPY\_PCT/1.31)^{-0.06}(BSLDEM10M/4.55)^{0.19}(ELEV/1721)^{-2.53}$	OLS	80.1	0.272	69.1	22
$JAND_{80} = 12.8(CONTDA/424)^{0.90}(CANOPY\_PCT/1.31)^{-0.23}(BSLDEM10M/4.55)^{0.81}(ELEV/1721)^{-4.99}$	OLS	66.1	0.382	109	9.22
$JAND_{90} = [9.91(CONTDA/424)^{0.76}(CANOPY\_PCT/1.31)^{-0.54}(BSLDEM10M/4.55)^{1.31}(ELEV/1721)^{-7.14}] - 0.5$	Tobit	55.3	0.455	142	5.24
$JAND_{95} = [7.74(CONTDA/424)^{0.74}(CANOPY\_PCT/1.31)^{-0.57}(BSLDEM10M/4.55)^{1.21}(ELEV/1721)^{-7.91}] - 0.5$	Tobit	45.9	0.530	182	3.91
$FEBD_{20} = 57.7(CONTDA/424)^{0.70}(OUTLETELEV/1294)^{-2.41}(BSLDEM10M/4.55)^{0.04}$	OLS	88.3	0.200	47.6	48.3
$FEBD_{50} = 28.8(CONTDA/424)^{0.72}(OUTLETELEV/1294)^{-2.65}(BSLDEM10M/4.55)^{0.12}$	OLS	84.7	0.242	60.2	21
$FEBD_{80} = 15.2(CONTDA/424)^{0.71}(OUTLETELEV/1294)^{-3.27}(BSLDEM10M/4.55)^{0.20}$	OLS	79.3	0.294	76.5	12.8
$FEBD_{90} = 10.0(CONTDA/424)^{0.64}(OUTLETELEV/1294)^{-5.48}(BSLDEM10M/4.55)^{0.47}$	OLS	61.5	0.447	138	6.52

Table 9. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 32 streamflow gaging stations in Region 1. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *JUNAVPRE*, mean June precipitation at the gage, in inches; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *BSLDEM10M*, mean drain-basin slope, in feet per foot; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *SOILPERM*, mean drainage-basin soil permeability in inches per year; *CANOPY_PCT*, percentage of drainage-basin that is forested; *APRAVPRE*, mean April precipitation at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression equation[1]	Method	Adjusted R^2 (%)	Standard Error of Estimate in log 10 units of ft^3/s	Standard Error of Estimate as percent (%)	Median Statistic (ft^3/s)
$FEBD_{95} = [7.99(CONTDA/424)^{0.45}(OUTLETELEV/1294)^{-6.01}(BSLDEM10M/4.55)^{0.53}] - 0.2$	OLS	52.7	0.527	180	4.06
$MARD_{20} = 73.1(CONTDA/424)^{0.74}(OUTLETELEV/1294)^{-2.79}$	OLS	87.4	0.227	55.6	64.2
$MARD_{50} = 32.7(CONTDA/424)^{0.72}(OUTLETELEV/1294)^{-2.64}$	OLS	83.7	0.254	63.5	24.1
$MARD_{80} = 16.6(CONTDA/424)^{0.71}(OUTLETELEV/1294)^{-3.23}$	OLS	76.1	0.329	88.8	13.7
$MARD_{90} = 11.0(CONTDA/424)^{0.61}(OUTLETELEV/1294)^{-4.82}$	OLS	62.7	0.462	145	6.29
$MARD_{95} = [9.83(CONTDA/424)^{0.44}(OUTLETELEV/1294)^{-5.33}] - 0.3$	OLS	51.1	0.533	183	4.86
$APRD_{20} = 83.4(CONTDA/424)^{0.80}(OUTLETELEV/1294)^{-2.60}(APRAVPRE/2.73)^{1.03}$	OLS	90.4	0.211	51.3	91.5
$APRD_{50} = 31.7(CONTDA/424)^{0.75}(OUTLETELEV/1294)^{-1.71}(APRAVPRE/2.73)^{2.07}$	OLS	87.6	0.224	54.3	30.4
$APRD_{80} = 15.2(CONTDA/424)^{0.73}(OUTLETELEV/1294)^{-2.02}(APRAVPRE/2.73)^{2.28}$	OLS	79.6	0.298	78.0	12.7
$APRD_{90} = 10.1(CONTDA/424)^{0.65}(OUTLETELEV/1294)^{-4.54}(APRAVPRE/2.73)^{0.56}$	OLS	65.8	0.437	133	6.29
$APRD_{95} = 7.38(CONTDA/424)^{0.56}(OUTLETELEV/1294)^{-7.06}(APRAVPRE/2.73)^{-1.14}$	OLS	56.6	0.574	208	4.28
$MAYD_{20} = 128(CONTDA/424)^{0.91}(OUTLETELEV/1294)^{-1.42}(PREG\_06\_10/15.2)^{3.93}$	OLS	93.3	0.187	44.7	145
$MAYD_{50} = 41.0(CONTDA/424)^{0.82}(OUTLETELEV/1294)^{-1.42}(PREG\_06\_10/15.2)^{4.5}$	OLS	88.9	0.223	54.3	40
$MAYD_{80} = 15.2(CONTDA/424)^{0.76}(OUTLETELEV/1294)^{-2.49}(PREG\_06\_10/15.2)^{3.2}$	OLS	81.8	0.287	74.3	12.9
$MAYD_{90} = 8.45(CONTDA/424)^{0.78}(OUTLETELEV/1294)^{-2.98}(PREG\_06\_10/15.2)^{5.89}$	OLS	76.9	0.366	102	6.43
$MAYD_{95} = [5.71(CONTDA/424)^{0.63}(OUTLETELEV/1294)^{-5.15}(PREG\_06\_10/15.2)^{4.31}] - 0.1$	OLS	58.4	0.567	204	3.71
$JUND_{20} = 134(CONTDA/424)^{0.94}(OUTLETELEV/1294)^{-0.52}(PRECIPOUT/31.1)^{4.32}$	OLS	94.1	0.177	41.7	162
$JUND_{50} = 41.3(CONTDA/424)^{0.88}(OUTLETELEV/1294)^{-0.87}(PRECIPOUT/31.1)^{3.90}$	OLS	91.4	0.204	49.1	38.6
$JUND_{80} = 12.2(CONTDA/424)^{0.78}(OUTLETELEV/1294)^{-3.41}(PRECIPOUT/31.1)^{0.81}$	OLS	81.7	0.302	79.5	10.9
$JUND_{90} = [6.47(CONTDA/424)^{0.64}(OUTLETELEV/1294)^{-4.57}(PRECIPOUT/31.1)^{0.10}] - 0.2$	Tobit	63.2	0.433	131	4.15
$JUND_{95} = [4.62(CONTDA/424)^{0.37}(OUTLETELEV/1294)^{-7.49}(PRECIPOUT/31.1)^{-2.84}] - 0.4$	Tobit	51.6	0.533	183	2.01

Table 9. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 32 streamflow gaging stations in Region 1. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *JUNAVPRE*, mean June precipitation at the gage, in inches; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *BSLDEM10M*, mean drain-basin slope, in feet per foot; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *SOILPERM*, mean drainage-basin soil permeability in inches per year; *CANOPY_PCT*, percentage of drainage-basin that is forested; *APRAVPRE*, mean April precipitation at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression equation[1]	Method	Adjusted R^2 (%)	Standard Error of Estimate in log 10 units of ft^3/s	Standard Error of Estimate as percent (%)	Median Statistic (ft^3/s)
$JULD_{20} = 52.2(CONTDA/424)^{1.00}(CSL10\_85fm/8.56)^{0.35}(BSLDEM10M/4.55)^{-0.09}(PREG\_06\_10/15.2)^{7.63}$	OLS	94.2	0.170	40.0	53.2
$JULD_{50} = 18.2(CONTDA/424)^{0.79}(CSL10\_85fm/8.56)^{-0.21}(BSLDEM10M/4.55)^{0.02}(PREG\_06\_10/15.2)^{7.64}$	OLS	91.2	0.191	45.6	14.2
$JULD_{80} = [6.18(CONTDA/424)^{0.30}(CSL10\_85fm/8.56)^{-1.36}(BSLDEM10M/4.55)^{0.77}(PREG\_06\_10/15.2)^{12.7}] - 0.02$	OLS	67.8	0.471	150	2.5
$JULD_{90} = [2.10(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-2.02}(BSLDEM10M/4.55)^{0.66}(PREG\_06\_10/15.2)^{16.1}] - 0.1$	Tobit	51.3	0.684	289	0.63
$JULD_{95} = [0.73(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-2.64}(BSLDEM10M/4.55)^{0.25}(PREG\_06\_10/15.2)^{15.2}] - 0.1$	Tobit	45.9	0.740	338	0.06
$AUGD_{20} = 35.5(CONTDA/424)^{0.87}(CSL10\_85fm/8.56)^{0.07}(PREG\_06\_10/15.2)^{6.97}$	OLS	90.8	0.201	48.3	34.6
$AUGD_{50} = 10.6(CONTDA/424)^{0.62}(CSL10\_85fm/8.56)^{-0.54}(PREG\_06\_10/15.2)^{7.30}$	OLS	85.2	0.255	63.8	8.65
$AUGD_{80} = [2.76(CONTDA/424)^{0.05}(CSL10\_85fm/8.56)^{-2.05}(PREG\_06\_10/15.2)^{15.1}] - 0.03$	Tobit	42.1	0.839	442	1.69
$AUGD_{90} = [1.78(CONTDA/424)^{0.03}(CSL10\_85fm/8.56)^{-1.44}(PREG\_06\_10/15.2)^{13.8}] - 0.2$	Tobit	40.4	0.646	259	0.42
$AUGD_{95} = [1.05(CONTDA/424)^{0.03}(CSL10\_85fm/8.56)^{-1.79}(PREG\_06\_10/15.2)^{11.2}] - 0.3$	Tobit	29.3	0.689	293	0.02
$SEPD_{20} = 33.7(CONTDA/424)^{0.89}(CSL10\_85fm/8.56)^{0.26}(SOILPERM/76.7)^{-0.38}(OUTLETELEV/1294)^{-2.97}$	OLS	91.1	0.191	45.7	35.6
$SEPD_{50} = 9.78(CONTDA/424)^{0.60}(CSL10\_85fm/8.56)^{-0.41}(SOILPERM/76.7)^{-0.75}(OUTLETELEV/1294)^{-3.06}$	OLS	65.4	0.418	124	8.59
$SEPD_{80} = [2.84(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.57}(SOILPERM/76.7)^{-0.75}(OUTLETELEV/1294)^{-4.50}] - 0.09$	Tobit	38.3	0.775	371	2.11
$SEPD_{90} = [1.35(CONTDA/424)^{0.10}(CSL10\_85fm/8.56)^{-0.83}(SOILPERM/76.7)^{-1.10}(OUTLETELEV/1294)^{-5.02}] - 0.2$	Tobit	37.2	0.604	229	0.36
$SEPD_{95} = [0.77(CONTDA/424)^{0.00}(CSL10\_85fm/8.56)^{-1.00}(SOILPERM/76.7)^{-1.17}(OUTLETELEV/1294)^{-4.17}] - 0.2$	Tobit	36.9	0.591	219	0.04

[1]Final units of all computations from regression equations are in cubic feet per second (ft^3/s). Definition and naming conventions for statistics follow that of USGS StreamStats (*http://water.usgs.gov/osw/streamstats/StatisticsDefinitions.html*, accessed September 10, 2009)

Table 10. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 30 streamflow gaging stations in Region 2.

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
Annual Mean Flow					
$AVE\_DV = 193(CONTDA/323)^{0.91}(PREG\_06\_10/19.3)^{3.35}$	OLS	95.1	0.129	30.3	181
Flow Duration Statistics					
$D_{20} = 142(CONTDA/323)^{1.09}(CSL10\_85fm/6.04)^{0.23}(OUTLETELEV/783)^{1.04}(PREG\_11\_05/22.0)^{5.92}$	OLS	91.6	0.188	44.7	79.8
$D_{50} = 32.1(CONTDA/323)^{1.51}(CSL10\_85fm/6.04)^{1.00}(OUTLETELEV/783)^{2.76}(PREG\_11\_05/22.0)^{9.29}$	OLS	91.2	0.234	57.3	17.6
$D_{80} = [7.01(CONTDA/323)^{2.19}(CSL10\_85fm/6.04)^{2.26}(OUTLETELEV/783)^{4.93}(PREG\_11\_05/22.0)^{14.7}] - 0.1$	OLS	87.5	0.359	100	3.23
$D_{90} = [3.44(CONTDA/323)^{2.58}(CSL10\_85fm/6.04)^{2.89}(OUTLETELEV/783)^{5.90}(PREG\_11\_05/22.0)^{20.5}] - 0.1$	Tobit	81.3	0.587	217	1.38
$D_{95} = [2.21(CONTDA/323)^{2.35}(CSL10\_85fm/6.04)^{2.71}(OUTLETELEV/783)^{5.90}(PREG\_11\_05/22.0)^{21.9}] - 0.2$	Tobit	81.0	0.550	194	0.45
$D_{20}SUM = 84.3(CONTDA/323)^{1.31}(CSL10\_85fm/6.04)^{0.42}(OUTLETELEV/783)^{1.81}(PREG\_11\_05/22.0)^{5.93}$	OLS	94.5	0.167	39.5	47.6
$D_{50}SUM = 17.7(CONTDA/323)^{1.93}(CSL10\_85fm/6.04)^{1.57}(OUTLETELEV/783)^{3.87}(PREG\_11\_05/22.0)^{10.6}$	OLS	90.4	0.280	72.1	12.1
$D_{80}SUM = [5.95(CONTDA/323)^{2.00}(CSL10\_85fm/6.04)^{1.92}(OUTLETELEV/783)^{5.00}(PREG\_11\_05/22.0)^{15.0}] - 0.5$	Tobit	82.2	0.432	131	2.52
$D_{90}SUM = [3.67(CONTDA/323)^{2.02}(CSL10\_85fm/6.04)^{2.12}(OUTLETELEV/783)^{5.36}(PREG\_11\_05/22.0)^{18.3}] - 0.5$	Tobit	80.1	0.487	158	1.61
$D_{95}SUM = [2.01(CONTDA/323)^{1.83}(CSL10\_85fm/6.04)^{1.86}(OUTLETELEV/783)^{5.27}(PREG\_11\_05/22.0)^{18.4}] - 0.5$	Tobit	77.6	0.462	145	0.64
$D_{20}WSP = 179(CONTDA/323)^{1.00}(CSL10\_85fm/6.04)^{0.13}(OUTLETELEV/783)^{0.65}(PREG\_11\_05/22.0)^{5.81}$	OLS	89.0	0.211	50.6	123
$D_{50}WSP = 48.0(CONTDA/323)^{1.31}(CSL10\_85fm/6.04)^{0.77}(OUTLETELEV/783)^{2.27}(PREG\_11\_05/22.0)^{8.97}$	OLS	88.8	0.236	58.0	25.8
$D_{80}WSP = 11.6(CONTDA/323)^{1.95}(CSL10\_85fm/6.04)^{1.95}(OUTLETELEV/783)^{4.28}(PREG\_11\_05/22.0)^{11.9}$	OLS	85.6	0.346	95.0	7.47
$D_{90}WSP = [4.97(CONTDA/323)^{2.48}(CSL10\_85fm/6.04)^{2.90}(OUTLETELEV/783)^{5.96}(PREG\_11\_05/22.0)^{15.7}] - 0.03$	OLS	79.0	0.524	178	3.30
$D_{95}WSP = [2.85(CONTDA/323)^{2.35}(CSL10\_85fm/6.04)^{2.76}(OUTLETELEV/783)^{6.03}(PREG\_11\_05/22.0)^{20.1}] - 0.2$	Tobit	88.4	0.476	152	1.62
$OCTD_{20} = 67.7(CONTDA/323)^{1.33}(CSL10\_85fm/6.04)^{0.75}(OUTLETELEV/783)^{1.62}(PRECIPOUT/41.3)^{7.18}$	OLS	93.9	0.162	38.0	46.4
$OCTD_{50} = 14.0(CONTDA/323)^{2.13}(CSL10\_85fm/6.04)^{2.42}(OUTLETELEV/783)^{4.01}(PRECIPOUT/41.3)^{12.2}$	OLS	84.9	0.350	96.5	9.70
$OCTD_{80} = [5.82(CONTDA/323)^{1.99}(CSL10\_85fm/6.04)^{2.36}(OUTLETELEV/783)^{4.17}(PRECIPOUT/41.3)^{15.0}] - 0.8$	Tobit	78.5	0.450	140	1.51
$OCTD_{90} = [3.07(CONTDA/323)^{2.21}(CSL10\_85fm/6.04)^{2.9}(OUTLETELEV/783)^{4.44}(PRECIPOUT/41.3)^{19.8}] - 0.5$	Tobit	76.7	0.503	166	0.63
$OCTD_{95} = [0.80(CONTDA/323)^{2.82}(CSL10\_85fm/6.04)^{4.06}(OUTLETELEV/783)^{5.08}(PRECIPOUT/41.3)^{29.0}] - 0.1$	Tobit	72.6	0.719	319	0.02

Table 10. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 30 streamflow gaging stations in Region 2. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$NOVD_{20} = 106(CONTDA/323)^{1.06}(CSL10\_85fm/6.04)^{0.21}(OUTLETELEV/783)^{1.66}(PREG\_11\_05/22.0)^{6.85}$	OLS	86.0	0.243	60.2	61.1
$NOVD_{50} = 20.8(CONTDA/323)^{1.67}(CSL10\_85fm/6.04)^{1.48}(OUTLETELEV/783)^{3.46}(PREG\_11\_05/22.0)^{9.22}$	OLS	86.2	0.291	75.0	13.1
$NOVD_{80} = [5.10(CONTDA/323)^{2.45}(CSL10\_85fm/6.04)^{2.96}(OUTLETELEV/783)^{5.72}(PREG\_11\_05/22.0)^{16.9}] - 0.08$	OLS	79.9	0.517	174	2.53
$NOVD_{90} = [3.92(CONTDA/323)^{2.14}(CSL10\_85fm/6.04)^{2.46}(OUTLETELEV/783)^{5.71}(PREG\_11\_05/22.0)^{19.1}] - 0.3$	Tobit	81.7	0.476	152	1.04
$NOVD_{95} = [2.45(CONTDA/323)^{2.05}(CSL10\_85fm/6.04)^{2.45}(OUTLETELEV/783)^{5.29}(PREG\_11\_05/22.0)^{19.8}] - 0.4$	Tobit	80.4	0.461	145	0.41
$DECD_{20} = 109(CONTDA/323)^{1.09}(CSL10\_85fm/6.04)^{0.35}(OUTLETELEV/783)^{1.42}(PREG\_11\_05/22.0)^{7.09}$	OLS	83.4	0.267	67.6	54.9
$DECD_{50} = 28.1(CONTDA/323)^{1.60}(CSL10\_85fm/6.04)^{1.28}(OUTLETELEV/783)^{3.41}(PREG\_11\_05/22.0)^{9.58}$	OLS	84.8	0.311	82.5	16.4
$DECD_{80} = [7.82(CONTDA/323)^{2.12}(CSL10\_85fm/6.04)^{2.37}(OUTLETELEV/783)^{5.04}(PREG\_11\_05/22.0)^{13.2}] - 0.09$	OLS	82.0	0.417	124	3.57
$DECD_{90} = [5.34(CONTDA/323)^{2.03}(CSL10\_85fm/6.04)^{2.27}(OUTLETELEV/783)^{5.19}(PREG\_11\_05/22.0)^{14.6}] - 0.5$	Tobit	83.4	0.396	115	1.91
$DECD_{95} = [4.31(CONTDA/323)^{1.85}(CSL10\_85fm/6.04)^{2.15}(OUTLETELEV/783)^{4.95}(PREG\_11\_05/22.0)^{16.2}] - 0.8$	Tobit	82.3	0.376	107	0.76
$JAND_{20} = 113(CONTDA/323)^{1.09}(CSL10\_85fm/6.04)^{0.38}(OUTLETELEV/783)^{1.32}(PREG\_11\_05/22.0)^{7.48}$	OLS	86.4	0.239	58.7	59.7
$JAND_{50} = 34.1(CONTDA/323)^{1.45}(CSL10\_85fm/6.04)^{1.05}(OUTLETELEV/783)^{2.81}(PREG\_11\_05/22.0)^{9.42}$	OLS	86.7	0.273	69.1	20.5
$JAND_{80} = 9.48(CONTDA/323)^{2.05}(CSL10\_85fm/6.04)^{2.11}(OUTLETELEV/783)^{4.78}(PREG\_11\_05/22.0)^{12.0}$	OLS	84.9	0.364	102	5.04
$JAND_{90} = [4.20(CONTDA/323)2.36(CSL10\_85fm/6.04)^{2.86}(OUTLETELEV/783)^{5.26}(PREG\_11\_05/22.0)^{16.3}] - 0.07$	OLS	85.0	0.421	125	2.41
$JAND_{95} = [3.73(CONTDA/323)^{2.01}(CSL10\_85fm/6.04)^{2.24}(OUTLETELEV/783)^{5.37}(PREG\_11\_05/22.0)^{16.4}] - 0.4$	Tobit	84.0	0.426	128	1.22
$FEBD_{20} = 143(CONTDA/323)^{1.00}(CSL10\_85fm/6.04)^{0.16}(OUTLETELEV/783)^{0.89}(PREG\_11\_05/22.0)^{6.69}$	OLS	88.8	0.210	50.6	85.0
$FEBD_{50} = 44.1(CONTDA/323)^{1.32}(CSL10\_85fm/6.04)^{0.84}(OUTLETELEV/783)^{2.31}(PREG\_11\_05/22.0)^{9.13}$	OLS	87.2	0.254	63.9	25.4
$FEBD_{80} = 13.0(CONTDA/323)^{1.79}(CSL10\_85fm/6.04)^{1.69}(OUTLETELEV/783)^{3.70}(PREG\_11\_05/22.0)^{11.5}$	OLS	85.4	0.334	90.6	8.87
$FEBD_{90} = [7.13(CONTDA/323)^{2.02}(CSL10\_85fm/6.04)^{2.19}(OUTLETELEV/783)^{4.89}(PREG\_11\_05/22.0)^{13.4}] - 0.1$	OLS	83.1	0.399	116	3.63
$FEBD_{95} = [3.97(CONTDA/323)^{2.51}(CSL10\_85fm/6.04)^{3.00}(OUTLETELEV/783)^{6.48}(PREG\_11\_05/22.0)^{16.1}] - 0.08$	Tobit	75.6	0.650	262	1.62
$MARD_{20} = 253(CONTDA/323)^{1.05}(CSL10\_85fm/6.04)0.10(OUTLETELEV/783)^{0.2}7(PREG\_11\_05/22.0)^{5.82}$	OLS	88.2	0.212	51.3	177
$MARD_{50} = 72.8(CONTDA/323)^{1.30}(CSL10\_85fm/6.04)^{0.61}(OUTLETELEV/783)^{1.76}(PREG\_11\_05/22.0)^{8.99}$	OLS	90.3	0.198	47.6	33.5
$MARD_{80} = 19.4(CONTDA/323)^{1.71}(CSL10\_85fm/6.04)^{1.37}(OUTLETELEV/783)^{3.68}(PREG\_11\_05/22.0)^{12.6}$	OLS	90.0	0.248	61.7	10.2

Table 10. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 30 streamflow gaging stations in Region 2. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$MARD_{90} = 8.89(CONTDA/323)^{2.23}(CSL10\_85fm/6.04)^{2.38}(OUTLETELEV/783)^{5.57}(PREG\_11\_05/22.0)^{14.5}$	OLS	78.1	0.456	142	4.44
$MARD_{95} = [4.19(CONTDA/323)^{2.84}(CSL10\_85fm/6.04)^{3.44}(OUTLETELEV/783)^{7.43}(PREG\_11\_05/22.0)^{18.0}] - 0.02$	OLS	70.0	0.661	270	1.86
$APRD_{20} = 260(CONTDA/323)^{0.97}(CSL10\_85fm/6.04)^{0.02}(OUTLETELEV/783)^{0.14}(PREG\_11\_05/22.0)^{5.31}$	OLS	86.7	0.241	59.5	193
$APRD_{50} = 82.2(CONTDA/323)^{1.18}(CSL10\_85fm/6.04)^{0.50}(OUTLETELEV/783)^{1.30}(PREG\_11\_05/22.0)^{8.37}$	OLS	87.9	0.239	58.7	43.6
$APRD_{80} = 23.8(CONTDA/323)^{1.49}(CSL10\_85fm/6.04)^{1.00}(OUTLETELEV/783)^{3.19}(PREG\_11\_05/22.0)^{12.0}$	OLS	89.8	0.255	63.9	12.8
$APRD_{90} = 11.6(CONTDA/323)^{1.76}(CSL10\_85fm/6.04)^{1.45}(OUTLETELEV/783)^{3.94}(PREG\_11\_05/22.0)^{14.2}$	OLS	87.5	0.326	87.6	5.86
$APRD_{95} = [6.18(CONTDA/323)^{2.15}(CSL10\_85fm/6.04)^{2.28}(OUTLETELEV/783)^{4.97}(PREG\_11\_05/22.0)^{16.9}] - 0.05$	OLS	81.2	0.470	149	3.22
$MAYD_{20} = 336(CONTDA/323)^{1.22}(CSL10\_85fm/6.04)^{0.36}(OUTLETELEV/783)^{0.30}(PRECIPOUT/41.3)^{3.20}$	OLS	96.6	0.125	29.1	259
$MAYD_{50} = 86.4(CONTDA/323)^{1.50}(CSL10\_85fm/6.04)^{1.02}(OUTLETELEV/783)^{1.39}(PRECIPOUT/41.3)^{7.29}$	OLS	94.0	0.175	41.7	49.7
$MAYD_{80} = 29.0(CONTDA/323)^{1.81}(CSL10\_85fm/6.04)^{1.63}(OUTLETELEV/783)^{2.39}(PRECIPOUT/41.3)^{11.1}$	OLS	91.4	0.237	58.0	16.0
$MAYD_{90} = 16.3(CONTDA/323)^{1.98}(CSL10\_85fm/6.04)^{1.95}(OUTLETELEV/783)^{2.52}(PRECIPOUT/41.3)^{13.7}$	OLS	90.1	0.278	70.6	8.08
$MAYD_{95} = 9.14(CONTDA/323)^{2.19}(CSL10\_85fm/6.04)^{2.38}(OUTLETELEV/783)^{2.55}(PRECIPOUT/41.3)^{18.2}$	OLS	90.5	0.312	82.5	4.46
$JUND_{20} = 253(CONTDA/323)^{1.23}(CSL10\_85fm/6.04)^{0.17}(OUTLETELEV/783)^{1.33}(PRECIPOUT/41.3)^{3.41}$	OLS	94.6	0.170	40.2	202
$JUND_{50} = 60.3(CONTDA/323)^{1.69}(CSL10\_85fm/6.04)^{1.17}(OUTLETELEV/783)^{2.38}(PRECIPOUT/41.3)^{7.44}$	OLS	92.4	0.215	52.1	37.1
$JUND_{80} = 18.4(CONTDA/323)^{2.09}(CSL10\_85fm/6.04)^{2.01}(OUTLETELEV/783)^{3.61}(PRECIPOUT/41.3)^{11.5}$	OLS	89.4	0.290	75.0	9.48
$JUND_{90} = [10.2(CONTDA/323)^{2.25}(CSL10\_85fm/6.04)^{2.42}(OUTLETELEV/783)^{4.35}(PRECIPOUT/41.3)^{14.4}] - 0.1$	OLS	87.2	0.348	95.8	4.49
$JUND_{95} = [6.15(CONTDA/323)^{2.38}(CSL10\_85fm/6.04)^{2.80}(OUTLETELEV/783)^{4.04}(PRECIPOUT/41.3)^{19.3}] - 0.2$	Tobit	85.4	0.434	131	2.91
$JULD_{20} = 81.8(CONTDA/323)^{1.58}(CSL10\_85fm/6.04)^{0.86}(OUTLETELEV/783)^{2.17}(PRECIPOUT/41.3)^{8.24}$	OLS	91.1	0.236	58.0	47.7
$JULD_{50} = [26.1(CONTDA/323)^{1.78}(CSL10\_85fm/6.04)^{1.65}(OUTLETELEV/783)^{3.53}(PRECIPOUT/41.3)^{11.5}] - 1$	OLS	92.0	0.221	53.6	11.5
$JULD_{80} = [7.77(CONTDA/323)^{2.73}(CSL10\_85fm/6.04)^{3.12}(OUTLETELEV/783)^{4.79}(PRECIPOUT/41.3)^{18.5}] - 0.05$	OLS	78.7	0.562	201	3.78
$JULD_{90} = [5.30(CONTDA/323)^{2.55}(CSL10\_85fm/6.04)^{3.06}(OUTLETELEV/783)^{5.31}(PRECIPOUT/41.3)^{20.4}] - 0.3$	Tobit	80.8	0.522	177	1.21
$JULD_{95} = [3.93(CONTDA/323)^{2.30}(CSL10\_85fm/6.04)^{2.78}(OUTLETELEV/783)^{5.12}(PRECIPOUT/41.3)^{19.4}] - 0.5$	Tobit	79.4	0.497	163	0.53

Table 10. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 30 streamflow gaging stations in Region 2. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *OUTLETELEV*, gage elevation, in feet above North American Vertical Datum of 1988; *PREG_11_05*, winter-spring precipitation defined as the mean monthly precipitation for November through May at the gage, in inches; *PRECIPOUT*, mean annual precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$AUGD_{20} = 36.8(CONTDA/323)^{1.81}(CSL10\_85fm/6.04)^{1.33}(OUTLETELEV/783)^{2.60}(\mathrm{PRECIPOUT}/41.3)^{8.82}$	OLS	88.0	0.294	76.5	18.5
$AUGD_{50} = [12.6(CONTDA/323)^{2.21}(CSL10\_85fm/6.04)^{2.33}(OUTLETELEV/783)^{4.09}(PRECIPOUT/41.3)^{14.4}] - 0.2$	OLS	86.4	0.354	98.0	7.04
$AUGD_{80} = [5.27(CONTDA/323)^{2.53}(CSL10\_85fm/6.04)^{3.08}(OUTLETELEV/783)^{5.01}(PRECIPOUT/41.3)^{20.4}] - 0.3$	Tobit	79.5	0.525	179	1.38
$AUGD_{90} = [4.01(CONTDA/323)^{2.27}(CSL10\_85fm/6.04)^{2.80}(OUTLETELEV/783)^{4.87}(PRECIPOUT/41.3)^{19.2}] - 0.5$	Tobit	77.9	0.509	170	0.46
$AUGD_{95} = [1.83(CONTDA/323)^{2.44}(CSL10\_85fm/6.04)^{3.12}(OUTLETELEV/783)^{5.83}(PRECIPOUT/41.3)^{23.3}] - 0.2$	Tobit	76.4	0.560	200	0.03
$SEPD_{20} = 53.5(CONTDA/323)^{1.36}(CSL10\_85fm/6.04)^{0.68}(OUTLETELEV/783)^{1.38}(PRECIPOUT/41.3)^{6.14}$	OLS	90.3	0.216	52.1	32.7
$SEPD_{50} = [12.8(CONTDA/323)^{2.08}(CSL10\_85fm/6.04)^{2.24}(OUTLETELEV/783)^{3.85}(PRECIPOUT/41.3)^{12.8}] - 0.3$	OLS	85.3	0.343	93.6	6.91
$SEPD_{80} = [5.00(CONTDA/323)^{2.49}(CSL10\_85fm/6.04)^{3.08}(OUTLETELEV/783)^{4.76}(PRECIPOUT/41.3)^{20.1}] - 0.3$	Tobit	78.1	0.548	192	1.28
$SEPD_{90} = [3.41(CONTDA/323)^{2.10}(CSL10\_85fm/6.04)^{2.58}(OUTLETELEV/783)^{4.48}(PRECIPOUT/41.3)^{19.5}] - 0.5$	Tobit	75.0	0.514	172	0.24
$SEPD_{95} = [0.96(CONTDA/323)^{2.39}(CSL10\_85fm/6.04)^{3.18}(OUTLETELEV/783)^{4.09}(PRECIPOUT/41.3)^{29.9}] - 0.2$	Tobit	65.6	0.646	259	0.02

[1]Final units of all computations from regression equations are in cubic feet per second (ft^3/s). Definition and naming conventions for statistics follow that of USGS StreamStats (*http://water.usgs.gov/osw/streamstats/StatisticsDefinitions.html* accessed September 10, 2009).

Table 11. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 51 streamflow gaging stations in Region 3.

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *PRECIPOUT*, mean annual precipitation at the gage, in inches; *CANOPY_PCT*, percentage of drainage-basin that is forested; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *DECAVPRE*, mean December precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
Annual Mean Flow					
$AVE\_DV = 203(CONTDA/203)^{1.02}(PRECIPOUT/47.8)^{4.51}$	OLS	98.8	0.073	18.0	251
Flow Duration Statistics					
$D_{20} = 197.8(CONTDA/203)^{1.09}(CANOPY\_PCT/40.8)^{-0.11}(ELEV/1010)^{0.74}(PRECIPOUT/47.8)^{6.27}$	OLS	97.3	0.115	26.9	250
$D_{50} = 48.9(CONTDA/203)^{1.13}(CANOPY\_PCT/40.8)^{-0.73}(ELEV/1010)^{1.83}(PRECIPOUT/47.8)^{8.53}$	OLS	92.8	0.178	42.4	58.1
$D_{80} = [9.39(CONTDA/203)^{1.32}(CANOPY\_PCT/40.8)^{-2.07}(ELEV/1010)^{3.24}(PRECIPOUT/47.8)^{11.7}] - 0.1$	OLS	83.8	0.318	84.7	9.83
$D_{90} = [4.87(CONTDA/203)^{1.30}(CANOPY\_PCT/40.8)^{-2.67}(ELEV/1010)^{3.47}(PRECIPOUT/47.8)^{12.6}] - 0.3$	Tobit	75.7	0.390	112	3.30
$D_{95} = [3.01(CONTDA/203)^{1.22}(CANOPY\_PCT/40.8)^{-3.12}(ELEV/1010)^{3.99}(PRECIPOUT/47.8)^{14.6}] - 0.4$	Tobit	68.0	0.461	145	1.26
$D_{20}SUM = 72.5(CONTDA/203)^{1.17}(CANOPY\_PCT/40.8)^{-0.51}(ELEV/1010)^{0.82}(PREG\_06\_10/20.2)^{8.22}$	OLS	96.5	0.127	29.9	71.2
$D_{50}SUM = 17.1(CONTDA/203)^{1.22}(CANOPY\_PCT/40.8)^{-1.24}(ELEV/1010)^{1.66}(PREG\_06\_10/20.2)^{12.0}$	OLS	90.7	0.227	55.8	19.3
$D_{80}SUM = [5.32(CONTDA/203)^{1.29}(CANOPY\_PCT/40.8)^{-2.13}(ELEV/1010)^{1.81}(PREG\_06\_10/20.2)^{18.5}] - 0.2$	Tobit	78.5	0.425	128	3.48
$D_{90}SUM = [2.21(CONTDA/203)^{1.41}(CANOPY\_PCT/40.8)^{-2.98}(ELEV/1010)^{1.77}(PREG\_06\_10/20.2)^{28.3}] - 0.05$	Tobit	74.5	0.603	228	1.15
$D_{95}SUM = [1.20(CONTDA/203)^{1.20}(CANOPY\_PCT/40.8)^{-3.63}(ELEV/1010)2.00(PREG\_06\_10/20.2)^{34.4}] - 0.07$	Tobit	75.7	0.721	320	0.33
$D_{20}WSP = 283(CONTDA/203)^{1.07}(CANOPY\_PCT/40.8)^{0.04}(ELEV/1010)^{0.41}(PRECIPOUT/47.8)^{6.35}$	OLS	97.2	0.120	28.4	357
$D_{50}WSP = 92.7(CONTDA/203)^{1.06}(CANOPY\_PCT/40.8)^{-0.29}(ELEV/1010)^{1.31}(PRECIPOUT/47.8)^{8.27}$	OLS	93.0	0.177	41.7	108
$D_{80}WSP = 27.9(CONTDA/203)^{1.17}(CANOPY\_PCT/40.8)^{-0.95}(ELEV/1010)^{2.35}(PRECIPOUT/47.8)^{11.6}$	OLS	88.7	0.237	58.0	35.0
$D_{90}WSP = [13.5(CONTDA/203)^{1.28}(CANOPY\_PCT/40.8)^{-1.48}(ELEV/1010)^{3.22}(PRECIPOUT/47.8)^{14.0}] - 0.07$	OLS	85.9	0.291	75.0	17.3
$D_{95}WSP = [8.61(CONTDA/203)^{1.17}(CANOPY\_PCT/40.8)-1.8(ELEV/1010)^{3.06}(PRECIPOUT/47.8)^{12.8}] - 0.6$	Tobit	77.1	0.303	79.5	9.3
$OCTD_{20} = 68.7(CONTDA/203)^{1.09}(CANOPY\_PCT/40.8)^{-0.33}(PREG\_06\_10/20.2)^{9.73}$	OLS	94.0	0.168	39.5	60.6
$OCTD_{50} = 15.7(CONTDA/203)^{1.10}(CANOPY\_PCT/40.8)^{-1.30}(PREG\_06\_10/20.2)^{15.8}$	OLS	84.2	0.287	74.3	15.9
$OCTD_{80} = [4.07(CONTDA/203)^{1.25}(CANOPY\_PCT/40.8)^{-2.82}(PREG\_06\_10/20.2)^{23.5}] - 0.1$	Tobit	66.3	0.584	214	2.45
$OCTD_{90} = [1.93(CONTDA/203)^{1.19}(CANOPY\_PCT/40.8)^{-3.28}(PREG\_06\_10/20.2)^{30.7}] - 0.1$	Tobit	71.8	0.630	247	0.65
$OCTD_{95} = [1.16(CONTDA/203)^{1.02}(CANOPY\_PCT/40.8)^{-3.65}(PREG\_06\_10/20.2)^{35.7}] - 0.1$	Tobit	71.6	0.694	297	0.19

Table 11. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 51 streamflow gaging stations in Region 3. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *PRECIPOUT*, mean annual precipitation at the gage, in inches; *CANOPY_PCT*, percentage of drainage-basin that is forested; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *DECAVPRE*, mean December precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$NOVD_{20} = 159(CONTDA/203)^{1.08}(CANOPY\_PCT/40.8)^{-0.21}(ELEV/1010)^{1.43}(\mathrm{PRECIPOUT}/47.8)^{7.98}$	OLS	91.6	0.194	46.2	170
$NOVD_{50} = 35.7(CONTDA/203)^{1.16}(CANOPY\_PCT/40.8)^{-0.99}(ELEV/1010)^{2.56}(\mathrm{PRECIPOUT}/47.8)^{10.3}$	OLS	88.4	0.248	61.7	39.2
$NOVD_{80} = 7.84(CONTDA/203)^{1.55}(CANOPY\_PCT/40.8)^{-2.61}(ELEV/1010)^{4.82}(\mathrm{PRECIPOUT}/47.8)^{16.5}$	OLS	71.1	0.554	196	8.74
$NOVD_{90} = [4.92(CONTDA/203)^{1.30}(CANOPY\_PCT/40.8)^{-2.86}(ELEV/1010)^{3.53}(\mathrm{PRECIPOUT}/47.8)^{14.3}] - 0.09$	OLS	71.6	0.499	165	3.88
$NOVD_{95} = [3.40(CONTDA/203)^{1.15}(CANOPY\_PCT/40.8)^{-3.10}(ELEV/1010)^{4.26}(\mathrm{PRECIPOUT}/47.8)^{14.3}] - 0.4$	Tobit	66.5	0.524	178	1.71
$DECD_{20} = 202.5(CONTDA/203)^{0.97}(CANOPY\_PCT/40.8)^{0.00}(ELEV/1010)^{1.15}(\mathrm{DECAVPRE}/3.51)^{3.29}$	OLS	94.1	0.161	38.0	282
$DECD_{50} = 63.2(CONTDA/203)^{1.02}(CANOPY\_PCT/40.8)^{-0.53}(ELEV/1010)^{2.45}(\mathrm{DECAVPRE}/3.51)^{4.10}$	OLS	89.6	0.215	52.1	73.6
$DECD_{80} = [19.1(CONTDA/203)^{1.13}(CANOPY\_PCT/40.8)^{-1.19}(ELEV/1010)^{3.83}(\mathrm{DECAVPRE}/3.51)^{4.76}] - 0.3$	Tobit	83.6	0.293	75.8	22.2
$DECD_{90} = [9.60(CONTDA/203)^{1.18}(CANOPY\_PCT/40.8)^{-1.80}(ELEV/1010)^{4.01}(\mathrm{DECAVPRE}/3.51)^{5.25}] - 0.4$	Tobit	76.7	0.326	87.6	10.1
$DECD_{95} = [6.21(CONTDA/203)^{1.20}(CANOPY\_PCT/40.8)^{-2.17}(ELEV/1010)^{4.22}(\mathrm{DECAVPRE}/3.51)^{5.11}] - 0.3$	Tobit	71.6	0.406	119	4.58
$JAND_{20} = 214(CONTDA/203)^{0.99}(CANOPY\_PCT/40.8)^{-0.06}(ELEV/1010)^{1.12}(DECAVPRE/3.51)^{3.30}$	OLS	93.7	0.164	38.7	284
$JAND_{50} = 77.3(CONTDA/203)^{1.05}(CANOPY\_PCT/40.8)^{-0.36}(ELEV/1010)^{2.03}(DECAVPRE/3.51)^{3.82}$	OLS	91.6	0.199	47.6	96.4
$JAND_{80} = [27.4(CONTDA/203)^{1.08}(CANOPY\_PCT/40.8)^{-0.92}(ELEV/1010)^{2.80}(DECAVPRE/3.51)^{4.75}] - 0.4$	OLS	87.1	0.248	61.7	32.5
$JAND_{90} = [13.8(CONTDA/203)^{1.13}(CANOPY\_PCT/40.8)^{-1.27}(ELEV/1010)^{3.64}(DECAVPRE/3.51)^{5.10}] - 0.3$	OLS	86.4	0.270	68.4	17.2
$JAND_{95} = [8.60(CONTDA/203)^{1.12}(CANOPY\_PCT/40.8)^{-1.60}(ELEV/1010)^{4.05}(DECAVPRE/3.51)^{5.06}] - 0.6$	Tobit	76.5	0.295	76.5	7.46
$FEBD_{20} = 267(CONTDA/203)^{1.09}(CANOPY\_PCT/40.8)^{0.02}(ELEV/1010)^{0.18}(PRECIPOUT/47.8)^{7.60}$	OLS	95.4	0.154	36.5	411
$FEBD_{50} = 104(CONTDA/203)^{1.07}(CANOPY\_PCT/40.8)^{-0.28}(ELEV/1010)^{1.07}(PRECIPOUT/47.8)^{9.23}$	OLS	91.7	0.195	46.9	130
$FEBD_{80} = 37.6(CONTDA/203)^{1.14}(CANOPY\_PCT/40.8)^{-0.69}(ELEV/1010)^{1.76}(PRECIPOUT/47.8)^{11.7}$	OLS	88.6	0.238	58.7	43.6
$FEBD_{90} = 21.5(CONTDA/203)^{1.25}(CANOPY\_PCT/40.8)^{-1.05}(ELEV/1010)^{2.31}(PRECIPOUT/47.8)^{14.2}$	OLS	85.1	0.298	78.0	23.9
$FEBD_{95} = [15.2(CONTDA/203)^{1.15}(CANOPY\_PCT/40.8)^{-1.09}(ELEV/1010)^{2.06}(PRECIPOUT/47.8)^{13.3}] - 0.4$	OLS	87.7	0.243	60.2	15.2
$MARD_{20} = 377(CONTDA/203)^{1.02}(CANOPY\_PCT/40.8)^{0.14}(PRECIPOUT/47.8)^{5.80}$	OLS	95.9	0.146	34.3	489
$MARD_{50} = 140(CONTDA/203)^{0.97}(CANOPY\_PCT/40.8)^{-0.13}(PRECIPOUT/47.8)^{7.78}$	OLS	90.7	0.202	48.4	167
$MARD_{80} = 55.9(CONTDA/203)^{1.01}(CANOPY\_PCT/40.8)^{-0.57}(PRECIPOUT/47.8)^{10.8}$	OLS	86.0	0.249	61.7	59.4

Table 11. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 51 streamflow gaging stations in Region 3. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *PRECIPOUT*, mean annual precipitation at the gage, in inches; *CANOPY_PCT*, percentage of drainage-basin that is forested; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *DECAVPRE*, mean December precipitation at the gage, in inches]

Regression Equation [1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$MARD_{90} = 32.2(CONTDA/203)^{1.03}(CANOPY\_PCT/40.8)^{-0.81}(PRECIPOUT/47.8)^{12.5}$	OLS	83.4	0.280	71.3	30.5
$MARD_{95} = [23.0(CONTDA/203)^{0.93}(CANOPY\_PCT/40.8)^{-0.84}(PRECIPOUT/47.8)^{11.7}] - 1$	OLS	80.5	0.275	70.6	20.6
$APRD_{20} = 382(CONTDA/203)^{1.10}(ELEV/1010)^{-0.06}(PRECIPOUT/47.8)^{5.48}$	OLS	96.1	0.146	34.3	445
$APRD_{50} = 135(CONTDA/203)^{1.04}(ELEV/1010)^{1.10}(PRECIPOUT/47.8)^{6.03}$	OLS	93.6	0.177	41.7	132
$APRD_{80} = 56.0(CONTDA/203)^{1.02}(ELEV/1010)^{1.85}(PRECIPOUT/47.8)^{6.81}$	OLS	88.8	0.234	57.3	56.5
$APRD_{90} = 36.3(CONTDA/203)^{1.05}(ELEV/1010)^{2.22}(PRECIPOUT/47.8)^{7.41}$	OLS	86.7	0.260	65.4	34.9
$APRD_{95} = 24.7(CONTDA/203)^{1.09}(ELEV/1010)^{2.59}(PRECIPOUT/47.8)^{8.85}$	OLS	82.1	0.314	83.2	22.6
$MAYD_{20} = 399(CONTDA/203)^{1.15}(CANOPY\_PCT/40.8)^{0.08}(ELEV/1010)^{0.15}(PRECIPOUT/47.8)^{3.44}$	OLS	97.1	0.128	29.9	453
$MAYD_{50} = 119(CONTDA/203)^{1.19}(CANOPY\_PCT/40.8)^{-0.33}(ELEV/1010)^{1.16}(PRECIPOUT/47.8)^{5.17}$	OLS	94.9	0.163	38.0	120
$MAYD_{80} = 43.6(CONTDA/203)^{1.18}(CANOPY\_PCT/40.8)^{-0.73}(ELEV/1010)^{1.95}(PRECIPOUT/47.8)^{7.28}$	OLS	91.6	0.200	47.6	53.6
$MAYD_{90} = 27.6(CONTDA/203)^{1.21}(CANOPY\_PCT/40.8)^{-0.95}(ELEV/1010)^{2.29}(PRECIPOUT/47.8)^{8.89}$	OLS	88.2	0.240	59.5	35.9
$MAYD_{95} = 19.5(CONTDA/203)^{1.24}(CANOPY\_PCT/40.8)^{-1.15}(ELEV/1010)^{2.47}(PRECIPOUT/47.8)^{10.6}$	OLS	84.3	0.287	73.6	24.5
$JUND_{20} = 195(CONTDA/203)^{1.18}(CANOPY\_PCT/40.8)^{-0.26}(ELEV/1010)^{0.65}(PREG\_06\_10/20.2)^{5.87}$	OLS	94.1	0.171	40.2	204
$JUND_{50} = 55.6(CONTDA/203)^{1.20}(CANOPY\_PCT/40.8)^{-0.63}(ELEV/1010)^{1.40}(PREG\_06\_10/20.2)^{8.23}$	OLS	92.9	0.203	49.1	54.6
$JUND_{80} = 19.5(CONTDA/203)^{1.27}(CANOPY\_PCT/40.8)^{-1.04}(ELEV/1010)^{2.09}(PREG\_06\_10/20.2)^{12.4}$	OLS	86.1	0.299	78.0	22.8
$JUND_{90} = [12.0(CONTDA/203)^{1.23}(CANOPY\_PCT/40.8)^{-1.16}(ELEV/1010)^{2.13}(PREG\_06\_10/20.2)^{13.9}] - 0.2$	OLS	82.7	0.335	90.6	13.5
$JUND_{95} = [8.32(CONTDA/203)^{1.21}(CANOPY\_PCT/40.8)^{-1.35}(ELEV/1010)^{1.78}(PREG\_06\_10/20.2)^{16.6}] - 0.3$	Tobit	78.8	0.361	101	6.91
$JULD_{20} = 66.8(CONTDA/203)^{1.17}(CANOPY\_PCT/40.8)^{-0.73}(ELEV/1010)^{1.25}(PREG\_06\_10/20.2)^{8.29}$	OLS	93.6	0.166	38.7	73.1
$JULD_{50} = 19.1(CONTDA/203)^{1.26}(CANOPY\_PCT/40.8)^{-1.33}(ELEV/1010)^{2.10}(PREG\_06\_10/20.2)^{11.5}$	OLS	87.6	0.272	69.1	20.0
$JULD_{80} = [7.13(CONTDA/203)^{1.31}(CANOPY\_PCT/40.8)^{-1.76}(ELEV/1010)^{2.15}(PREG\_06\_10/20.2)^{17.5}] - 0.2$	Tobit	81.8	0.394	114	4.31
$JULD_{90} = [3.87(CONTDA/203)^{1.51}(CANOPY\_PCT/40.8)^{-2.39}(ELEV/1010)^{1.86}(PREG\_06\_10/20.2)^{25.5}] - 0.05$	Tobit	78.0	0.539	187	1.98
$JULD_{95} = [2.03(CONTDA/203)^{1.76}(CANOPY\_PCT/40.8)^{-3.11}(ELEV/1010)^{1.99}(PREG\_06\_10/20.2)^{31.4}] - 0.01$	Tobit	70.9	0.752	349	1.04

Table 11. Regression equations developed to estimate flow-duration statistics and annual mean-flow at 51 streamflow gaging stations in Region 3. —Continued

[*AVE_DV*, annual mean from daily mean streamflow; *Dxx*, daily mean discharge which is exceeded xx percent of the time; *DxxSUM*, daily mean discharge from June 1 to October 31 exceeded xx percent of the time; *DxxWSP*, daily mean discharge from November 1 to May 31 exceeded xx percent of the time; *OCTDxx*, first three letters indicate the month where daily mean discharge is exceeded xx percent of the time; OLS, Ordinary Least Squares regression procedure; Tobit, Tobit Maximum Likelihood Estimator regression procedure; Median Statistic, median of flow statistic (dependent variable) used to develop regression equations]; ft^3/s, cubic feet per second; *CONTDA*, contributing drainage area, in square miles; *PRECIPOUT*, mean annual precipitation at the gage, in inches; *CANOPY_PCT*, percentage of drainage-basin that is forested; *ELEV*, mean basin elevation, in feet above North American Vertical Datum of 1988; *PREG_06_10*, summer-autumn precipitation defined as the mean monthly precipitation for June through October at the gage, in inches; *CSL10_85fm*, channel slope between points 10 and 85 percent of the stream length starting from the gage and along the longest flow path, in feet per mile; *DECAVPRE*, mean December precipitation at the gage, in inches]

Regression Equation[1]	Method	Adjusted R^2 (%)	Standard error of estimate in log 10 units of ft^3/s	Standard error of estimate as percent (%)	Median Statistic (ft^3/s)
$AUGD_{20} = 29.8(CONTDA/203)^{1.23}(CANOPY\_PCT/40.8)^{-1.10}(ELEV/1010)^{1.20}(PREG\_06\_10/20.2)^{10.5}$	OLS	91.1	0.208	49.9	31.0
$AUGD_{50} = [12.6(CONTDA/203)^{1.03}(CANOPY\_PCT/40.8)^{-1.40}(ELEV/1010)^{1.50}(PREG\_06\_10/20.2)^{11.3}] - 1$	OLS	86.5	0.246	61.0	9.71
$AUGD_{80} = [3.44(CONTDA/203)^{1.34}(CANOPY\_PCT/40.8)^{-2.51}(ELEV/1010)^{1.98}(PREG\_06\_10/20.2)^{22.0}] - 0.1$	Tobit	75.5	0.550	194	1.81
$AUGD_{90} = [1.77(CONTDA/203)^{1.22}(CANOPY\_PCT/40.8)^{-3.28}(ELEV/1010)^{1.76}(PREG\_06\_10/20.2)^{29.7}] - 0.09$	Tobit	77.0	0.669	277	0.44
$AUGD_{95} = [0.70(CONTDA/203)^{1.28}(CANOPY\_PCT/40.8)^{-3.92}(ELEV/1010)^{2.98}(PREG\_06\_10/20.2)^{36.3}] - 0.04$	Tobit	76.5	0.817	417	0.11
$SEPD_{20} = 41.5(CONTDA/203)^{1.12}(CANOPY\_PCT/40.8)^{-0.81}(PREG\_06\_10/20.2)^{9.91}$	OLS	94.2	0.155	36.5	40.4
$SEPD_{50} = 10.4(CONTDA/203)^{1.29}(CANOPY\_PCT/40.8)^{-1.92}(PREG\_06\_10/20.2)^{18.4}$	OLS	82.1	0.370	104	9.40
$SEPD_{80} = [3.19(CONTDA/203)^{1.37}(CANOPY\_PCT/40.8)^{-2.96}(PREG\_06\_10/20.2)^{27.0}] - 0.06$	Tobit	73.9	0.560	200	1.61
$SEPD_{90} = [1.65(CONTDA/203)^{1.03}(CANOPY\_PCT/40.8)^{-3.32}(PREG\_06\_10/20.2)^{32.1}] - 0.2$	Tobit	72.3	0.597	223	0.31
$SEPD_{95} = [0.90(CONTDA/203)^{1.13}(CANOPY\_PCT/40.8)^{-3.92}(PREG\_06\_10/20.2)^{39.5}] - 0.09$	Tobit	71.9	0.799	397	0.05

[1]Final units of all computations from regression equations are in cubic feet per second (ft^3/s). Definition and naming conventions for statistics follow that of USGS StreamStats (*http://water.usgs.gov/osw/streamstats/StatisticsDefinitions.html* accessed September 10, 2009).