STATE OF LOUISIANA

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

OFFICE OF HIGHWAYS

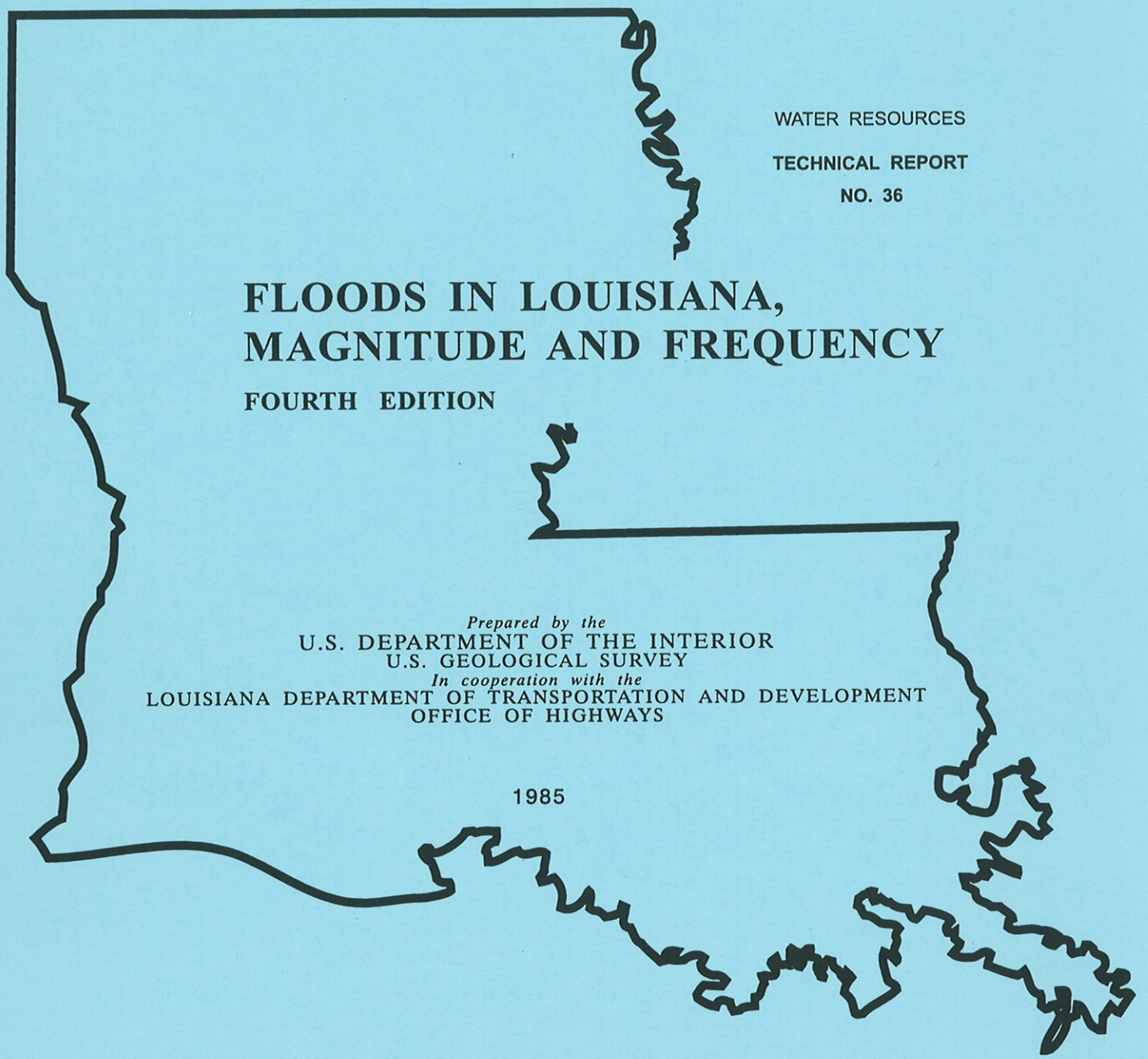
WATER RESOURCES

TECHNICAL REPORT

NO. 36

FLOODS IN LOUISIANA, MAGNITUDE AND FREQUENCY

FOURTH EDITION



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LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF HIGHWAYS

1985

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FOURTH EDITION

By

Fred N. Lee
U.S. Geological Survey

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EDWIN W. EDWARDS, Governor

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

ROBERT G. GRAVES, Secretary

OFFICE OF HIGHWAYS

NEIL L. WAGONER, Assistant Secretary

Cooperative projects with

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DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

DALLAS L. PECK, Director

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Multiply	By	To obtain
inch (in.)	25.40	millimeter (mm)
inch per year (in/yr)	25.40	millimeter per year (mm/yr)
foot (ft)	0.3048	meter (m)
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)

To convert temperature in degrees Celsius (°C) to degrees Fahrenheit (°F), multiply by 9/5 and add 32.

FLOODS IN LOUISIANA, MAGNITUDE AND FREQUENCY

FOURTH EDITION

By Fred N. Lee

ABSTRACT

The magnitude and frequency of floods are presented in this report for 287 streamflow-gaging sites in Louisiana and bordering sites in the adjacent states of Mississippi and Arkansas. Regression equations, using 217 of these sites that are basically natural and unaltered and with drainage areas less than 3,000 square miles, were developed using multiple regression techniques and were used to estimate discharges for return periods of 2, 5, 10, 25, 50, and 100 years. Accuracy of the estimated discharges range from ±35 percent to ±43 percent. The report includes data used in the analyses through the 1983 water year. Independent variables, defined as being significant as predictors, are contributing drainage area, main-channel slope, and a mean annual precipitation index. Discharge weighted on the basis of station discharge and regression discharge is recommended for use at gaged sites when the stream is basically natural and unaltered. Examples of use of the estimating techniques that were developed are given.

Peak-discharge data for the return periods of 2, 5, 10, 25, 50, and 100 years are given for streamflow sites with drainage areas larger than 3,000 square miles. Graphs of discharge versus drainage area are presented for those streams that have more than one data-collection location.

INTRODUCTION

As man encroaches upon flood plains, it becomes important to have a good understanding and quantitative description of the magnitude and frequency of floods. This understanding is of utmost importance for the design of highways, levees, dams, and other structures that encroach on flood plains. In addition, flood-plain management plans and flood-insurance rates are based on the best information available.

This report presents methods for estimating the magnitude and frequency of floods for many of the streams in Louisiana that have not been significantly changed by man. A relationship was established between flood magnitude and frequency for individual streamflow sites using a log-Pearson Type III analysis. A log-linear regression analysis was then used to develop equations for estimating the discharge for the return periods 2, 5, 10, 25, 50, and 100 years (Q_2, Q_5, Q_{10}, Q_{25}, Q_{50}, and Q_{100}) at ungaged sites for natural, basically unaltered, Louisiana streams.

Magnitude and frequency of floods for Louisiana have previously been reported by Cragwall (1952), Sauer (1964), Neely (1976), and Lowe (1979). Landers (1985) presented flood-frequency results for the Mississippi River delta using streamflow data from Louisiana streams in the delta to augment streamflow data from Mississippi and Arkansas. Cragwall (1952) developed a set of composite curves of the relationship between the recurrence interval and the ratio to the mean annual flood for each of the four regions in Louisiana. The curves were based on data for the period 1926-50. Sauer's (1964) analysis used an additional 10 years of record (1951-60) for most of the streams Cragwall used in his report, plus many stations with 5 to 15 years of record that were not used in the first report. Neely (1976) used peak-flow data for 170 streamflow-gaging stations with more than 9 years of record to develop equations to estimate the peak discharge for recurrence intervals ranging from 2 to 100 years. The equations are based on three basin characteristics (area, precipitation, and channel slope) that can be measured from topographic maps and from an isohyetal map. Frequency analyses of data for stations on the main stems of larger streams were handled separately in all of the above studies.

Lowe (1979) developed non-linear equations to estimate discharges for recurrence intervals ranging from 2 to 100 years for streamflow sites within Louisiana with drainage areas less than 10 mi^2. Discharge data for 47 streamflow-gaging stations with lengths of record varying from 6 to 14 years were available for analysis. Lowe's equations are applicable for non-regulated streams in Louisiana that have drainage areas between 0.1 and 10 mi^2 and main channel slopes between 5 and 100 ft/mi.

This report, which supersedes all previous flood-frequency reports for Louisiana, is the result of a cooperative agreement between the Louisiana Department of Transportation and Development and the U.S. Geological Survey. The data base is from streamflow-gaging station records collected and assembled through the 1983 water year by the U.S. Geological Survey in cooperation with various Federal and State agencies, principally the Louisiana Department of Transportation and Development, Office of Highways, and the U.S. Army Corps of Engineers (New Orleans, Mobile, and Vicksburg Districts).

GENERAL DESCRIPTION OF STUDY AREA

Louisiana is located in the south-central United States and lies wholly witnin the coastal plains physiographic province (Fenneman, 1938). Judge (1979) indicates that Louisiana has 2.2 million acres of inland water surface (7 percent of the total State area) and is ranked fifth in relation to other states in ratio of total inland water-surface area to total land area.

Louisiana has a humid-subtropical climate. Temperatures are moderate the year round with lowest temperatures occurring during January and February and highest temperatures during July and August. Mean temperatures range from 19.0°C in northern Louisiana to 20.5°C in southern Louisiana. Because periods of prolonged freezing rarely occur, snow and ice have no effect on flood runoff from streams originating within the State.

Annual rainfall ranges from about 46 in. in the northeast to about 68 in. in the southeast. The median rainfall is about 56 in. The most intense rainfall occurs during localized thunderstorms, which produce large amounts of rainfall and are usually of short duration.

Another source of heavy rainfall is from tropical storms. These storms originate over the warm ocean waters and move slowly inland. During this slow inland movement, extremely heavy rainfall can occur over much of the State in a short period of time and may cause major flooding.

Storms that produce the most severe flooding throughout the State are associated with frontal movements. These fronts, which usually come in from the northwest, often stall over the Gulf of Mexico and pump warm, moist air back over the State, subjecting large areas to intense rainfall for hours or even days.

Louisiana has been divided into four physiographic divisions: (1) Pine Hills, (2) Prairies, (3) Coastal Marshes, and (4) Alluvial Plains (Fenneman, 1938) (fig. 1). The Pine Hills includes a large part of the State and almost all of the area where peak-flow data are available for flood-frequency analysis. The terrain is typically rolling hills and except where farms and pastures exist, heavily forested with pine and hardwood trees. The Prairies, however, is located only in the southwestern part of the State. It is typically flat, with elevations ranging from 20 to 30 ft above sea level and is generally treeless, except along fence lines and the meandering, sluggish streams. The Coastal Marshes border the Prairies west of the Atchafalaya River and the Pine Hills east of the Mississippi River. The terrain is extremely flat and, therefore, subject to tidal flooding from the nearby Gulf of Mexico. The Alluvial Plains consists of the river flood plains that extend from the Mississippi River delta, the Ouachita River, and the Red River. The terrain is extremely flat, and the meandering stream channels are complex and interconnected, permitting interchange of flow between basins during high floods.

Principal rivers draining Louisiana are the Pearl River, the Mississippi River, the Red River-Atchafalaya River system, and the Sabine River. All other streams are tributary to these rivers with the exception of two groups.

One of these groups consist of those streams east of the Mississippi River and west of the Pearl River. Major streams in this area are the Tchefuncta River, Tangipahoa River, Natalbany River, and the Amite River. These streams flow into the Gulf of Mexico through Lake Maurepas, Lake Pontchartrain, and Lake Borgne.

The other group of streams is west of the Mississippi River and east of the Sabine River. Major streams in this system are Bayou Teche, Vermilion River, Mermentau River, and the Calcasieu River. These streams either flow directly into the Gulf of Mexico or eventually discharge to the gulf through coastal lakes and estuaries.

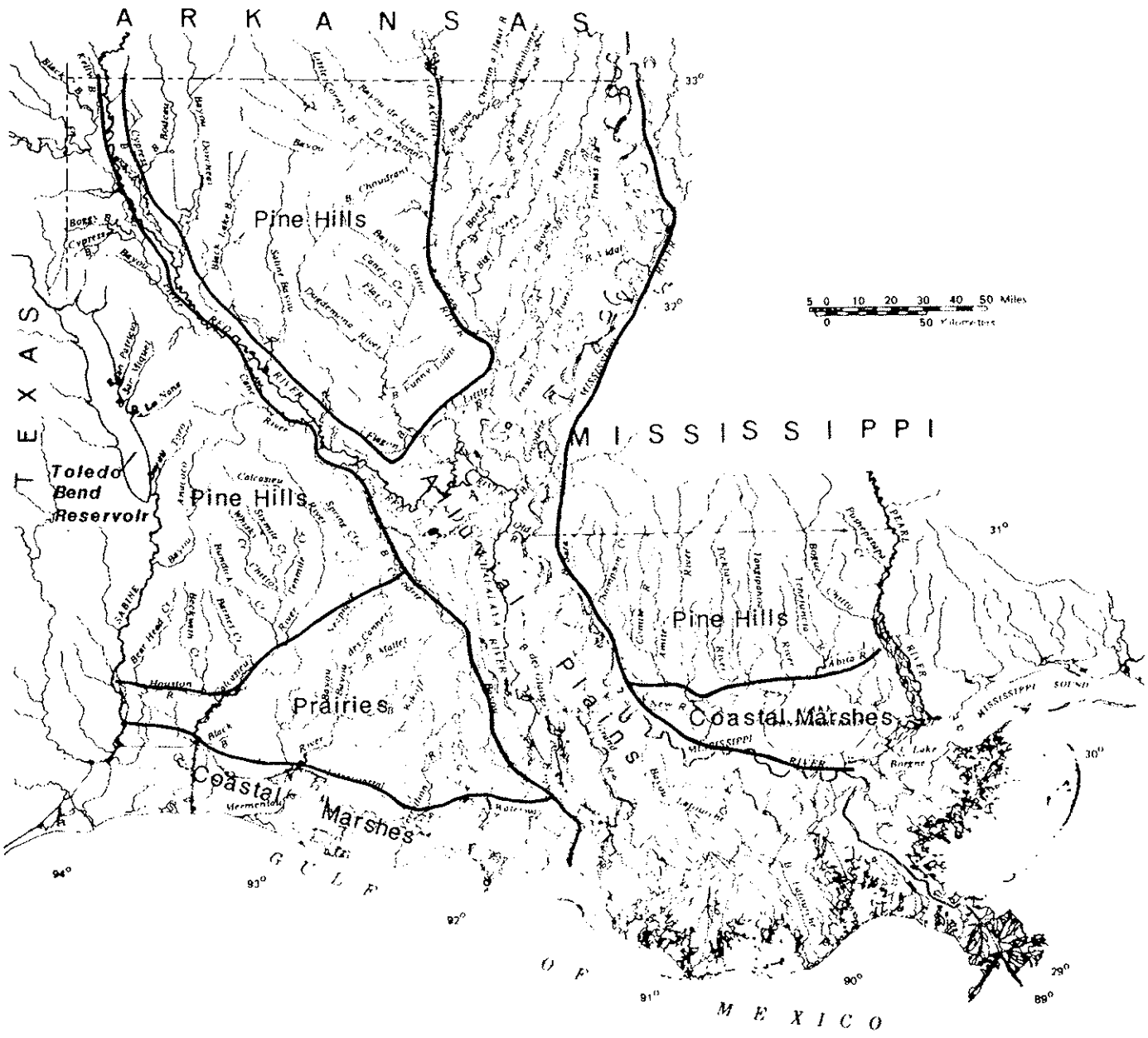

Figure 1.--Physiographic divisions and stream systems.

The Mississippi River is the largest river in the State, but only a few streams within the State are tributary to it. The two largest streams are Thompson Creek and Bayou Sara.

The Atchafalaya River, a significant part of the lower Mississippi River system, is now a controlled distributary of the Mississippi River. In addition, it carries flow from the Red River (which drains a large part of northern Louisiana) to the Gulf of Mexico.

The Pearl River is part of the eastern boundary between Louisiana and Mississippi. This large river drains only a small part of the State. The Bogue Chitto is its only significant tributary within the State.

The Sabine River is part of the western boundary between Louisiana and Texas. This river, which drains only a small part of the State, is the main source of water supply to the Toledo Bend Reservoir.

AVAILABLE DATA

Flood-peak data have been collected systematically at some Louisiana streamflow sites since 1921. Most of the streams for which long-term systematic data (1921-83) are available are those with large drainage basins.

Observed peak-discharge data at 287 streamflow gaging stations were available for this flood-frequency analysis. These sites are shown on plate 1 and listed in tables 1, 2, and 3. Table 1 contains those stations operated by the Geological Survey on a regular basis and have drainage areas ranging from 0.019 to 1,880 mi^2 and periods of record ranging from 10 to 97 years. Table 2 contains 47 sites that were operated as a small streams network (Lowe, 1979) and have drainage areas ranging from 0.1 to 10 mi^2 and periods of record ranging from 5 to 13 years. Table 3 contains streamflow sites operated on a regular basis with drainage areas larger than 3,000 mi^2 and periods of records ranging from 16 to 107 years.

Included in table 1 are three streamflow stations in Mississippi and three in Arkansas for streams that flow into Louisiana, either directly or indirectly. Each of these six streamflow sites have drainage areas less than 3,000 mi^2 and are used in this study to provide continuity between flood-frequency analyses among the three states.

The analysis in this report is based on peak-discharge data collected through the 1983 water year at most streamflow sites. The distribution of drainage area size, the average length of record, the minimum length of record, and the maximum length of record are shown in table 4. Table 4 shows that about 60 percent of the sites have drainage areas between 10 and 500 mi^2 and length of record generally increases with drainage-area size. The average length of record for the 287 streamflow sites is 26 years.

Table 1.--Discharges at gaging stations in Louisiana, except where noted, for selected recurrence intervals

[A, drainage area; P, precipitation; and S, slope; L, length of record; mi^2, square miles; in., inches; ft/mi, feet per mile; yr, years; ft^3/s, cubic feet per second. Numbers not in parentheses are weighted values based on stations skew and regional skew. Numbers in parentheses are values computed by weighting the regression discharges with those values that are not in parentheses.]

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
02489400	Pushepatapa Creek at Varnado-------	158	61	12	17	Yes	4,770	13,100	23,000	43,500	66,600	99,000
							(5,300)	(14,000)	(23,300)	(41,200)	(59,400)	(83,400)
02490000	Bogue Lusa Creek near Franklinton--	12.1	61	15.9	20	Yes	1,500	3,940	6,290	10,100	13,400	17,300
02490105	Bogue Lusa Creek at State Highway 439 at Bogalusa.	72.7	61	9.6	20	Yes	2,350	4,690	6,760	9,980	12,800	16,100
							(2,700)	(5,720)	(8,520)	(13,200)	(17,200)	(21,400)
02490113	Bogue Lusa Creek at State Highway 21 at Bogalusa.	75.9	60	6.2	14	No	3,470	5,920	7,790	10,400	12,500	14,700
02490500	Bogue Chitto near Tylertown, Miss--	502	60	4.7	[a]46	Yes	13,900	27,300	38,000	53,200	65,500	78,500
02490750	McGees Creek at Tylertown, Miss----	151	60	7.6	[a]81	Yes	4,170	8,220	11,700	16,900	21,400	26,400
02491200	Silver Springs Creek (Silver Creek) near Clifton.	50.1	62	8.2	18	No	2,620	5,900	8,860	13,400	17,500	22,000
02491350	Hays Creek near Franklinton--------	42.2	62	10.7	18	Yes	2,530	5,260	7,610	11,200	14,200	17,600
02491500	Bogue Chitto at Franklinton--------	985	62	4.4	[a]83	Yes	21,200	39,200	52,900	71,700	86,600	102,000
							(20,900)	(38,600)	(52,300)	(72,000)	(87,800)	(104,000)
02491600	West Fork Burch Creek tributary near Franklinton.	.06	61	32.4	10	No	20	35	46	62	74	87
02491700	Lawrence Creek near Franklinton----	44.2	61	11.3	20	Yes	3,270	6,600	9,550	12,200	18,400	23,200
							(3,250)	(6,550)	(9,480)	(12,900)	(18,300)	(22,800)
02492000	Bogue Chitto near Bush----------	1,210	62	4.0	[a]83	Yes	18,400	33,800	45,900	63,400	77,800	93,200
							(18,400)	(34,000)	(46,500)	(65,700)	(81,400)	(98,200)
02492200	Talisheek Creek at Talisheek-------	17.3	62	5.9	15	Yes	642	1,150	1,590	2,270	2,870	3,570
							(840)	(1,600)	(2,240)	(3,200)	(4,020)	(4,830)
07344450	Paw Paw Bayou near Greenwood-------	78	45	9.4	27	Yes	2,700	5,350	7,530	10,700	13,400	16,200
							(2,540)	(4,910)	(6,810)	(9,550)	(11,800)	(14,400)
07346300	Caddo Lake tributary near Mooringsport.	.03	--	------	11	No	12	25	37	57	75	96
07346450	Black Bayou near Rodessa----------	177	49	3.7	12	Yes	2,830	4,790	6,140	7,860	9,130	10,400
							(2,850)	(4,960)	(6,510)	(8,850)	(10,500)	(12,100)
07346500	Black Bayou near Hosston----------	231	47	2.9	12	Yes	2,400	3,400	3,990	4,670	5,120	5,540
							(2,490)	(3,920)	(4,990)	(6,670)	(7,740)	(8,750)
07346950	Kelly Bayou near Ida----------	73	--	------	13	No	870	1,670	2,350	3,380	4,280	5,290
07347000	Kelly Bayou near Hosston----------	116	48	4.2	25	Yes	1,420	2,030	2,460	3,010	3,440	3,880
							(1,540)	(2,470)	(3,230)	(4,440)	(5,280)	(6,070)
07347500	Black Bayou near Gilliam----------	364	48	2.2	29	Yes	3,140	5,570	7,610	10,700	13,500	16,600
							(3,200)	(5,670)	(7,670)	(10,700)	(13,200)	(15,800)
07348100	McCain Creek near Shreveport-------	13.8	--	------	24	No	452	877	1,220	1,700	2,100	2,520
07348700	Bayou Dorcheat near Springhill-----	605	50	3.5	26	Yes	6,190	12,900	18,800	27,900	35,800	44,800
							(6,250)	(12,800)	(18,400)	(27,100)	(34,100)	(42,100)
07348720	Bayou Dorcheat near Sarepta--------	718	50	3.2	13	Yes	8,460	12,200	14,600	17,600	19,700	21,700
							(8,210)	(12,700)	(16,100)	(21,900)	(25,900)	(29,800)

07348725	Indian Creek at Shongaloo----------	33.1	50	7.2	17	Yes	1,790	2,850	3,600	4,590	5,350	6,120
							(1,690)	(2,730)	(3,520)	(4,610)	(5,550)	(6,470)
07348740	Bayou Dorcheat near Cotton Valley--	804	50	2.8	16	Yes	9,440	17,500	24,200	34,200	42,900	52,500
							(8,920)	(16,200)	(22,000)	(30,900)	(38,000)	(46,000)
07348760	Black Bayou at Leton----------	49.8	50	9.3	a29	Yes	1,970	3,690	4,940	6,590	7,830	9,060
							(1,960)	(3,710)	(5,040)	(6,970)	(8,440)	(9,920)
07348800	Flat Lick Bayou near Leton---------	66.9	50	8.4	24	Yes	1,890	3,730	5,260	7,550	9,500	11,600
							(1,950)	(3,880)	(5,530)	(8,080)	(10,100)	(12,300)
07348900	Brushy Creek near Hortman----------	16.1	49	7.9	15	Yes	782	1,320	1,740	2,310	2,770	3,260
							(797)	(1,380)	(1,850)	(2,520)	(3,040)	(3,560)
07348950	Brushy Creek tributary near Minden-	.08	49	17	12	No	11	22	30	44	55	69
07349000	Bayou Dorcheat near Minden---------	1,097	49	2.2	51	Yes	8,410	16,800	23,600	33,300	41,400	49,900
							(8,340)	(16,400)	(22,800)	(31,900)	(39,200)	(47,200)
07349200	Clark Bayou near Haughton----------	35.1	49	4.1	15	Yes	1,480	2,450	3,140	4,010	4,670	5,330
							(1,340)	(2,300)	(2,940)	(3,780)	(4,370)	(4,980)
07349500	Bodcau Bayou (Bayou Bodcau) near Sarepta.	546	49	1.8	a78	Yes	4,340	7,540	9,800	12,700	14,800	16,900
							(4,370)	(7,570)	(9,830)	(12,900)	(15,000)	(17,200)
07349800	Cypress Bayou near Benton----------	133	--	------	a36	No	2,200	4,140	5,670	7,820	9,560	11,400
07349850	Red Chute Bayou near Shreveport----	--------	--	------	30	No	2,270	3,050	3,510	4,020	4,360	4,660
07350990	Boggy Bayou at Woolworth Road near Keithville.	41.3	45	12.4	17	Yes	2,460	4,500	6,050	8,210	9,930	11,700
07351000	Boggy Bayou near Keithville--------	79	48	8.6	44	Yes	2,540	6,300	8,380	11,200	13,500	15,800
							(3,400)	(5,990)	(7,950)	(10,700)	(12,900)	(15,200)
07351300	Brush Bayou near Shreveport--------	27.1	47	9.2	22	No	4,660	7,940	10,200	13,000	15,100	17,000
07351500	Cypress Bayou near Keithville------	66	47	12	44	Yes	4,570	8,380	11,300	15,400	18,800	22,200
							(4,307)	(7,730)	(10,300)	(14,000)	(17,000)	(20,200)
07351700	Bayou Na Bonchasse near Mansfield--	19.5	48	18.2	24	Yes	947	2,020	3,010	4,650	6,170	7,970
							(976)	(2,080)	(3,090)	(4,730)	(6,160)	(7,800)
07351900	Bayou Dupont near Robeline---------	35.1	--	------	13	No	1,270	2,980	4,670	7,580	10,400	13,800
07351980	Saline Bayou near Bienville--------	54.9	53	5.8	18	Yes	1,380	2,430	3,150	4,080	4,760	5,420
							(1,540)	(2,850)	(3,870)	(5,430)	(6,550)	(7,620)
07352000	Saline Bayou near Lucky----------	154	50	6.1	43	Yes	2,670	4,930	7,180	10,700	13,800	17,200
							(2,740)	(5,180)	(7,560)	(11,400)	(14,500)	(17,900)
07352200	Black Lake Bayou near Minden-------	38.6	49	10.2	27	Yes	971	1,600	2,070	2,740	3,280	3,860
							(1,070)	(1,940)	(2,690)	(3,930)	(4,880)	(5,810)
07352295	Black Lake Creek at Gibsland-------	44.8	52	28.4	16	Yes	1,610	3,110	4,420	6,460	8,280	10,400
							(1,810)	(3,820)	(5,730)	(9,000)	(11,700)	(14,700)
07352300	Black Lake Creek near Gibsland-----	48.9	--	------	16	No	680	1,180	1,560	2,070	2,470	2,890
07352400	Kepler Creek at Sparta----------	21.1	52	10.9	25	Yes	645	1,340	1,890	2,650	3,240	3,850
							(762)	(1,640)	(2,390)	(3,540)	(4,420)	(5,780)
07352500	Black Lake Bayou near Castor-------	423	50	3.9	43	Yes	3,950	6,980	9,400	12,900	15,800	19,000
							(4,100)	(7,510)	(10,300)	(14,800)	(18,200)	(21,800)
07352700	Castor Creek at Castor----------	27.9	50	9.4	15	Yes	735	1,580	2,330	3,490	4,520	5,680
							(888)	(1,920)	(2,810)	(4,240)	(5,360)	(6,550)
07352800	Grand Bayou near Coushatta---------	93.9	50	5.3	25	Yes	2,050	3,430	4,510	6,060	7,350	8,750
							(2,100)	(3,650)	(4,920)	(6,870)	(8,380)	(9,940)
07353000	Saline Bayou near Clarence---------	1,386	--	------	24	No	5,620	7,910	9,440	11,400	12,900	14,400
07353500	Nantachie Creek near Montgomery----	47	53	6.2	26	Yes	1,650	4,680	7,880	13,500	18,900	25,500
							(1,700)	(4,410)	(7,030)	(11,300)	(15,200)	(20,000)
07353520	Nantachie Lake (Nantachie Creek) near Aloha.	79.7	53	6.2	15	Yes	1,340	3,620	6,130	10,800	15,700	22,000
							(1,680)	(4,120)	(6,480)	(10,500)	(14,100)	(18,500)

[a] Indicates that years of record represent historical period.

Table 1.--Discharges at gaging stations in Louisiana, except where noted, for selected recurrence intervals--Continued

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
07353990	Kisatchie Bayou at Kisatchie-------	37.3	54	9.6	18	Yes	2,750	6,980	11,300	19,100	26,600	36,000
							(2,600)	(6,060)	(9,280)	(14,600)	(19,500)	(25,700)
07354000	Little Sandy Creek at Kisatchie----	21.4	54	15.3	30	Yes	2,700	4,200	5,160	6,300	7,090	7,840
							(2,560)	(4,050)	(5,130)	(6,690)	(7,920)	(9,140)
07354200	Bayou Santabarb at Bellwood--------	51.1	54	12.3	11	Yes	1,770	3,820	5,840	9,300	12,700	16,800
							(2,060)	(4,580)	(6,970)	(11,000)	(14,500)	(18,400)
07354400	Edmund Bayou tributary near Provencal.	.02	54	233	11	No	20	28	34	41	47	53
07354500	Horsepen Creek near Provencal------	5.27	54	25.9	19	Yes	476	1,010	1,500	2,280	3,000	3,830
							(528)	(1,120)	(1,640)	(2,470)	(3,180)	(3,940)
07355000	Hemphill Creek near Hot Wells------	18	58	13.9	15	Yes	1,920	3,300	4,440	6,120	7,570	9,180
							(1,890)	(3,390)	(4,720)	(6,820)	(8,600)	(10,500)
07362100	Smackover Creek near Smackover, Ark.	377	52	4.0	42	Yes	5,970	12,000	17,200	25,100	32,000	39,700
							(5,980)	(12,000)	(17,100)	(24,900)	(31,400)	(38,700)
07364190	Bayou Bartholomew at Wilmot, Ark---	1,170	53	.43	48	Yes	4,810	6,040	6,800	7,700	8,330	8,950
							(4,860)	(6,280)	(7,140)	(8,360)	(9,050)	(9,670)
07364200	Bayou Bartholomew near Jones-------	1,187	--	------	26	No	4,340	5,930	6,840	7,850	8,510	9,110
07364300	Chemin-A-Haut near Beekman---------	271	52	3.3	24	Yes	4,860	10,400	15,000	21,800	27,500	33,500
							(4,780)	(9,790)	(13,700)	(19,500)	(24,100)	(29,100)
07364500	Bayou Bartholomew near Beekman-----	1,645	52	.41	53	Yes	7,040	9,040	10,300	11,700	12,700	13,700
							(7,020)	(9,080)	(10,400)	(12,000)	(13,100)	(14,100)
07364700	Bayou De Loutre near Laran---------	141	50	3.6	22	Yes	2,490	5,580	8,770	14,500	20,400	28,000
							(2,520)	(5,350)	(7,980)	(12,300)	(16,500)	(21,800)
07364740	Bayou De Loutre near Farmerville---	241	50	2.9	18	Yes	3,240	5,670	7,720	10,700	13,600	16,800
							(3,290)	(5,800)	(7,830)	(11,000)	(13,400)	(16,100)
07364800	Bayou D'Arbonne at Homer----------	30	50	12.8	30	Yes	1,390	3,130	4,740	7,340	9,700	12,400
							(1,400)	(3,130)	(4,680)	(7,150)	(9,300)	(11,700)
07364830	Bayou D'Arbonne tributary No. 2 near Homer.	.03	50	240	11	No	15	25	32	42	49	56
07364860	Sugar Creek tributary at Lake Foursome near Arcadia.	.93	50	62	11	Yes	175	363	528	781	1,000	1,250
							(181)	(350)	(486)	(672)	(828)	(996)
07364870	Sugar Creek near Arcadia----------	47	50	13.5	18	Yes	2,150	3,740	4,800	6,080	6,970	7,810
							(2,140)	(3,940)	(5,380)	(7,620)	(9,360)	(11,100)
07364900	Big Creek near Vienna-------------	68.9	50	11.1	12	Yes	2,340	4,310	5,820	7,900	9,560	11,300
							(2,380)	(4,640)	(6,570)	(9,670)	(12,100)	(14,700)
07365000	Bayou D'Arbonne near Dubach-------	355	50	4.7	29	Yes	5,990	11,000	15,100	21,400	26,800	32,800
							(5,870)	(10,800)	(14,900)	(21,300)	(26,500)	(32,300)
07365100	Cypress Creek near Unionville------	63.3	50	10.3	12	Yes	1,770	3,750	5,530	8,320	10,800	13,700
							(1,930)	(4,120)	(6,070)	(9,220)	(11,800)	(14,600)
07365300	Middle Fork Bayou D'Arbonne near Colquitt.	43.9	50	9.9	25	Yes	2,010	4,080	5,990	9,150	12,100	15,700
							(1,980)	(3,960)	(5,720)	(8,560)	(11,100)	(14,100)
07365400	Middle Fork Bayou D'Arbonne tributary near Bernice.	.02	51	146	12	No	4.2	12	19	33	47	65

07365500	Middle Fork Bayou D'Arbonne near Bernice.	178	51	4.4	30	Yes	2,650 (2,780)	5,240 (5,510)	7,710 (8,010)	11,900 (12,200)	15,900 (15,800)	20,800 (20,000)
07365800	Cornie Bayou near Three Creeks, Ark.	180	49	5.0	25	Yes	4,110 (4,050)	10,100 (9,670)	16,300 (15,100)	27,200 (25,000)	38,200 (34,300)	51,800 (46,400)
07366000	Corney Bayou near Lillie----------	462	50	3.5	43	Yes	5,930 (5,890)	11,500 (11,300)	16,500 (16,100)	24,300 (23,500)	31,400 (29,900)	39,700 (37,300)
07366200	Little Corney Bayou near Lillie (near Spearsville).	208	52	3.7	27	Yes	3,210 (3,320)	6,970 (6,990)	10,300 (10,100)	15,600 (14,900)	20,300 (18,900)	25,700 (23,500)
07366350	Stowe Creek near Farmerville-------	29	52	11.9	[a]30	Yes	967 (1,070)	2,770 (2,890)	4,750 (4,760)	8,360 (7,980)	12,000 (11,000)	16,600 (14,700)
07366360	Bayou D'Arbonne tributary near Downsville.	.18	52	84.4	12	No	32	71	103	154	197	246
07366380	Townsend Pond (S. Choudrant Creek tributary).	.36	52	90	12	No	26	39	48	59	68	76
07366420	Bayou Choudrant near Calhoun-------	113	51	6.9	18	Yes	2,700 (2,780)	6,580 (6,410)	10,600 (9,850)	17,800 (15,600)	24,900 (20,800)	33,900 (27,300)
07367300	North Cheniere Creek at Cheniere---	38	52	10.1	[a]30	Yes	1,310 (1,410)	2,670 (2,920)	3,890 (4,280)	5,830 (6,480)	7,580 (8,320)	9,620 (10,400)
07367600	Cypress Creek near Vixen----------	16	52	12.7	25	Yes	1,490 (1,440)	3,400 (3,140)	5,060 (4,550)	7,520 (6,570)	9,590 (8,280)	11,800 (10,100)
07367700	Boeuf River near Ark-La State line-	785	--	------	11	No	11,700	15,300	17,400	19,800	21,400	22,800
07367800	Boeuf River near Oak Grove---------	1,052	--	------	14	No	10,400	14,500	17,300	21,000	23,900	26,800
07367950	Boeuf River near Oak Ridge---------	1,199	--	------	14	No	11,800	15,700	18,200	21,500	24,000	26,500
07368500	Big Colewa Bayou near Oak Grove----	40	53	2.7	28	Yes	1,070 (1,110)	1,390 (1,540)	1,590 (1,850)	1,830 (2,310)	2,010 (2,610)	2,180 (2,880)
07369000	Bayou Lafourche near Crew Lake-----	361	--	------	45	No	14,200	20,500	24,100	28,300	31,000	33,500
07369250	Turkey Creek tributary at Potato Research Pond at Chase.	.35	53	14	13	Yes	88 (98)	133 (155)	168 (201)	216 (262)	255 (309)	298 (353)
07369500	Tensas River at Tendal----------	309	52	1.1	[a]55	Yes	2,670 (2,730)	3,440 (3,640)	3,880 (4,210)	4,360 (5,000)	4,690 (5,480)	4,980 (5,900)
07369640	Bayou Vidal at Quimby----------	9.79	--	------	12	No	712	918	1,030	1,150	1,240	1,310
07369700	Bayou Macon near Kilbourne---------	485	--	------	12	No	2,910	4,230	5,040	5,960	6,590	7,180
07370000	Bayou Macon near Delhi----------	782	--	------	56	No	4,900	6,850	8,150	9,820	11,100	12,300
07370200	Castor Creek (Bayou Castor) at Chatham.	60	--	------	19	No	2,020	3,220	4,090	5,270	6,200	7,170
07370500	Castor Creek (Bayou Castor) near Grayson.	271	54	3.0	30	Yes	5,040 (5,000)	9,790 (9,520)	13,500 (13,000)	18,800 (18,000)	23,000 (21,800)	27,400 (25,800)
07370530	Black Bayou near Kelly----------	51.9	54	4.7	18	Yes	3,310 (3,020)	6,010 (5,230)	8,280 (6,970)	11,800 (9,530)	14,800 (11,700)	18,300 (14,200)
07370575	Caney Creek at Chatham----------	48.8	54	11.6	18	Yes	1,870 (2,030)	4,190 (4,530)	6,420 (6,860)	10,200 (10,800)	13,700 (14,200)	18,000 (18,000)
07370600	Beaucoup Creek (Bayou Beaucoup) near Cotton Plant.	127	53	4.4	28	Yes	4,320 (4,150)	7,790 (7,360)	10,500 (9,820)	14,500 (13,500)	17,700 (16,300)	21,300 (19,600)
07370650	Flat Creek near Sykes----------	41.5	54	7.2	[a]33	Yes	2,090 (2,080)	4,820 (4,600)	7,730 (7,120)	13,100 (11,500)	18,800 (15,900)	26,200 (21,600)
07370660	Flat Creek near Olla----------	103	55	1.9	18	Yes	3,920 (3,590)	8,760 (7,200)	13,000 (9,980)	19,600 (13,900)	25,400 (17,200)	31,700 (21,100)
07370700	Beech Creek near Olla----------	58	56	7.1	25	Yes	2,620 (2,630)	7,140 (6,650)	11,800 (10,500)	20,000 (16,700)	27,800 (22,400)	37,200 (29,400)
07370750	Chickasaw (Big Chickasaw) Creek near Olla.	47.6	56	8.1	30	Yes	1,950 (2,030)	3,550 (3,810)	4,930 (5,370)	7,070 (7,890)	8,970 (10,000)	11,200 (12,300)
07370820	Dugdemona River near Quitman-------	117	52	8.9	19	Yes	1,570 (2,000)	3,360 (4,580)	5,130 (7,090)	8,210 (11,500)	11,200 (15,300)	15,000 (19,500)

Table 1.--Discharges at gaging stations in Louisiana, except where noted, for selected recurrence intervals--Continued

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
07370840	Choctaw Creek near Hodge (near Quitman).	16.5	53	12	18	Yes	1,100 (1,140)	2,120 (2,220)	2,990 (3,150)	4,320 (4,590)	5,480 (5,790)	6,800 (7,080)
07370900	Caney Creek tributary near Quitman-	.02	52	117	12	No	8	14	18	23	28	33
07370930	Cypress Bayou (Cypress Creek) at Quitman.	91.8	--	------	18	No	2,790	6,380	9,850	15,700	21,100	27,700
07370980	Little Dugdemona River near Hodge--	20	53	12.7	19	Yes	1,110 (1,180)	2,280 (2,450)	3,290 (3,560)	4,840 (5,300)	6,200 (6,750)	7,720 (8,300)
07371000	Garrett Creek at Jonesboro---------	2.14	52	63.5	18	Yes	535 (499)	866 (804)	1,120 (1,040)	1,490 (1,380)	1,790 (1,670)	2,120 (1,970)
07371500	Dugdemona River near Jonesboro-----	355	52	4.6	45	Yes	6,240 (6,200)	12,500 (12,300)	17,900 (17,500)	26,100 (25,500)	33,300 (32,300)	41,400 (39,900)
07371800	Big Creek near Dodson--------------	81	53	7.2	12	Yes	2,440 (2,570)	3,760 (4,470)	4,740 (6,120)	6,120 (8,860)	7,240 (11,000)	8,440 (13,100)
07372000	Dugdemona River near Winnfield-----	654	53	2.4	43	Yes	8,020 (7,940)	13,900 (13,800)	18,100 (18,000)	23,600 (23,900)	27,800 (28,300)	32,000 (32,800)
07372100	Port de Luce at Winnfield----------	31	55	12.5	15	Yes	1,090 (1,340)	2,440 (3,070)	3,800 (4,730)	6,220 (7,590)	8,630 (10,100)	11,700 (13,000)
07372110	Brushy Creek near Joyce----------	24	55	10.8	19	Yes	1,770 (1,760)	4,310 (4,010)	7,030 (6,220)	13,000 (9,900)	17,200 (13,500)	23,800 (18,100)
07372200	Little River near Rochelle---------	1,880	54	2.1	26	Yes	19,000 (18,200)	38,500 (35,700)	54,200 (49,200)	76,400 (68,600)	94,500 (84,000)	113,000 (100,000)
07372300	Bear Creek near Packton----------	11	56	13.3	25	Yes	1,080 (1,100)	3,020 (2,840)	5,300 (4,700)	9,800 (8,030)	14,700 (11,100)	21,300 (16,100)
07372500	Bayou Funny Louis near Trout-------	92	57	7.1	31	Yes	3,330 (3,390)	6,180 (6,420)	8,800 (9,180)	13,100 (13,800)	17,200 (17,800)	22,200 (22,600)
07372600	Fish Creek near Pollock----------	30	57	10.8	12	No	791	1,290	1,630	2,050	2,360	2,670
07372700	Mill Creek tributary near Pollock--	.11	57	88	12	No	39	74	102	142	174	208
07372800	Flem Branch (Big Creek) tributary near Pollock.	.06	57	189	11	No	8	13	17	23	28	33
07372900	Dyson Creek near Pollock----------	12	56	18.4	18	Yes	754 (880)	1,660 (1,960)	2,480 (2,960)	3,790 (4,570)	4,960 (5,930)	6,300 (7,390)
07373000	Big Creek at Pollock---------------	51	58	11.3	42	Yes	2,520 (2,590)	6,650 (6,630)	11,100 (10,800)	19,100 (18,000)	27,100 (24,900)	37,200 (33,600)
07373450	Thompson Creek at Jackson----------	99.3	56	9.2	22	Yes	18,200 (15,600)	27,400 (22,300)	33,500 (26,800)	41,400 (32,900)	47,200 (38,100)	53,000 (43,800)
07373500	West Fork Thompson Creek near Wakefield.	35.3	57	11.8	21	Yes	6,320 (5,580)	11,000 (9,330)	14,500 (12,100)	19,300 (16,000)	23,100 (19,300)	27,100 (23,000)
07373550	Moores Branch near Woodville, Miss-	.22	58	30	26	Yes	209 (195)	301 (275)	362 (330)	439 (396)	497 (451)	555 (505)
07373700	Thompson Creek near Starhill-------	249	--	------	[a]35	No	34,600	58,800	76,000	98,400	115,000	132,000
07373800	Alexander Creek near St. Francisville.	23.9	56	14.3	28	Yes	5,060 (4,590)	7,720 (6,890)	9,510 (8,540)	11,800 (10,800)	13,500 (12,700)	15,200 (14,700)
07373900	Bayou Baton Rouge (Baton Rouge Bayou) above Baker.	13.7	56	6.5	[a]31	No	868	1,670	2,380	3,510	4,540	5,760

07374700	Tchefuncta (Chefuncte) River near Franklinton.	53.1	61	11.4	[a]35	Yes	3,340 (3,370)	6,750 (6,870)	9,750 (9,990)	14,400 (15,000)	18,500 (19,300)	23,400 (24,300)
07375000	Tchefuncta (Chefuncte) River near Folsom.	95.5	61	7.1	40	Yes	4,330 (4,340)	9,670 (9,490)	14,600 (14,100)	22,700 (21,600)	30,000 (28,100)	38,500 (35,700)
07375050	Tchefuncta (Chefuncte) River near Covington.	145	61	6.4	15	Yes	5,520 (5,520)	9,900 (10,200)	13,500 (14,200)	18,900 (20,800)	23,600 (26,200)	28,700 (32,000)
07375100	Bills Creek tributary near Folsom--	.03	61	200	11	No	14	33	52	85	116	154
07375170	Bogue Falaya at Covington----------	88.2	58	8.4	20	Yes	3,890 (3,920)	6,670 (7,090)	8,850 (9,790)	12,000 (14,200)	14,600 (17,800)	17,400 (21,500)
07375222	Abita River north of Abita Springs-	46.1	62	6.5	18	Yes	2,220 (2,330)	4,020 (4,320)	5,380 (5,910)	7,260 (8,340)	8,730 (10,200)	10,300 (12,200)
07375300	Tangipahoa River near Kentwood-----	237	--	------	[a]33	No	9,860	18,100	24,500	33,500	40,700	48,500
07375307	Terrys Creek near Kentwood---------	52	64	8.2	18	Yes	3,540 (3,460)	9,390 (8,380)	15,500 (13,000)	26,100 (20,500)	36,500 (27,500)	49,200 (36,200)
07375430	Tangipahoa River near Amite--------	472	64	7.1	18	No	8,930	15,000	19,500	25,500	30,200	35,100
07375463	Chappepeela Creek near Husser------	31.7	63	10.3	18	Yes	2,920 (2,830)	6,490 (6,000)	9,720 (8,740)	14,900 (13,000)	19,400 (16,600)	24,700 (20,800)
07375480	Chappepeela Creek southeast of Loranger.	91	60	9.7	20	Yes	6,040 (5,780)	13,000 (12,100)	19,300 (17,600)	29,200 (26,300)	38,100 (33,900)	48,200 (42,700)
07375500	Tangipahoa River at Robert---------	646	60	5.3	[a]62	Yes	13,900 (13,800)	27,000 (27,000)	37,800 (38,000)	53,700 (55,100)	67,100 (69,300)	81,900 (85,000)
07375800	Tickfaw River at Liverpool---------	89.7	60	8.7	28	Yes	4,110 (4,170)	9,240 (9,210)	14,200 (13,900)	22,400 (21,600)	30,200 (28,600)	39,500 (36,800)
07375960	Tickfaw River at Montpelier--------	220	60	7.2	[a]33	Yes	7,190 (7,220)	13,400 (13,800)	18,400 (19,300)	25,900 (28,200)	32,300 (35,700)	39,400 (43,900)
07376000	Tickfaw River at Holden------------	247	60	6.3	43	Yes	5,340 (5,580)	10,200 (11,000)	14,200 (15,700)	20,000 (23,200)	24,900 (29,400)	30,200 (35,900)
07376200	Hog Branch near Doyle--------------	110	58	5.9	16	Yes	4,630 (4,520)	9,510 (8,970)	13,800 (12,700)	20,600 (18,600)	26,700 (23,600)	33,600 (29,200)
07376290	Blood River near Springfield-------	26.6	57	4.9	19	Yes	1,330 (1,380)	1,870 (2,090)	2,230 (2,640)	2,700 (3,490)	3,060 (4,110)	3,430 (4,700)
07376500	Natalbany River at Baptist---------	79.5	59	6.6	40	Yes	3,230 (3,280)	5,340 (5,620)	6,920 (7,490)	9,110 (10,400)	10,900 (12,700)	12,700 (15,000)
07376520	Little Natalbany River at Albany---	40.6	56	5.6	18	Yes	3,120 (2,880)	4,700 (4,350)	5,800 (5,440)	7,240 (7,010)	8,330 (8,230)	9,440 (9,480)
07376600	Ponchatoula Creek at Natalbany-----	13.8	59	4.3	32	Yes	1,360 (1,320)	1,790 (1,770)	2,050 (2,080)	2,360 (2,500)	2,580 (2,810)	2,800 (3,100)
07376790	Woodland Creek tributary near Felps.	.07	--	------	11	No	13	22	30	41	51	61
07376795	Woodland Creek tributary No. 2 at Felps.	.13	--	------	11	No	46	71	89	111	128	145
07377000	Amite River near Darlington--------	580	58	6.4	35	Yes	20,500 (19,400)	42,400 (39,200)	60,500 (55,400)	86,400 (79,100)	108,000 (99,100)	131,000 (121,000)
07377190	Sandy Creek southeast of Clinton---	17.2	58	14.8	18	Yes	1,560 (1,610)	4,340 (4,100)	7,390 (6,600)	13,000 (10,800)	18,700 (14,800)	25,800 (19,800)
07377300	Amite River at Magnolia------------	884	58	5.5	35	Yes	25,900 (24,500)	43,000 (40,800)	55,400 (53,300)	72,000 (72,300)	85,000 (87,700)	98,300 (104,000)
07377400	Comite River near Clinton----------	112	58	7.7	32	Yes	7,550 (7,150)	14,400 (13,300)	20,100 (18,400)	28,600 (26,000)	35,900 (32,600)	43,900 (39,900)
07377500	Comite River near Olive Branch-----	145	58	8.1	42	Yes	6,710 (6,580)	13,200 (12,900)	18,600 (18,100)	26,500 (26,100)	33,200 (32,800)	40,500 (40,200)
07377700	Redwood Creek near Slaughter-------	41.4	56	9.7	18	Yes	2,370 (2,380)	3,560 (3,920)	4,300 (5,170)	5,190 (7,190)	5,810 (8,750)	6,400 (10,300)

Table 1.--Discharges at gaging stations in Louisiana, except where noted, for selected recurrence intervals--Continued

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
07377750	Comite River near Zachary----------	230	58	6.3	33	Yes	10,200	17,900	23,200	30,100	35,200	40,200
							(9,740)	(17,000)	(22,300)	(29,900)	(35,800)	(41,800)
07378000	Comite River near Comite----------	284	58	5.2	40	Yes	10,400	17,000	21,700	27,600	32,000	36,400
							(10,000)	(16,500)	(21,400)	(28,200)	(33,500)	(38,900)
07378500	Amite River near Denham Springs----	1,280	58	5.2	[a]63	Yes	26,200	48,000	65,500	91,200	113,000	136,000
							(25,600)	(47,000)	(64,500)	(91,500)	(114,000)	(139,000)
07379000	Ward Creek at Government Street at Baton Rouge.	4.1	--	------	14	No	1,280	1,720	2,020	2,390	2,670	2,950
07380000	Ward Creek at Siegen Lane near Baton Rouge.	40	56	4.0	18	Yes	2,610	4,630	6,090	8,010	9,470	10,900
							(2,430)	(4,120)	(5,290)	(6,830)	(8,020)	(9,240)
07380130	Colyell Creek at Livingston--------	20.7	57	3.8	18	No	919	1,690	2,410	3,590	4,710	6,070
07380160	Middle Colyell Creek near Walker---	20.3	56	4.6	33	No	1,070	1,670	2,070	2,560	2,920	3,270
07380180	West Colyell Creek near Walker-----	28.5	56	4.0	18	No	1,270	1,670	1,920	2,230	2,460	2,680
07381800	Spring Creek near Glenmora---------	68.3	61	8.4	31	Yes	1,960	3,700	5,080	7,050	8,670	10,400
							(2,210)	(4,460)	(6,430)	(9,640)	(12,200)	(14,800)
07382000	Bayou Cocodrie near Clearwater (near Meeker).	240	--	------	[a]61	No	1,380	2,370	3,280	4,800	6,260	8,050
07382500	Bayou Courtableau at Washington----	715	58	1.0	37	Yes	4,700	5,760	6,460	7,330	7,980	8,630
							(5,020)	(6,760)	(8,090)	(9,950)	(11,600)	(12,800)
07383000	Chatlin Lake Canal near LeCompte---	75.9	--	------	37	No	1,990	2,320	2,510	2,700	2,830	2,950
07383500	Bayou Des Glaises Diversion Channel at Moreauville.	270	--	------	40	No	2,510	3,410	4,020	4,820	5,430	6,050
07386000	Bayou Carencro near Sunset---------	37.1	59	2.2	21	Yes	2,270	3,040	3,540	4,170	4,630	5,080
							(2,140)	(2,860)	(3,340)	(3,990)	(4,460)	(4,930)
07386500	Bayou Bourbeau at Shuteston--------	19	59	1.8	28	Yes	1,170	1,600	1,880	2,250	2,520	2,800
							(1,140)	(1,550)	(1,810)	(2,150)	(2,400)	(2,650)
08010000	Bayou Des Cannes near Eunice-------	131	60	1.6	45	Yes	4,610	6,820	8,360	10,400	11,900	13,500
							(4,480)	(6,540)	(7,950)	(9,850)	(11,200)	(12,700)
08010100	Bayou Mallet near Eunice-----------	94.5	--	------	13	No	3,620	5,480	6,870	8,810	10,400	12,100
08010300	Long Point Gully near Crowley------	25.7	--	------	10	No	1,250	1,870	2,300	2,880	3,330	3,790
08010500	Bayou Wikoff near Rayne------------	51.3	--	------	18	No	2,420	3,720	4,560	5,570	6,290	6,980
08011200	East Fork Bayou Nezpique near Reddell.	40	--	------	13	No	926	1,250	1,450	1,700	1,890	2,060
08011500	Boggy Bayou (Cypress Creek) near Pine Prairie.	51.3	62	4.2	28	Yes	3,080	6,020	8,670	12,900	16,900	21,500
							(2,490)	(5,640)	(7,880)	(11,300)	(14,400)	(18,000)
08011600	Beaver Creek at Beaver------------	14.4	62	6.1	16	Yes	1,550	3,000	4,310	6,420	8,360	10,600
							(1,490)	(2,730)	(3,760)	(5,300)	(6,660)	(8,220)
08011800	Castor Creek near Oberlin (at Hampton).	43.9	61	6.1	18	Yes	2,350	4,120	5,460	7,310	8,770	10,300
							(2,400)	(4,290)	(5,790)	(8,040)	(9,800)	(11,600)
08012000	Bayou Nezpique near Basile---------	527	62	2.6	45	Yes	7,380	11,600	15,100	20,400	25,100	30,400
							(7,550)	(12,300)	(16,400)	(23,000)	(28,300)	(34,100)
08012650	Floctaw Creek near LaCamp----------	18.7	58	12.3	28	Yes	1,930	4,120	6,290	10,100	13,800	18,500
							(1,900)	3,970	(5,920)	(9,180)	(12,200)	(16,000)

08012700	Big Creek near Leander----------	37.1	59	8.9	18	Yes	1,960	2,990	3,760	4,810	5,650	6,550
							(2,080)	(3,560)	(4,860)	(6,980)	(8,670)	(10,300)
08012900	Calcasieu River at Hineston--------	436	58	4.8	16	Yes	11,800	22,700	31,900	45,700	57,700	71,100
							(11,200)	(21,200)	(29,600)	(42,800)	(53,800)	(66,100)
08013000	Calcasieu River near Glenmora------	499	59	3.8	a97	Yes	12,300	22,900	31,100	42,100	50,800	59,700
							(12,000)	(22,100)	(30,000)	(41,200)	(50,000)	(59,300)
08013500	Calcasieu River near Oberlin-------	753	60	3.0	a97	Yes	14,100	24,400	32,000	42,300	50,500	58,900
							(14,000)	(24,100)	(31,800)	(43,200)	(52,100)	(61,300)
08013700	Drakes Creek near Pitkin-----------	22.1	59	10.5	25	Yes	1,280	2,990	4,680	7,580	10,400	13,800
							(1,390)	(3,160)	(4,840)	(7,590)	(10,100)	(13,000)
08013800	Little Sixmile Creek near Pitkin---	10.4	56	17.8	30	Yes	1,130	2,050	2,780	3,840	4,720	5,680
							(1,140)	(2,120)	(2,950)	(4,210)	(5,260)	(6,370)
08013950	Big Brushy Creek near Pitkin-------	34.4	59	10.9	19	Yes	2,070	3,930	5,510	7,900	9,970	12,300
							(2,180)	(4,280)	(6,140)	(9,120)	(11,600)	(14,300)
08014000	Sixmile Creek near Sugartown-------	171	58	6.7	27	Yes	4,320	8,190	11,500	16,700	21,400	26,700
							(4,530)	(8,920)	(12,800)	(19,200)	(24,700)	(30,600)
08014200	Tenmile Creek near Elizabeth-------	94.2	60	5.4	34	Yes	3,350	6,850	9,980	14,900	19,300	24,500
							(3,430)	(6,960)	(10,000)	(14,800)	(19,000)	(23,700)
08014500	Whisky (Whiskey) Chitto Creek near Oberlin.	510	59	5.8	a97	Yes	10,100	20,000	28,700	42,000	53,800	67,200
							(10,200)	(20,200)	(29,200)	(43,200)	(55,500)	(69,300)
08014600	Flat Creek near De Ridder----------	26.3	56	10.8	20	Yes	1,880	3,700	5,270	7,660	9,740	12,100
							(1,880)	(3,700)	(5,260)	(7,670)	(9,710)	(11,900)
08014800	Bundick Creek near De Ridder-------	120	58	7.7	a31	Yes	4,470	9,380	13,800	20,700	26,900	34,000
							(4,520)	(9,430)	(13,800)	(20,700)	(26,700)	(33,500)
08015000	Bundick Creek near Dry Creek-------	238	58	4.9	a84	Yes	5,360	11,800	17,800	27,400	36,100	46,200
							(5,490)	(11,900)	(17,600)	(26,800)	(34,600)	(43,700)
08015200	Dry Creek at Dry Creek-------------	42.7	58	6.2	24	Yes	2,310	4,470	6,290	9,010	11,300	13,900
							(2,320)	(4,420)	(6,140)	(8,730)	(10,800)	(13,200)
08015500	Calcasieu River near Kinder--------	1,700	60	2.7	a70	Yes	25,600	45,000	60,400	82,600	101,000	121,000
							(25,200)	(44,200)	(59,300)	(82,000)	(100,000)	(121,000)
08015600	Barnes Creek near Reeves-----------	111	58	5.5	17	Yes	4,330	8,220	11,300	15,500	18,900	22,500
							(4,270)	(8,040)	(11,000)	15,500	19,000	22,700
08015700	Clear Creek at Reeves--------------	23.1	59	8.8	17	Yes	1,880	2,450	2,820	3,280	3,610	3,950
							(1,880)	(2,780)	(3,570)	(4,870)	(5,880)	(6,850)
08016200	Cowpen Creek near De Ridder--------	28.3	57	7.8	15	Yes	1,930	3,700	5,110	7,090	8,690	10,400
							(1,920)	(3,610)	(4,970)	(6,940)	(8,530)	(10,200)
08016300	Beckwith Creek near Singer---------	76	57	5.8	15	Yes	3,440	7,120	10,200	14,800	18,600	22,800
							(3,360)	(6,660)	(9,320)	(13,300)	(16,500)	(20,000)
08016400	Beckwith Creek near De Quincy------	148	57	4.9	a79	Yes	3,810	6,520	8,660	11,700	14,300	17,100
							(3,890)	(6,850)	(9,270)	(13,000)	(16,000)	(19,200)
08016500	Hickory Branch near Longville------	34.9	58	6.8	23	Yes	2,770	5,000	6,740	9,190	11,200	13,300
							(2,660)	(4,710)	(6,310)	(8,590)	(10,500)	(12,400)
08016600	Hickory Branch at Kernan-----------	82.2	58	6.4	38	Yes	4,220	7,170	9,420	12,500	15,100	17,700
							(4,140)	(7,100)	(9,420)	(12,800)	(15,600)	(18,500)
08016700	Bear Head (Bearhead) Creek near Singer.	45.6	57	5.7	15	Yes	2,590	5,250	7,490	10,800	13,600	16,800
							(2,510)	(4,840)	(6,700)	(9,390)	(11,600)	(14,100)
08016800	Bear Head (Bearhead) Creek near Starks.	177	56	3.8	30	Yes	3,580	6,280	8,390	11,400	13,900	16,500
							(3,700)	(6,630)	(8,980)	(12,600)	(15,400)	(18,200)
08016990	Cowards Gully near De Quincy-------	15.3	57	6.8	17	Yes	2,700	3,970	4,800	5,840	6,590	7,320
							(2,360)	(3,380)	(4,070)	(4,990)	(5,720)	(6,480)
08022765	Bayou Castor near Funston----------	91.5	48	7.1	12	Yes	2,150	3,740	4,860	6,300	7,370	8,440
							(2,170)	(3,960)	(5,380)	(7,570)	(9,180)	(10,800)

Table 1.--Discharges at gaging stations in Louisiana, except where noted, for selected recurrence intervals--Continued

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
08023000	Bayou Castor near Loganspport-------	96.5	48	7.2	27	Yes	1,970	3,700	5,040	6,920	8,430	10,000
							(2,020)	(3,880)	(5,380)	(7,660)	(9,420)	(11,200)
08023270	Bull Bayou near Hunter-------------	8.54	48	13.7	19	No	340	456	526	607	662	715
08023400	Bayou San Patricio near Benson-----	80.2	51	7.3	21	Yes	2,880	5,420	7,400	10,100	12,300	14,600
							(2,820)	(5,280)	(7,240)	(10,100)	(12,400)	(14,800)
08023500	Bayou San Patricio near Noble------	154	51	5.3	16	Yes	2,500	5,630	8,400	12,600	16,200	20,200
							(2,720)	(5,920)	8,630	(12,800)	(16,100)	(19,700)
08024000	Bayou San Miguel near Zwolle-------	111	52	6.9	20	Yes	2,340	5,410	8,300	13,000	17,300	22,300
							(2,520)	(5,670)	(8,510)	(13,100)	(16,900)	(21,200)
08024030	Bayou Scie at Zwolle---------------	45.9	52	9.4	29	Yes	1,800	4,430	7,140	11,900	16,700	22,600
							(1,840)	(4,350)	(6,780)	(10,800)	(14,700)	(19,400)
08024050	Harpoon Bayou at Many-------------	22.7	52	11.7	18	No	2,220	5,470	8,750	14,400	19,900	26,600
08024060	Blackwell Creek at Many------------	3.16	--	------	22	No	496	742	890	1,060	1,170	1,280
08024080	Lewis Creek near Many--------------	12.5	53	16.8	15	Yes	1,200	1,910	2,460	3,220	3,840	4,500
							(1,190)	(2,060)	(2,820)	(4,020)	(5,000)	(6,000)
08024200	Bayou La Nana near Zwolle----------	130	53	8.0	11	Yes	2,680	5,110	7,210	10,500	13,300	16,600
							(3,090)	(6,350)	(9,300)	(14,300)	(18,200)	(22,500)
08025400	Bayou Toro near Florien------------	78.6	54	11.9	19	Yes	3,130	8,040	13,200	22,600	32,000	43,900
							(3,210)	(7,850)	(12,400)	(20,300)	(27,600)	(36,800)
08025500	Bayou Toro near Toro---------------	148	54	8.9	28	Yes	3,790	8,820	14,100	23,700	33,600	46,300
							(3,930)	(9,040)	(14,200)	(23,200)	(31,800)	(42,500)
08025850	Pearl Creek at State Highway 111 at Burr Ferry.	9.66	54	21.4	15	No	468	907	1,340	2,010	2,580	3,210
08026200	Red Bank Creek at Evans------------	17.2	54	13.4	19	Yes	783	3,270	3,950	7,150	10,500	14,800
							(916)	(2,430)	(3,960)	(6,630)	(9,180)	(12,300)
08026700	West Anacoco Creek near Hornbeck---	22.4	55	11.0	[a]63	Yes	1,970	4,280	6,360	9,650	12,600	16,000
							(1,920)	(4,040)	(5,880)	(8,690)	(11,200)	(14,000)
08027200	East Anacoco Creek near Anacoco----	40.6	56	9.6	17	Yes	2,390	4,850	6,920	10,000	12,600	15,500
							(2,390)	(4,800)	(6,820)	(9,910)	(12,500)	(15,300)
08027500	Bayou Anacoco near Leesville-------	115	56	7.9	[a]35	Yes	4,500	11,800	19,400	32,800	45,900	62,100
							(4,450)	(10,800)	(16,800)	(26,700)	(35,800)	(47,100)
08027550	Prairie Creek near Leesville-------	40	57	12.2	30	Yes	2,820	7,180	12,200	22,200	33,300	48,500
							(2,800)	(6,820)	(11,100)	(19,100)	(27,600)	(39,100)
08028000	Bayou Anacoco near Rosepine--------	365	56	6.0	32	No	7,030	17,800	29,600	52,100	75,800	10,700
08028700	Hoosier Creek near Merryville------	13.1	56	11.4	27	Yes	822	1,390	1,870	2,600	3,250	4,000
							(890)	(1,610)	(2,260)	(3,300)	(4,150)	(5,050)
08029700	Brushy Creek at Bancroft-----------	25.9	55	6.6	25	Yes	1,300	2,800	4,200	6,500	8,630	11,200
							(1,340)	(2,780)	(4,040)	(6,020)	(7,750)	(9,780)

Table 2.--Discharges of small watersheds in Louisiana for selected recurrence intervals as reported by Lowe (1979)

[A, drainage area; P, precipitation; and S, slope; L, length of record; mi^2, square miles; in., inches; ft/mi, feet per mile; yr, years; ft^3/s, cubic feet per second. Peak discharges are weighted values based on stations skew and regional skew.]

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
02489990	Bogue Lusa Creek tributary near Franklinton.	0.41	61	40.6	11	Yes	148	242	314	416	497	585
07344467	Logan Bayou near Shreveport----------	2.60	47	25.6	8	Yes	568	765	893	1,050	1,170	1,290
07349794	Collinsburg Creek near Plain Dealing-	7.39	48	12.7	10	Yes	321	728	1,060	1,500	1,870	2,250
07349870	Red Chute Bayou tributary at Skannel Pond near Sligo.	.44	48	26	11	Yes	124	193	242	305	342	381
07350980	Boggy Bayou tributary near Greenwood-	.26	46	96.8	11	Yes	71	119	152	195	222	250
07351725	Buffalo Bayou tributary near Mansfield.	.79	47	74.2	7	Yes	460	645	761	900	996	1,090
07351990	Pea Vine Creek at Bienville----------	7.05	52	13.5	10	Yes	459	748	942	1,190	1,400	1,600
07352265	Leatherman Creek tributary at Athens-	2.90	52	50.1	9	Yes	379	747	1,050	1,470	1,760	2,080
07352580	Mill Creek at Ringgold---------------	.91	49	20.1	11	Yes	215	329	402	492	561	628
07352723	Black Lake Bayou tributary near Ashland.	.79	49	43.3	10	Yes	231	370	464	582	663	743
07353780	Sibley Lake tributary near Natchitoches.	.65	51	36.9	11	Yes	244	384	478	594	676	757
07354420	Bayou Provencal tributary near Provencal.	.82	52	59.5	9	Yes	306	510	643	800	928	1,050
07355456	Williamson Branch at Gardner---------	.57	56	30.8	11	Yes	183	291	371	480	556	637
07355618	Slash Bayou tributary at Holloway----	.22	59	18.0	9	Yes	80	132	166	208	242	276
07364108	Cook Creek tributary at Spencer------	.49	50	52.7	9	Yes	90	174	234	307	367	426
07364507	Horse Bayou at Bastrop---------------	2.05	50	20.1	10	Yes	722	1,060	1,290	1,580	1,750	1,940
07366403	Bayou Choudrant tributary near Tremont.	.54	51	47.8	11	Yes	116	214	286	379	453	526
07367250	Guyton Creek near Eros---------------	8.76	51	18.7	9	Yes	562	1,090	1,500	2,040	2,480	2,940
07368300	Muddy Bayou tributary at Alto--------	.42	52	4.7	11	Yes	35	65	89	122	145	170
07368558	Dry Fork at Archibald----------------	2.78	52	1.9	9	Yes	127	180	222	280	314	352
07369950	Buck Bayou tributary at Murphy Pond near Epps.	.53	52	6.5	9	Yes	138	216	272	348	397	450
07370950	Coulee Creek tributary near Hodge----	.46	53	24.3	11	Yes	82	177	251	351	431	512
07372113	Dugdemona River tributary near Joyce-	.14	56	38.2	10	Yes	55	96	124	159	189	216
07372766	Big Creek tributary near Dry Prong---	.30	56	58.0	10	Yes	141	246	321	416	492	567
07373640	Hammer Creek tributary near Jackson--	.20	56	64.8	9	Yes	152	204	239	284	317	351
07374590	North Carson Creek tributary near Sunny Hill.	.22	63	74.1	9	Yes	110	191	254	343	415	491
07375185	Little Bogue Falaya near Blond-------	.91	62	28.6	10	Yes	266	408	514	661	776	898
07375345	Ashleys Branch near Kentwood---------	1.74	64	27.6	11	Yes	539	848	1,080	1,400	1,650	1,910
07375790	Bridges Branch near Liverpool--------	.76	64	36.6	9	Yes	274	487	649	868	1,060	1,250
07375920	Hoffman Creek near Greensburg--------	.78	64	25.4	10	Yes	235	399	516	673	812	956
07376250	Killian Bayou near Maurepas----------	1.88	57	5.2	8	Yes	195	308	392	505	592	684

Table 2.--Discharges of small watersheds in Louisiana for selected recurrence intervals as reported by Lowe (1979)--Continued

Station No.	Stream name and location	A (mi^2)	P (in.)	S (ft/mi)	L (yr)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
							Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
07376627	Yellow Water River Canal tributary near Hammond.	6.79	59	4.2	7	Yes	559	812	1,010	1,290	1,480	1,690
07377405	Pretty Creek tributary near Clinton--	.29	59	81.9	9	Yes	237	356	437	439	622	706
07377650	Little Redwood Creek tributary at Joe Howell Pond near Wilson.	.73	57	24	13	Yes	416	649	815	1,030	1,200	1,370
07381750	Spring Creek tributary near Hineston-	.18	57	58.4	10	Yes	97	140	169	206	231	257
07381850	Hurricane Creek tributary at Forest Hill.	.95	59	42.2	9	Yes	437	644	784	963	1,090	1,230
07386503	Bayou Sylvain tributary near Sunset--	1.46	55	14.4	6	Yes	388	592	729	906	1,050	1,200
08011700	Beaver Creek tributary at Fontenot Pond near Beaver.	.15	61	29	11	Yes	116	165	197	238	266	295
08011760	West Fork Caney Creek near Oakdale---	1.25	60	6.9	10	Yes	202	320	405	515	596	682
08013350	Chinquapin Creek near Oberlin--------	1.80	60	5.6	11	Yes	217	328	405	505	579	656
08013610	Whisky (Whiskey) Chitto Creek tributary near Leesville.	.32	55	37.4	11	Yes	335	409	458	523	561	601
08014900	Jim Burney Branch tributary at Smithhart Pond near Dry Creek.	.25	57	6.0	5	Yes	180	242	283	334	370	405
08015687	Mud Creek tributary near Reeves------	1.37	58	24.6	9	Yes	528	808	994	1,230	1,410	1,600
08022680	Bushneck Bayou tributary near Keatchie.	1.27	46	20.9	10	Yes	103	194	265	366	434	506
08023424	Bayou San Patricio tributary No. 2 near Converse.	.89	50	43.7	10	Yes	172	293	377	480	557	632
08024160	Hurricane Creek tributary at Loring Lake near Zwolle.	.92	51	42.0	11	Yes	273	491	650	853	997	1,140
08027600	Wyatt Creek tributary at Lewis and Killian Lake near Leesville.	.19	55	56.8	11	Yes	128	190	233	285	321	357

Table 3.--Discharges at streamflow sites with drainage areas larger than 3,000 square miles for selected recurrence intervals

Station No.	Stream name and location	Drainage area (square miles)	Length of record (years)	Used in regression	Peak discharge, Q_x (ft^3/s), at indicated recurrence intervals, x (years)					
					Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
02489000	Pearl River near Columbia, Miss.[1]----	5,690	106	No	36,300	51,100	61,500	75,300	86,000	97,100
02489500	Pearl River near Bogalusa, La.[1]------	6,570	6/107	No	42,500	62,600	77,200	97,000	113,000	129,000
02492600	Pearl River at Pearl River, La.[1]-----	8,590	6/107	No	56,500	87,400	111,000	143,000	169,000	198,000
07289000	Mississippi River near Vicksburg, Miss.	1,118,160	67	No	1,383,000	1,669,000	1,825,000	1,994,000	2,104,000	2,203,000
07348000	Twelvemile Bayou near Dixie, La------	3,137	39	No	11,600	19,400	25,100	32,600	38,500	44,500
07348500	Red River at Shreveport, La.[1]--------	60,613	37	No	114,000	164,000	196,000	237,000	267,000	297,000
07355500	Red River at Alexandria, La.[1]--------	67,500	37	No	117,000	160,000	185,000	214,000	233,000	251,000
07367000	Ouachita River at Monroe, La.[2]-------	15,298	92	No	48,700	64,800	74,300	85,200	92,700	99,600
07381500	Atchafalaya River at Krotz Springs, La.[3]	(4)	30	No	389,000	472,000	519,000	571,000	606,000	637,000
08026000	Sabine River (below Toledo Bend) near Burkeville, Tx.[5]	7,482	16	No	22,000	38,100	50,500	67,600	81,400	96,000
08028500	Sabine River near Bon Wier, Tx.[5]-----	8,229	16	No	23,500	40,000	52,400	69,500	83,200	97,700
08030500	Sabine River near Ruliff, Tx.[5]-------	9,329	16	No	29,300	44,300	54,900	68,800	79,600	90,700

[1] Through the 1980 water year.
[2] Through the 1975 water year.
[3] Through the 1964 water year.
[4] Distributary from Mississippi River.
[5] Regulated by Toledo Bend Reservoir.
[6] Years of record represent historic period.

Table 4.--Summary of drainage area size, distribution, and length of record

Drainage area (square miles)	Number of stations	Average length of record	Minimum length of record	Maximum length of record
			in years	
1	49	10	[a]5	26
1 - 5	15	11	[a]6	22
5 - 10	7	13	[a]7	19
10 - 50	80	26	10	33
50 - 100	41	31	11	33
100 - 500	54	29	11	81
500 - 1,000	16	42	11	97
1,000 - 2,000	11	43	14	83
2,000 - 3,000	0	--	--	---
3,000	14	49	16	107
Total	287	Overall average 26		

[a] Number of years of actual data collection. Record extended synthetically to about 60 years using rainfall-runoff model.

COMPUTATION OF STATION FLOOD MAGNITUDES AND FREQUENCIES

The guidelines in Bulletin 17B (Hydrology Subcommittee, 1982) recommend applying a Pearson Type III distribution to the logarithm of annual peaks to analyze annual flood-peak discharges. Suggestions are made for using skew weighting, high and low outliers, historical peak information, and peaks below a base.

The U.S. Geological Survey log-Pearson Type III program E675 (updated version), which incorporates the guidelines from Bulletin 17B, was used in this study. The guidelines and suggestions were followed closely, so that others who might use the same data base to make a flood-frequency analysis would obtain the same results.

Of the 287 streamflow gaging stations available for this flood-frequency analysis (tables 1, 2, and 3), 276 have drainage areas less than 3,000 mi^2, and 47 of these 276 stations have drainage areas ranging from 0.1 to 10 mi^2 (table 2). A flood-frequency analysis using long-term precipitation data (Lowe, 1979) previously had been made for these 47 sites; therefore, no further refinement to the flood-frequency curves was deemed necessary. Flood-frequency statistics for individual stations were taken from this previous analysis.

Flood-frequency analyses were made for all streamflow-gaging stations with 10 or more years of record. Many of these sites had historical information or periods of missing record that required special handling during the analysis.

A site that had data missing during its record period (example: period of record 1950-83, missing data 1960-65) was compared to a nearby site that had a complete data set for the same period. The time period for which data were missing (1960-65) was used in the frequency computations if the comparison site showed that peak discharges for 1960-65 did not equal or exceed the maximum peak for the rest of the period. (At the comparison site, discharges for 1960-65 did not equal or exceed peak discharge for 1950-59 or 1966-83.) For the site with the missing data, utilization of this time period (1960-65) in the analysis was accomplished by setting the high-outlier threshold discharge to 1 ft^3/s less than the highest peak discharge of record (for periods 1950-59 and 1966-83) and by specifying a historical period to be inclusive of the period with missing data.

Documented historical data or information outside the continous record period were available at some sites. This information included peak stage and, occasionally, an estimated discharge. When only an historical stage was available, the high-outlier threshold was set to 1 ft^3/s less than the highest discharge of record, and the historical period was set to include the time period between the historical peak and the beginning of systematic record collection. This procedure resulted in adjustments to the plotting positions of the frequency curve defined by the systematic record.

Peak discharges for selected recurrence intervals of 2, 5, 10, 25, 50, and 100 years were taken from flood frequency curves developed by using guidelines of the Hydrology Subcommittee (1982) and the criteria described above. These discharges are shown in tables 1 and 3 as the discharges based on weighted values between station skews and regional skews.

REGRESSION ANALYSIS

A log-linear regression analysis (Ezekiel, 1953) was used to develop equations for estimating the Q_2, Q_5, Q_{10}, Q_{25}, Q_{50}, and Q_{100} discharges. This analysis was done using the regression model

$$\text{Log } Q_x = \log a + x\log A + y\log(P-35) + z\log S \qquad (1)$$

where Q_x = the peak discharge for a given recurrence interval, in cubic feet per second;
a = the regression constant;
A = the contributing drainage, in square miles;
P = the average annual precipitation taken from figure 2, in inches per year. (P is limited to no more than 60 in/yr to minimize the standard error of estimate;
S = the stream-channel slope taken between the 10 and 85 percent distances from the gaging-station site along the streamline, in feet per mile. (S is limited to no steeper than 16 ft/mi to minimize the standard error of estimate); and
x, y, z = the regression coefficients.

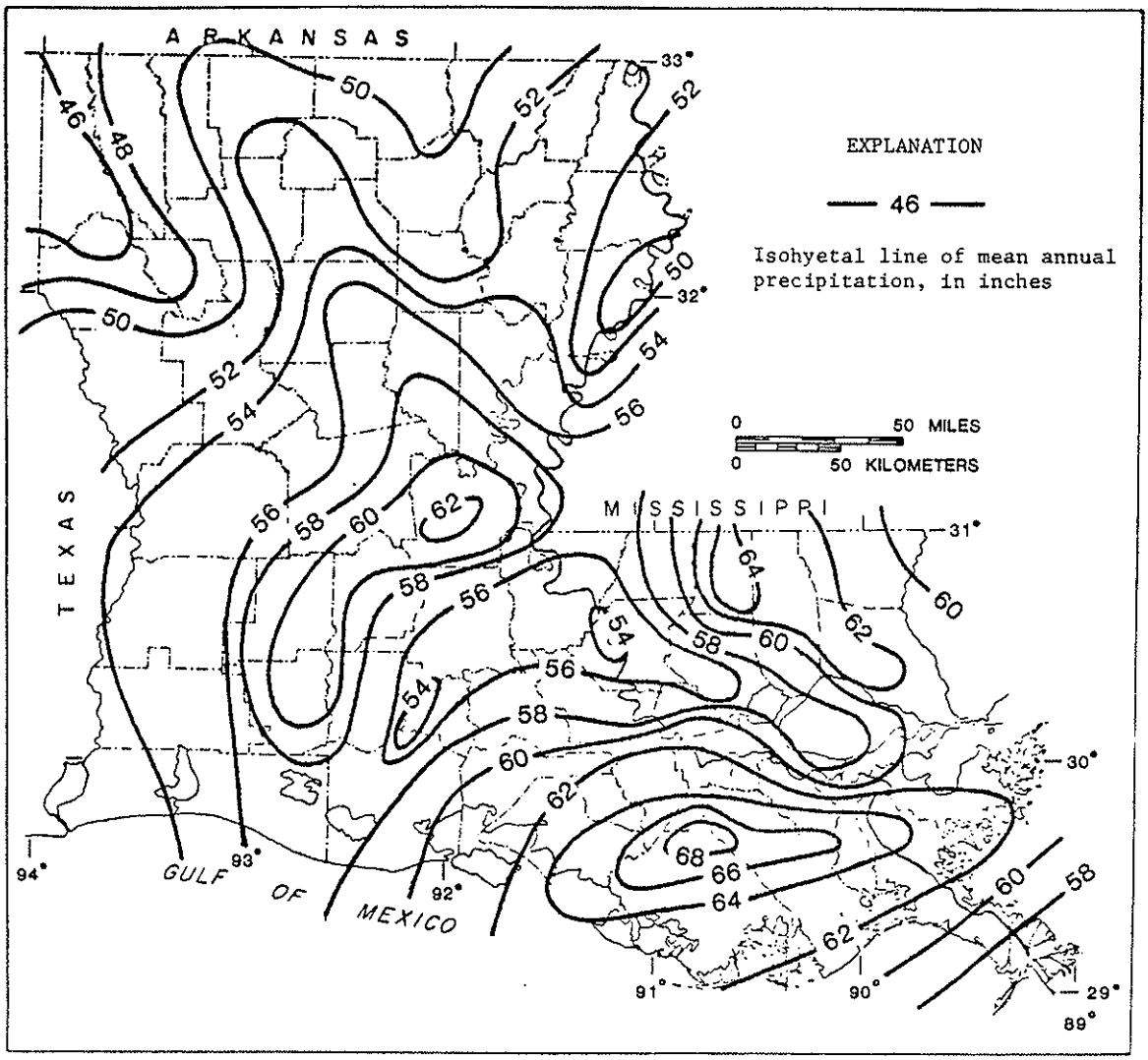

Figure 2.--Average annual precipitation for Louisiana, 1931-60.

Criteria for a station to be used in this regression analysis were:

1. Must have at least 10 years of record. (Those stations used by Lowe (1976) were exceptions to this criterion.)
2. No significant man-made regulations.
3. Drainage area less than 3,000 mi^2.
4. Drainage area and channel slope definable.
5. Rating curve adequately defined by either current-meter measurements or a combination of current-meter measurements and indirect measurements. Stations were discarded where the rating was questionable or was developed entirely from indirect measurements.

A total of 217 streamflow stations met the criteria for the regression analysis. Data for these stations are listed in tables 1 and 2. The following equations were developed using these 217 streamflow stations.

$$Q_2 = 5.45\ A^{.62}\ (P-35)^{1.00}\ S^{.33} \quad (2)$$

$$Q_5 = 5.50\ A^{.68}\ (P-35)^{1.01}\ S^{.51} \quad (3)$$

$$Q_{10} = 5.24\ A^{.71}\ (P-35)^{1.03}\ S^{.61} \quad (4)$$

$$Q_{25} = 4.85\ A^{.74}\ (P-35)^{1.06}\ S^{.71} \quad (5)$$

$$Q_{50} = 4.25\ A^{.77}\ (P-35)^{1.10}\ S^{.78} \quad (6)$$

$$Q_{100} = 3.85\ A^{.79}\ (P-35)^{1.13}\ S^{.84} \quad (7)$$

The above equations were tested for statewide bias by obtaining a ratio of the actual discharge, [Q_x(A)(actual)], to the regression discharge, [Q_x(R)(regression)]. These ratios were then plotted on a map of the State and visually inspected. No significant bias could be detected.

The adequacy of each equation was assessed by making residual discharge plots [residual Q = Q_x(A)-Q_x(R)] versus each independent variable (A, P, and S). The plot using the independent variable, P, showed a slight irregularity resembling a sine curve. An effort was made to straighten this curve by modifying precipitation (P) using several offsets (P-35, P-30, and so forth). Although none of these offsets were effective in straightening the residual Q versus P curve, the offset (P-35) did improve the overall standard error of estimate as well as reduce the size of the equation exponents.

As a replacement for precipitation, the 2-year, 24-hour rainfall intensity was inserted into the regression. This variable indicated the same irregularity in the plot as precipitation, but the standard error of estimate was increased significantly.

To check the equations, the predicted discharge, Q_x(R), was compared to the actual discharge, Q_x(A). There was a slight bias (10-20 percent) in the upper, extreme values for Q_2, Q_5, Q_{10}, and Q_{25}, which was not considered great enough to require further refinement of the equations. In addition, it was found that certain combinations of the predictors could give Q_{100} values less than Q_2 when the slope is less than 1.75 ft/mi and drainage area is less than 2.0 mi^2.

Accuracy of the Equations

Accuracy of equations 2 through 7 can be expressed in two ways: (1) standard error of estimate, in percent, or (2) equivalent years of record. The standard error of estimate is the range of error, in percent, to be expected about two thirds of the time. It is computed from the differences between station Q_x(A) and Q_x(R) obtained from the regression equation. Equivalent years of record is the number of actual years of record required to provide an estimate of the Q_x with the same accuracy as the standard error of estimate (Hardison, 1969).

The regression analysis resulted in acceptable standard errors of estimate. The standard error of estimate and corresponding equivalent years of record for selected recurrence intervals are given in table 5.

Table 5.--Accuracy of regression equations

Recurrence interval (years)	Standard error of estimate (percent)	Equivalent years of record
2	±38	5
5	±35	8
10	±35	10
25	±38	13
50	±41	14
100	±43	14

FLOOD MAGNITUDE AND FREQUENCY OF LARGE STREAMS

For this study, streamflow sites having drainage areas equal to or greater than 3,000 mi^2 are considered large streams and were not used in the regression analysis (table 3). Many of these large streams are regulated by controls and diversions. Flood frequencies resulting from log-Pearson Type III analyses for these streams are shown in table 3, and the flood frequency for those streams with more than one data collection location are shown in graphical form in figures 3, 4, and 5. Following are brief synopses of those streams that are in the above category.

Mississippi River System

The Mississippi River extends from Minnesota to the Gulf of Mexico. Its drainage basin covers an area from New York to Montana, comprising about 40 percent of the conterminous United States. Flood-frequency relation for one gaging station, Mississippi River near Vicksburg, Miss. (07289000), is shown in table 3.

The Atchafalaya River serves as a distributary to the Mississippi River through the Old River control structure. This diversion occurs about 128 mi downstream from Vicksburg, Miss., and about 8 mi upstream from Tarbert Landing in Mississippi. This river also serves as an outlet for the Red River to the Gulf of Mexico. One station, Atchafalaya River at Krotz Springs (07381500), was available for analysis on the Atchafalaya River. The flood-frequency analysis for this station is shown in table 3.

The Red River flows into the Atchafalaya River near the Old River control structure. At this point, it drains approximately 18,400 mi^2 of the State, or about 38 percent.

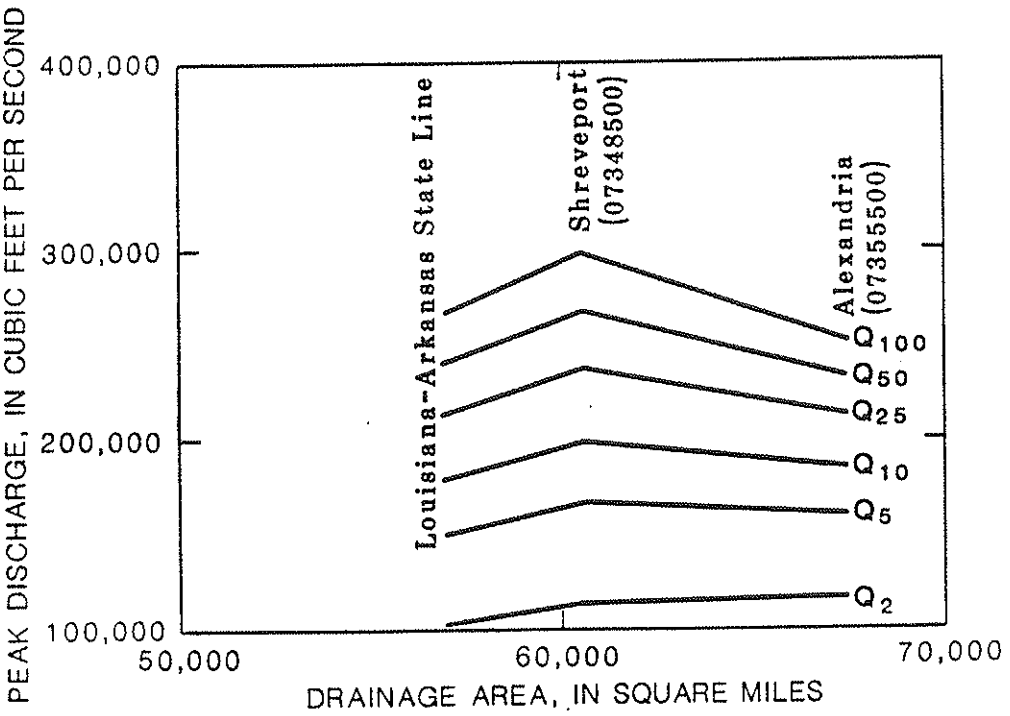

Figure 3.--Flood-frequency discharge curves for Red River.

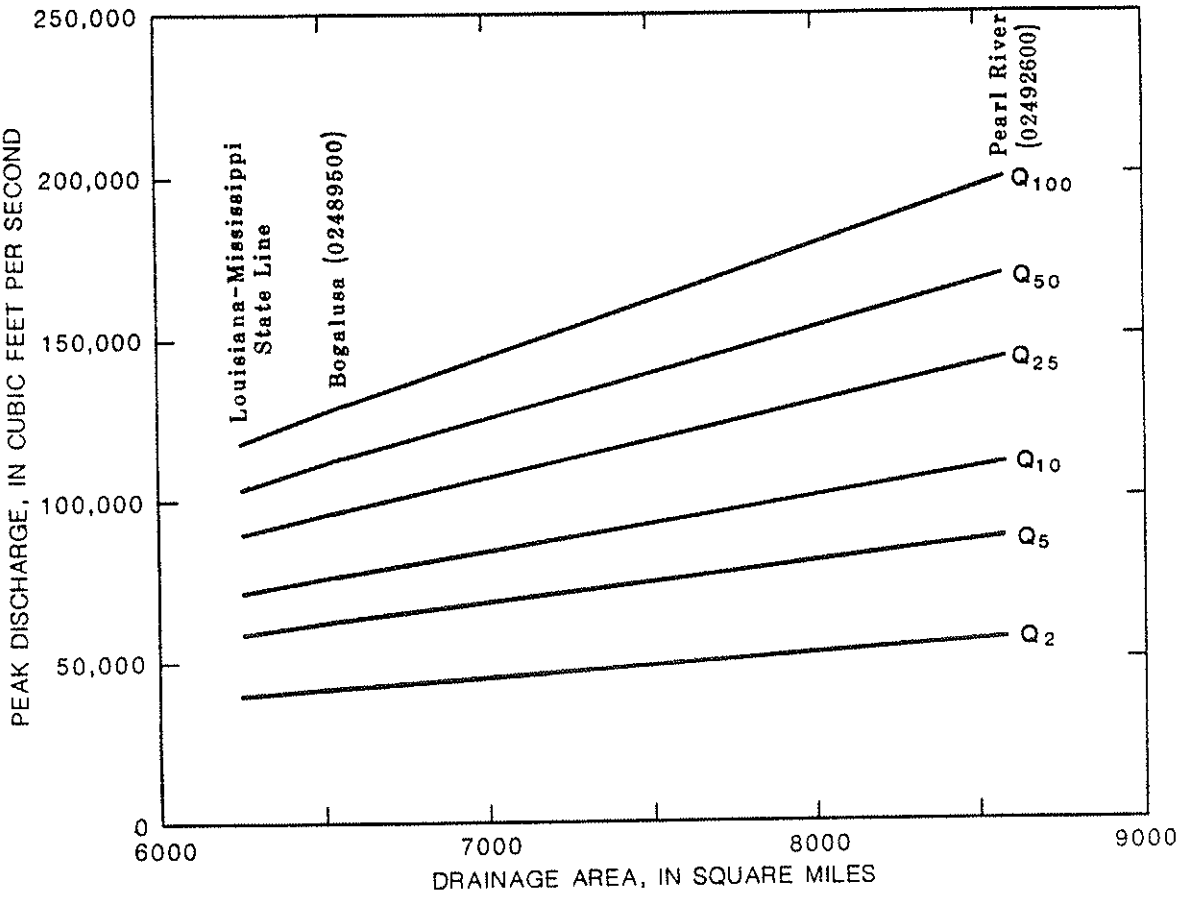

Figure 4.--Flood-frequency discharge curves for Pearl River.

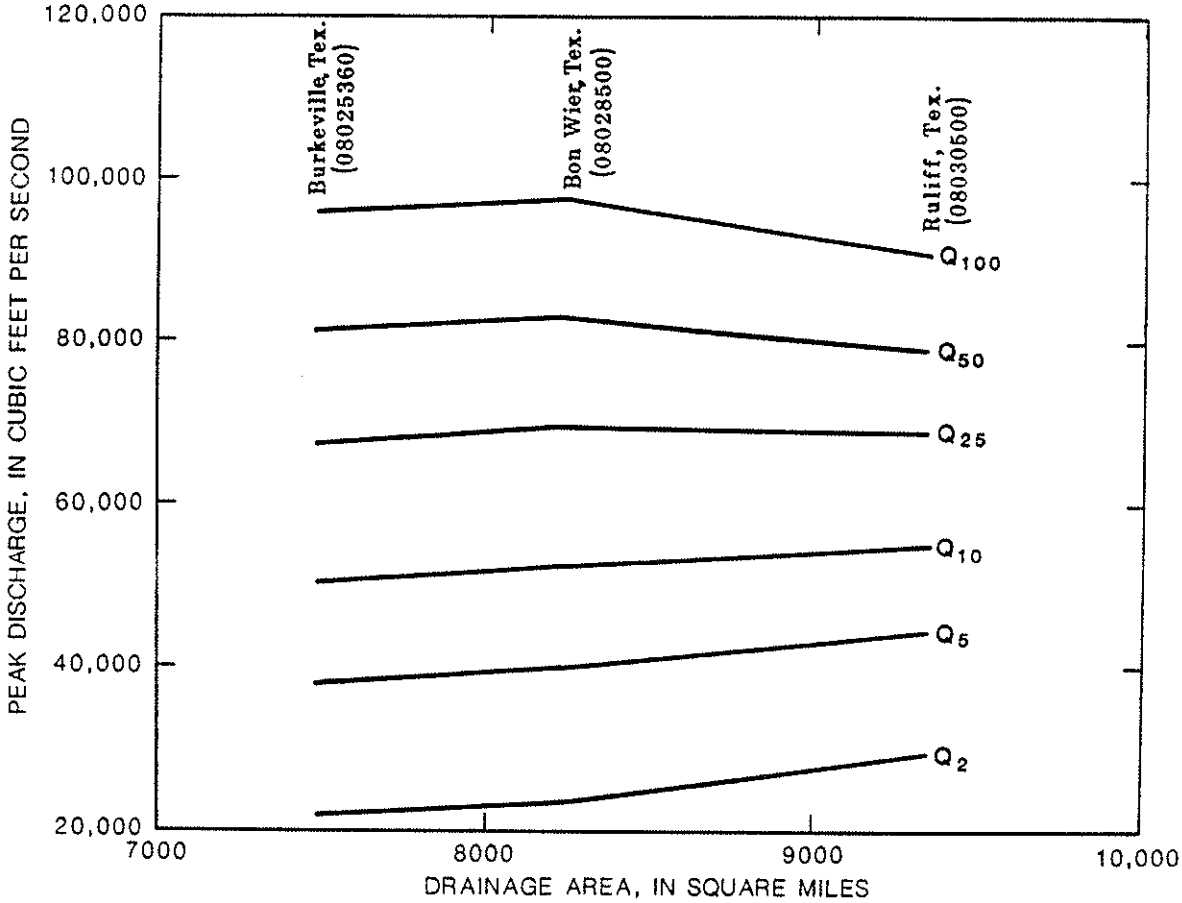

Figure 5.--Flood-frequency discharge curves for Sabine River.

Regulation of the Red River began in 1943 when Lake Texoma dam was completed. The flood-frequency curves (fig. 3) and the data shown in table 3 are based on peak-flow information collected after 1943 and represent regulated conditions.

Ouachita-Black River System

The Ouachita River originates in the hills of central Arkansas. From there, it flows in a southeasterly direction until it crosses into Louisiana where the direction of flow changes into a southerly one. This river continues its meandering course until it intersects the Tensas and Little Rivers to form the head of the Black River at Jonesville, La.

The flow pattern of the Ouachita River is altered by many locks and dams. Because of the difficulty in obtaining daily-discharge data on streams that are regulated by locks and dams, only two continuous discharge stations are operated on the Ouachita River in Louisiana. These sites are at Monroe and at the Columbia Lock and Dam. Flood-frequency discharges for the Monroe site are shown in table 3. A flood-frequency analysis was not done for the Columbia Lock and Dam because of the short period of record.

Lower Pearl River System

The lower Pearl River forms the southern part of the boundary between Louisiana and Mississippi. Flood-frequency discharges for the Pearl River at two stations in Louisiana and one in Mississippi are shown in table 3. Figure 4 shows the flood-frequency relationships for these sites. Discharges shown are those agreed upon by the U.S. Geological Survey and the Corps of Engineers, Mobile District, in 1980, following the extreme floods in 1979 and 1980.

Sabine River System

The Sabine River forms part of the western boundary of Louisiana. This river flows through the largest reservoir in Louisiana, the Toledo Bend Reservoir, which supplies electrical power to parts of Louisiana and Texas. Flood-frequency discharge relationships (table 3) were computed for three sites along this river. These relationships are shown in figure 5 and represent conditions after the reservoir started operating.

EXAMPLE APPLICATION OF REGRESSION EQUATIONS

The accepted procedure (Neely, 1976) for computing Q_x at gaged sites having drainage areas less than 3,000 mi^2 is to weight the station flood-frequency discharge, $Q_x(A)$, with the regression flood-frequency discharge $Q_x(R)$. This weighting process is based on the number of years of record at the site and the equivalent years of record for the regression equation, listed in table 5. The equation for computing the weighted average discharge, $Q_x(w)$ [Q_x(weighted)], is

$$Q_x(w) = \frac{Q_x(A)(N) + Q_x(R)(E)}{N + E}, \qquad (8)$$

where $Q_x(w)$ = the weighted discharge for recurrence interval x,
$Q_x(A)$ = the actual discharge for recurrence interval x (table 1),
$Q_x(R)$ = the regression discharge for recurrence interval x (using eqs. 2-7),
N = the number of years of record for $Q_x(A)$ (table 1), and
E = the equivalent years of record for $Q_x(R)$ (table 5).

An example of this weighting technique is illustrated in the following table using the station, Amite River near Denham Springs (07378500).

Recurrence interval, x (years)	$Q_x(A)$ (ft^3/s)	N (years)	$Q_x(R)$ (ft^3/s)	E (years)	$Q_x(w)$ (ft^3/s)
2	26,200	63	18,200	5	25,600
5	48,000	63	39,200	8	47,000
10	65,500	63	58,200	10	64,500
25	91,200	63	86,500	13	90,400
50	113,000	63	120,000	14	114,000
100	136,000	63	151,000	14	139,000

Flood frequency at sites having drainage areas less than 3,000 mi^2 and that are not at but near a gaged site on the same stream, can be computed using a combination of the regression equations and data from the nearby station. If the drainage area of the ungaged site is within 50 percent of that of the gaged site, the following procedure should be used.

1. Obtain a weighted ratio for the gaged site using the following equation

$$R = \frac{Q_x(w)}{Q_x(R)} \tag{9}$$

Where $Q_x(w)$ is from tables 1 or 2 and $Q_x(R)$ is computed from equations 2 through 7. This ratio, R, adjusts the regression $Q_x(R)$ to the $Q_x(w)$.

2. Next, determine a correction factor, R', for the ungaged site using the equation

$$R' = R - \frac{\Delta A}{0.5\ Ag} \quad (R\text{-}1.00), \tag{10}$$

where ΔA = the difference between the drainage areas of the gaged and the ungaged sites, and
Ag = the drainage area of the gaged site.

If $\Delta A/Ag$ is greater than 0.5, the regression equations should be used directly and no further adjustments made.

The following example for computing the Q_{100} is given to illustrate the aforementioned procedure using the Amite River at Denham Springs (07378500) as the gaged site:

Ag = 1,280 mi^2;

S = 5.2 ft/mi;

P = 58 in/yr;

N = 63 years;

E = 14 years;

$Q_{100(A)}$ = 136,000 ft^3/s (from table 1);

$Q_{100(R)}$ = 151,000 ft^3/s (from eq. 7);

$Q_{100(w)}$ = 139,000 ft^3/s (from eq. 8);

$$R = \frac{Q_{100(w)}}{Q_{100(R)}} = \frac{139,000}{151,000} = 0.92 \text{ (from eq. 8).}$$

The ungaged site is upstream from Denham Springs:

A = 700 mi^2;

S = 6.0 ft/mi;

P = 55 in/yr;

$Q_{100(R)}$ = 90,600 (from eq. 7);

$$\Delta A = 1,280 - 700 = 580 \text{ mi}^2$$

$$\frac{\Delta A}{Ag} = \frac{580}{1,280} = 0.45 \text{ (less than 0.5);}$$

$$R' = 0.92 - \frac{580}{0.5(1,280)}(0.92\text{-}1.00), \text{ (eq. 10);}$$

$$R' = 0.99;$$

$$Q_{100} = Q_{100(R)}(R') = 90,600\ (0.99) = 89,700 \text{ ft}^3/\text{s}.$$

If the ungaged site is located between two gaged sites, the drainage area at the ungaged site should be compared to each gaged site. The gaged site that is nearest in drainage area size to the ungaged site, (ratio = $\Delta A/Ag$ - 0.5), should be used in the computations. If the ratio of both of the gaged sites is greater than 0.50, then equations 2 through 7 should be used and not adjusted.

LIMITATIONS

Equations presented in this report are based on streamflow data for basically natural, unaltered streams. They should not be used for streams that are controlled by dams, flood-detention structures, or other manmade encumbrances that may significantly affect the flood peak. In addition, these equations are not applicable to streams where the channels have been dredged.

The main-channel slopes used in developing the equations ranged in magnitude from 0.41 to 96.8 ft/mi and drainage area ranged from 0.14 to 1,880 mi^2. In using the regression analysis, the upper limit of the slope was held to 16 ft/mi. By holding the slope to 16 ft/mi, the standard error of estimate was greatly decreased and a bias in the plot of residual Q versus S was eliminated. When the equations were tested, it was found that slopes less than 1.75 ft/mi and drainage areas less than 2.00 mi^2 could, in some instances, give Q_{100} values less than Q_2. Use of the equations presented in this report should be limited to the range in channel slope used in developing them, with an upper limit of the slope not to exceed 16 ft/mi. In addition, when slopes less than 1.75 ft/mi and drainage areas less than 2.0 mi^2 are used, caution is advised, and the results should be examined to make sure the Q_{100} is greater than the Q_2.

Because the sites used in this study are basically natural, unaltered streams, peak discharges for those streams affected by significant urban development should not be evaluated with equations presented in this report. Flood-frequency discharges for streams affected by urban areas can be estimated using information presented by Neely (1976) or methods presented by Sauer and others (1983).

The average annual rainfall ranges from 45 to 64 in/yr. In using the regression analysis, the upper limit for the average annual rainfall was set to 60 in/yr. The equations in this report are limited to use when the average annual rainfall is equal to or greater than 45 in/yr. If the average annual rainfall exceeds 60 in/yr, then 60 in/yr should be used instead of the actual value. The average annual rainfall is derived from the base period 1931-60, as indicated in figure 2.

Graphical relations shown in this report for streamflow sites having drainage areas larger than 3,000 mi^2 are not transferable to other sites. For those streams that are natural, unaltered water bodies, estimates of discharge for a given recurrence interval can be made for sites between or near gaged locations on the same stream. For those streams that are affected by regulation of some sort, the graphs are given for information only and are not applicable for estimating discharge at any location other than at the gaged site.

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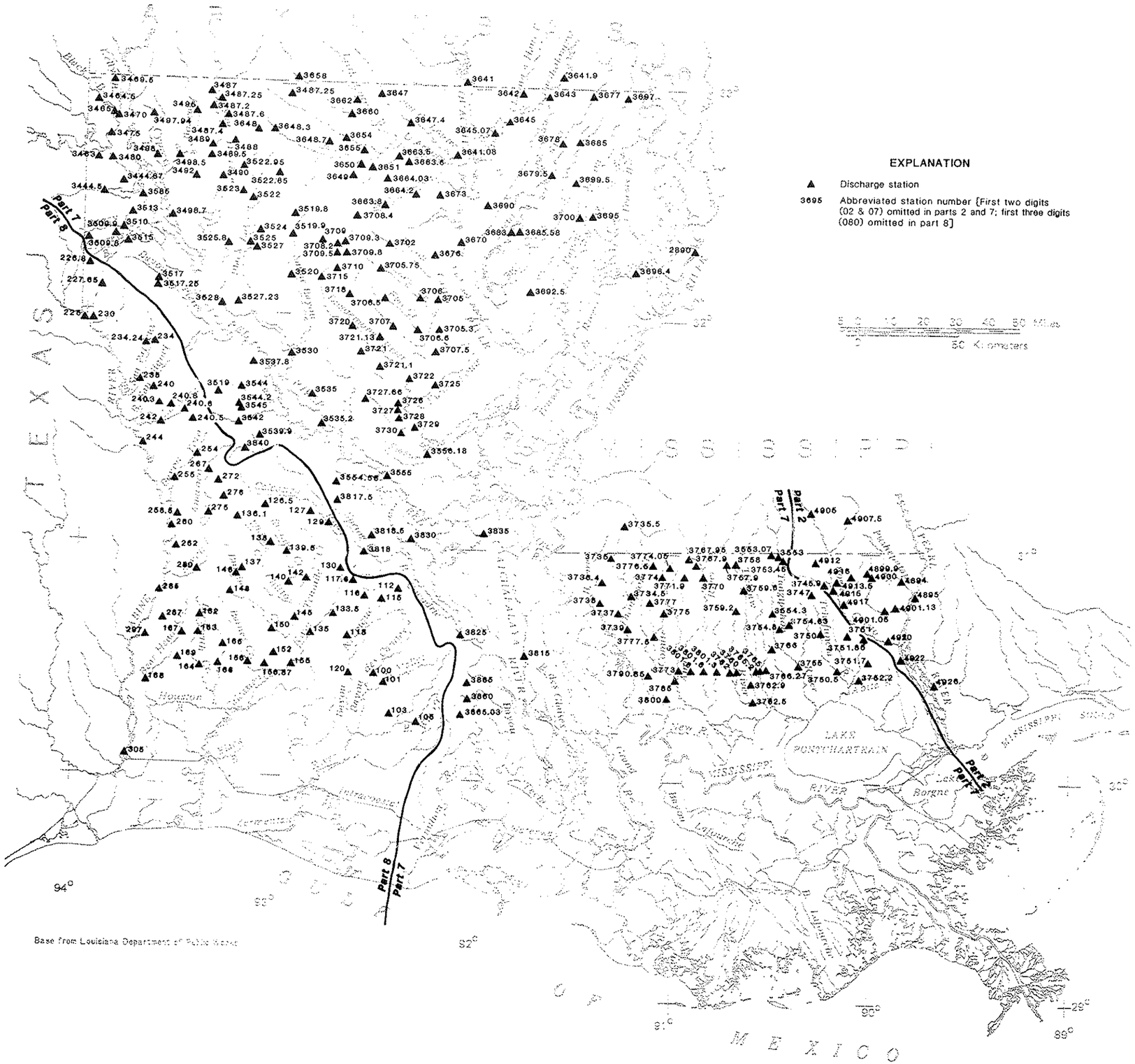

PLATE 1. LOCATION OF GAGING STATIONS.