# Techniques for Estimating Flood-Depth Frequency Relations on Natural Streams in Georgia

## U.S. GEOLOGICAL SURVEY

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## TECHNIQUES FOR ESTIMATING FLOOD-DEPTH FREQUENCY

## RELATIONS ON NATURAL STREAMS IN GEORGIA

By McGlone Price

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## U.S. GEOLOGICAL SURVEY

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August 1977

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## TECHNIQUES FOR ESTIMATING FLOOD-DEPTH FREQUENCY RELATIONS ON NATURAL STREAMS IN GEORGIA

## By McGlone Price

#### ABSTRACT

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Regional relations are defined for estimating the depth of floods having recurrence intervals of 10, 50, and 100 years on streams with natural flow in Georgia.

Multiple-regression analysis of station data is used to define the relations between flood depths and frequency for streams draining from 1 to 1,000 square miles, and for 10 climatological and physical basin characteristics.

The analysis indicates that the drainage area of the basin is the most significant variable. Five regions having distinct flood-depth frequency characteristics are delineated.

The developed relations, expressed as equations and graphs, are considered usable for any site in Georgia where the drainage area is between 1 and 1,000 square miles, and the flow is natural; exceptions include streams that are urbanized, regulated, tide affected, channelized, or where manmade structures significantly affect peak stages.

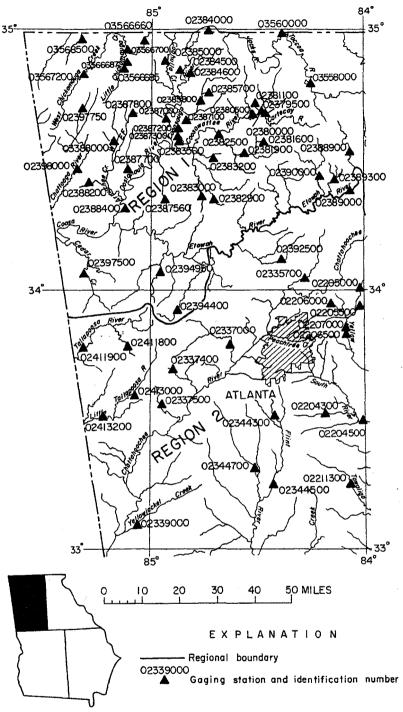
#### INTRODUCTION

When the U.S. Geological Survey began preparing maps of flood-prone areas, a need arose for a quick and easy method of determining flood depths for use in delineating approximate flood-prone areas. Regional flood-depth frequency relationships were developed for this purpose. The purpose of this report is to describe a technique for determining and using these relations for estimating flood depths on most natural streams in Georgia.

The flood-depth frequency relations developed herein will be of great value in preparing flood-prone area maps in Georgia for floods having recurrence intervals of 10, 50, and 100 years, and in answering local requests concerning the depth of flooding.

## DETERMINATION OF FLOOD-DEPTH FREQUENCY RELATION

Streamflow and stage records for 217 gaging stations on areal streams draining basins from 1 to 1,000 square miles were analyzed to provide planners and designers with relations for estimating the depth of floods having recurrence intervals of 10, 50, and 100 years on streams with natural flow in Georgia. (See figs. la-ld.) The results are valid for natural flow only, and do not apply to streams that are urbanized, regulated, tide affected, channelized, or where other manmade structures significantly affect peak stage or discharge.

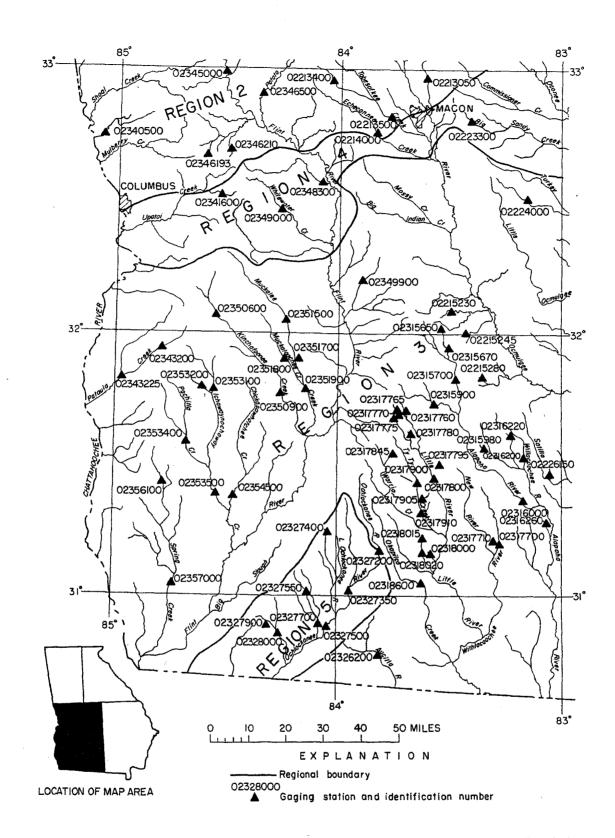


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FIGURE IA --- LOCATION OF GAGING STATIONS IN NORTHWEST GEORGIA.

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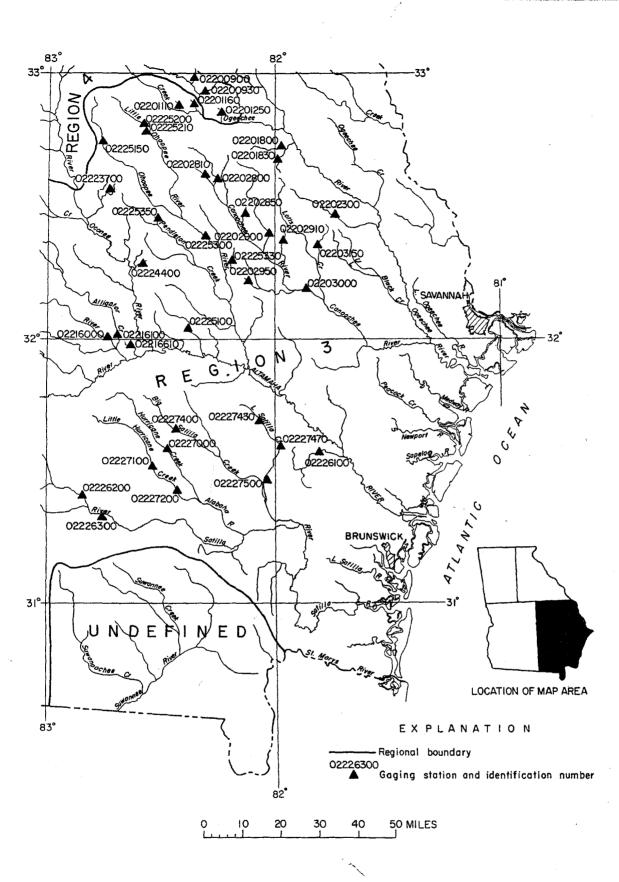
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## FIGURE IC .- LOCATION OF GAGING STATIONS IN SOUTHWEST GEORGIA.

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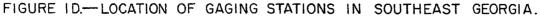
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Depths above the elevation of zero flow at gaging stations were computed for the 10-, 50-, and 100-year floods from elevation-discharge relations. The elevation of zero flow corresponds to the lowest point in the low-water control, usually a riffle, just downstream from the gage or point of interest. The depths for selected flood frequencies were determined as follows:

- Discharges were obtained for the 10-, 50-, and 100-year floods at gaging stations using discharge-frequency data from the statewide flood-frequency study now in progress. Guidelines in Water Resources Council Bulletin 17 (1976) for determining flood-flow frequency are being used in this study.
- 2. The elevation of the 10-, 50-, and 100-year floods and "zero" flow were obtained from the defined elevation-discharge relations at gaging stations.
- 3. The flood depth was computed as the difference between the elevation of the desired flood (10-, 50-, or 100-year flood) and the elevation of zero flow.

Several gaging stations were deleted from the analysis because the elevation-discharge relations for the higher frequency floods could not be defined adequately.

## Regression Analysis

Since flood-depth information is collected at only a few of the many sites where this information is needed, gaging-station information must be transferred to ungaged sites. Regional analysis is a method for doing this. The regression method described by Riggs (1973) is a useful means of regionalization as the flood depth for a given flood-frequency level can be related to physical and climatological basin characteristics.

The regression model used is of the form

 $Dn = a A^b B^c C^d$ 

1 mg

where Dn = flood depth above bottom of channel having a n-year recurrence interval.

A, B, C = physical and climatological characteristics of drainage basin.

a, b, c, d = constants and coefficients for a given recurrence interval, n.

Multiple regression provides a mathematical relation between a single dependent (10- to 100-year flood depth) variable and the independent (10 basin characteristics) variables. It also provides a measure of the accuracy of the defined relation (the standard error of estimate) and measures the usefulness of each independent variable in the relation. Previous studies (Hains, 1976) have indicated that flood depth is linearly related to most basin characterisics if the logarithmic transform of each is used. Therefore, all flood depths and basin characteristics were transformed to logarithmic values before the regressions were made. The logarithmic transforms and multiple regressions were performed on a digital computer using both step-forward and step-backward analysis (Draper and Smith, 1967).

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The standard error of estimate of a regression is a measure of the standard deviations of residuals about the regression line.

The value of each independent variable (climatological and physical basin characteristics) to the regression is assessed by its statistical significance in reducing the standard error of the regression. For this study a 5 percent level of significance was used to select the significant variables.

The climatological and physical basin characteristics tested for significance are the same as those tested by Carter (1970) in an evaluation of the surface-water data program in Georgia and subsequently tested by Golden and Price (1976) in a flood-frequency study of small natural streams in Georgia. These characteristics are defined as follows:

Drainage area (A), in square miles, is the total drainage area upstream from the gaging station, as planimetered from U.S. Geological Survey topographic maps or aerial photographs.

<u>Main-channel length (L)</u>, in miles, is the length of the main channel between the gaging station and the basin divide, as measured along the channel which drains the largest area of the basin above each junction.

<u>Main-channel slope (S)</u>, in feet per mile, is the average slope between points 10 percent and 85 percent of the distance from the gaging site to the basin divide.

Surface-storage area (St), is the surface area of lakes, ponds, and swamps expressed as a percent of the total drainage area.

<u>Mean-basin elevations (E)</u>, in feet, is the mean elevation of the entire basin above mean sea level.

Forested area (F), in percent, is the area of forest expressed as a percent of the total drainage area.

<u>Soils-infiltration-capacity index (Si)</u>, in inches, is soil infiltration capacity estimated by the U.S. Soil Conservation Service from information on soil type, cover, and agricultural practice.

Lag-time index (T), an index of basin lag time, is defined by the term  $\frac{L}{S^{5}}$ , where L is main-channel length and S is main-channel slope, as previously defined.

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<u>Mean annual precipitation (P)</u>, in inches, was determined from a map published by the U.S. Weather Bureau (now National Weather Service) (1959).

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<u>Precipitation intensity  $(P_{24,2})$ </u>, the 24-hour, 2-year rainfall, in inches, was determined for each basin based on isopluvial maps prepared by the U.S. Weather Bureau (1959).

The initial multiple-regression analysis utilized data from 217 gaging stations throughout the State. Drainage area, A, was the most significant variable. Other basin characteristics, S, T, and St, appeared to be significant at the 5 percent level of significance for various flood-depth frequency recurrence intervals. However, only drainage area appears to be of practical significance, as the other variables reduce the standard error by 1 to 2 percent.

Residuals from the regression analysis were plotted on a State map to check for geographic bias. A geographic bias, as previously noted by Carter (1970) and Golden and Price (1976), was again detected. Five regional flooddepth boundaries corresponding to the boundaries previously used by Golden and Price (1976) were delineated based on those previous studies, geologic and soils maps, and a map of residuals for the initial analysis. Region 1 includes all of the Valley and Ridge, the Cumberland Plateau, and the Blue Ridge physiographic provinces, and a small area of the adjacent Piedmont province. Region 2 includes all of the Piedmont province, except for the part in Region 1. Region 3 includes all of the Coastal Plain province, except for the parts in Regions 4 and 5. Region 4 is located in the northern part of the Coastal Plain and is commonly referred to as the Sand Hills area. Region 5 includes all of the Ochlockonee River basin downstream from State Highway 37 at Moultrie, Ga. The boundary delineations for these regions are shown in figure 2. The drainage area in the Okefenokee Swamp is not included in the defined regions, as the stage-discharge relationships are undefined.

The regression analysis for Region 1 used 54 stations. Basin variables A, S, and T were found significant at the 5 percent level of significance for various flood-depth frequency intervals. Only drainage area appeared to be of practical significance, as the other variables reduced the standard error by less than 2 percent.

The regression analysis for Region 2 used 62 stations. Basin variables A and St were found significant at the 5 percent level of significance for various flood-depth frequency intervals. However, only drainage area was considered to be of practical significance.

The regression analysis for Region 3 used 85 stations. Drainage area was the significant variable at the 5 percent level of significance.

The regression analysis for Region 4 used only 9 stations. Such a small sample size is far from ideal for a 10-variable multiple-regression analysis. On the other hand, the scant hydrologic data and physical characteristics of the area strongly indicate that the flood characteristics of this region should be distinctive from Regions 2 and 3. This area was included as a separate region because it was used in the report by Golden and Price (1976),

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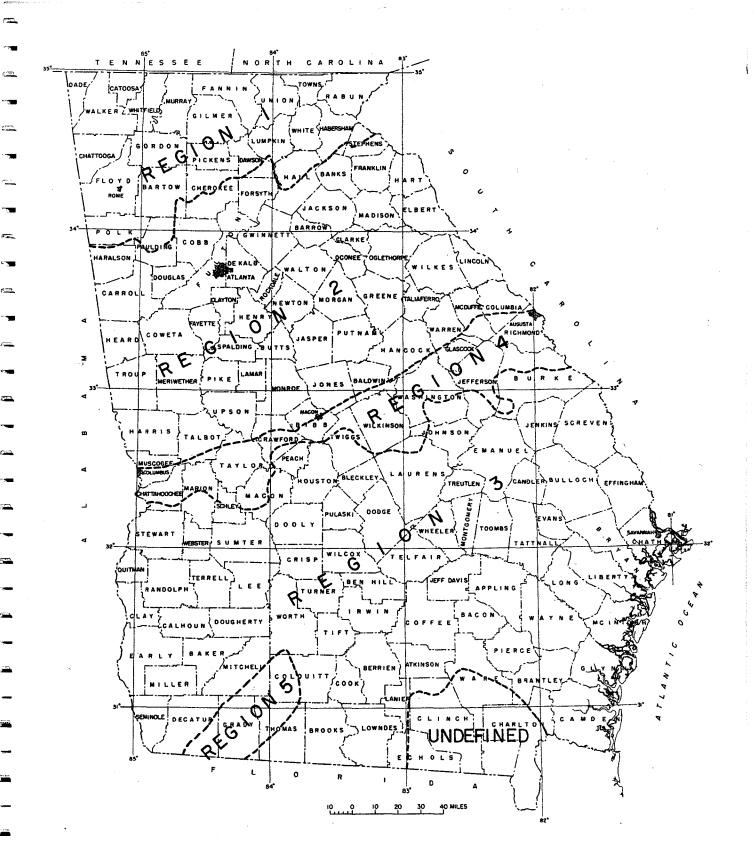


FIGURE 2---LOCATION OF REGIONAL FLOOD-DEPTH FREQUENCY BOUNDARIES IN GEORGIA.

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and the residuals for this area indicated smaller flood depths than Regions 2 or 3. Drainage area was the only significant variable at the 5 percent level of significance.

Regression analysis of Region 5 used only 7 stations. As in Region 4, this is too small a sample for multiple-regression analysis. This area was also included as a separate region because it was used in the report by Golden and Price (1976), and the residuals for this area indicated higher flood depths than Region 3. Drainage area was the only significant variable at the 5 percent level of significance.

Recurrence	Regression equations for the indicated hydrologic region, where A = drainage area in square miles				
interval in years	1	2	3	4	5
10	3.06 $A^{0.31}$	4.86 A <sup>0.23</sup>	2.09 $A^{0.29}$	1.87 $A^{0.29}$	2.24 A <sup>0.38</sup>
50	3.55 $A^{0.32}$	5.96 A <sup>0.22</sup>	2.56 $A^{0.28}$	2.28 $A^{0.28}$	2.62 $A^{0.38}$
100	3.79 A <sup>0.32</sup>	6.38 A <sup>0.22</sup>	2.72 A0.28	2.48 A <sup>0.28</sup>	2.93 A <sup>0.37</sup>

Table 1.--Summary of regression equations.

The 100-year flood-depth estimating equations for all regions are compared graphically in figure 3. Note that the curves for Regions 1 and 2 cross at a drainage area of about 150 square miles. This indicates that the flood depth is greater for the smaller drainage areas in Region 2 than in Region 1, and probably is attributable to differences in slope, forest cover, and soil type in the two regions. Those variables were insignificant when used in the multiple-regression analyses for defining the flood-depth estimating equations. However, the lack of significance may be due to the difficulty in finding the proper index measure of those variables. The Region 5 curve has a steeper slope than those of the other regions, and crosses the Region 1 and 2 curves at a drainage area of about 150 square miles. This slope difference in the Region 5 curve may be due to the small number of sites used for analysis and to the fact that Region 5 has high runoff compared to Regions 3 and 4.

#### ACCURACY AND LIMITATIONS

The equations in this report can be used to estimate the 10-, 50-, and 100-year flood-depth frequencies on streams in Georgia having drainage areas from 1 to 1,000 square miles. The equations should not be used for streams subject to regulations, tide effect, urbanization, significant channelization, or where other manmade structures significantly affect peak stage or discharge. These equations are not applicable to drainage areas in the Okefenokee Swamp, because the stage-discharge relationships are undefined.

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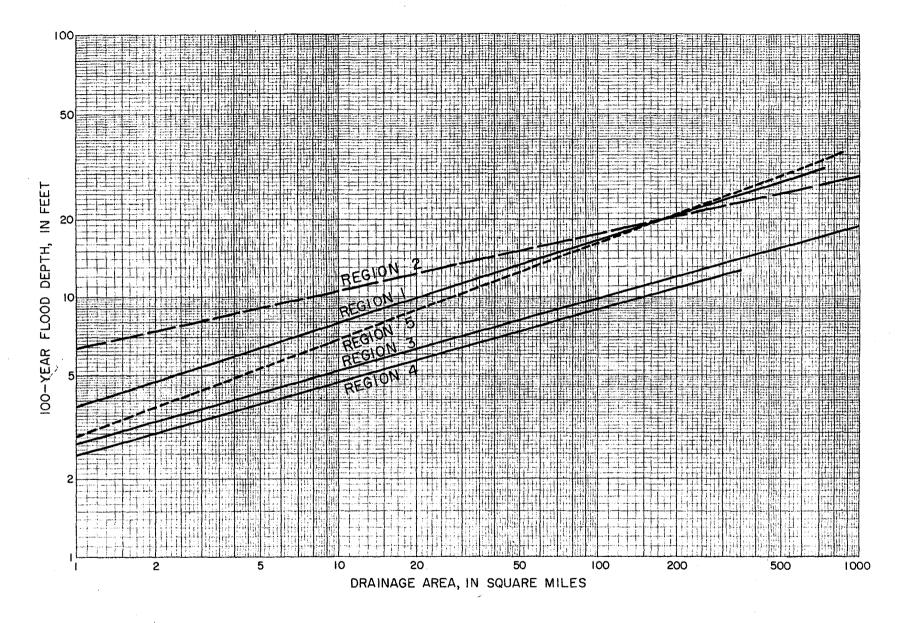


FIGURE 3-RELATION OF 100-YEAR FLOOD DEPTH TO DRAINAGE AREA IN REGIONS 1-5.

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The reliability of the flood-depth frequency relations is approximated by the standard error of estimate of the regression equations. The standard error of estimate is a measure of the standard deviation of the residuals about the regression lines. Approximately two-thirds of the values based on gaged records are within one standard error of the computed value, and approximately 95 percent are within two standard errors. The approximate standard error of estimate for the flood-depth frequency relations for each hydrologic region is given in table 2.

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Recurrence		ard error of ated hydrolog	estimate, in gic region	n percent, f	or the
interval in years	1	2	3	4	5
10	27	26	25	24	24
50	25	27	24	23	24
100	24	27	24	22	22

Table 2.--Standard error of estimate of the regression equations.

Users are cautioned that these regression equations should not be used for drainage areas less than 1 square mile or greater than 1,000 square miles.

The user is cautioned not to use the flood-depth frequency relations to obtain discharges. Due to variations in the physical shape of the main channel and flood plain, the resulting error in obtaining discharge for a flood depth from these relations could be several times the error for computing flood depth.

In computing flood depths near the confluence of tributaries, the drainage area below the confluence should be used, as the major tributary would probably cause backwater for some distance upstream in the minor tributary.

Most streams whose drainage areas are larger than 1,000 square miles have flood-profile data and gaging-station records available for use in estimating flood depths. Many of these major streams have extensive regulation and the frequency of flood discharge and depth magnitude depends on the operation of the reservoirs controlling their flood flow. Flood-profile data for most regulated streams may be available from the U.S. Army Corps of Engineers and the Tennessee Valley Authority.

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#### USE OF FLOOD-DEPTH FREQUENCY RELATIONS

#### Ungaged Sites

Flood depths for the 10-, 50-, and 100-year recurrence intervals for most ungaged natural rural basins draining 1 to 1,000 square miles can be estimated by solving the equations in table 1. Locations of the hydrologic regions needed for selecting the applicable equations are shown in figure 2. Graphs were prepared, using equations for each region (figs. 4-8), for estimating the 10-, 50-, and 100-year flood depths. For ungaged basins lying in more than one region, flood depths can be estimated by using the regional equations for the region in which the site is located. The depth of the 10-, 50-, and 100-year floods may be estimated by the following procedure:

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- 1. Locate the drainage basin. For example, Towaliga River at State Highway 36, near Jackson, Butts County, lies within Region 2 (fig. 2).
- 2. From the best available topographic map or aerial photograph, determine the drainage area upstream from the highway crossing. The drainage area as determined from U.S. Geological Survey quadrangle maps is 148 square miles.
- 3. Using the equations for Region 2, from table 1 or the graph in figure 5, the 100-year flood depth is determined as 19 feet. This is the estimated 100-year flood depth for Towaliga River near Jackson.

#### Gaged Sites

Flood-depth magnitude and frequency can be obtained for the gaged sites from table 3. To estimate flood depths for ungaged sites on the same stream and near one of the gaged sites listed in table 3, the following procedure is recommended. Using an up-to-date topographic map, estimate the variability in flood-plain width and channel slope throughout the reach between the gaged and ungaged sites. If the flood-plain width and channel slope in the subject reach are fairly uniform, then the user should transfer the flood-depth station value upstream or downstream by the equation:

$$Du = \left(\frac{Au}{Ag}\right)^n Dg$$

Where Du is the flood depth at the ungaged site for selected recurrence interval transferred from the gaged site;

Dg is the flood depth for the selected recurrence interval at the nearby gaged site from table 3;

n is the drainage area regression exponent from table 1 for the applicable hydrologic region and selected recurrence interval;

Au is the drainage area at the ungaged site;

Ag is the drainage area at the nearby gaged site.

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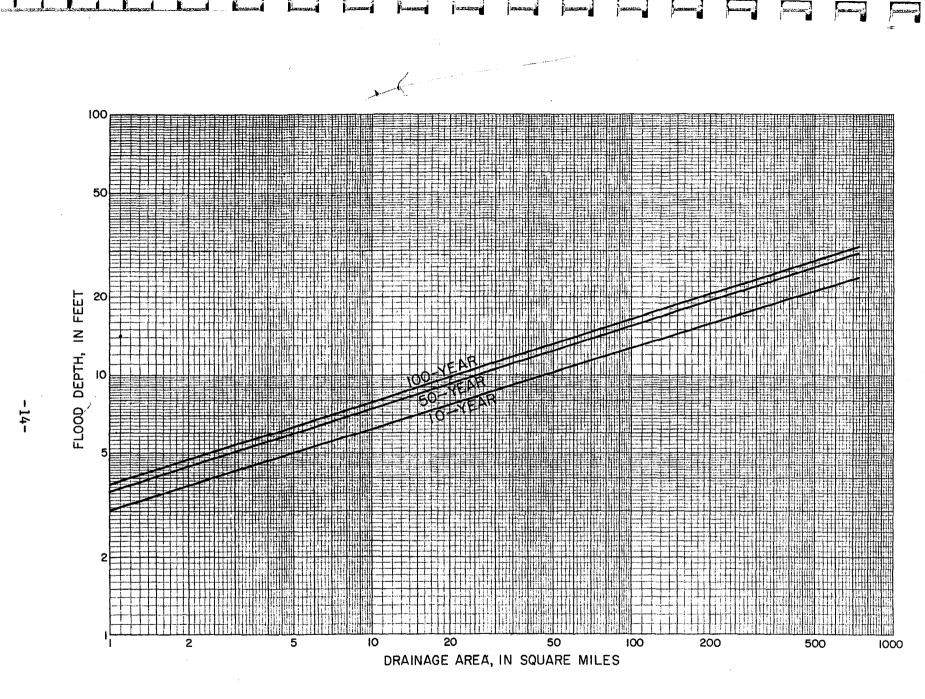


FIGURE 4 .-- RELATION OF FLOOD-DEPTH FREQUENCY TO DRAINAGE AREA IN REGION I.

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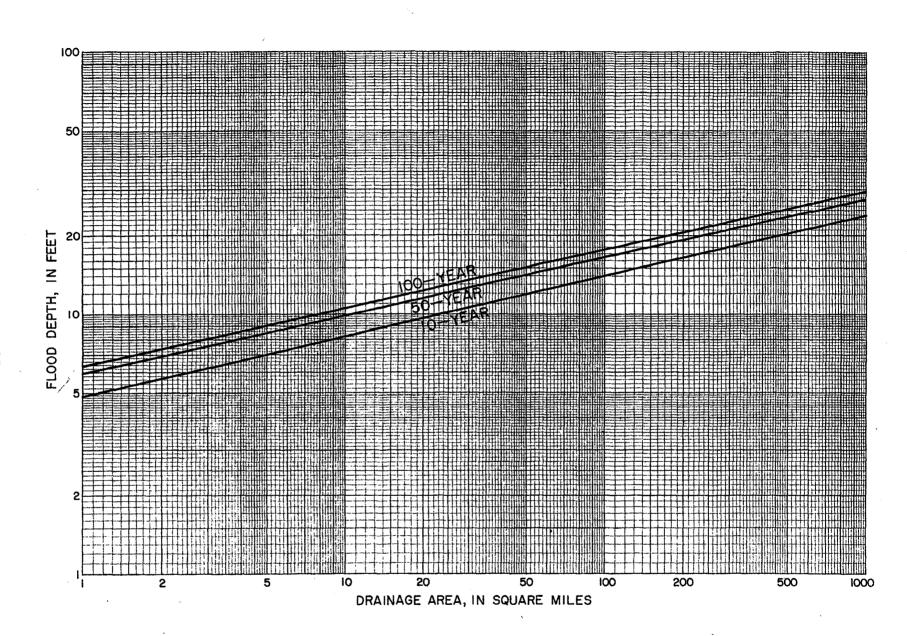


FIGURE 5-RELATION OF FLOOD-DEPTH FREQUENCY TO DRAINAGE AREA IN REGION 2.

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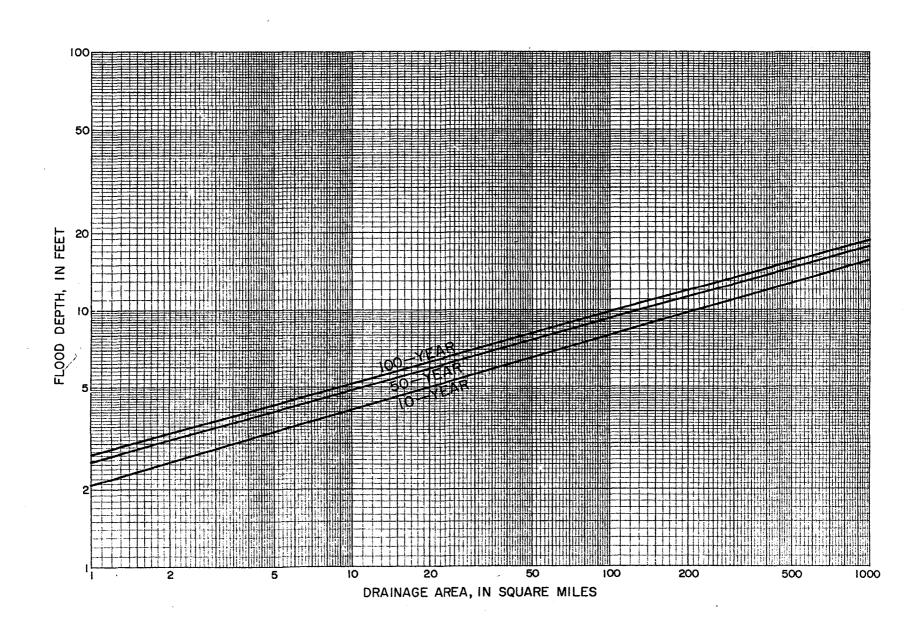


FIGURE 6 --- RELATION OF FLOOD-DEPTH FREQUENCY TO DRAINAGE AREA IN REGION 3.

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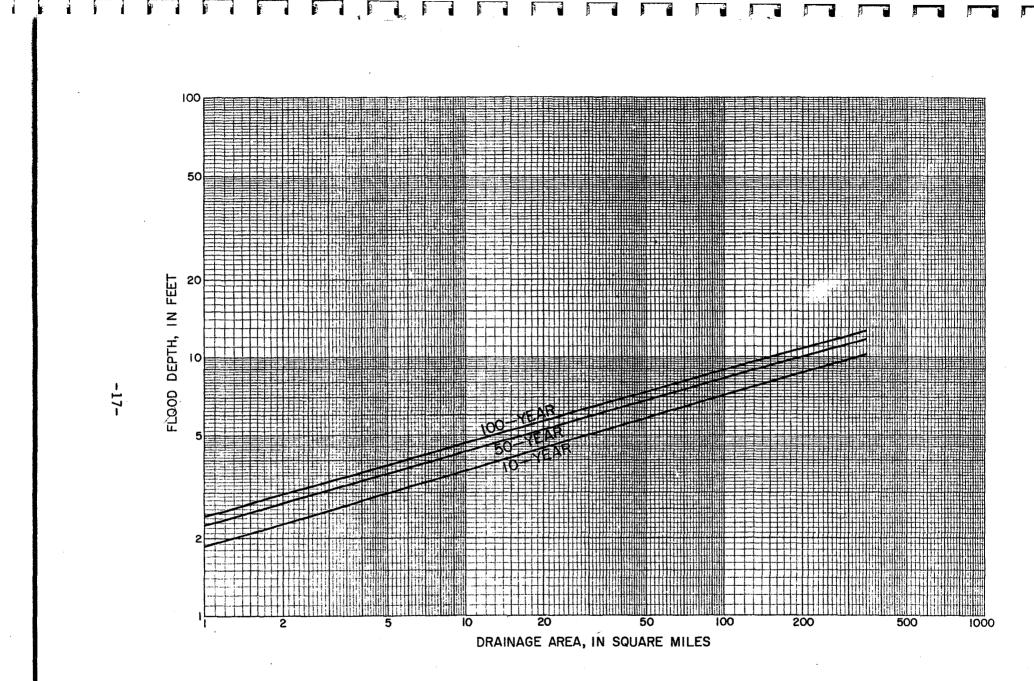


FIGURE 7 --- RELATION OF FLOOD-DEPTH FREQUENCY TO DRAINAGE AREA IN REGION 4.

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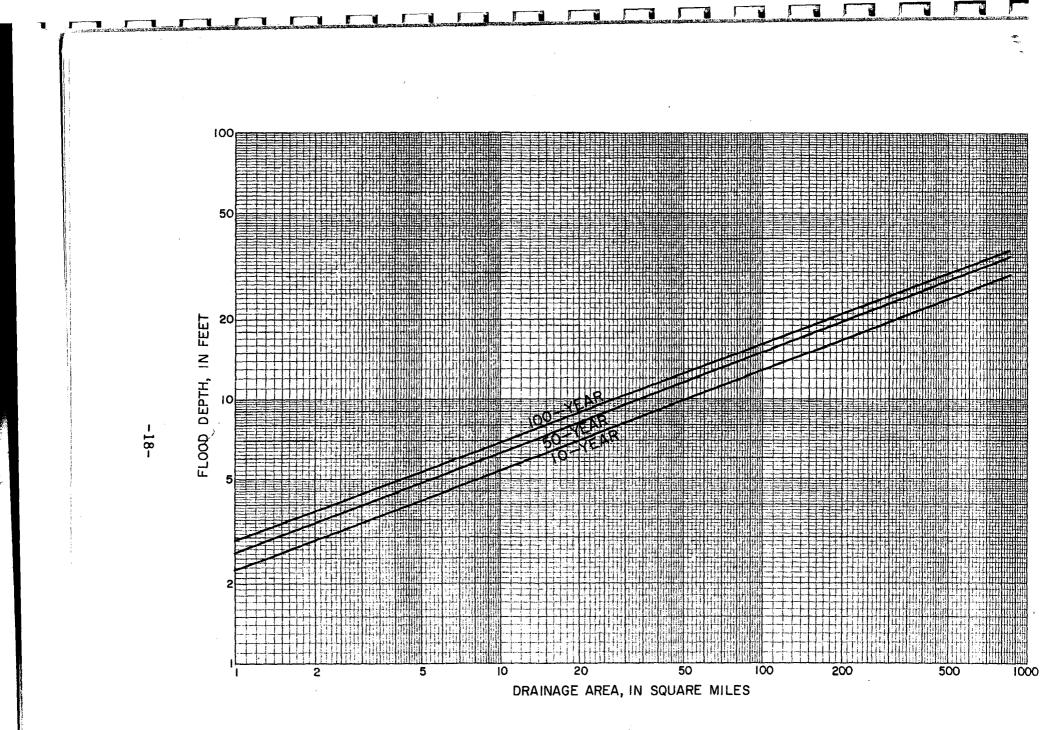


FIGURE S .-- RELATION OF FLOOD-DEPTH FREQUENCY TO DRAINAGE AREA IN REGION 5.

If the flood-plain width or channel slope in the subject reach is not uniform, then use the applicable regression equation. The flood-depth magnitude and frequency for the 10-, 50-, and 100-year floods may be determined by the following procedure:

- 1. Locate the drainage basin. For example, Middle Oconee River at State Highway 82 near Arcade, Jackson County, lies within Region 2.
- 2. For the gaging station on Middle Oconee River, station 02217500, determine from table 3 the drainage area, Ag, is 398 square miles and the 100-year flood depth, Dg, is 25 feet.
- 3. For the ungaged site, determine the drainage area, Au, to be 340 square miles.
- 4. From table 1, determine "n" for hydrologic Region 2 for the 100-year flood to be 0.22.
- 5. Transfer the 100-year flood depth from the gage site using

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$$Du = \left(\frac{Au}{Ag}\right)^n Dg = \left(\frac{340}{398}\right)^{0.22} 25 = 24 \text{ feet}$$

#### SUMMARY

Since 1968, the U.S. Geological Survey has used regional flood-depth relations for estimating flood-depth magnitude for selected frequencies in the preparation of flood-prone area maps.

This report describes the method used to estimate the flood depth for floods having recurrence intervals of 10, 50, and 100 years for natural streams having drainage areas from 1 to 1,000 square miles in Georgia.

Five regions having distinct flood-depth frequency characteristics were delineated, as shown in figure 2. Equations for estimating the 10-, 50-, and 100-year flood depth for each region are shown in table 1. The accuracy of those equations are indicated in table 2.

Flood-depth frequency data for 217 streams with natural runoff were used in this study. The data were regionalized by multiple-regression analyses, using 10 physical and climatological characteristics of the gaged basins. For the final estimating equations, flood depths are related to only one variable, drainage area. The other variables significant at the 5 percent level of significance were deleted because they only reduced the standard error of estimate about 3 percent.

Users are cautioned that the equations developed are applicable to natural drainage areas of from 1 to 1,000 square miles in Georgia. Extrapolation of the equations beyond these limits should be checked by other methods.

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These equations are not applicable to streams subject to regulation, tide, urbanization, or significant channelization. Also, they are not applicable to drainage areas in the Okefenokee Swamp, because the stage-discharge relationships have not been defined in this area.

Generally, for streams having drainage areas larger than 1,000 square miles, gaging-station records and flood-profile data are available. Many of these major streams are subject to extensive regulation, and the frequency of flood discharge and depth magnitude depends on the operation of the reservoirs controlling their flood flows. Flood-profile data from some regulated streams may be available from the U.S. Army Corps of Engineers and the Tennessee Valley Authority.

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## Table 3.--Flood depths for selected recurrence intervals for gaging stations in Georgia.

Station No.	Station name	Location	Drainage area in		oth, in feet currence in	
			square miles	10-year	50-year	100-year
02177000	Chattooga River near Clayton, Ga.	Lat 34°48'50", long 83°18'22", Oconee County, S.C., 150 feet downstream from bridge on U.S. Highway 76, 7 miles southeast of Clayton.	207	9.5	12.5	14.0
02178400	Tallulah River near Clayton, Ga.	Lat 34°53'25", long 83°31'50", Rabun County, 100 feet downstream from county highway bridge, 10.3 miles west of Clayton.	56.6	9.5	12.0	13.5
02181800	Little Panther Greek near Toccoa, Ga.	Lat 34°42'48", long 82°24'07", Habersham County, at culvert on U.S. Highway 441, 1.3 miles southwest of Tallulah Falls.	2.5	3.0	4.5	
02182000	Panther Creek near Toccoa, Ga.	Lat 34°40'40", long 83°20'43", Stephens County, at Yonah Dam Settlement, 0.2 mile upstream from mouth, and 7 miles north of Toccoa.	32.5	11.0	15.0	17.0
02188500	South Beaverdam Creek at Dewy Rose, Ga.	Lat 34°10'52", long 82°56'38", Elbert County, 50 feet upstream from highway bridge, 1 mile northeast of Dewy Rose.	35.8	12.0	15.5	17.0
02189020	Indian Creek near Carnesville, Ga.	Lat 34°21'20", long 83°17'16", Franklin County, at culvert on State Highway 59, 3.2 miles west of Carnesville.	7.63	9.0	10.0	10.5
02190800	Double Branch at Bowersville, Ga.	Lat 32°22'51", long 83°05'28", Hart County, at culvert on State Highway 17, at Bowersville.	0.50	2.5	3.5	4.0
2191000	North Fork Broad River near Carnes- ville, Ga.	Lat 34°19'25", long 83°11'10", Franklin County, at bridge on State Highway 51, 4 miles south- east of Carnesville.	119	11.0	14.5	16.0
2191200	Hudson River at Homer, Ga.	Lat 34°20'15", long 83°29'17", Banks County, at bridge on State Highway 15, at Homer.	61.1	12.5	14.0	15.5
2191270	Scull Shoal Creek near Danielsville, Ga.	Lat 34°09'30", long 83°09'51", Madison County, at State Highway 191, 4 miles northeast of Danielsville.	8.75	6.5	7.5	9.0
2191300	Broad River above Carlton, Ga.	Lat 34°04'24", long 83°00'12", Madison County, at State Highway 72, 2.8 miles northeast of Carlton.	<sub>.</sub> 760	25.0	33.0	36.0
2191600	Double Branch near Danielsville, Ga.	Lat 34°06'06", long 83°14'11", Madison County, at culvert on U.S. Highway 29, l.8 miles south of Danielsville.	4.77	7.5	9.0	9.5
2191750	Fork Creek at Carl- ton, Ga.	Lat 34°02'55", long 83°01'16", Madison County, at State Highway 72, at Carlton.	a16	11.0	12.0	13.0
2191890	Brooks Creek near Lexington, Ca.	Lat 33°50'30", long 83°05'22", Oglethorpe County, at State Highway 22, 2.2 miles south of Lexington.	12.3	9.5	12.0	12.5
02191930	Buffalo Creek near Lexington, Ga.	Lat 33°46'40", long 83°03'01", Oglethorpe County, at culvert on State Highway 22, 7 miles southeast of Lexington.	5.80	6.0	6.5	7.0
02192400	Anderson Mill Creek near Danburg, Ga.	Lat 33°48'35", long 82°41'35", Wilkes County, at culvert on State Highway 44, 4.2 miles southwest of Danburg.	5.49	8.5	10.0	10.5
02192420	Anderson Mill Creek tributary near Danburg, Ga.	Lat 33°49'42", long 82°41'13", Wilkes County, at culvert on State Highway 44, 3.5 miles southwest of Danburg.	0.92	5.5	8.5	9.5
02193300	Stephens Creek near Crawfordville, Ga.	Lat 33°36'05", long 82°55'28", Taliaferro County, at culvert on State Highway 22, 3.5 miles northwest of Crawfordville.	6.30	8.0	8.5	9.0
02193400	Harden Creek near Sharon, Ga.	Lat 33°33'10", long 82°50'15", Taliaferro County, at culvert on State Highway 47, 2.5 miles west of Sharon.	4.33	5.5	6.5	7.0

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## Table 3.--Flood depths for selected recurrence intervals for gaging stations in Georgia.--Continued

Station No.	Station name	Location	Drainage area in square	Flood depth, in feet, for indic ted recurrence interval		
			miles	10-year	50-year	100-year
02193500	Little River near Washington, Ga.	Lat 33°36'40", long 82°44'40", Taliaferro County, at county highway bridge pier, 9 miles south of Washington.	291	26.0	32.0	34.0
02193600	Rocky Creek near Washington, Ga.	Lat 33°42'55", long 82°44'42", Wilkes County, at culvert on State Highway 47, l.5 miles south of Washington.	1.14	6.0	7.0	7.5
02197190	McBean Creek near McBean, Ga.	Lat 33°14'12", long 82°02'38", Richmond County, at State Highway 21, 5.5 miles west of McBean.	41.4	4.0	5.0	6.0
02197600	Brushy Creek near Wrens, Ga.	Lat 33°10'37", long 82°18'20", Jefferson County, at bridge on State Highway 80, 5 miles southeast of Wrens.	28	7.0	8.0	8.5
02200900	Big Creek near Louisville, Ga.	Lat 32°59'00", long 82°21'23", Jefferson County, at State Highway 17, about 3.2 miles southeast of Louisville.	95.8	6.0	6.5	7.0
02200930	Ogeechee River tributary near Louisville, Ga.	Lat 32°55'20", long 82°18'49", Jefferson County, at culvert on State Righway 17, 8.5 miles southeast of Louisville.	14.2	5.0	6.0	6.5
02201110	Gray Coat Creek near Bartow, Ga.	Lat 32°52'25", long 82°26'34", Jefferson County, at culvert on U.S. Highway 319, 1.8 miles east of Bartow.	8.36	4.0	4.5 •	5.0
02201160	Boggy Gut Creek near Wadley, Ga.	Lat 32°53'42", long 82°24'02", Jefferson County, at culvert on U.S. Highway 1, 2 miles morth of Wadley.	7.05	6.0	6.5	7.0
02201250	Ogeechee River tributary No. 2 near Midville, Ga.	Lat 32°51'04", long 82°13'58", Burke County, at culvert on State Highway 305, 2.2 miles north of Midville.	0.99	1.5	2.0	2.5
02201800	Richardson Creek near Millen, Ga.	Lat 32°43'23", long 81°58'35", Jenkins County, at State Highway 67, 6 miles south of Millen.	<b>a</b> 43	4.5	5.5	6.0
02201830	Hooker Branch tributary near Millen, Ga.	Lat 32°39'34", long 81°59'29", Jenkins County, at culvert on State Highway 121, 11 miles southwest of Millen.	4.38	4.0	5.5	6.0
02202300	Mill Creek mear Statesboro, Ga.	Let 32°28'28", long 81°45'17", Bulloch County, at State Highway 73, 2.2 miles northeast of Statesboro.	<b>a</b> 39	4.5	5.0	5.5
02202800	Canoochee Creek near Swainsboro, Ga.	Lat 32°36'19", long 82°15'21", Emanuel County, at U.S. Highway 80, 4.8 miles east of Swainsboro.	a55	6.5	7.5	8.0
02202810	Rock Creek near Swainsboro, Ga.	Lat 32°37'29", long 82°19'04", Emanuel County, at culvert on State Highway 56, 2 miles north of Swainsboro.	5.05	3.5	4.0	5.0
02202850	Reedy Branch near Metter, Ga.	Lat 32°28'43", long 82°07'45", Candler County, at culvert on State Highway 23, 7.5 miles northwest of Metter.	3.41	3.5	4.0	4.5
02202900	Fifteen Mile Creek near Metter, Ga.	Lat 32°23'33", long 82°00'55", Candler County, at State Highway 46, 2.5 miles east of Metter.	147	6.0	7.0	8.0
02202910	Ten Mile Creek tributary st Pulaski, Ga.	Lat 32°23'18", long 81°58'17", Candler County, at culvert on State Highway 46, 0.8 mile west of Pulaski.	1.14	3.0	3.5	4.0
02202950	Cypress Flat Creek near Collins, Ga.	Lat 32°13'09", long 82°07'14", Tattnall County, at culvert on State Highway 212, 3 miles north of Collins.	1.39	2.5	3.0	3.5

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Station No.	Station name	Location	Drainage area in		th, in feet currence in	
			square miles	10-year	50-year	100-year
02203000	Canoochee River near Claxton, Ga.	Lat 32°11'05", long 81°53'20", Evans County, at bridge on State Highway 73, 2 miles northeast of Claxton.	a555	14.0	16.0	17.0
02203150	Lotts Creek tributary near Statesboro, Ga.	Lat 32°20'53", long 81°52'06", Bulloch County, at culvert on U.S. Highways 25 and 301, 8 miles southwest of Statesboro.	2.37	4.0	5.0	5.5
02204300	Little Cotton Indian Creek near Stockbridge,, Ca.	Lat 33°31'26", long 84°11'41", Henry County, at State Highway 42, 2.5 miles southeast of Stockbridge.	a50	8.0	9.5	10,5
02204500	South River near McDonough, Ga.	Lat 33°29'48", long 84°00'53", Henry County, at Butler Bridge, 9 miles northeast of McDonough.	456	22.0	26.0	27.0
02205000	Wildcat Creek near Lawrenceville, Ga.	Lat 34°00'08", long 84°00'18", Gwinnett County, 75 feet upstream from highway bridge, 1.1 miles east of State Highway 20, and 3.2 miles north of Lawrenceville.	1.59	5.5	7.0	8.0
02205500	Pew Creek near Lawrenceville, Ga.	Lat 33°56'05", long 84°01'00", Gwinnett County, on right bank 20 feet upstream from highway bridge, 1 mile upstream from Redland Creek, and 2.25 miles southwest of Lawrenceville.	2.23	7.5	10.0	11.5
02206000	Shetley Greek near Norcross, Ga.	Lat 33°57'20", long 84°09'40", Gwinnett County, on right bank 150 feet upstream from highway bridge, 1 mile upstream from mouth, and 2.8 miles northeast of Norcross.	0-98	5.5	6.5	7.0
02206500	Yellow River near Snellville, Ga.	Lat 33°51'00", long 84°05'00", Gwinnett County, on left bank at downstream side of county highway bridge, 3.25 miles west of Snellville.	134	17.0	20.0	21.5
02207000	Garner Creek near Snellville, Ga.	Lat 33°51'45", long 84°05'50", Gwinnett County, on left bank 100 feet downstream from highway culvert, 0.9 mile upstream from mouth, and 4.25 miles west of Snellville.	5.54	3.5	4.5	5.0
02207500	Yellow River near Covington, Ga.	Lat 33°36'52", long 83°54'54", Newton County, at bridge on State Highway 12, 3.5 miles northeast of Covington.	378	18.5	21.0	22.5
02208200	Beaverdam Creek tributary at Bold Springs, Ga.	Lat 33°53'59", long 83°47'36", Walton County, at culvert on secondary road 917, 0.6 mile east of Bold Springs.	1.03	6.0	7.5	8.0
02209000	Alcovy River below Covington, Ga.	Lat 33°30'21", long 83°49'30", Newton County, at county road bridge 600 feet downstream from Henderson Mill, and 7 miles southeast of Covington.	244	20.0	25.5	27.0
02211300	Towaliga River near Jackson, Ga.	Lat 33°15'50", long 84°04'17", Butts County, at bridge on State Highway 16, 6.5 miles west of Jackson.	a105	15.0	17.5	19.0
02211500	Towaliga River near Forsyth, Ga.	Lat 33°07'17", long 83°36'36", Monroe County, at bridge on State Highway 42, 6 miles north of Forsyth.	315	20.5	25.0	27.0
02212600	Falling Creek near Juliette, Ga.	Lat 33°05'59", long 83°43'25", Jones County, on left bank 100 feet upstream from highway bridge, 4 miles upstream from Ganey Creek, and 5.1 miles east of Juliette.	72.2	21.0	24.5	26.0
02213050	Walnut Creek near Gray, Ga.	Lat 32°58'20", long 83°37'08", Jones County, on downstream side of right bank pier of abandoned bridge, 500 feet downstream from bridge on State Highway 18, 1.4 miles up- stream from Bonner Creek, and 5.5 miles southeast of Gray.	a29	12.0	15.5	17.0

Table 3.--Flood depths for selected recurrence intervals for gaging stations in Georgia .-- Continued

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Table 3 Flood depths for sele	cted recurrence intervals	for gaging stations	in GeorgiaContinued
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Station No.	o. Station name	Station name Location	Drainage area in square	Flood depth, in feet, for indic ted recurrence interval		
······································			miles	10-year	50-year	100-year
02213400	Little Tobesofkee Creek near Forsyth, Ga.	Lat 32°57'10", long 84°02'33", Monroe County, at bridge on State Highway 83, 8.2 miles southwest of Forsyth.	16.8	12.0	13.5	14.0
02213500	Tobesofkee Creek near Macon, Ga.	Lat 32°48'32", long 83°45'30', Bibb County, on right bank at downstream end of pier of bridge on U.S. Highway 80, 8 miles west of Macon, and 14 miles upstream from mouth.	182	19.0	24.5	26.5
02214000	Echeconnee Creek near Macon, Ga.	Lat 32°45'54", long 83°50'22", Crawford-Bibb Counties, at county road, 13 miles south- west of Macon.	147	14.0	16.0	17.0
02215230	Cedar Creek near Pineview, Ga.	Lat 32°05'34", long 83°30'12", Wilcox County, at culvert on State Highway 112, 1.5 miles south of Pineview.	7.46	4.0	5.0	5.5
02215245	Folsom Creek tributary near Rochelle, Ga.	Lat 32°00'15", long 83°25'58", Wilcox County, at culvert on State Highway 233, 4 miles north of Rochelle.	1.44	2.5	5.0	5.5
02215280	Little House Creek tributary near Rebeccca, Ga.	Lat 31°50'05", long 83°22'14", Ben Hill County, at culvert on State Highway 90, 7.5 miles east of Rebecca.	2.45	2.5	3.0	3.5
02216000	Little Ocmulgee River at Towns, Ga.	Lat 32°00'28", long 82°45'10", Telfair County, at State Highway 134, at Towns.	329	15.0	17.0	18.0
02216100	Alligator Creek near Alamo, Ga.	Lat 32°01'35", long 82°41'44", Wheeler County, at'bridge on State Highway 134, 9.5 miles northeast of Alamo.	255	12.0	14.0	15.0
02216610	Ocmulgee River tributary near Lumber City, Ga.	Lat 31°58'53", long 82°38'25", Wheeler County, at culvert on State Highway 19, 4.8 miles northeast of Lumber City.	3.23	3.0	3.5	4.0 ~
02217000	Allen Creek at Talmo, Ga.	Lat 34°11'34", long 83°43'11", Jackson County, 400 feet upstream from bridge on State High- way 11, 0.5 mile north of Talmo, and 5 miles upstream from confluence with Pond Fork.	17.9	10.0	13.0	15.0
02217200	Middle Oconee River near Jefferson, Ga.	Lat 34°05'46", long 83°36'23", Jackson County, at bridge on State Highway 11, 2.2 miles southwest of Jefferson.	128	11.5	13.5	14.5
02217250	Buffalo Greek tributery near Jefferson, Ga.	Lat 34°05'00", long 83°38'01", Jackson County, at culvert on State Highway 11, 4 miles southwest of Jefferson.	0.39	3.5	5.5	6.0
02217500	Middle Oconee River near Athens, Ga.	Lat 33°56'48", long 83°25'22", Clarke County, on left bank 0.5 mile upstream from U.S. Highway 29, 2 miles west of Athens, and 5 miles upstream from Barber Creek.	398	20.0	24.0	25.0
02217660	Little Curry Creek near Jefferson, Ga.	Lat 34°08'25", long 83°32'09", Jackson County, at culvert on State Highway 15, 2.8 miles northeast of Jefferson.	0.87	5.5	7.0	8.0
02217900	North Oconee River at Athens, Ga.	Lat 33°56'55", long 83°22'04", Clarke County, at Cemetery Bridge in Athens, 0.5 mile below bridge on U.S. Highway 78.	283	20.5	25.0	26.0
02218100	Porters Creek at Watkinsville, Ga.	Lat 33°50'56", long 83°23'42", Oconee County, at culvert on State Highway 15, 0.9 mile east of Watkinsville.	1.95	4.5	5.0	5.5
02218450	Town Creek near Greensboro, Ga.	Lat 33°38'29", long 83°13'36", Greene County, at State Highway 15, 5 miles northwest of Greensboro.	11.9	8.0	9.0	9.5

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Table 3 Flood depths for selected rec	currence intervals for gaging	stations in GeorgiaContinued
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Station No.	Station name		Drainage area in square miles	ted recurrence inte		
				10-year	50-year	100-year
02219500	Apalachee River near Buckhead, Ga.	Lat 33°36'31", long 83°20'58", Morgan County, at downstream side of right bank pier of bridge on State Highway 12, 2 miles down- stream from Hard Labor Creek, 3 miles north- east of Buckhead, and 9 miles upstream from mouth.	436	24.0	28.5	30.0
02220550	Whitten Creek near Sparta, Ga.	Lat 33°23'13", long 83°01'29", Hancock County in right bank 100 feet upstream from bridge on State Highway 15, 5 miles upstream from mouth and 8.5 miles northwest of Sparta.	a15	14.0	16.0	17.0
02221000	Murder Creek near Monticello, Ga.	Lat 33°24'56", long 83°39'43", Jasper County, 350 feet upstream from bridge on State High- way 229, and 8 miles north of Monticello.	a24	8.5	10.5	11.5
02223300	Big Sandy Creek near Jefferson- ville, Ga.	Lat 32°48'15", long 83°25'04", Twiggs County, at county road bridge, 9 miles northwest of Jeffersonville.	a31	5.0	5.5	6.0
02223700	Indian Branch tributary near Scott, Ga.	Lat 32°33'22", long 82°44'33", Laurens County, at culvert on U.S. Highway 80, 4.8 miles west of Scott.	2.13	3.5	4.0	4.5
02224000	Rocky Creek near Dudley, Ga.	Lat 32°29'38", long 83°08'49", Laurens County, on downstream side of highway bridge, 3.2 miles upstream from Buckhorn Branch, and 5 miles southwest of Dudley.	62.9	9.5	11.0	12.0
02224400	Cypress Creek near Tarry- town, Ga.	Lat 32°16'40", long 82°35'45", Montgomery County, at U.S. Highway 221, 3.2 miles southwest of Tarrytown.	6.77	5.0	5.5	6.0
02225100	Cobb Creek near Lyons, Ga.	Lat 32°02'06", long 82°22'47", Toombs County, at bridge on State Highway 56, 13 miles south- west of Lyons.	a69	6.5	8.0	8.5
02225150	Ohoopee River near Wrights- ville, Ga.	Lat 32°42'50", long 82°45'20", Johnson County, at U.S. Highway 319, 2.5 miles west of Wrightsville.	a55	8.5	9.5	10.0
02225200	Little Ohoopee River near Wrightsville, Ga.	Lat 32°47'20", long 82°33'02", Johnson County, at U.S. Highway 310, 10 miles northeast of Wrightsville.	a63	7.0	8.0	8.5
02225210	Hurricane Branch near Wrights- ville, Ga.	Lat 32*47'00", long 82*34'42", Johnson County, at culvert on U.S. Highway 319, 9 miles northeast of Wrightsville.	3.53	3.5	4.0	4.5
02225300	Ohoopee River near Oak Park, Ga.	Lat 32°23'29", long 82°18'49", Emanuel County, at U.S. Highway 1, 2.5 miles north of Oak Park.	<b>a</b> 620	12.5	14.0	15.0
02225330	Beaver Creek near Cobbtown, Ga.	Lat 32°16'52", long 82°11'27", Tattnall County, at culvert on State Highway 152, 3.2 miles west of Cobbtown.	9.58	6.0	6.5	7.0
02225350	Pendleton Creek tributary No. 2 near Soperton, Ga.	Lat 32°25'35", long 82°29'52", Treutlen County, at culvert on State Highway 86, 6.5 miles northeast of Soperton.	1.68	3.0	4.0	4.5
02226100	Penholoway Creek near Jesup, Ga.	Lat 31°34'00", long 81°50'18", Wayne County, on downstream side of bridge on U.S. High- way 341, 4 miles southeast of Jesup, and about 9.5 miles upstream from mouth.	a210	11.5	13.0	13.5
02226150	Satilla River tributary near Willacoochee, Ga.	Lat 31°27'24", long 83°03'02", Coffee County, at culvert on State Highway 149, 8.5 miles north of Willacoochee.	6.38	3.5	4.0	4.5
02226200	Satilla River near Douglas, Ga.	Lat 31°24'45", long 82°51'01", Coffee County, at U.S. Highway 441, 6.5 miles south of Douglas.	a235	8.5	10.5	11.5

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Station No.	Station name	Station name Location	Drainage area in square miles	Flood depth, in feet, for indic ted recurrence interval			
				10-year	50-year	100-year	
02226300	Satilla River near Pearson, Ga.	Lat 31°20'11", long 82°46'07", Atkinson County, at bridge on State Highway 64, 6 miles north- east of Pearson.	a355	18.0	20.0	21.0	
02227000	Hurrícane Creek near Alma, Ga.	Lat 31°34'00", long 82°27'50", Bacon County, at bridge on U.S. Highway 1, 1.5 miles north of Alma.	a150	6.5	8.0	9.0	
02227100	Little Hurricane Creek near Alma, Ga.	Lat 31°29'44", long 82°31'40", Bacon County, at bridge on State Highway 64, 5 miles south- west of Alma.	a61	6.0	7.5	8.0	
02227200	Little Hurricane Creek below Alma, Ga.	Lat 31°25'25", long 82°25'59", Bacon County, at State Highway 4, 8.5 miles south of Alma.	111	6.0	7.5	8.5	
02227400	Big Satilla Creek near Alma, Ga.	Lat 31°39'24", long 82°25'55", Eacon County, at State Highway 4, 8.2 miles north of Alma.	112	5.5	7.5	8.5	
92227430	Little Satilla Creek at Odom, Ga.	Lat 31°40'00", long 82°02'23", Wayne County, at State Highway 27 at Odom, 10 miles north- west of Jesup.	<b>a</b> 49	5.5	7.0	8.0	
<b>02227470</b>	Little Satilla Creek near Jesup, Ga.	Lat 31°33'48", long 81°59'11", Wayne County, at bridge on State Highway'99, 7 miles southwest of Jesup.	#83 •	5.5	7.5	8.0	
02227500	Little Satilla River near Offerman, Ga.	Lat 31°27'04", long 82°03'17", Pierce County, at right bank pier of steel truss span of Seaboard Coast Line Railroad bridge, 1,500 feet downstream from bridge on State High- way 38, 4 miles northeast of Offerman, and 16 miles upstream from mouth.	646	13.0	14.5	15.5	
02315650	Alapaha River tributary No. 2 near Pitts, Ga.	Lat 32°00'20", long 83°33'27", Wilcox County, at culvert on State Righway 215, 3.5 miles north of Pitts.	0.14	1.0	1.5	2.0	
02315670	Alapaha River tributary No. 3 near Rochelle, Ga.	Lat 31°56'40", long 83°30'52", Wilcox County, at culvert on U.S. Highway 280, 3.5 miles west of Rochelle.	3.95	3.0	3.5	4.0	
02315700	Alapaha River at Rebecca, Ga.	Lat 31°48'55", long 83°28'26", Ben Hill County, at State Highway 90, 1 mile east of Rebecca.	112	6-5	8.0	8.5	
02315900	Deep Creek near Ashburn, Ga.	Lat 31°43'49", long 83°35'00", Turner County, at State Highway 112, 4.5 miles east of Ashbur	137 n.	8.0	9.0	9.5	
02315980	Alapaha River tributary near Ocilla, Ga.	Lat 31°33'38", long 83°21'28", Irwin County, at culvert on U.S. Highway 319, 7 miles west of Ocilla.	1.21	3.0	3.5	4.0	
02316000	Alapaha River near Alapaha, Ga.	Lat 31°23'03", long 83°11'33", Berrien County, near right bank on downstream side of bridge on State Highway 50, 2 miles east of Alapaha, and 6 miles upstream from Willacoochee River.	563	16.5	18.5	19.5	
02316200	Willacoochee River near Ocilla, Ga.	Lat 31°30'06", long 83°09'43", Irwin County, at State Highway 90, 8 miles southeast of Ocilla.	a90	6.5	8.0	8.5	
02316220	Little Brushy Creek near Ocilla, Ga.	Lat 31°36'30", long 83°13'56", Irwin County, at culvert on secondary road 1533, 1.2 miles northeast of Ocilla.	1.65	1.5	2.0	2.5	
02316260	Alapaha River tributary No. 4 near Willa- coochee, Ga.	Lat 31°16'50", long 83°03'45", Berrien County, at culvert on State Highway 135, 4.5 miles south of Willacoochee.	4.16	5.0	5.5	6.0	
02317700	Withlacoochee River near Nashville, Ga.	Lat 31°11'54", long 83°16'21", Berrien County, at State Highway 87, 1.5 wiles southwest of Nashville.	132	9.0	11.5	12.0	

Table 3. -- Flood depths for selected recurrence intervals for gaging stations in Georgia. -- Continued

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Table 3 Flood depths for selected recurre	nce intervals for gaging stations in GeorgiaContinu	ıed
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Station No.	Station name	Location	Drainage area in			Flood depth, in feet, for indic ted recurrence interval			
			square miles	10-year	50-year	100-year			
02317710	Withlacoochee River tributary pear Nashville, Ga.	Lat 31°11'54", long 83°17'17", Berrien County, at culvert on State Highway 76, 2.2 miles southwest of Nashville.	0.86	1.5	2.0	2.5			
02317760	Little River near Ashburn, Ga.	Lat 31°41'33", long 83°42'16", Turner County, at culvert on State Highway 32, 3.2 miles west of Ashburn.	8.54	4.0	4.5	5.0			
02317765	Newell Branch near Worth, Ga.	Lat 31°44'20", long 83°43'30", Turner County, at culvert on secondary road 1531, 3.2 miles west of Worth.	0.98	1.5	2.0	2.5			
02317770	Newell Branch near Ashburn, Ga.	Lat 31°41'50", long 83°41'56", Turner County, at culvert on State Highway 32, 2.8 miles west of Ashburn.	6.48	3.5	4.0	4.5			
02317775	Daniels Creek near Ashburn, Ga.	Lat 31°40'40", long 83°45'06", Turner County, near culvert on State Highway 32, 6.2 wiles west of Ashburn.	1.11	1.5	2.0	2.5			
02317780	Lime Sink Creek near Sycamore, Ga.	Lat 31°36'20", long 83°40'31", Turner County, at culvert on secondary road 1181, 4.5 miles southwest of Sycamore.	0.68	1.0	1.5	2.0			
02317795	Mill Creek near Tifton, Ga	Lat 31°29'46", long 83°33'15", Tift County, at culvert on county road, 3 miles morth- west of Tifton.	6.21	4.0	4.5	5.0			
02317800	Little River near Tifton, Ga.	Let 31°26'21", long 83°33'38", Tift County, at bridge on U.S. Highway 82, 3 miles west of Tifton.	<b>a</b> 145	6.0	6.5	7.0			
02317845	Warrior Creek tributary near Sylvester, Ga.	Let 31°32'54", long 83°49'11", Worth County, at culvert on State Highway 112, 1.2 miles northwest of Sylvester.	1.64	3.0	3.5	4.0			
02317900	Ty Ty Creek at Ty Ty, Ga.	Lat 31°28'22", long 83°39'47", Tift County, at U.S. Highway 82, l mile west of Ty Ty.	<b>a</b> 47	5.5	6.5	7.0			
02317905	Little Creek near Omega, Ga.	Lat 31°23'35", loug 83°38'00", Tift County, at secondary road 546, 4.2 miles north of Omega.	4.22	6.0	7.0	7.5			
02317910	Ty Ty Creek tributary at Crosland, Ge.	Lat 31°19'17", long 83°37'24", Colquitt County, at culvert on U.S. Highway 319, at Crosland.	2.07	2.0	2.5	3.0			
02318000	Little River near Adel, Ga.	Lat 31°09'18", long 83°32'38", Cook County, on right bank 500 feet downstream from bridge on State Highway 37, 7 miles west of Adel.	577	17.0	19.0	19.5			
02318015	Bull Creek near Norman Park, Ga.	Lat 31°13'13", long 83°37'20", Colquitt County, at culvert on secondary road 548, 5 miles southeast of Norman Park.	1.36	2.0	2.5	3.0			
02318020	Bull Creek tribu- tary near Ellenton, Ga.	Lat 31°09'19", long 83°37'06", Colquitt County, at culvert on State Highway 37, 3 miles west of Ellenton.	0.27	1.0	1.5	2.0			
02318600	Okapilco Creek near Berlin, Ga.	Lat 31°02'48", long 83°37'02", Colquitt County, on county road, 1 mile south of Berlin.	101	10.5	12.0	12.5			
02326200	Aucilla River near Boston, Ga.	Lat 30°46'44", long 83°48'12", Thomas County, at bridge on State Highway 133, 1.2 miles south of Boston.	<b>a</b> 81	6.5	9.0	10.0			
02327200	Ochlockonee River at Moultrie, Ga.	Lat 31°10'58", long 83°48'32", Colquitt County, at State Highway 37 at Moultrie.	<b>a</b> 96	9.0	10.0	10.5			
02327350	Ochlockonee River tributary near Coolidge, Ga.	Lat 31°01'33", long 83°57'32", Thomas County, at culvert on State Highway 202, 5.5 miles west of Coolidge.	1.81	2.0	2.5	3.0			

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Table 3Flood depths for selected recurrence i	intervals for gaging stations in Georgia Continued
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Station No.	Station name	Location	Drainage area in square	ted recurrence interval			
			miles	10-year	50-year	100-year	
02327400	Sellys Branch tributary mear Sale City, Ga.	Lat 31°14'46", long 84°01'40", Mitchell County, at culvert on State Highway 93, 1.2 miles south of Sale City.	3.70	3.5	4.0	4.5	
02327500	Ochlockonee River near Thomas- ville, Ga.	Lat 30°52'32", long 84°02'44", Thomas County, on downstream side of bridge on U.S. Highway 84, 2 miles upstream from Seaboard Coast Line Railroad bridge, 4 miles upstream from Barnetts Creek, 5 miles northwest of Thomasville, and 6 miles downstream from Little Ochlockonee River.	1	19.0	21.5	23.0	
02327550	Barnetts Creek near Meigs, Ga.	Lat 31°01'32", long 84°08'14", Grady County, at State Highway 111, 4.2 miles southwest of Meigs.	15	7.0	8.5	9.0	
02327700	Barnetts Creek near Thomas- ville, Ga.	Lat 30°54'18", long 84°04'34", Grady County, at county road, 7.5 miles northwest of Thomasville.	104	17.5	20.0	21.0	
02327900	Wolf Creek near Whigham, Ga.	Lat 30°53'36", long 84°17'26", Grady County, at U.S. Bighway 84, 2.2 miles northeast of Whigham.	a19	9.0	9.5	10.0	
02328000	Tired Creek near Cairo, Ga.	Lat 30°51'54", long 84°15'46", Grady County, 140 feet upstream from highway bridge, and 3 miles west of Cairo.	<b>a60</b>	10.0	13.0	14.0	
02331000	Chattahoochee River near Leaf, Ga.	Lat 34°34'37", long 83°38'09", Habersham County, 700 feet upstream from bridge on State Righway 115, 1.5 miles east of Leaf, and 7.5 miles southwest of Cleveland.	150	13.0	16.5	17.5	
02331500	Soque River near Demorest, Ga.	Lat 34°34'23", long 83°35'27", Habersham County, 300 feet upstream from bridge on State Highway 105, 2.5 miles west of Demo- rest, 3 miles downstream from Habersham Hill Dam, and 3 miles upstream from mouth.	156	19.0	25.5	27.5	
02331600	Chattahoochee River near Cornelia, Ga.	Lat 34° 32'27", long 83° 37'14", White County, on downstream side of Duncan Bridge, 1 mile downstream from Soque River, 6 miles north- west of Cornelia, and at mile 401.4.	315	20.0	25.0	28.0	
02333500	Chestatee River near Dahlonega, Ga.	Lat 34°31'42", long 83°56'23", Lumpkin County, on left bank 250 feet upstream from Bearden Bridge on State Highway 52, 2 miles down- stream from Ballplay Creek, 2.5 miles east of Dahlonega, and 3.5 miles upstream from Yahoola Creek.	153	19.0	25.0	28.5	
02335700	Big Creek near near Alpharetta, Ga.	Lat 34°03'02", long 84°16'10", Fulton County, on left bank at downstream side of county highway bridge, 2.6 miles southeast of Alpharetta, and 9.4 miles upstream from mouth.	£72	12.0	13.5	14.0	
02337000	Sweetwater Creek near Austell, Ga.	Lat 33°46'22", long 84°36'53", Douglas County, on right bank 100 feet upstream from bridge on Interstate Highway 20, 400 feet upstream from Blair Bridge, 3 miles southeast of Austell, and 5.5 miles upstream from mouth.	246	17.0	20.5	22.0	
02337400	Dog River near Douglasville, Ga.	Lat 33° 39'36", long 84° 51'41", Douglas County, at county road, 2.2 miles north of Fair Play.	a43	16.0	17.5	19.0	
02337500	Snake Creek near Whitesburg, Ga.	Lat 33°31'46", long 84°55'42", Carroll County, at downstream end of left bank pier of high- way bridge at Banning Mills, 1.5 miles north of State Highway 16, 3 miles northwest of Whitesburg, 4 miles downstream from Little Snake Creek, and 7 miles upstream from mouth.	<b>a</b> 37	10.0	12.5	13.5	

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Station No.	Station name	Station name Location	Drainage area in	Flood depth, in feet, for indicated recurrence interval		
			square miles	10-year	50-year	100-year
02339000	Yellowjacket Creek near LaGrange, Ga.	Lat 33°05'27", long 85°03'40", Troup County, at bridge on State Highway 219, 1.2 miles downstream from Beach Creek, 2 miles upstream from Jackson Creek, and 4.2 miles northwest of LaGrange.	182	15.5	19.0	20.0
02340500	Mountain Oak Creek near Hamilton, Ga.	Lat 32°44'28", long 85°04'08", Harris County, on right bank 300 feet upstream from bridge on State Highway 103, 11 miles west of Hamilton.	61.7	5.5	7.0	8.0
02341600	Juniper Creek near Geneva, Ga.	Lat 32°31'41", long 84°34'41", Talbot County, at State Highway 41, 1.8 miles south of Geneva.	47.4	7.0	8.0	8.5
02343200	Pataula Creek near Lumpkin, Ga.	Lat 31°56'03", long 84°48'12", Stewart County, at bridge on U.S. Highway 27, 8 miles south of Lumpkin.	a70	6.5	8.0	8.5
02343225	Pataula Creek near Georgetown, Ga.	Lat 31°49'06", long 84°57'27", Quitman County, at bridge on U.S. Highway 82 (State Highway 50), about 11 miles east of Georgetown.	295	10.0	12.0	12.5
02344300	Camp Creek near Fayetteville, Ga.	Lat 33°31'00", long 84°25'39", Fayette County, at downstream side of bridge on State High- way 85, 3.5 miles upstream from mouth, and 5.2 miles north of Fayetteville.	17.2	8.0	9.5	10.0
02344500	Flint River near Griffin, Ga.	Lat 33°14'39", long 84°25'45", Spalding County, at downstream side of pier of bridge on State Highway 16, 1.5 miles downstream from Shoal Creek, 5.5 miles upstream from Line Creek, 10 miles west of Griffin, and at mile 304.4.	272	14.5	17.0	18.0
02344700	line Creek near Senoia, Ga.	Lat 33°19'10", long 84°31'25", Coweta County, on downstream side of bridge on State High- way 85, 2.2 miles northeast of Senois, 4.1 miles upstream from Whitewater Creek, and 11.2 miles upstream from mouth.	101	12.0	13.5	15.0
02345000	Flint River near Molena, Ga.	Lat 32°59'21", long 84°31'45", Pike County, on right bank at downstream end of pier of bridge on State Highway 18, 2 miles south- west of Molena, and at mile 278.1.	a990	25.0	29.0	31.0
02346193	Scott Creek near Talbotton, Ga.	Lat 32°39'48", long 84°36'06", Talbot County, at culvert on county road, 3.7 miles west of Talbotton.	3.36	7.0	8.0	8.5
02346210	Kimbrough Creek near Talbotton, Ga.	Lat 32°41'19", long 84°30'48", Talbot County, at culvert on State Highway 22, 1.8 miles northeast of Talbotton.	6.62	7.0	7.5	8.0
02346500	Potato Creek near near Thomaston, Ga.	Lat 32°54'15", long 84°21'45", Upson County, on right bank 300 feet downstream from State Highway 74, 600 feet downstream from Basin Creek, 1,000 feet downstream from Central of Georgia Railway bridge, 1 mile downstream from Ten Mile Creek, and 2.5 miles northwest of Thomaston.	186	6.0	7.5	8.0
02348300	Patsiliga Creek near Reynolds, Ga.	Lat 32°34'20", long 84°05'27", Taylor County, at State Highway 128, 1 mile north of Reynolds.	139	7.0	8.5	9.0
02349000	Whitewater Creek below Rambulette Creek, near Butler, Ga.	Lat 32°28'02", long 84°15'59", Taylor County, on left bank 500 feet downstream from bridge on U.S. Highway 19, and 6.5 miles south of Butler.	93.4	6.0	7.0	7.5
02349900	Turkey Creek at Byromville, Ca.	Lat 32°11'44", long 83°54'03", Dooly County, on downstream side of bridge on State High- way 90, 0.5 mile southwest of Byromwille, and 11 miles upstream from mouth.	a45	7.0	8 <b>.</b> 5 <sup>-</sup>	9.0

Table 3 .-- Flood depths for selected recurrence intervals for gaging stations in Georgia .-- Continued

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Station No.	Station name	Location	Drainage area in	Flood depth, in feet, for indi ted recurrence interval			
			square miles	10-year	50-year	100-year	
02350600	Kinchafoonee Creek at Preston, Ga.	Lat 32°03'09", long 84°32'54", Webster County, near right bank on downstream side of bridge on State Highway 41, 1 mile southwest of Preston, and 1 mile upstream from Harrel Hill Creek.	197	9.0	10.0	10.5	
02350900	Kinchafoonee Creek near Dawson, Ga.	Let 31°45'52", long 84°15'12", Lee County, et bridge on State Highway 32, 5.2 miles morth- west of Leesburg, and 10 miles east of Dawson.	527	12.5	17.5	18.0	
02351500	Muckalee Creek mear Americus, Ga.	Lat 32°04'59", long 84°15'29", Sumter County, at State Highway 30, 1 mile west of Americus.	140	10.0	12.0	13.0	
02351700	Muckalee Creek near Smithville, Ga.	Lat 31°53'43", long 84°11°52", Lee County, at bridge on State Highway 118, 3 miles east of Smithville.	265	10.0	11.5	12.5	
02351800	Muckaloochee Creek at Smithville, Ga.	Lat 31°54'19", long 84°14'44", Lee County, at State Highway 118, at Smithville.	<b>a</b> 47	8-0	9.5	10.0	
02351900	Muckalee Creek mear Leesburg, Ga.	Lat 31°43'55", long 84°07'30", Lee County, at bridge on State Highway 32, 2.8 miles east of Leesburg.	405	15.0	19.0	20.0	
02353100	Ichawaynochaway Creek near Dawson, Ga.	Lat 31°46'18", long 84°33'45", Terrell County. at State Highway 50, 7 miles west of Dawson.	118	11.0	12.5	13.0	
02353200	Nochaway Creek near Shellman, Ga.	Let 31°46'45", long 84°36'13", Randolph County, at bridge on State Highway 41, 1.5 miles north of Shellman.	<b>a</b> 52	7.0	<b>8.</b> 0	8.5	
02353400	Pachitla Creek near Edison, Ga.	Lat 31°33'18", long 84°40'51", Calhoun County, at bridge on State Highway 37, 3.5 miles east of Edison.	188	9.0	10.0	10.5	
02353500	Ichawaynochaway Creek at Milford, .Ga.	Lat 31°22'58", long 84°32'52", Baker County, on downstream end of left bank pier of bridge on State Highway 216 at Milford, 2.2 miles upstream from Alligator Creek, and 5.5 miles upstream from Chickesawhatchee Creek.	a620	14.5	19.0	20.0	
02354500	Chickasawhatchee Creek at Elmodel, Ga.	Lat 31°21'09", long 84°29'10", Baker County, at bridge on State Highway 37 at Elmodel.	<b>a</b> 320	13.5	15.0	15.5	
02356100	Spring Creek near Arlington, Ga.	Lat 31°24'47", long 84°46'33", Early County, at bridge on State Highway 62, 3.5 miles southwest of Arlington.	<b>a</b> 49	6.5	7.0	7.5	
02357000	Spring Creek mear Iron City, Ga.	Lat 31°02'23", long 84°44'18", Decatur County, on right bank 125 feet downstream from county road bridge, 5.5 miles northeast of Iron City.	a485	18.0	21.0	23.5	
02379500	Cartecay River near Ellijay, Ga.	Lat 34*40'53", long 84*27'20", Gilmer County, on right bank adjacent to State Highway 52, 0.8 mile downstream from Owltown Creek, 2 miles southeast of Ellijay, and 2 miles up- stream from confluence with Ellijay River.	135	8.5	10.0	11.5	
02380000	Ellijay River at Ellijay, Ga.	Lat 34°41'06", long 84°28'40", Gilmer County, on left bank at downstream side of bridge on State Highway 5 at Ellijay, and 1 mile upstream from confluence with Cartecay River.	<b>a</b> 90	13.5	15.0	16.0	
02380500	Coosawattee River near Ellijay, Ga.	Lat 34 <sup>4</sup> 40'18", long 84 <sup>°</sup> 30'31", Gilmer County, on right bank 0.5 mile downstream from State Highway 5, 2 miles southwest of Ellijay, and 2.2 miles downstream from confluence of Cartecay and Ellijay Rivers.	238	14.5	20.0	23.0	
02381100	Mountaintown Creek tributary near Ellijay, Ga.	Lat 34°42'04", long 84°31'54", Gilmer County, at culvert on State Highway 282, 3 miles west of Ellijay.	2.41	3-5	4.5	5.5	

#### Table 3 .--- Flood depths for selected recurrence intervals for gaging stations in Georgia .-- Continued

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## Table 3 .--- Flood depths for selected recurrence intervals for gaging stations in Georgia .-- Continued

Station No.	Station name	Location	Drainage area in		oth, in feet currence in	
			square miles	10-year	50-year	100-year
02381600	Faucett Creek near Talking Rock, Ga.	Lat 34°34'17", long 84°27'55", Gilmer County, at culvert on secondary road 1011, 4.5 miles northeast of Talking Rock.	9.99	3.5	4.0	4.5
02381900	Ball Creek near Talking Rock, Ga.	Lat 34°31'52", long 84°34'11", Pickens County, at culvert on State Highway 156, 3.8 miles west of Talking Rock.	a3.5	5.5	6.5	7.0
02382500	Coosawattee River at Carters, Ga.	Lat 34°36'15", long 84°41'29", Murray County, on downstream side of left bank pier of bridge on U.S. Bighway 411 at Carters, 200 feet upstream from Louisville & Nashville Railroad bridge, and 0.6 mile downstream from Talking Rock Creek.	531	29.0	33.0	34.5
02382900	Pine Log Creek near Rydal, Ga.	Lat 34°22'02", long 84°42'45", Bartow County, at U.S. Highway 411 (State Highway 61), 2 miles north of Rydal.	12.8	5.5	7.0	8.0
02383000	Rock Creek near Fairmount, Ga.	Lat 34°21'32", long 84°46'46", Bartow County, at State Highway 140, 2.8 miles upstream from mouth, and 7 miles southwest of Fairmount.	5.61	4.0	5.0	5.5
02383200	Redbud Creek near Ranger, Ga.	Lat 34°31'57", long 84°43'39", Gordon County, at culvert on State Highway 156, 2.5 miles northwest of Ranger.	1.97	4.0	5.0	6.0
02383500	Coosawattee River at Pine Chapel, Ga.	Lat 34°34'37", long 84°51'35", Gordon County, on right bank at downstream edge of highway bridge at Pine Chapel, 4 miles downstream from Sallacoa Greek, 5 miles east of Resaca and 6 miles upstream from confluence with Conasauga River.	856	28.0	31.0	32.0
02384000	Conasauga River near Tennga, Ga.	Lat 35°00'34", long 84°44'02", Polk County, Tenn., at U.S. Highway 411, 1.5 miles north of Tennga.	108	13.0	14.5	15.5
02384500	Conasauga River near Eton, Ga.	Lat 34°49'40", long 84°51'03, Murray County, at State Highway 286, 5 miles west of Eton.	253	17.0	19.0	20.0
02384600	Mill Creek tributary near Eton, Ga.	Lat 34°49'38", long 84°48'58", Murray County, at culvert on State Highway 286, 3 miles west of Eton.	4.28	6.0	6.5	7.0
02385000	Coahulla Creek near Varnell, Ga.	Lat 34°53'43", long 84°55'15", Whitfield County, 250 feet downstream from Praters Mill at State Highway 2, 3 miles west of Varnell.	<b>a</b> 87	12.0	14.0	14.5
02 <b>385700</b>	Rock Creek near Chatsworth, Ga.	Lat 34°46'33", long 84°44'33", Murray County, at culvert on secondary road 2321, 1.5 miles northeast of Chatsworth.	3.46	2.0	3.0	3.5
02385800	Holly Creek near Chatsworth, Ga.	Lat 34°43'00", long 84°46'12", Murray County, on right bank 100 feet upstream from bridge on county road, 3 wiles upstream from Rock Creek, and 3.3 miles south of Chatsworth.	64-9	10.0	11.0	11.5
02387000	Conasauga River at Tilton, Ga.	Lat 34°40'00", long 84°55'42", Murray County, on left bank 250 feet downstream from high- way bridge, 0.2 mile downstream from Swamp Greek, 0.5 mile northeast of Tilton, and 12 miles upstream from confluence with Coosa- wattee River.	682	26.5	29.5	31.5
02387100	Polecat Creek near Spring Place, Ga.	Lat 34°39'08", long 84°50'33", Murray County, at culvert on State Highway 225, 7.5 miles south of Spring Place.	1.22	4.5	5.0	5.5
02387200	Beamer Creek near Spring Place, Ga.	Lat 34°38'03", long 84°51'52", Murray County, at culvert on State Highway 225, 8.8 miles south of Spring Place.	1.29	3.5	4.0	4.5

a Approximately.

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Table 3 Flood depths for selected recurrence	intervals for gaging	stations in Georgia Continued
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Station No.	Station name	Location	Drainage area in		th, in feet currence in	
			square miles	10-year	50~year	100-year
02387300	Dead Mans Branch near Resaca, Ga.	Lat 34°35'44", long 84°52'11", Cordon County, at culvert on State Highway 225, 4.2 miles east of Resaca.	0.17	2.5	3.0	3.5
02387560	Oothkalooga Greek tributary at Adairsville, Ga.	Lat 34°21'34", long 84°55'20", Bartow County, at culvert on U.S. Highway 41, 1 mile south of Adairsville.	3.56	4.5	5.0	5.5
02387700	Rocky Creek at Curryville, Ga.	Lat 34°26'44", long 85°05'12", Gordon County, at culvert on State Highway 156, 0.4 mile west of Curryville.	9.41	4.5	5.5	6.0
02387800	Bailey Creek near Villanow, Ga.	Lat 34 <sup>°</sup> 40'10", long 85 <sup>°</sup> 05'40", Walker County, at culvert on State Highway 143, 1.2 miles east of Villanow.	3.82	6.0	7.0	7.5
02388000	West Armuchee Creek near Subligna, Ga.	Lat 34°34'04", long 85°09'16", Chattooga County, on left bank 500 feet downstream from bridge on county road, 1 mile upstream from Ruff Greek, and 2 miles east of Subligna.	34.5	10.0	11.0	11.5
02388200	Storey Mill Creek near Summerville, Ga.	Lat 34°25'39", long 85°16'03", Chattooga County, at culvert on county road, 6 miles southeast of Summerville.	6.02	6.5	7.0	7.5
02388400	Dozier Creek near Shannon, Ga.	Lat 34°18'53", long 85°05'47", Floyd County, at culvert on State Highway 53, 2 miles southwest of Shannon.	3.00	4.0	4.5	5.0
02388900	Etowah River near Dahlonega, Ga.	Lat'34°30'56", long 84°03'40", Lumpkin County, at bridge on State Highway 9, 4.5 miles west of Dahlonega.	a68	13.0	14.5	15.0
02389000	Etowah River near Dawsonville, Ga.	Lat 34°22'57", long 84°03'21", Dawson County, on left bank 0.4 mile upstream from Palmer Creek, 0.5 mile upstream from bridge on State Highway 53, 1.2 miles downstream from Russell Creek, 4 miles southeast of Dawson- ville, and 7.5 miles upstream from Shoal Creek.	103	12.0	15.0	16.0
02389300	Shoal Creek near Dawsonville, Ga.	Let 34°25'13", long 84°08'47", Dawson County, on left bank at bridge on State Highway 53, 650 feet upstream from Flat Creek, 1 mile west of Dawsonville, and 6.5 miles upstream from mouth.	20.5	10.0	12.5	13.5
02390000	Amicalola Creek near Dawson- ville, Ga.	Lat 34°25'32", long 84°12'43", Dawson County, at bridge on State Highway 53, 5.2 miles west of Dawsonville.	84.7	7.0	9.0	10.0
02392500	Little River near Roswell, Ga.	Lat 34°07'09", long 84°23'18", Fulton County, on upstream side of bridge on State Highway 140, 1 mile downstream from Cooper Sandy Creek, and 7 miles north of Roswell.	60.5	12.0	14.5	15.5
02394400	Pumpkinvine Creek / below Dallas, Ga.	Lat 33°54'57", long 84°52'40", Paulding County, at State Highway 6, 2.2 miles west of Dallas.	a40	15.0	17.5	19.0
02394950	Hills Creek near Taylorsville, Ga.	Lat 34°04'27", long 84°57'02", Polk County, on left bank on downstream side of highway bridge on county road, 2 miles southeast of Taylorsville, and 2 miles upstream from mouth.	826	10.0	12.5	13.5
02397500	Cedar Creek near Cedartown, Ga.	Lat 34°03'38", long 85°18'41", Polk County, on left bank 700 feet downstream from bridge on State Highway 161, 4.5 miles upstream from Lake Creek, and 4.5 miles northwest of Cedartown.	109	16.0	19.5	21.0
02397750	Duck Creek above LaFayette, Ga.	Lat 34°42'17", long 85°19'40", Walker County, at culvert on county road, 2.5 miles west of LaFayette.	6.34	6.5	7.5	8.0

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Exercise 20

100020-025

Station No.	Station name	Station name Location	Drainage area in	ted recurrence interval		
			square miles	10-year	50-year	100-year
02398000	Chattooga River at Summerville, Ga.	Lat 34°28'03", long 85°20'19", Chattooga County, on left bank 600 feet downstream from bridge on U.S. Highway 27, 1 mile southeast of Summerville, and 4 miles upstream from Rac- coon Creek.	193	17.0	20.0	21.0
02411800	Little River near Buchanan, Ga.	Lat 33°47'51", long 85°07'03", Haralson County, on right bank 150 feet upstream from county highway bridge, 4.5 miles east of Buchanan, and 7 miles upstream from mouth.	a18	12.5	15.0	16.0
02411900	Tallapoosa River at Tallapoosa, Ga.	Lat 33°46'27", long 85°18'00", Haralson County, at State Highway 100, 2 miles north of Tallapoosa.	237	21.5	23.5	24.5
02413000	Little Tallapoosa River at Carroll- ton, Ga.	Lat 33°35'50", long 85°04'49", Carroll County, 200 feet downstream from bridge on U.S. High- way 27 at Carrollton.	<b>#89</b>	16.0	20.0	21.5
02413200	Little Tallapoosa River near Bowdon, Ga.	Lat 33°30'48", long 84°14'03", Carroll County, at State Highway 5, 2.2 miles southeast of Bowdon.	a210	18.0	22.0	23.5
03545000	Hiwassee River at at Presley, Ga.	Lat 34°54'17", long 83°42'01", Towns County, on left bank 0.1 mile downstream from Cynth Creek, 0.5 mile southeast of Presley, 1.4 miles upstream from Hightover Creek, and at mile 133.9.	45.5	12.0	15.0	16.5
03550500	Nottely River near Blairsville, Ga.	Lat 34"50'28", long 83"56'10", Union County, on left bank 250 feet upstream from county road bridge, 0.1 mile downstream from Arkaqua Greek, 0.2 mile upstream from Akins Creek, 2.7 miles southeast of Blairsville, and at mile 44.3.	74.8	14.5	18.0	19.5
03558000	Toccoa River near Dial, Ga.	Lat 34"47'24", long 84"14'24", Fannin County, on right bank 1.4 miles upstream from Shallow- ford Bridge, 1.8 miles upstream from Stanley Creek, 2.5 miles northwest of Dial, and at mile 69.1.	177	11.0	14.0	15.5
0356000	Fightingtown Creek at McCaysville, Ga.	Lat 34°58'53", long 84°23'12", Fannin County, on right bank, 0.2 mile upstream from high- way bridge, 0.9 mile upstream from mouth, and 0.9 mile west of McCaysville.	70.9	10.5	13.0	14.0
03566660	Sugar Creek near Ringgold, Ga.	Lat 34°58'14", long 85°01'29", Catoosa County, at culvert on secondary road 1286, 6 miles northeast of Ringgold.	4.44	6.0	6.5	7.0
03566685	Little Chickamauga Creek near Ring- gold, Ga.	Lat 34°50'32", long 85°08'28", Catoosa County, at State Highway 151, 5.2 miles south of Ringgold.	35.5	7.5	8.5	9.0
03566687	Little Chickamauga Creek tributary near Ringgold, Ga.	Lat 34°51'36", long 85°08'40", Catoosa County, at culvert on State Highway 151, 4.2 miles south of Ringgold.	3.36	3.5	4.0	4.5
03566700	South Chickamauga Creek at Ring- gold, Ga.	Lat 34°55'07", long 85°07'32", Catoosa County, at State Highway 3, at Ringgold.	169	21.0	24.0	25.0
03567200	West Chickamauga Creek near Ken- sington, Ga.	Lat 34°48'10", long 85°20'52", Walker County, at State Highway 143, 2.5 miles northeast of Kensington.	73	16.0	17.5	18.0
03568500	Chattanooga Creek near Flintstone, Ga.	Lat 34°58'20", long 85°19'40", Walker County, on right bank, 0.8 mile south of Georgia- Tennessee State line, 2.3 miles northeast of Flintstone, and at mile 10.3.	50.6	13.0	14.5	15.0

Table 3, --- Flood depths for selected recurrence intervals for gaging stations in Georgia. -- Continued

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