STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS

Water Resources
TECHNICAL REPORT NO. 23

FLOOD DEPTH-FREQUENCY RELATIONS FOR LOUISIANA

STATE OF LOUISIANA

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

OFFICE OF PUBLIC WORKS

In cooperation with the

UNITED STATES GEOLOGICAL SURVEY

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By

Alfred S. Lowe
U.S. Geological Survey

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UNITED STATES GEOLOGICAL SURVEY

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The analyses and compilations in this report were made with inch-pound units of measurement. To convert inch-pound units to metric units, the following conversion factors should be used:

Multiply inch-pound units	By	To obtain SI units
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)

FLOOD DEPTH-FREQUENCY RELATIONS FOR LOUISIANA

By Alfred S. Lowe

ABSTRACT

A study was made to define flood-prone areas by estimating the depth of floods on streams having recurrence intervals of 25, 50, and 100 years. Drainage-area size is the only independent variable required for estimating flood depth for natural streams in Louisiana. The average standard error of estimate for the three equations developed in the study is about 30 percent.

INTRODUCTION

The 89th Congress (1966), in House Document 465, provided for preparation of flood-prone area maps to assist in minimizing flood losses by identifying areas of potential hazard.

This study was made in an effort to define flood-prone areas by estimating flood depths of streams at ungaged sites for the 25-, 50-, and 100-year-frequency floods. Flood depths determined at various locations along a stream enable the development of a stream profile showing flood elevations for a selected recurrence interval. The approximate boundaries of the 25-, 50-, and 100-year floods can then be delineated on topographic maps.

The relation between flood depth and frequency for Louisiana can be estimated for ungaged sites on streams draining areas of as much as 3,000 mi^2 through the use of equations developed in this study. Flood depths from 191 stations throughout the State (pl. 1) were determined and were related to basin parameters by regression techniques. The analysis indicated that only one independent parameter was significant for this study, the drainage-area size.

This report should prove useful to individuals, governmental agencies, and others responsible for land-use development, flood-plain zoning, and flood insurance studies.

Much of the analysis for this report was done as part of the national program of flood-plain mapping administered under the flood-prone area-mapping program sponsored by the U.S. Department of Housing and Urban Development. The methods described are used by the U.S. Geological Survey to delineate flood-prone maps in Louisiana. For streams where data are available, the methods are used to supplement the data. For streams where data are not available, methods outlined in this report provide the only means for constructing the profiles used for delineation of flood-prone area maps.

This report was prepared by the U.S. Geological Survey as part of the program of water-resources studies in cooperation with the Louisiana Department of Transportation and Development, Office of Public Works.

Basin and Flood Parameters

The two parameters used in this report are defined as follows:

(1) Drainage area (A).--The contributing drainage area of the basin, in square miles.

(2) Flood depth (d_x).--Flood depth in this report is the difference, in feet, between the flood elevation for a defined frequency and the streambed elevation at the same location as derived from a topographic contour map.

RELATION OF FLOOD DEPTH TO BASIN PARAMETERS

Standard linear regression techniques were used to determine the relation of basin parameters to flood depths for selected recurrence intervals.

The model used in the regression analysis is of the form

$$d_x = aA^b,$$

where d_x = flood depth, in feet, for recurrence interval x;
$\quad$ a = regression constant;
$\quad$ b = regression coefficient; and
$\quad$ A = drainage area as previously defined.

One equation was developed for each of the three recurrence intervals of 25, 50, and 100 years. The equations apply statewide for the range of drainage areas from 1.0 to 3,000 mi^2. Tests were made to see if the relations varied regionally or with basin size, but no significant trends could be detected.

2

The equations derived from the regression analysis for the three frequencies are:

$$d_{25} = 7.05 A^{0.153},\qquad(1)$$

$$d_{50} = 7.43 A^{0.154},\qquad(2)$$

and

$$d_{100} = 7.74 A^{0.155}.\qquad(3)$$

The above equations are based on inch-pound units of measurements and will not give correct answers if metric units are used in the formulas. To convert results, in feet, to metric equivalents, multiply the answer by 0.3048.

The following types of stations and criteria were used to select the flood-depth data for use in the regression.

A. Flood depths for the 25-, 50-, and 100-year frequencies were computed for the following types of stations:

    (1) Continuous-gaging stations.--Stations where continuous records of stage (including peak discharge) are collected and discharge is computed.

    (2) Crest-stage stations.--Stations where peak stage and peak discharge records are collected.

    (3) Bridge-site data.--From bridge-site reports, special reports in which all available information and hydrologic techniques are used to define stage-discharge and frequency relations at various bridge locations.

B. Criteria for selecting data:

    (1) Stations having drainage areas of less than 3,000 mi^2 were used.

    (2) Only continuous-gaging stations and crest-stage stations with more than 10 years of record were used.

    (3) All flood-frequency curves derived by the log-Pearson type III method were adjusted using the skew coefficients recommended by the U.S. Water Resources Council (1976).

    (4) The alluvial areas of the Ouachita and Mississippi Rivers and the coastal marshes were not included in this study, and flood depths for these areas should not be estimated using relations presented in this study.

ACCURACY

To appraise the accuracy of the regression equation, the standard error of estimate was computed. Standard error of estimate is a measure of how well the flood depths estimated by regression equations approximate observed depths. For this report the standard error of estimate was calculated in logarithmic units and then converted to a percentage for convenience. For this study the average standard error of estimate for flood depths was 30 percent for 50- and 100-year floods and 31 percent for the 25-year flood.

Table 1 shows the station-data flood depths and the ratio of the station flood depths to the equation flood depths for 191 stations. The ratio values multiplied by the equation flood depths equal the station-data flood depths. The ratio values were plotted on a State map to determine if any regional trends existed, but no trends were evident.

EXAMPLE

The following procedure illustrates the use of the equations. Assume that an estimate of the elevation of a 50-year flood is desired for a site on a stream draining 100 mi^2.

Step 1.--Determine the streambed elevation at the site by inter-
polating between contours shown on a topographic map.
Step 2.--Determine the drainage area for the site.
Step 3.--Determine the flood depth (d_{50}) from equation 2.
Step 4.--Add the flood depth (d_{50}) to the streambed elevation
obtained from step 1. This is an estimate of the
elevation for the 50-year flood at the site.

To develop a 50-year flood profile on a stream, use the following procedure:

Step A.--Develop a streambed profile of the stream.
Step B.--Compute the 50-year flood elevations for a number of
locations along the stream length using steps 1-4,
above.
Step C.--Plot these 50-year elevations and draw a smooth curve
using the streambed profile to shape the 50-year
flood profile.

The drainage area of most streams in Louisiana can be determined from the report "Drainage Area of Louisiana Streams" (Sloss, 1971).

LIMITATIONS

The following limitations should be considered when using the regression equations presented in this report:

1. The equations were determined from data for stream sites that were some distance upstream from a confluence; consequently, the equations should not be used to estimate flood depths for sites at or near the confluence of streams.

2. The equations should not be used for sites where dams, flood-detention structures, and other manmade works will have a significant effect on flood depths. For improved channels, flood depth should be computed using open-channel hydraulic formulas.

3. The user is cautioned that the magnitude of the error of the flood depth obtained from the equations in this report may be large because of the range in topography and soils in the State. Normally a regional analysis is made to determine if there is any regional variation in the accuracy of the equations. The analysis for this study consisted of plotting the ratios of the actual depth to the equation depth on a map and searching for regional trends. No definite regional trends were observed, and boundaries related to topographic or soil variations could not be determined. However, the user is encouraged to plot the adjacent ratio values for all streams that are being studied to determine any local trends. If the ratio values indicate a local trend for part of a stream system or a stream reach, then applying an average ratio value to the equation depth is encouraged.

4. The equations should not be used for urban areas where a significant percentage (greater than 15 percent) of the basin is impervious (paved) or served by storm sewers.

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HYDROLOGIC DATA

Table 1

Table 1.--Station-data flood depths and ratio to equation flood depths

Type of station: D, discharge station, continuous record of stage and discharge; C, crest-stage station, peak stage and peak discharge only; BSR, bridge-site report, special reports in which all available information and hydraulic techniques are used to define stage-discharge and frequency relations at various bridge locations.

Drainage area: Contributing drainage area determined from the latest U.S. Geological Survey topographic maps.

Flood depth: The flood depth for the 25-, 50-, and 100-year floods determined as the difference between the 25-, 50-, and 100-year flood elevations and the streambed elevations at the gage.

Ratio: The ratio of the station flood depths to the equation flood depths.

Station No.	Station name	Type of station	Drainage area (mi2)	Flood depth (ft)			Ratio		
				25-year	50-year	100-year	25-year	50-year	100-year
-------	Abita River at U.S. Highway 190-------	BSR	60.0	12.0	12.6	13.0	0.91	0.90	0.89
7-3771.50	Amite River at Grangeville-------	C	741.0	15.3	16.5	17.6	.79	.81	.82
7-3773.00	Amite River at Magnolia-------	C	884.0	23.7	25.2	25.9	1.19	1.20	1.17
7-3770.00	Amite River near Darlington-------	D	580.0	13.0	13.3	13.6	.70	.67	.66
7-3785.00	Amite River near Denham Springs-------	D	1,280.0	27.3	28.8	30.2	1.30	1.29	1.28
8-0156.00	Barnes Creek near Reeves-------	C	111.0	14.0	14.6	15.1	.97	.95	.94
8-0275.00	Bayou Anacoco near Leesville-------	D	115.0	17.4	18.4	19.3	1.19	1.19	1.19
8-0280.00	Bayou Anacoco near Rosepine-------	D	365.0	24.4	26.0	27.5	1.41	1.41	1.42
7-3645.00	Bayou Bartholomew near Beekman-------	D	1,645.0	19.6	20.0	20.3	.90	.86	.83
7-3642.00	Bayou Bartholomew near Jones-------	D	1,187.0	19.1	19.2	19.3	.90	.87	.83
7-3865.00	Bayou Bourbeau at Shuteston-------	D	19.0	9.0	9.3	9.4	.81	.80	.77
7-3860.00	Bayou Carencro near Sunset-------	D	37.1	15.6	16.3	16.8	1.28	1.26	1.24
-------	Bayou Castor at U.S. Highway 171-------	BSR	51.0	23.2	24.6	25.8	1.81	1.81	1.81
8-0230.00	Bayou Castor near Logansport-------	D	96.5	22.6	24.3	25.7	1.60	1.62	1.63
7-3820.00	Bayou Cocodrie near Clearwater-------	D	240.0	15.8	16.8	17.1	.97	.97	.94
7-3817.35	Bayou Cocodrie near Glenmora-------	C	72.1	13.0	14.4	15.7	.96	1.01	1.04
7-3825.00	Bayou Courtableau at Washington-------	D	715.0	28.8	30.0	30.6	1.50	1.47	1.42
-------	Bayou Cypre at Louisiana Highway 118-------	BSR	12.0	12.0	12.8	13.3	1.17	1.17	1.17
7-3648.00	Bayou D'Arbonne at Homer-------	C	30.0	5.6	6.0	6.3	.47	.48	.48
7-3650.00	Bayou D'Arbonne near Duback-------	D	355.0	15.8	16.9	17.7	.92	.92	.92

Number	Station name	Type							
7-3663.00	Bayou D'Arbonne Lake at Farmerville	C	1,470.0	27.0	28.8	30.2	1.26	1.27	1.26
7-3647.00	Bayou de Loutre near Laran	D	141.0	21.9	23.7	25.3	1.46	1.49	1.52
8-0100.00	Bayou Des Cannes near Eunice	D	131.0	16.5	17.2	17.9	1.11	1.10	1.08
7-3835.00	Bayou Des Cannes Diversion Channel at Moreauville	D	270.0	19.3	20.4	21.3	1.16	1.16	1.16
7-3490.00	Bayou Dorcheat, near Minden	D	1,097.0	21.2	22.4	23.7	1.03	1.03	1.03
7-3487.00	Bayou Dorcheat near Springhill	D	605.0	13.9	15.4	17.2	.74	.78	.82
7-3725.00	Bayou Funny Louis near Trout	D	92.0	19.2	20.1	21.5	1.37	1.35	1.38
--------	Bayou Ill Des Cannes at U.S. Highway 167	BSR	48.0	13.7	15.0	16.0	1.08	1.11	1.13
8-0242.00	Bayou La Nana near Zwolle	D	130.0	23.4	24.5	25.4	1.58	1.56	1.54
7-3690.00	Bayou Lafourche near Crew Lake	D	361.0	21.4	21.8	22.3	1.24	1.19	1.15
7-3700.00	Bayou Macon near Delhi	D	782.0	21.6	22.0	22.3	1.11	1.06	1.02
7-3698.30	Bayou Macon near Floyd	C	625.0	25.1	25.6	26.0	1.33	1.28	1.24
7-3697.00	Bayou Macon near Kilbourne	D	504.0	25.6	26.4	26.8	1.41	1.37	1.32
8-0101.00	Bayou Mallet near Eunice	C	94.5	16.0	18.0	20.1	1.14	1.21	1.28
7-3517.00	Bayou Na Bonchasse near Mansfield	D	19.5	13.8	15.3	17.1	1.24	1.30	1.39
8-0120.00	Bayou Nezpique near Basile	D	527.0	24.7	27.9	31.7	1.35	1.43	1.55
7-3509.50	Bayou Pierre near Gayles	C	44.0	15.9	18.1	20.2	1.27	1.36	1.45
7-3516.00	Bayou Pierre near Grand Bayou	C	661.0	27.3	28.8	30.2	1.43	1.43	1.42
8-0240.00	Bayou San Miguel near Zwolle	D	111.0	12.9	14.4	14.9	.89	.94	.93
8-0234.00	Bayou San Patricio near Benson	C	80.2	14.1	14.4	14.8	1.03	.99	.97
8-0235.00	Bayou San Patricio near Noble	D	154.0	14.5	15.5	16.4	.95	.96	.97
7-3542.00	Bayou Santabarb at Bellwood	C	51.1	11.8	12.7	13.5	.92	.93	.95
8-0240.30	Bayou Scie at Zwolle	C	45.9	15.8	17.0	18.0	1.25	1.27	1.28
7-3850.00	Bayou Teche at Arnaudville	D	1,531.0	22.7	23.5	24.2	1.05	1.03	1.00
8-0254.00	Bayou Toro near Florien	C	78.6	19.6	20.6	21.1	1.43	1.42	1.38
8-0255.00	Bayou Toro near Toro	D	148.0	22.1	23.4	24.0	1.46	1.46	1.43
8-0105.00	Bayou Wikoff near Rayne	D	51.3	19.5	19.7	19.8	1.52	1.45	1.39
7-3723.00	Bear Creek near Packton	D	11.0	14.3	14.6	14.9	1.41	1.36	1.33
--------	Bear Creek at U.S. Highway 171	BSR	14.0	11.2	11.6	12.0	1.06	1.04	1.03
8-0167.00	Bear Head Creek near Singer	C	45.6	10.6	11.9	13.7	.84	.89	.98
8-0168.00	Bear Head Creek near Starks	D	177.0	8.7	9.1	9.5	.56	.55	.55
7-3706.00	Beaucoup Creek near Cotton Plant	C	127.0	11.1	11.6	12.0	.76	.75	.73
8-0216.00	Beaver Creek at Beaver	C	14.4	13.1	13.6	14.0	1.24	1.22	1.20
8-0164.00	Beckwith Creek near De Quincy	D	148.0	21.3	22.6	23.9	1.41	1.41	1.42
8-0163.00	Beckwith Creek near Singer	C	76.0	15.7	17.5	19.3	1.15	1.21	1.27
7-3707.00	Beech Creek near Olla	C	58.0	12.4	12.8	13.1	.95	.92	.90

Table 1.--Station-data flood depths and ratio to equation flood depths--Continued

Station No.	Station name	Type of station	Drainage area (mi²)	Flood depth (ft)			Ratio		
				25-year	50-year	100-year	25-year	50-year	100-year
7-3685.00	Big Colewa Bayou near Oak Grove-------	D	42.0	10.1	10.3	10.4	0.81	0.78	0.75
7-3731.00	Big Creek at Fishville-------------	C	66.5	13.4	14.3	15.0	1.00	1.01	1.01
7-3730.00	Big Creek at Pollock--------------	D	51.0	16.4	17.5	18.2	1.28	1.29	1.28
7-3718.00	Big Creek near Dodson-------------	C	81.0	10.7	10.8	10.9	.78	.74	.71
8-0127.00	Big Creek near Leander------------	C	37.1	14.6	15.3	15.9	1.19	1.18	1.17
7-3649.00	Big Creek near Vienna-------------	C	68.9	11.8	12.8	13.6	.88	.90	.91
7-3487.60	Black Bayou at Leton--------------	C	49.8	11.0	11.7	12.3	.86	.86	.87
7-3475.00	Black Bayou near Gilliam----------	D	364.0	21.8	24.2	27.4	1.26	1.32	1.42
7-3522.00	Black Lake Bayou near Minden------	C	38.6	7.2	7.8	8.5	.58	.60	.62
7-3523.00	Black Lake Creek near Gibsland----	C	48.9	8.1	8.6	9.2	.64	.64	.66
7-3495.00	Bodcau Bayou near Sarepta---------	D	546.0	18.6	19.5	20.2	1.01	1.00	.98
7-3677.00	Boeuf River near Arkansas-Louisiana State line------	D	785.0	19.9	20.3	20.3	1.02	.98	.93
7-3680.00	Boeuf River near Girard-----------	D	1,226.0	14.8	15.5	16.2	.71	.70	.69
---------	Boeuf River at I-20---------------	BSR	1,230.0	14.2	15.6	17.0	.68	.70	.73
8-0115.00	Boggy Bayou near Pine Prairie-----	D	51.3	14.0	15.0	16.0	1.09	1.10	1.12
7-3510.00	Boggy Bayou near Keithville-------	D	79.0	11.4	12.0	12.8	.83	.83	.84
2-4918.00	Bogue Chitto at Enon--------------	C	1,107.0	16.0	16.8	17.4	.78	.77	.76
2-4915.00	Bogue Chitto at Franklinton-------	D	985.0	14.9	15.3	15.5	.74	.71	.69
2-4920.00	Bogue Chitto near Bush------------	D	1,210.0	12.1	12.3	12.4	.58	.56	.53
2-4910.00	Bogue Chitto at Warnerton---------	BSR	846.0	15.0	16.5	18.0	.76	.79	.82
---------	Bogue Falaya near Covington-------	BSR	88.0	23.9	25.3	26.6	1.71	1.71	1.71
---------	Bogue Lusa Creek at Louisiana Highway 21-----------	BSR	75.0	5.8	6.3	6.7	.43	.44	.44
2-4900.00	Bogue Lusa Creek near Franklinton-	D	12.1	11.3	12.0	12.6	1.10	1.10	1.11
7-3513.00	Brush Bayou near Shreveport-------	C	27.1	9.8	10.1	10.4	.84	.82	.80
8-0297.00	Brushy Creek at Bancroft----------	C	25.9	11.8	12.4	12.9	1.02	1.01	1.00
7-3489.00	Brushy Creek near Hortman---------	C	16.1	8.5	8.9	9.2	.79	.78	.77
8-0148.00	Bundick Creek near De Ridder------	D	120.0	14.8	15.0	15.3	1.01	.97	.94
8-0150.00	Bundick Creek near Dry Creek------	D	238.0	18.2	20.4	23.1	1.12	1.19	1.28
8-0129.00	Calcasieu River at Hineston-------	C	436.0	15.6	15.8	18.1	.88	.84	.91

Station number	Station name	Type	Drainage area						
8-0130.00	Calcasieu River near Glenmora	D	499.0	17.2	18.1	19.9	.95	.94	.98
8-0155.00	Calcasieu River near Kinder	D	1,700.0	22.5	25.1	25.7	1.03	1.08	1.05
8-0135.00	Calcasieu River near Oberlin	D	753.0	17.8	19.3	20.9	.92	.94	.97
-------	Calcasieu River near Sieper	BSR	337.0	19.0	19.8	20.4	1.11	1.09	1.07
7-3547.60	Cane River near Montrose	C	25.8	16.4	16.9	17.2	1.36	1.32	1.28
7-3549.00	Cane River near Galbraith	C	687.0	28.1	29.7	30.6	1.47	1.47	1.43
7-3527.00	Castor Creek at Castor	C	27.9	8.0	8.5	9.3	.68	.69	.72
7-3702.00	Castor Creek at Chatham	C	60.0	15.8	16.4	17.0	1.20	1.18	1.16
7-3708.00	Castor Creek at Tullos	C	923.0	31.1	32.4	33.6	1.56	1.53	1.50
7-3705.00	Castor Creek near Grayson	D	271.0	12.5	13.3	13.5	.75	.76	.73
7-3830.00	Chatlin Lake Canal near Lecompte	D	75.9	12.6	13.0	13.2	.92	.90	.87
7-3643.00	Chemin-a-Haut Bayou near Beekman	D	271.0	20.3	20.9	21.5	1.23	1.19	1.16
7-3707.50	Chickasaw Creek near Olla	C	47.6	16.7	17.2	17.4	1.31	1.28	1.23
-------	Choudrant Creek at I-20	BSR	89.0	6.9	7.4	7.8	.49	.50	.50
7-3492.00	Clarke Bayou near Haughton	C	35.1	9.9	10.2	10.4	.82	.80	.77
8-0157.00	Clear Creek at Reeves	C	23.1	16.5	17.6	18.8	1.45	1.46	1.49
7-3801.30	Colyell Creek at Livingston	C	20.7	13.7	14.4	14.8	1.22	1.21	1.19
7-3774.00	Comite River near Clinton	C	112.0	12.8	13.0	13.3	.88	.85	.83
-------	Comite River near Wilson	BSR	63.0	13.6	14.0	14.2	1.03	1.00	.96
7-3780.00	Comite River near Comite	D	284.0	20.1	20.9	22.8	1.20	1.18	1.23
7-3775.00	Comite River near Olive Branch	D	145.0	17.3	18.7	20.1	1.15	1.17	1.20
7-3777.50	Comite River near Zachary	C	230.0	23.9	25.5	26.9	1.48	1.49	1.49
7-3660.00	Corney Bayou near Lillie	D	462.0	15.2	17.4	19.7	.85	.91	.98
-------	Corney Bayou at Louisiana Highway 2	BSR	812.0	28.6	29.5	30.0	1.46	1.42	1.37
8-0169.90	Cowards Gully near De Quincy	C	15.3	8.2	8.6	8.9	.77	.76	.75
8-0162.00	Cowpen Creek near De Ridder	C	28.3	12.4	13.6	14.8	1.06	1.10	1.14
7-3498.00	Cypress Bayou near Benton	D	133.0	13.1	13.8	14.5	.88	.88	.88
7-3515.00	Cypress Bayou near Keithville	D	66.0	8.5	9.0	9.6	.64	.64	.65
-------	Cypress Bayou near Sieper	BSR	160.0	20.7	21.3	21.8	1.35	1.31	1.28
7-3651.00	Cypress Creek near Unionville	C	63.3	9.1	9.6	9.9	.69	.68	.67
8-0137.00	Drakes Creek near Pitkin	C	22.1	10.5	11.0	11.4	.93	.92	.91
8-0152.00	Dry Creek at Dry Creek	C	42.7	18.3	18.9	19.2	1.46	1.43	1.38
7-3716.00	Dugdemona River near Dodson	C	412.0	10.5	12.4	14.2	.59	.66	.72
7-3715.00	Dugdemona River near Jonesboro	D	355.0	12.0	13.0	14.0	.70	.71	.73
7-3720.00	Dugdemona River near Winnfield	D	654.0	16.5	17.5	18.7	.87	.87	.88
8-0272.00	East Anacoco Creek near Anacoco	C	40.6	19.8	21.3	22.8	1.59	1.62	1.65
8-0112.00	East Fork Bayou Nezpique near Reddell	C	40.0	7.5	7.9	8.1	.60	.60	.59
7-3726.00	Fish Creek near Pollock	C	30.0	9.6	10.0	10.5	.81	.80	.80
7-3706.50	Flat Creek near Sikes	C	41.5	8.2	8.7	9.2	.66	.66	.66

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Table 1.--Station-data flood depths and ratio to equation flood depths--Continued

Station No.	Station name	Type of station	Drainage area (mi²)	Flood depth (ft)			Ratio		
				25-year	50-year	100-year	25-year	50-year	100-year
7-3488.00	Flat Lick Bayou near Leton-------	D	66.9	9.2	10.0	11.0	0.69	0.71	0.74
8-0126.50	Floctaw Creek near Lacamp-------	C	18.7	16.6	17.6	18.8	1.50	1.51	1.54
-------	Floctaw Creek at Louisiana Highway 28--	BSR	23.0	14.8	15.2	15.4	1.30	1.26	1.22
7-3528.00	Grand Bayou near Coushatta-------	D	93.9	10.1	11.0	12.0	.72	.74	.77
8-0240.50	Harpoon Bayou at Many-------	C	22.7	9.6	10.3	10.9	.84	.86	.86
7-3550.00	Hemphill Creek near Hot Wells-------	D	18.0	11.2	12.6	14.1	1.02	1.09	1.16
7-3762.00	Hog Branch near Doyle-------	C	110.0	20.8	21.6	22.4	1.44	1.41	1.39
8-0287.00	Hoosier Creek near Merryville-------	D	13.1	8.8	9.1	9.3	.84	.83	.81
-------	Hudson Creek near Rock Hill-------	BSR	14.0	9.3	9.8	10.3	.88	.88	.88
7-3470.00	Kelly Bayou near Hosston-------	D	116.0	19.5	20.3	21.3	1.34	1.32	1.32
7-3524.00	Kepler Creek at Sparta-------	C	21.1	4.4	4.8	5.2	.39	.40	.42
7-3547.00	Kisatchie Bayou at Cypress-------	C	360.0	26.0	27.2	28.0	1.50	1.48	1.45
7-3541.00	Kisatchie Bayou near Bellwood-------	C	140.0	17.8	18.5	19.2	1.19	1.17	1.15
7-3522.80	Leatherman Creek near Gibsland-------	C	57.0	7.3	7.8	8.3	.56	.56	.57
8-0240.80	Lewis Creek near Many-------	C	12.5	13.8	14.0	14.2	1.34	1.29	1.25
7-3689.00	Little Bayou Boeuf near Collinston-------	C	67.0	6.3	6.6	6.8	.47	.47	.46
7-3662.00	Little Corney Bayou near Lillie-------	D	208.0	12.7	15.3	18.8	.80	.91	1.06
-------	Little River at Zenoria-------	BSR	1,890.0	30.0	30.8	31.2	1.35	1.30	1.25
7-3722.00	Little River near Rochelle-------	D	1,899.0	25.3	25.8	26.3	1.14	1.09	1.05
-------	Little River near Holloway-------	BSR	2,400.0	17.5	19.0	20.3	.76	.77	.78
7-3540.00	Little Sandy Creek at Kisatchie-------	D	21.4	12.3	13.3	14.4	1.10	1.12	1.16
7-3500.00	Loggy Bayou near Ninock-------	D	2,628.0	26.8	28.8	30.4	1.14	1.16	1.16
8-0103.00	Long Point Gully near Crowley-------	D	25.7	12.2	12.4	12.6	1.05	1.01	.98
7-3698.00	Lyon Bayou at Forest-------	C	9.8	12.7	12.9	13.0	1.27	1.22	1.17
7-3481.00	McCain Creek near Shreveport-------	C	13.8	11.6	12.4	13.0	1.10	1.11	1.11
7-3801.60	Middle Colyell Creek near Walker-------	C	20.3	12.6	13.4	13.8	1.13	1.14	1.12
7-3655.00	Middle Fork Bayou D'Arbonne near Bernice-------	D	178.0	11.1	12.0	13.1	.71	.73	.76
7-3653.00	Middle Fork Bayou D'Arbonne near Colquitt-------	C	43.9	10.6	11.3	11.9	.84	.85	.85
7-3535.00	Nantachie Creek near Montgomery-------	D	47.0	11.7	14.5	18.0	.92	1.08	1.28

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Station number	Station name								
--------	Natalbany River at Louisiana Highway 442	BSR	63.0	13.4	14.0	14.5	1.01	1.00	.98
7-3765.00	Natalbany River at Baptist	D	79.5	16.0	16.9	17.9	1.16	1.16	1.17
--------	Natalbany River at I-12	BSR	125.0	15.6	16.7	17.8	1.06	1.07	1.09
7-3673.00	North Cheniere Creek at Cheniere	C	38.0	7.8	8.5	9.0	.64	.65	.66
7-3444.50	Paw Paw Bayou near Greenwood	D	80.5	12.6	13.1	13.6	.92	.90	.89
7-3766.00	Ponchatoula Creek at Natalbany	C	13.8	14.2	14.4	14.6	1.35	1.29	1.25
7-3721.00	Port de Luce Creek at Winnfield	C	31.0	6.8	7.6	8.0	.57	.60	.61
8-0275.50	Prairie Creek near Leesville	C	40.0	19.2	19.7	20.1	1.55	1.50	1.46
2-4894.00	Pushepatapa Creek at Varnado	C	158.0	14.8	15.8	16.6	.97	.98	.98
7-3530.00	Saline Bayou near Clarence	D	1,386.0	12.8	14.6	16.0	.60	.65	.67
7-3520.00	Saline Bayou near Lucky	D	154.0	9.8	10.9	12.5	.64	.68	.74
8-0140.00	Sixmile Creek near Sugartown	D	171.0	16.8	17.4	17.9	1.09	1.06	1.04
7-3818.00	Spring Creek near Glenmora	D	68.4	12.8	13.7	14.6	.95	.96	.98
--------	Spring Creek at Louisiana Highway 497	BSR	80.0	13.4	13.8	14.2	.97	.95	.93
7-3663.50	Stowe Creek near Farmerville	C	29.0	9.7	9.9	10.1	.82	.79	.77
7-3755.00	Tangipahoa River at Robert	D	646.0	15.8	16.2	17.2	.81	.81	.81
--------	Tangipahoa River south of Robert	BSR	686.0	13.0	14.2	15.3	.68	.70	.72
7-3754.30	Tangipahoa River near Amite	C	472.0	10.9	11.5	12.0	.60	.60	.59
--------	Tangipahoa River near Independence	BSR	512.0	15.1	15.9	16.6	.83	.82	.81
7-3753.00	Tangipahoa River near Kentwood	C	296.0	12.2	12.5	12.7	.73	.70	.68
7-3750.50	Tchefuncta River near Covington	C	145.0	19.1	20.1	21.0	1.27	1.26	1.25
7-3750.00	Tchefuncta River near Folsom	D	95.5	16.1	16.3	16.6	1.14	1.09	1.06
7-3747.00	Tchefuncta River near Franklinton	C	53.1	11.2	11.6	12.0	.87	.85	.84
8-0142.00	Tenmile Creek near Elizabeth	D	94.2	16.0	17.5	19.1	1.14	1.17	1.22
7-3695.00	Tensas River at Tendal	D	309.0	20.7	21.2	21.8	1.22	1.18	1.16
7-3736.00	Thompson Creek below Jackson	C	166.0	14.9	15.4	15.7	.97	.95	.92
7-3737.00	Thompson Creek near Starhill	C	249.0	17.7	18.1	18.4	1.08	1.04	1.01
7-3760.00	Tickfaw River at Holden	D	247.0	16.4	17.2	18.0	1.00	.99	.99
7-3759.60	Tickfaw River at Montpelier	D	220.0	13.9	14.4	14.8	.87	.85	.83
7-3758.50	Tickfaw River near Greensburg	C	136.0	12.4	13.0	13.6	.83	.82	.82
--------	Tickfaw River at Starns Bridge, Louisiana Highway 441	BSR	237.0	17.4	18.0	18.5	1.07	1.05	1.02
7-3480.00	Twelvemile Bayou near Dixie	D	3,137.0	27.9	30.2	33.4	1.16	1.18	1.24
7-3800.00	Ward Creek at Siegan Lane, near Baton Rouge	D	40.0	21.9	22.7	23.3	1.77	1.73	1.70
8-0267.00	West Anacoco Creek near Hornbeck	C	22.2	17.6	18.2	18.6	1.51	1.48	1.44
--------	West Anacoco Creek near Anacoco	BSR	54.0	22.7	23.5	24.0	1.75	1.71	1.67

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Table 1.--Station-data flood depths and ratio to equation flood depths--Continued

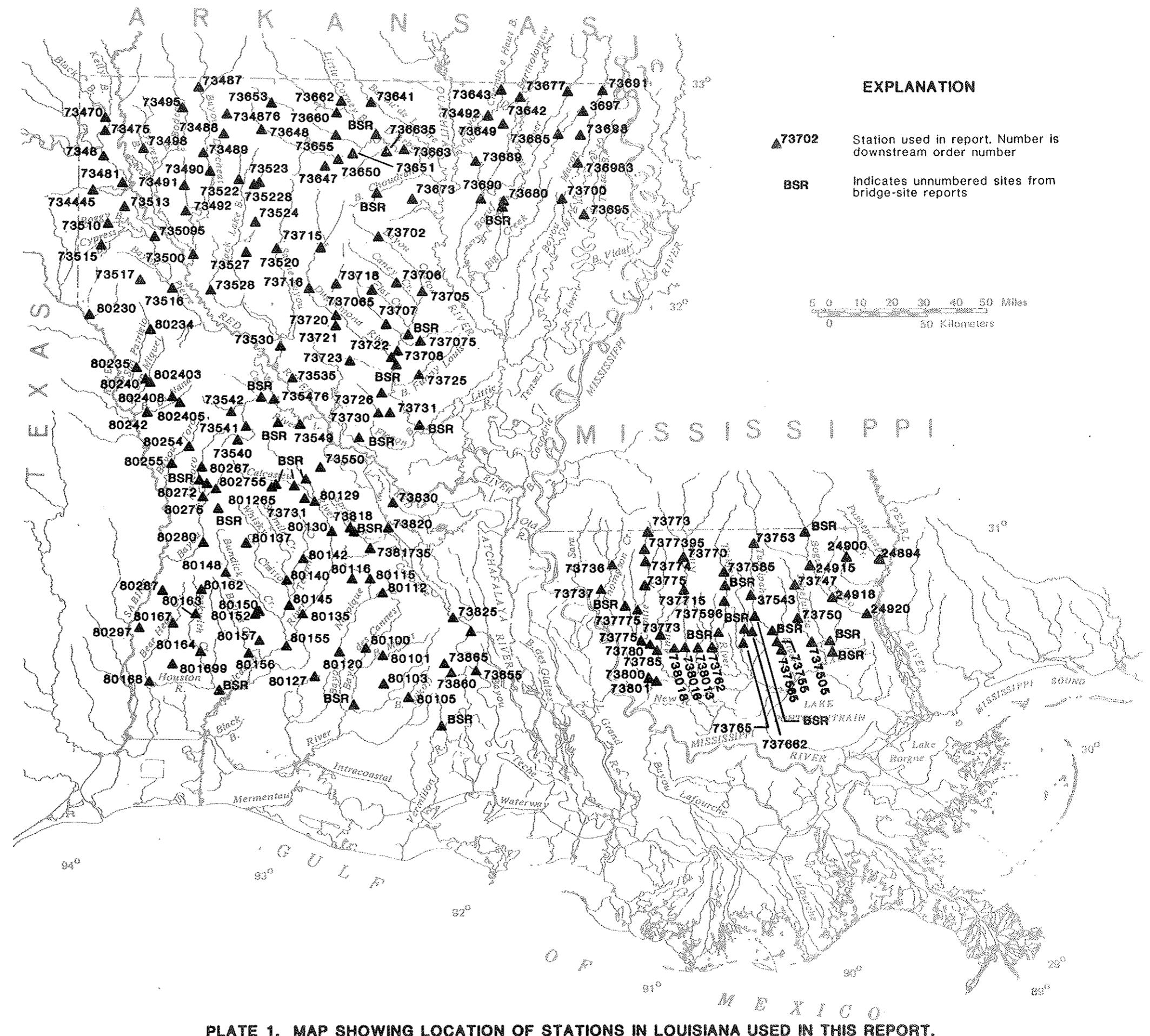| Station No.	Station name	Type of station	Drainage area (mi^2)	Flood depth (ft) 25-year	50-year	100-year	Ratio 25-year	50-year	100-year
7-3801.80	West Colyell Creek near Walker--------	C	28.5	11.1	11.6	11.9	0.95	0.94	0.92
8-0145.00	Whisky Chitto Creek near Oberlin-------	D	510.0	21.3	23.4	25.8	1.17	1.21	1.27
--------	White Bayou at Louisiana Highway 64-----	BSR	44.0	11.1	11.8	12.4	.88	.89	.89

PLATE 1. MAP SHOWING LOCATION OF STATIONS IN LOUISIANA USED IN THIS REPORT.