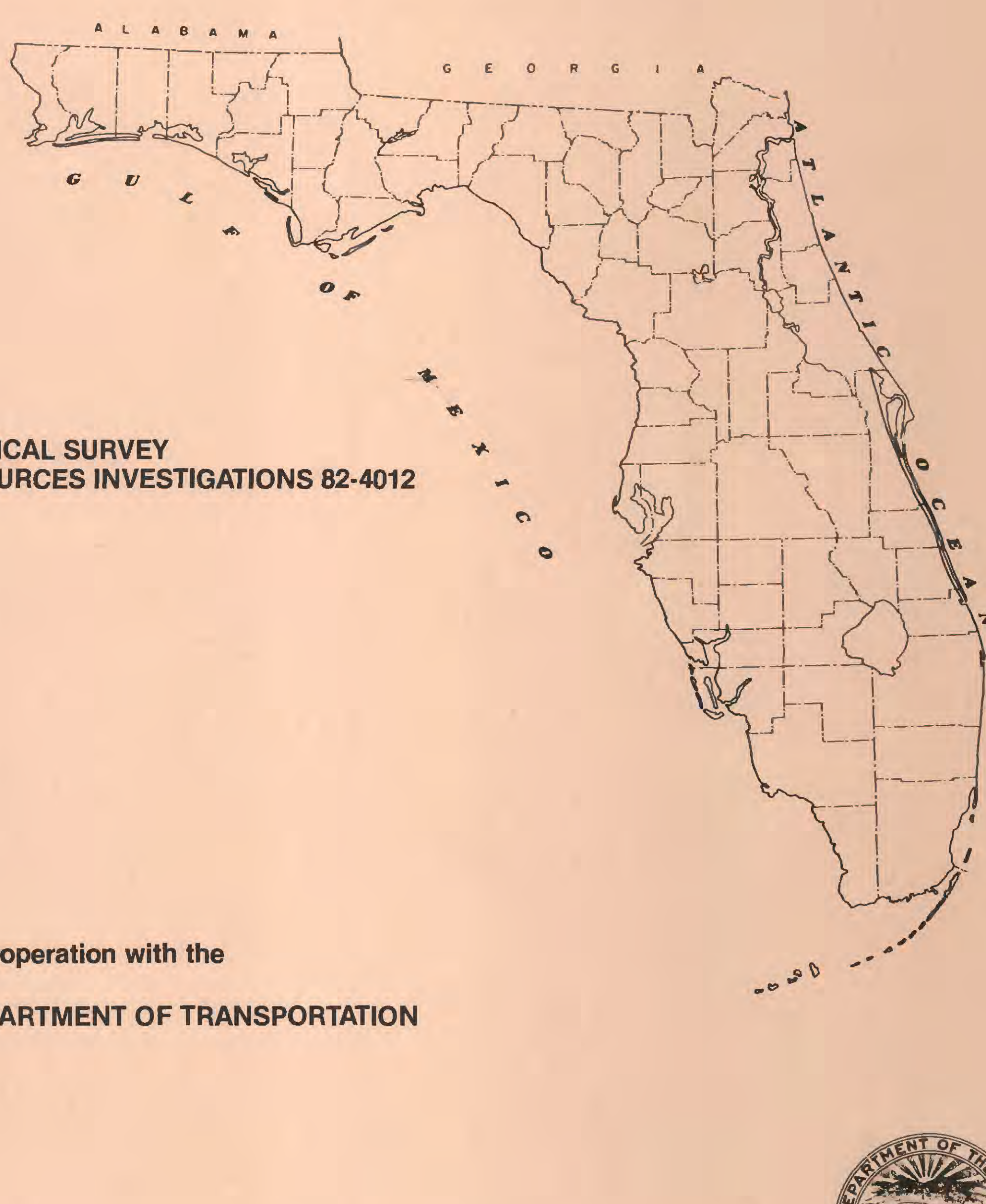
TECHNIQUE FOR ESTIMATING MAGNITUDE AND FREQUENCY OF FLOODS ON NATURAL-FLOW STREAMS IN FLORIDA



U.S. GEOLOGICAL SURVEY
WATER-RESOURCES INVESTIGATIONS 82-4012

Prepared in cooperation with the

FLORIDA DEPARTMENT OF TRANSPORTATION

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UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

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By Wayne C. Bridges

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Tallahassee, Florida

1982

UNITED STATES DEPARTMENT OF THE INTERIOR

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GEOLOGICAL SURVEY

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SYMBOLS

A_g = Drainage area for gaged site, in square miles;

A_u = Drainage area for ungaged site, in square miles;

B_1, B_2, B_3... = Partial regression coefficients;

C = Regression constant;

C_2, C_{25}, C_{100} = Geographic coefficient for estimating 2-, 25-, and 100-year recurrence-interval flood discharge at rainfall-runoff stations;

DA = Drainage area, in square miles;

EY = Accuracy for a flood estimate, in equivalent years of record;

K = Pearson Type III deviate;

LE = Channel length, in miles;

LK = Total area of lakes and ponds, in percent of drainage area;

M = Mean of logarithms of the annual peaks;

N = Number of items in a data set;

n = Time interval, in years;

P = Exceedance probability;

p = Probability of at least one exceedance within the specified time interval;

Q_g = Estimate from log-Pearson Type III distributions of T-year flood, in cubic feet per second;

Q_r = Estimate from regression equation of T-year flood for gaged site, in cubic feet per second;

Q_{ru} = Regional estimate of T-year flood from regression equation for ungaged site, in cubic feet per second;

Q_t = Estimate of the T-year flood from log-Pearson Type III distribution, in cubic feet per second;

Q_u = Adjusted estimate of T-year flood for ungaged site, in cubic feet per second;

Q_{wt} = Weighted estimate of T-year flood at gaged site, in cubic feet per second;

R = Multiple correlation coefficient;

S = Standard deviation of the logarithms of annual peaks;

SL = Channel slope, in feet per mile;

T = Recurrence interval, in years;

X_1, X_2, X_3... = Independent variables in linear regression.

ABBREVIATION AND CONVERSION FACTORS

Factors for converting inch-pound units to International System of units (SI) and abbreviation of units.

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

TECHNIQUE FOR ESTIMATING MAGNITUDE AND FREQUENCY OF FLOODS ON NATURAL-FLOW STREAMS IN FLORIDA

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ABSTRACT

A technique is provided for estimating floods on natural-flow streams in Florida for specific recurrence intervals of 2, 5, 10, 25, 50, 100, 200, and 500 years. Flood peaks from 159 stream-gaging stations with long-term records (10-53 years) and 23 rainfall-runoff stations with short-term records (7-17 years) were used in a multiple linear regression analysis to develop the regional equations relating peak discharge to basin characteristics. The State is divided into three hydrologic regions, A, B, and C. The significant independent variables were drainage area, channel slope, and lake area in Regions A and C. In Region B, the significant independent variables were drainage area and lake area.

INTRODUCTION

The ability to adequately define the magnitude and frequency of floods is necessary for the regulation, planning, and design of activities along rivers and streams in Florida. One of the first considerations in the safe and economical design of drainage structures is the magnitude and frequency of the design flood or the maximum peak flow that can safely pass through the structure. The most desirable basis for selection of the design discharge is a flood-frequency analysis of a long-term record of floods that have occurred at or near the site, but long-term flood records are rarely available for the site where they are needed.

In 1958, the Florida Department of Transportation and the U.S. Geological Survey began a cooperative program to establish a data base of annual peaks to be used in future statewide flood-frequency studies. This crest-stage network was expanded in 1964 to increase the geographic coverage.

With more than 50 percent of the Florida highway bridge construction funds being spent to build bridges and culverts on small basins, there was a great need for reliable flood-frequency information for small basins. As used in this report, basins that are 10 square miles or less are considered to be small. To meet this need for flood-frequency data on small basins, the Geological Survey and the Florida Department of Transportation expanded the cooperative program in July 1967 to develop a data base and to extend short-term flood peak records on small basins using the Geological Survey rainfall-runoff model (Dawdy and others, 1972).

Although the initial plan for the small-basins flood-frequency study called for a separate report dealing exclusively with small basins (Bridges, 1977), a decision was made during the study to incorporate the flood-peak data from the small basins with flood-peak data from the larger basins and have a single report covering all sizes of basins.

This report supersedes previous Geological Survey reports to estimate flood magnitudes and frequencies. Previous studies on regional flood-frequency relations are Pride (1958), Barnes and Golden (1966), and Rabon (1971). A regional flood-frequency study was done by Seijo and others (1979) for a 15-county area in west-central Florida.

The reports by Pride (1958) and Barnes and Golden (1966), based on flood-peak data through 1953 and 1961, respectively, used the index-flood method of analysis (Dalrymple, 1960). The Rabon report (1971) presented flood-frequency relations for the 2- through 50-year recurrence intervals and was based on a regression analysis of flood discharges (data to 1970) and basin characteristics. To show that the technique used in this report is comparable to that used in the regional report by Seijo and others (1979), a comparison was made of the 25-year flood for the 40 gaging stations in the study area used by Seijo. The weighted discharge for the 25-year flood from the report by Seijo averaged about 5 percent more than the weighted discharge computed in this report.

The purpose of this report is to:

1. Present flood data for the gaged sites used in the flood-frequency analysis.

2. Describe the method of analysis used to develop the flood-estimating technique.

3. Provide regression equations for estimating floods on natural-flow (unregulated) streams.

4. Provide a method for improving the flood estimate at gaged sites.

5. Provide illustrative examples of applying the flood-estimating technique.

Frequently, streamflow records are insufficient or else do not exist at the site where information is desired. Since flood characteristics at individual gaging stations have very limited transfer capability, estimates of flood characteristics should be based on a regional analysis of streamflow records. The method of multiple linear regression analysis was used to develop the regional flood-frequency relations which relate flood-peak discharge to selected basin characteristics.

The study benefited from the interest and support given by Edward G. Ringe, Jr., Engineer of Drainage, Florida Department of Transportation.

DATA BASE

Annual Maximum Discharge

Records of the annual maximum discharge for Florida stream-gaging stations are stored in the National Water Data Storage and Retrieval System computer file. Annual maximum discharges (through September 1978) for 182 streamflow stations were available for analysis. Long-term records (10 to 53 years) at 125 continuous and 34 crest-stage stream-gaging stations and short-term records (7 to 17 years) at 23 small-basin rainfall-runoff gaging stations were used in the flood-frequency analysis.

Dual digital recorders were used to collect concurrent rainfall and runoff data at the small basin sites. Stage-discharge ratings were defined by current meter measurements.

At the small basin sites, most of the records were short (less than 10 years) thereby increasing the probability of a time sampling error. A reliable flood-frequency curve requires many years of annual flood maximums. To overcome this deficiency on the small basins, the Survey's rainfall-runoff model, which uses long-term rainfall records as input, was utilized to synthesize long-term flood-peak data. For a detailed description of the model, computational procedures, assumptions, and reliability, see Dawdy and others (1972). The model and its application to Florida data are described by Bridges (1977).

Sites that were significantly affected by tides, regulation, diversion, or reserviors were not used in this analysis.

Flood-Frequency Curves

Frequency curves for individual gaging stations were developed following the guidelines described in Bulletin 17A, U.S. Water Resources Council (1977). In accordance with the recommended procedure, a log-Pearson Type III distribution function was used to fit observed data to log-probability curves. The distribution is defined by the equation:

$$\log Q_T = M + KS, \tag{1}$$

where

Q_T is the peak discharge for a selected recurrence interval T, in cubic feet per second;

M is the mean of the logarithms of the annual peaks;

K is the Pearson Type III frequency factor expressed in number of standard deviations from the mean for selected recurrence interval;

S is the standard deviation of the logarithms of the annual peaks.

To fit the log-Pearson Type III distribution to the annual maximum discharges at each gaging station, the Geological Survey computer program J-407, described by Kirby (1979), was used to perform the statistical analysis. Although program J-407 follows the guidelines of the U.S. Water Resources Council (WRC), the user is still required to use hydrologic judgment in supplying information on regional skew, historic peaks, gage-base discharge, low and high outliers, and the interpretation of the frequency distribution.

The skew coefficient determined from the station record is sensitive to extreme events; therefore, the longer the record, the more reliable the skew coefficient. It is recommended by WRC that a generalized skew be applied to station records of less than 25 years and, for station records of 25 to 100 years, a weighted-skew coefficient be used.

An effort was made to determine a better estimate of the generalized skew by plotting the station skews and drawing a skew isoline map for station records of 25 years or more. Distinct geographic and topographic patterns were not evident; therefore, the decision was made to use the WRC generalized-skew map. Values of skew can be found on the map in U.S. Water Resources Council (1977, pl. 1).

Frequency curves for 23 small-basin rainfall-runoff sites were computed using a procedure developed by Lichty and Liscum (1978) to improve the T-year (annual) flood estimates. The T-year flood estimates were computed as the weighted average of the map model estimate and the observed estimate in proportion to the accuracy of each estimate. The observed estimate is derived from the log-Pearson Type III distribution of annual peaks at the small basin site. The map model estimate is based on a long-term rainfall record that is transferred to the gaged site by means of three maps depicting the geographic variability of a coefficient, C_i, (i = 2-, 25-, and 100-year recurrence intervals). Maps were extended (R. W. Lichty, written commun., 1979) to include peninsular Florida.

For each small basin site, the rainfall-runoff model is calibrated and the fitted parameters from the rainfall-runoff model are used in conjunction with the climatic factor, C_i, to define a frequency curve.

The procedure for estimating the map model yields an accuracy (in equivalent years of record) ranging from 7 years for the 2-year flood to 30 years for the 100-year flood.

Basin Characteristics

Described below are the basin characteristics that were tested for significance as independent variables in the regression analysis. Many of the variables were not significant and do not appear in the final prediction equations. The streamflow and basin characteristics are stored in the National Water Data Storage and Retrieval System computer file.

1. Drainage area (DA), in square miles: the area that contributes to surface runoff. Basin boundaries are delineated on U.S. Geological Survey topographic maps and the contributing area is determined by planimetering.

2. Channel slope (SL), in feet per mile: the average slope of the main channel between points 10 and 85 percent of the distance upstream from the gaging site to the basin divide.

3. Channel length (LE), in miles: 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.

4. Elevation (EL), in feet: the mean basin elevation, in feet above National Geodetic Vertical Datum of 1929 (formerly referred to as "mean sea level"), measured from topographic maps by transparent grid-sampling method (20 to 80 points sampled in each basin).

5. Storage (ST), in percent: the surface area of lakes, ponds, and swamps expressed as a percentage of the contributing drainage area.

6. Lake area (LK), in percent: the surface area of lakes and ponds expressed as a percentage of the contributing drainage area.

7. Swamps (SW), in percent: the surface area of swamps (defined as marsh and wooded marsh on topographic maps) expressed as a percentage of the contributing drainage area (SW = ST-LK).

8. Forest (FO), in percent: the area of forest expressed as a percentage of the contributing drainage area; forested area shown on topographic maps.

9. Soil (SO), in inches: the soils index represents values of potential maximum infiltration during an annual flood, under average soil moisture conditions. Values of the soils index were computed from a map provided by the Soil Conservation Service, U.S. Department of Agriculture.

10. Precipitation (PR), in inches: the mean annual precipitation determined from an isohyetal map prepared from U.S. Weather Bureau (1959, rev. 1962) precipitation records.

11. Precipitation intensity (I24,2), in inches: the maximum 24-hour precipitation expected to be exceeded on an average of once each 2 years. Values for this index were determined from a U.S. Weather Bureau (1958) publication.

REGIONAL ANALYSIS

Multiple Regression Analysis

A multiple regression analysis was used to develop relations between flood-peak discharge (dependent variable) and drainage-basin characteristics (independent variables). A data-analysis system called Statistical Analysis System (SAS) was used to perform the multiple regression (Helwig and Council, eds., 1979). SAS contains five methods of stepwise regression. The stepwise procedure "maximum R^2 improvement" (MAXR) was selected to determine which of the independent variables would be included in the regression model.

R^2 is the square of the multiple correlation coefficient and measures how much variation in the dependent variable can be accounted for by the model. The MAXR method begins by finding the one-variable model producing the highest R^2 and adds another variable that will produce the greatest increase in R^2. Each variable in the two-variable model is compared to each variable not in the model. MAXR determines if removing one variable and replacing it with another would improve R^2. Comparison or replacement of variables continues until the "best" two-variable model, three-variable model, and so forth, is developed.

The regression model is in the form

$$Q_T = C \, X_1^{B_1} \, X_2^{B_2} \ldots X_n^{Bn} \qquad (2)$$

where

Q_T is the flood peak discharge (dependent variable) for recurrence interval of T-years, cubic feet per second;

X_1 to X_n are the basin characteristics (independent variable);

C is the regression constant for a given recurrence interval;

B_1 to B_n are the regression coefficients for a given recurrence interval.

Regression Models

Data from 182 gaging stations throughout the State were used in the initial multiple linear regression analysis. Streams with drainage areas larger than 10,000-square miles were excluded from the regression analysis. Flood magnitudes for recurrence intervals of 2, 5, 10, 25, 50, 100, 200, and 500 years (dependent variables) were regressed against the basin characteristics (independent variables). For each recurrence interval, the contributing drainage area (DA) was the most significant independent variable. Although the order of significance varied with recurrence interval, in most cases lake (LK) was the next most important variable, followed by slope (SL). For example, contributing drainage area accounted for approximately 62 percent of the variance of the 10-year recurrence interval flood.

Drainage area and lake area combined accounted for about 80 percent of the variance of the dependent variable and the addition of slope accounted for an additional 3 percent. The use of a fourth or fifth variable did not show significant improvement in the values of R^2 and standard error of the regression equation.

The differences between the station value and the value from the regression, called residuals, were plotted on a State base map to determine geographic bias. A plot of the residuals indicated three hydrologic regions for the State (see figure 1). Region A, the largest of the three regions, covers about three-quarters of peninsular Florida and extends from the St. Marys River basin to the Anclote River basin. In Region A, east Florida streams flow toward the Atlantic Ocean and those on the lower-west coast flow toward the Gulf of Mexico. Region B extends from the upper-west coast to the eastern panhandle and includes river basins from the Pithlachascotee to the Aucilla. Region C extends through the western panhandle from the St. Marks River to the Perdido River. All the streams in Regions B and C flow toward the Gulf of Mexico.

A separate stepwise regression was run using only those stations contained within each of the three regions. In each region, contributing drainage area was the primary independent variable followed in importance by lake area and slope. The exception was Region B where slope was not significant.

Iterations of the stepwise regressions were made, with increments to LK and SL being added, to find the optimum slope of the regression line that best fit the data. The standard error of the regression equation was improved an average of 6 percent when a constant was added to lake area and a minimum value set for slope. In Region A a constant of 3 percent was added to lake area and the minimum value of slope set at 0.9 ft/mi. In Region B a constant of 0.6 percent was added to lake area. In Region C a constant of 3 percent was added to lake area and the minimum slope is set at 0.9 ft/mi.

The regression models for estimating the flood magnitudes for the recurrence intervals of 2, 5, 10, 25, 50, 100, 200, and 500 years are summarized by region in tables 1, 2, and 3.

The regression model for Region A (table 1) has the form:

$$Q_T = C\ DA^{B_1}\ SL^{B_2}\ (LK+3.0)^{B_3} \qquad (3)$$

where

Q_T is the discharge for a recurrence interval of T-years, in cubic feet per second;

C is the regression constant;

DA is the drainage area, in square miles;

SL is the channel slope, minimum value set at 0.9, in feet per mile (for example, if SL is less than 0.9 foot per mile, then SL = 0.9 foot per mile);

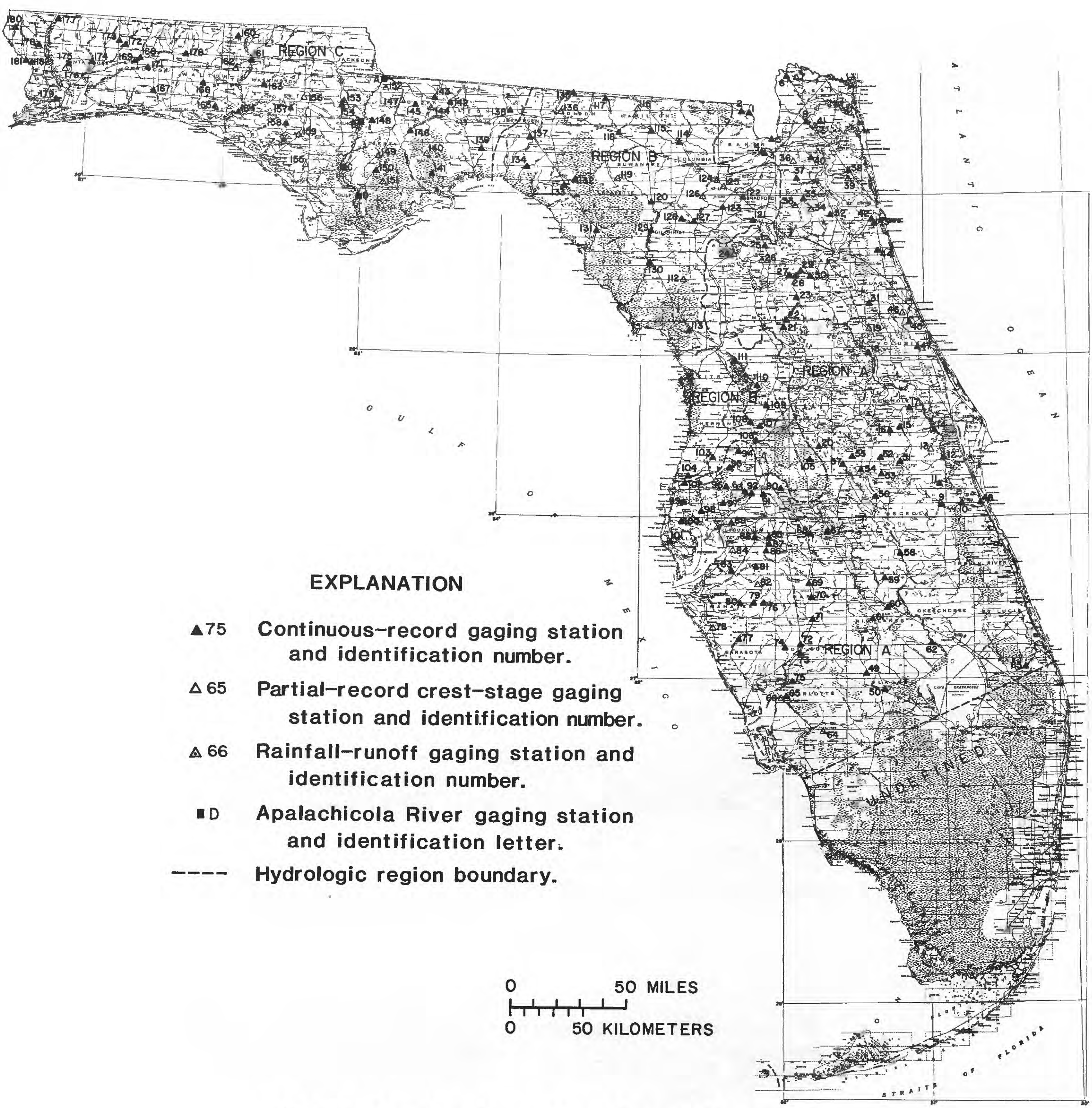

Figure 1.--Location of gaging stations and hydrologic region boundaries.

LK is lake area plus constant of 3, in percent, (for example, LK+3.0, in percent);

B_1, B_2, B_3 are exponents of the regression.

The regression model for Region B (table 2) has the form:

$$Q_T = C\ DA^{B_1}\ (LK+0.6)^{B_2} \tag{4}$$

where

Q_T is the discharge for a recurrence interval of T-years, in cubic feet per second;

C is the regression constant;

DA is the contributing drainage area, in square miles;

LK is lake area plus constant of 0.6 percent, (for example, LK+0.6, in percent);

B_1, B_2 are exponents of the regression.

The regression model for Region C (table 3) has the form:

$$Q_T = C\ DA^{B_1}\ SL^{B_2}\ (LK+3.0)^{B_3} \tag{5}$$

where

Q_T is the discharge for a recurrence interval of T-years, in cubic feet per second;

C is the regression constant;

DA is the contributing drainage area, in square miles;

SL is the channel slope, minimum value set at 0.9, in feet per mile (for example, if SL is less than 0.9 foot per mile, then SL = 0.9 foot per mile);

LK is lake area plus constant of 3, in percent, (for example, LK+3.0, in percent);

B_1, B_2, B_3 are exponents of the regression.

Flood Frequency for Larger Streams

The Apalachicola River in Region C is the only basin larger than 10,000-square miles and therefore is treated separately in this section. The Apalachicola River is formed by the confluence of the Chattahoochee River, the Flint River, and Spring Creek, at Jim Woodruff Dam. There is some regulation of peak discharges by Lake Seminole (Jim Woodruff Dam) and upstream reservoirs. The Apalachicola River flows 107 miles to Apalachee Bay and to the Gulf of Mexico.

Table 1.--Regression model for Region A

Recurrence interval T, in years	Exceedance probability	Regression constant C	Regression exponents DA B_1	SL B_2	(LK+3) B_3	R^2	Standard error, in percent
2	0.5	93.4	0.756	0.268	-0.803	0.868	42.6
5	.2	192	.722	.255	- .759	.858	42.4
10	.1	274	.708	.248	- .738	.843	44.2
25	.04	395	.696	.240	- .717	.821	47.3
50	.02	496	.690	.234	- .705	.803	50.0
100	.01	609	.685	.227	- .695	.784	52.9
200	.005	779	.674	.205	- .694	.763	55.8
500	.002	985	.668	.196	- .687	.738	59.7

Table 2.--Regression model for Region B

Recurrence interval T, in years	Exceedance probability	Regression constant C	Regression exponents DA B_1	(LK+0.6) B_2	R^2	Standard error, in percent
2	0.5	44.2	0.658	-0.561	0.876	60.9
5	.2	113	.614	- .573	.869	59.7
10	.1	182	.592	- .580	.863	59.9
25	.04	298	.570	- .585	.853	60.9
50	.02	410	.556	- .589	.845	61.9
100	.01	584	.543	- .591	.836	63.1
200	.005	694	.533	- .593	.827	64.4
500	.002	936	.521	- .594	.815	66.3

Table 3.--Regression model for Region C

Recurrence interval T, in years	Exceedance probability	Regression constant C	Regression exponents DA B_1	SL B_2	(LK+3) B_3	R^2	Standard error, in percent
2	0.5	58.9	0.824	0.387	-0.785	0.919	43.7
5	.2	117	.844	.482	-1.06	.905	45.9
10	.1	164	.860	.534	-1.21	.891	49.3
25	.04	234	.882	.586	-1.37	.870	54.8
50	.02	291	.900	.626	-1.48	.853	59.4
100	.01	351	.918	.658	-1.58	.835	64.6
200	.005	417	.936	.685	-1.67	.819	69.7
500	.002	507	.960	.725	-1.79	.797	76.5

The locations of the Apalachicola River sites are shown in figure 1. The relation between flood discharge and drainage area for selected frequencies along the Apalachicola River is shown in figure 2. It is based on a log-Pearson Type III distribution of annual peaks at Chattahoochee (site A) and near Blountstown (site B). Records were insufficient at Wewahitchka (site C) and near Sumatra (site D) to develop reliable frequency curves. Therefore, the flood discharges, shown in figure 2, for Wewahitchka are based on a relation between drainage area and flood discharge at Blountstown. Flood discharges for Sumatra are based on a relation between the combined flood discharges of Blountstown and the Chipola River (map No. 154) and drainage area. Figure 2 shows a decrease in discharge between Chattahoochee and the downstream stations at Blountstown and Wewahitchka with a slight increase in discharge at Sumatra. This is attributed to (1) the increasing width of the flood plain in the downstream direction allowing increased flood storage, and (2) no major tributaries entering the Apalachicola River below Chattahoochee except the Chipola River, whose confluence is about 8 miles above Sumatra.

ACCURACY OF THE REGRESSION MODELS

The reliability of the regression model can be expressed in two ways: (1) the standard error of estimate (in percent); and (2) equivalent years of record (in years).

The standard error of estimate is the standard deviation of the distribution of residuals about the regression line. This means that 68 percent of the values estimated are within one standard error and 95 percent are within two standard errors of the observed values. Tables 1 to 3 give the standard error by region for the selected recurrence intervals.

The second method used to indicate reliability is called equivalent years of record and is defined as an estimate of the number of years of actual streamflow record required at a site to obtain an accuracy equivalent to the standard error of estimate (Hardison, 1971). Table 4 gives the accuracy in equivalent years of record and, for example, in Region A, the 100-year flood, estimated from the regression equation, would have the equivalent accuracy obtained from 8 years of actual record.

RISK OF FLOOD OCCURRENCE

Although a structure such as a bridge or culvert is designed for a specified flood magnitude, it does not preclude a rare event occurring during the lifetime of the structure. Risk, as defined by the U.S. Water Resources Council (1977), is "***the probability that one or more events will exceed a given flood magnitude within a specified period of years." An estimate of the risk of the probability of exceedance during time periods greater than 1 year is given in table 5 and is computed by the following equation:

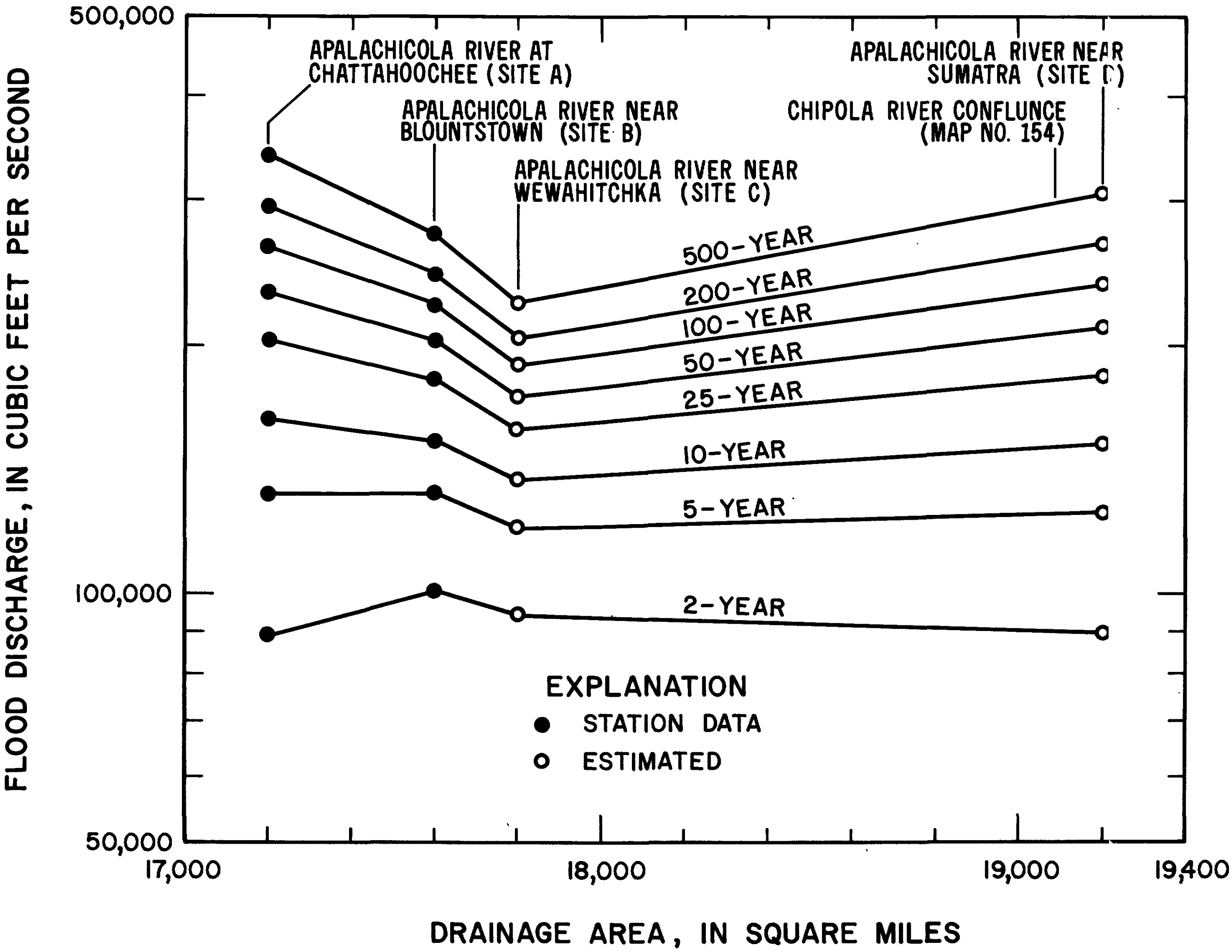

Figure 2.--Relation of flood discharge to drainage area for selected frequencies on the Apalachicola River.

Table 4.--Accuracy of regional flood relations in equivalent years of record

Recurrence interval T, in years	Exceedance probability	Accuracy in equivalent years		
		Region A	Region B	Region C
2	0.5	4	2	3
5	.2	5	3	4
10	.1	6	3	5
25	.04	7	5	6
50	.02	7	5	6
100	.01	8	6	6
200	.005	8	7	6
500	.002	9	8	6

Table 5.--Probability that a flood of given recurrence interval will be exceeded during indicated time period

Recurrence interval (years)	Period of time, in years					
	1	5	10	25	50	100
5	.20	[1]0.67	0.89	([2])	([2])	([2])
10	.10	.41	.65	.93	([2])	([2])
25	.04	.18	.34	.64	.87	.98
50	.02	.10	.18	.40	.64	.87
100	.01	.05	.10	.22	.40	.63

[1]Multiply probability values by 100 to obtain percent chance of exceedance.
[2]Probability greater than 0.99, but less than 1.00.

$$P_n = 1 - (1 - {}^1/T)^n \qquad (6)$$

where

P is the probability of at least one exceedance within the specified time interval;

n is the time period, in years;

T is the recurrence interval, in years.

An example would be: the 50-year flood has a 2 percent chance of exceedance in any 1-year period; an 18 percent chance of exceedance in any 10-year period; and a 64 percent chance of exceedance during any 50-year period.

APPLICATIONS OF TECHNIQUE

Improved Estimates at Gaged Sites

To compute flood estimates at gaged sites, the recommended procedure is to weight the station value with the regression value (U.S. Water Resources Council, 1977). Flood estimates from station frequency distributions tend to be independent of flood estimates from regional equations. Therefore, weighting the estimate is justified when the area of regionalization is large--radius of area more than 100 miles--(U.S. Water Resources Council, 1977) or the period of record is long when compared to the station record. To reduce the time sampling error, the gaged sites with short records need to reflect the long-term flood characteristics of hydrologically similar basins. Equation 7 can be used to compute the weighted average flood estimate.

$$\text{Log } Q_{wt} = \frac{N \log Q_g + EY \log Q_r}{N + EY} \qquad (7)$$

where

Q_{wt} = Weighted estimate of the T-year flood at gaged site, in cubic feet per second;

Q_g = T-year flood estimate from log-Pearson Type III frequency distribution of annual peaks at gaged site, in cubic feet per second;

Q_r = Regional flood estimate for the gaged site, computed from equation 3, 4, or 5, or from table 6, in cubic feet per second;

N = The number of annual peaks used to compute Q_g, in years;

EY = Accuracy of the regional flood estimate, in equivalent years from table 4.

For each of the 182 gaged sites used in the regression analysis, table 6 lists the T-year flood computed by the log-Pearson Type III distribution, the regional regression equations, and by the weighted station and regression values. At gaged sites, the weighted estimate is considered to be the best estimate for design purposes. Systematic records are annual peak flow records collected either by continuous recorder or periodic observations of a crest-stage gage for the number of years shown in table 6. The years of historic record shown in table 6 include the systematic record period as well as the intervening years to major flood events which have occurred either before or after the systematic record.

Ungaged Sites

Flood estimates at ungaged sites are determined by direct application of the regression equations. The procedure is illustrated as follows:

1. For example--determine the 50-year flood for Hurricane Creek at the mouth at U.S. Highway 90 near Quincy. The drainage basin is in Region C (fig. 1).

2. The contributing drainage area, planimetered from U.S. Geological Survey quadrangle maps, is 12.8 square miles. The slope is 15.4 feet per mile. The lake area is 0.05 percent of the drainage area.

3. The equation for the 50-year flood in Region C (table 3) is

$$Q_{ru} = 291 \times DA^{0.900} \times SL^{0.626} \times (LK + 3.0)^{-1.48}$$

$$Q_{50} = 291\ (12.8)^{0.900}\ (15.4)^{0.626}\ (0.05 + 3.0)^{-1.48}$$

$$Q_{50} = 3{,}070 \text{ cubic feet per second}$$

Ungaged Site on Gaged Stream

If an ungaged site is near a gaged site on the same stream, the flood estimate can be improved by using a weighted value of the ratio of the weighted and regional estimate at the gaged site to adjust the regional estimate at the ungaged site. This estimate transfers the flood characteristics determined at the gaged site to the ungaged site on the same stream. The following procedure is suggested (Hannum, 1976) when the drainage area ratio at the ungaged site is more than half, but less than twice the drainage area of the gaged site.

$$\text{Ratio} = A_g/A_u = \text{Area gaged site}/\text{Area ungaged site} \quad (>0.5-<2.0).$$

Table 6.--A comparison of station, regional, and weighted T-year flood estimates

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi²	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
1	2228500	36	--	160	0.16	0.17	1,530	2,980	4,210	6,060	7,660	9,440	11,400	14,400
	North Prong St. Marys River						1,670	3,040	4,140	5,760	7,120	8,630	10,500	13,000
	at Moniac, Ga.						1,540	2,990	4,200	6,010	7,570	9,290	11,200	14,100
2	2229000	13	--	125	2.53	2.40	1,080	1,820	2,370	3,140	3,750	4,390	5,070	6,030
	Middle Prong St. Marys						1,190	2,210	3,030	4,240	5,250	6,360	7,570	9,330
	River at Taylor						1,110	1,920	2,830	3,490	4,220	5,060	5,910	7,210
3	2230000	23	--	19.9	5.26	.10	790	1,260	1,610	2,070	2,430	2,810	3,200	3,740
	Turkey Creek at Macclenny						564	1,080	1,490	2,100	2,590	3,140	3,750	4,620
							752	1,230	1,580	2,080	2,470	2,890	3,330	3,970
4	2230500	22	25	156	2.69	.94	2,040	4,030	5,700	8,210	10,400	12,800	15,400	19,300
	South Prong St. Marys						1,840	3,340	4,550	6,300	7,750	9,350	11,100	13,600
	River at Glen St. Mary						2,010	3,890	5,430	7,700	9,690	11,800	14,100	17,400
5	2231000	52	--	700	2.56	.26	5,980	12,300	17,800	26,400	33,900	42,500	52,300	67,000
	St. Marys River near						6,590	11,300	14,900	20,300	24,700	29,500	34,400	41,800
	Macclenny						6,020	12,200	17,500	25,600	32,700	40,500	49,500	62,500
6	[1]2231230	10	--	9.36	13.4	0	478	882	1,170	1,510	1,750	1,960	2,140	2,390
	Pigeon Creek at Boulogne						420	812	1,130	1,590	1,960	2,370	2,790	3,430
							461	858	1,150	1,540	1,830	2,130	2,410	2,840
7	[2]2231250	18	--	19.8	9.88	0	754	1,290	1,710	2,280	2,750	3,240	3,760	4,500
	Little St. Marys River						682	1,290	1,780	2,490	3,070	3,690	4,350	5,330
	near Hilliard						740	1,290	1,730	2,340	2,840	3,370	3,930	4,760
8	2231280	13	--	29.9	7.54	0	868	1,800	2,600	3,850	4,930	6,150	7,520	9,570
	Thomas Creek near Crawford						867	1,620	2,230	3,100	3,820	4,600	5,430	6,660
							868	1,750	2,480	3,570	4,510	5,510	6,640	8,250

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
9	2231600	25	--	248	2.59	0.27	2,650	6,010	9,120	14,100	18,700	24,000	30,100	39,400
	Jane Green Creek near						3,010	5,330	7,170	9,850	12,100	14,500	17,100	20,900
	Deer Park						2,700	5,890	8,710	13,000	17,000	21,200	26,200	33,300
10	2232000	38	--	968	.15	3.90	3,210	6,710	9,790	14,500	18,700	23,400	28,600	36,500
	St. Johns River near						3,480	6,180	8,340	11,500	14,200	17,200	20,500	25,300
	Melbourne						3,230	6,650	9,580	14,000	17,900	22,200	27,000	34,100
11	2232200	22	--	25.7	6.83	.23	995	2,220	3,350	5,160	6,800	8,690	10,800	14,200
	Wolf Creek near Dear Park						710	1,340	1,850	2,590	3,200	3,850	4,570	5,610
							945	2,020	2,950	4,370	5,670	6,990	8,590	10,800
12	2232400	25	--	1,331	.18	4.85	3,410	5,650	7,310	9,580	11,400	13,300	15,300	18,100
	St. Johns River near Cocoa						3,990	7,050	9,500	13,100	16,200	19,600	23,300	28,600
							3,480	5,860	7,690	10,300	12,300	14,600	16,900	20,400
13	[2]2232450	19	--	22.7	6.14	.44	615	1,340	1,990	3,030	3,950	5,010	6,210	8,040
	Jim Creek near Christmas						597	1,140	1,580	2,210	2,740	3,310	3,930	4,840
							612	1,300	1,880	2,780	3,580	4,430	5,420	6,830
14	2232500	44	--	1,539	.18	4.93	4,080	7,170	9,510	12,700	15,300	18,000	20,800	24,700
	St. Johns River near						4,420	7,770	10,500	14,400	17,800	21,500	25,500	31,300
	Christmas						4,110	7,230	9,620	12,900	15,600	18,500	21,500	25,700
15	[1]2233102	10	--	1.83	3.90	.54	88	189	269	379	464	552	630	747
	Econlockatchee River						77	161	232	337	424	521	644	808
	tributary near Bithlo						85	179	254	361	447	538	636	775
16	2233200	19	--	27.1	3.73	3.84	385	837	1,240	1,890	2,460	3,120	3,870	5,010
	Little Econlockhatchee River						344	676	950	1,360	1,700	2,070	2,480	3,080
	near Union Park						378	801	1,160	1,730	2,230	2,760	3,390	4,280

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
17	2233500	43	--	241	2.00	1.46	2,490	4,600	6,330	8,890	11,100	13,500	16,100	20,000
	Econlockhatchee River near						2,140	3,860	5,240	7,260	8,950	10,800	12,800	15,800
	Chuluota						2,460	4,520	6,190	8,640	10,800	13,000	15,500	19,200
18	2236000	45	--	3,066	.18	6.07	7,200	10,600	12,900	15,900	18,200	20,500	22,800	25,900
	St. Johns River near DeLand						6,690	11,600	15,400	21,200	26,000	31,400	36,900	45,300
							7,160	10,700	13,200	16,500	19,100	21,900	24,500	28,400
19	[2]2236120	15	--	35.4	3.00	4.35	236	522	783	1,200	1,570	2,000	2,500	3,250
	Deep Creek near Barberville						375	734	1,030	1,470	1,840	2,250	2,700	3,360
							260	568	846	1,280	1,650	2,080	2,570	3,290
20	2236500	20	--	68	.75	4.64	91	208	318	498	664	857	1,080	1,430
	Big Creek near Clermont						431	840	1,180	1,690	2,120	2,600	3,190	4,000
							118	275	430	684	897	1,180	1,470	1,970
21	2239000	38	--	1,018	.91	19.04	908	1,430	1,790	2,250	2,600	2,940	3,290	3,750
	Oklawaha River near Ocala						1,430	2,660	3,680	5,210	6,520	7,980	9,510	11,800
							948	1,540	1,970	2,560	3,000	3,500	3,960	4,670
22	2240000	15	--	1,196	.91	17.85	1,930	2,540	2,920	3,380	3,710	4,030	4,340	4,760
	Oklawaha River near Conner						1,690	3,120	4,300	6,070	7,580	9,260	11,000	13,700
							1,890	2,670	3,260	4,070	4,660	5,380	6,000	7,080
23	2240500	12	--	1,367	.87	14.49	3,020	4,320	5,190	6,290	7,110	7,940	8,760	9,870
	Oklawaha River at Eureka						2,140	3,910	5,360	7,530	9,380	11,400	13,600	16,800
							2,770	4,200	5,250	6,720	7,870	9,180	10,400	12,400
24	[2]2240950	20	--	18.5	23.53	.55	583	955	1,230	1,610	1,910	2,220	2,550	3,010
	Hogtown Creek near						715	1,350	1,860	2,590	3,180	3,820	4,420	5,380
	Gainesville						603	1,020	1,350	1,820	2,180	2,590	2,980	3,600
25	[1]2241800	7	--	2.79	14.8	.36	253	502	671	880	1,040	1,200	1,330	1,510
	Lochloosa Creek near Melrose						158	319	452	646	805	977	1,170	1,440
							213	416	559	754	915	1,080	1,240	1,470

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
26	[2]2241900	21	--	37.4	6.33	6.57	416	846	1,220	1,790	2,280	2,830	3,450	4,370
	Lochloosa Creek at						386	756	1,060	1,510	1,890	2,300	2,720	3,370
	Grove Park						411	828	1,180	1,720	2,180	2,670	3,230	4,040
27	2243000	18	--	470	2.00	13.08	538	1,130	1,640	2,450	3,150	3,950	4,840	6,190
	Orange Creek at Orange						1,270	2,360	3,270	4,610	5,740	7,000	8,260	10,200
	Springs						629	1,330	1,950	2,920	3,730	4,710	5,700	7,310
28	2243500	22	--	2,010	.85	14.24	3,790	5,530	6,710	8,220	9,360	10,500	11,700	13,200
	Oklawaha River near						2,900	5,220	7,120	9,960	12,400	15,000	17,800	22,000
	Orange Springs						3,640	5,470	6,800	8,610	10,000	11,600	13,100	15,300
29	[1]2243530	7	--	4.63	11.60	2.80	166	367	526	738	889	1,040	1,170	1,360
	Bruntbridge Brook at						140	286	407	586	734	894	1,070	1,320
	Kenwood						156	331	467	658	808	959	1,120	1,340
30	2244000	25	--	2,100	.83	26.35	4,140	6,460	8,110	10,300	12,000	13,700	15,500	18,000
	Oklawaha River at Riverside						1,960	3,600	4,960	7,010	8,760	10,700	12,700	15,700
	Landing near Orange Springs						3,730	5,860	7,370	9,470	11,200	12,900	14,800	17,400
31	2244420	27	--	93	1.55	5.04	504	918	1,250	1,720	2,110	2,530	2,980	3,630
	Little Haw Creek near						606	1,160	1,620	2,310	2,880	3,520	4,260	5,290
	near Seville						516	952	1,310	1,830	2,250	2,730	3,230	3,990
32	[1]2245300	11	--	8.81	23.30	0	400	800	1,090	1,440	1,680	1,930	2,130	2,400
	Clarkes Creek near Green						466	895	1,240	1,740	2,140	2,570	3,000	3,670
	Cove Springs						417	829	1,140	1,550	1,850	2,180	2,460	2,910
33	[2]2245400	20	--	34.8	17.13	3.73	482	1,090	1,650	2,550	3,370	4,310	5,400	7,070
	South Fork Black Creek						662	1,260	1,740	2,450	3,030	3,650	4,220	5,160
	near Camp Blanding						508	1,120	1,670	2,520	3,280	4,110	5,030	6,410

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
34	[2]2245470	21	--	14.9	9.31	0.01	598	1,280	1,880	2,830	3,660	4,620	5,690	7,320
	Greens Creek near						540	1,030	1,430	2,010	2,480	2,990	3,540	4,350
	Penney Farms						588	1,230	1,770	2,600	3,320	4,100	4,990	6,260
35	2245500	39	--	134	7.98	16.40	2,970	6,140	8,930	13,200	17,000	21,300	26,200	33,500
	South Fork Back Creek						2,280	4,100	5,530	7,610	9,310	11,100	12,900	15,700
	near Penney Farms						2,890	5,860	8,380	12,100	15,500	19,100	23,200	29,100
36	[2]2245900	21	--	21.9	7.55	.04	796	1,390	1,860	2,510	3,030	3,600	4,200	5,060
	Yellow Water Creek						678	1,280	1,770	2,480	3,060	3,690	4,360	5,360
	near Maxville						776	1,370	1,840	2,500	3,040	3,620	4,240	5,150
37	2246000	47	60	177	5.22	1.47	3,780	7,180	9,890	13,700	16,900	20,300	23,800	28,900
	North Fork Black Creek						2,190	3,940	5,340	7,360	9,040	10,900	12,700	15,500
	near Middleburg						3,620	6,780	9,220	12,600	15,600	18,500	21,700	26,100
38	[1]2246150	15	--	13.6	8.70	.14	345	749	1,060	1,450	1,720	1,990	2,260	2,890
	Big Davis Creek at						479	921	1,280	1,800	2,220	2,690	3,190	3,920
	Bayard						370	789	1,120	1,550	1,870	2,210	2,550	3,240
39	[2]2246200	18	--	36.7	2.02	.31	617	1,500	2,370	3,830	5,190	6,810	8,710	11,700
	Durbin Creek near						657	1,250	1,730	2,430	3,020	3,670	4,450	5,510
	Durbin						624	1,440	2,190	3,370	4,460	5,630	7,080	9,100
40	2246300	13	--	30.9	2.41	.26	816	1,340	1,740	2,270	2,700	3,140	3,600	4,250
	Ortega River near						612	1,170	1,620	2,280	2,830	3,430	4,150	5,140
	Jacksonville						763	1,290	1,700	2,270	2,740	3,250	3,800	4,590
41	[2]2246600	18	--	20.9	10.11	.06	425	791	1,090	1,520	1,880	2,270	2,690	3,310
	Trout River at Dinsmore						704	1,330	1,830	2,560	3,160	3,800	4,470	5,480
							466	886	1,240	1,760	2,170	2,660	3,140	3,920

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
42	2246900	17	--	19.8	2.18	0.70	343	768	1,160	1,790	2,350	3,010	3,760	4,910
	Moultrie Creek at SR 207						385	749	1,050	1,490	1,860	2,260	2,760	3,430
	near St. Augustine						351	764	1,130	1,700	2,200	2,750	3,410	4,340
43	2247000	25	--	20.8	2.43	.60	504	1,010	1,450	2,110	2,690	3,330	4,040	5,090
	Moultrie Creek near						420	815	1,140	1,610	2,010	2,450	2,970	3,690
	St. Augustine						491	975	1,380	1,990	2,520	3,090	3,750	4,670
44	[1]2247200	17	--	4.62	1.80	.22	123	272	391	552	684	830	1,500	2,020
	Fish Swamp Outlet near						136	277	395	571	717	881	1,090	1,380
	Summer Haven						125	273	392	557	693	846	1,350	1,770
45	2247510	14	--	76.8	2.20	.42	680	1,370	1,970	2,870	3,650	4,520	5,490	6,930
	Tomoka River near						1,140	2,120	2,910	4,060	5,010	6,060	7,280	8,980
	Holly Hill						763	1,540	2,210	3,220	4,060	5,030	6,080	7,670
46	[2]2247600	17	--	10.0	2.00	.11	145	263	356	491	602	722	852	1,040
	Little Tomoka River						258	511	719	1,030	1,280	1,570	1,930	2,410
	near Ormond Beach						162	306	428	609	750	926	1,110	1,390
47	2248000	27	--	33.4	.60	.82	506	732	884	1,080	1,220	1,370	1,520	1,710
	Spruce Creek near Samsula						439	851	1,190	1,690	2,120	2,590	3,200	4,000
							497	749	933	1,180	1,370	1,580	1,800	2,110
48	2249500	17	--	12.6	.60	4.67	247	447	604	831	1,020	1,220	1,440	1,750
	Crane Creek at Melbourne						120	248	357	521	661	819	1,020	1,290
							215	391	527	725	899	1,070	1,290	1,570
49	2256000	11	--	188	1.32	.11	2,060	3,570	4,730	6,350	7,680	9,090	10,600	12,800
	Fisheating Creek near						2,120	3,820	5,180	7,160	8,820	10,600	12,800	15,800
	Venus						2,080	3,650	4,880	6,650	8,100	9,700	11,500	14,100

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
50	2256500	47	--	311	1.33	0.15	3,290	6,740	9,730	14,300	18,300	22,800	27,800	35,400
	Fisheating Creek at						3,080	5,450	7,340	10,100	12,400	14,900	17,800	21,900
	Palmdale						3,270	6,600	9,420	13,700	17,400	21,400	26,100	32,800
51	2261500	17	--	111	.29	28.16	267	534	760	1,100	1,400	1,730	2,090	2,640
	Myrtle-Mary Jane Canal						202	412	592	868	1,100	1,370	1,680	2,110
	near Narcoossee						253	503	712	1,030	1,300	1,600	1,950	2,440
52	2262900	19	--	83.6	2.04	8.79	453	969	1,430	2,150	2,800	3,530	4,360	5,630
	Boggy Creek near Taft						443	865	1,220	1,740	2,180	2,670	3,210	4,000
							451	946	1,380	2,030	2,620	3,250	3,980	5,040
53	2263500	18	--	308	.31	22.78	456	1,070	1,660	2,640	3,540	4,600	5,830	7,760
	St. Cloud Canal at						508	994	1,400	2,020	2,550	3,150	3,800	4,760
	S-59 near St. Cloud						465	1,050	1,590	2,450	3,230	4,090	5,110	6,590
54	2263800	20	--	89.2	1.78	6.72	511	980	1,370	1,940	2,430	2,970	3,570	4,430
	Shingle Creek at						523	1,010	1,420	2,020	2,530	3,100	3,730	4,640
	Airport, near Kissimmee						513	986	1,380	1,960	2,460	3,010	3,620	4,490
55	2264000	33	--	30.3	.41	27.55	30	87	149	261	372	509	675	946
	Cypress Creek at Vineland						77	164	240	356	457	571	708	899
							33	95	160	276	386	521	681	936
56	2265000	16	--	620	.29	19.42	789	2,260	3,870	6,830	9,810	13,500	18,200	25,800
	South Port Canal at						965	1,830	2,550	3,640	4,560	5,600	6,710	8,350
	S-61 near St. Cloud						821	2,150	3,450	5,640	7,770	10,100	13,100	17,200
57	2266300	17	19	75	3.60	9.92	355	662	913	1,280	1,590	1,920	2,290	2,830
	Reedy Creek near						441	862	1,210	1,730	2,170	2,650	3,150	3,900
	Vineland						370	703	983	1,400	1,740	2,130	2,540	3,160

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
58	2269000	36	--	1,607	0.21	17.18	2,310	4,660	6,640	9,620	12,200	15,000	18,100	22,600
	Kissimmee River below						2,160	3,940	5,410	7,610	9,480	11,600	13,700	17,000
	Lake Kissimmee						2,290	4,570	6,450	9,260	11,700	14,300	17,200	21,300
59	[1]2269720	8	--	13.9	6.40	1.07	872	1,590	2,090	2,740	3,240	3,790	4,240	4,930
	Morgan Hole Creek						364	710	993	1,410	1,750	2,120	2,540	3,130
	near Avon Park						652	1,170	1,520	2,010	2,430	2,830	3,280	3,880
60	2270500	39	--	379	1.40	8.99	1,750	3,430	4,850	6,970	8,780	10,800	13,000	16,300
	Arbuckle Creek near						1,240	2,310	3,190	4,500	5,600	6,830	8,140	10,100
	DeSoto City						1,690	3,280	4,590	6,520	8,200	9,990	12,000	14,900
61	2271500	29	--	109	3.81	19.32	379	734	1,030	1,470	1,840	2,250	2,710	3,370
	Josephine Creek near						383	756	1,070	1,540	1,930	2,370	2,800	3,480
	DeSoto City						379	737	1,040	1,480	1,860	2,280	2,730	3,400
62	2273000	34	--	2,899	.26	13.49	4,930	10,100	14,400	21,000	26,600	32,800	39,600	49,700
	Kissimmee River at						3,960	7,040	9,540	13,300	16,400	19,900	23,500	28,900
	S65E near Okeechobee						4,820	9,640	13,500	19,400	24,500	29,800	35,900	44,400
63	2276984	14	--	6.20	1.68	.01	199	377	524	739	920	1,120	1,340	1,650
	Monreve Ranch Drainage						176	355	503	723	907	1,110	1,380	1,730
	Canal near Stuart						194	371	518	734	916	1,120	1,350	1,680
64	[2]2293050	18	--	70	4.00	3.37	599	1,120	1,550	2,190	2,730	3,330	3,980	4,940
	Orange River at Buckingham						760	1,440	1,995	2,810	3,490	4,230	5,020	6,190
	near Fort Myers						625	1,180	1,650	2,350	2,920	3,580	4,270	5,330
65	[1]2293390	8	--	8.46	3.55	9.69	220	422	602	875	1,100	1,340	1,590	2,000
	North Prong Alligator						86	180	261	383	486	600	730	918
	Creek near Punta Gorda						161	304	421	595	751	897	1,080	1,320

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region A													
66	[2]2293400	13	--	31.1	2.46	5.31	645	1,290	1,850	2,710	3,460	4,300	5,250	6,680
	Alligator Creek near						292	579	818	1,180	1,470	1,810	2,200	2,730
	Punta Gorda						535	1,030	1,430	2,030	2,560	3,090	3,770	4,630
67	2293986	24	44	160	1.26	12.79	549	989	1,350	1,880	2,340	2,850	3,410	4,240
	Peace Creek Drainage						503	979	1,380	1,970	2,480	3,050	3,680	4,590
	Canal near Alturus						542	987	1,360	1,900	2,370	2,900	3,480	4,330
68	2294650	39	--	390	1.25	13.28	978	1,740	2,350	3,240	3,990	4,810	5,700	7,010
	Peace River at Bartow						960	1,820	2,520	3,580	4,490	5,490	6,560	8,140
							976	1,750	2,370	3,290	4,060	4,920	5,840	7,210
69	[1]2295435	8	--	5.31	12.20	0	313	607	854	1,230	1,540	1,890	2,240	2,820
	Hog Branch near Wauchula						267	527	738	1,050	1,300	1,570	1,870	2,310
							297	575	802	1,140	1,420	1,720	2,050	2,540
70	2295637	46	--	826	1.38	7.15	4,830	8,370	11,300	15,600	19,400	23,600	28,400	35,600
	Peace River at						2,540	4,580	6,240	8,690	10,800	13,000	15,400	19,000
	Zolfo Springs						4,590	7,890	10,600	14,400	18,000	21,600	25,900	32,100
71	2296500	28	--	330	1.68	.10	2,310	3,840	4,990	6,590	7,890	9,260	10,700	12,800
	Charlie Creek near						3,470	6,110	8,200	11,300	13,800	16,600	19,700	24,100
	Gardner						2,430	4,120	5,450	7,340	8,820	10,500	12,300	14,900
72	2296750	47	57	1,367	1.30	4.35	7,320	12,500	17,000	23,800	29,900	36,900	45,100	57,700
	Peace River at Arcadia						4,740	8,300	11,100	15,300	18,800	22,700	26,700	32,800
							7,070	12,000	16,200	22,500	28,200	34,400	41,800	52,700
73	2297100	28	--	132	4.06	.14	1,920	3,570	4,930	6,950	8,660	10,500	12,600	15,700
	Joshua Creek near Nocatee						2,180	3,910	5,290	7,280	8,930	10,700	12,600	15,400
							1,950	3,620	4,990	7,010	8,710	10,500	12,600	15,600

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region A													
74	2297310	28	--	218	2.79	0.12	2,230	3,580	4,580	5,930	7,000	11,300	13,500	16,600
	Horse Creek near Arcadia						2,890	5,130	6,910	9,480	11,600	13,900	16,400	20,100
							2,300	3,780	4,920	6,510	7,740	11,800	14,100	17,400
75	2298202	13	--	373	2.44	1.00	2,230	3,580	4,580	5,930	7,000	8,130	9,310	11,000
	Shell Creek near						3,430	6,050	8,130	11,200	13,700	16,400	19,300	23,600
	Punta Gorda						2,470	4,140	5,490	7,430	8,850	10,600	12,300	15,000
76	[1]2298482	8	--	3.18	8.04	0	114	242	358	531	661	792	944	1,160
	Johnson Creek near						162	327	463	663	827	1,010	1,220	1,510
	Myakka Head						128	272	400	589	735	894	1,070	1,330
77	2298830	42	--	229	2.14	1.81	2,080	3,490	4,590	6,160	7,470	8,890	10,400	12,700
	Myakka River near Sarasota						1,970	3,580	4,860	6,750	8,320	10,000	11,900	14,700
							2,070	3,500	4,620	6,240	7,590	9,060	10,600	13,000
78	[2]2299800	19	--	45.1	3.24	5.79	849	2,080	3,310	5,420	7,440	9,900	12,800	17,600
	Phillippi Creek at						398	779	1,090	1,560	1,950	2,390	2,860	3,550
	Sarasota						744	1,700	2,540	3,880	5,190	6,500	8,210	10,500
79	2299950	12	--	65.3	5.83	.17	1,860	2,310	2,580	2,900	3,130	3,350	3,560	3,830
	Manatee River near						1,400	2,560	3,490	4,830	5,940	7,140	8,390	10,300
	Mayakka Head						1,730	2,380	2,850	3,500	3,960	4,530	5,020	5,850
80	2300000	27	--	87.1	4.93	.22	2,410	4,520	6,260	8,840	11,000	13,400	16,100	20,100
	Manatee River near						1,640	2,990	4,060	5,610	6,890	8,280	9,740	11,900
	Bradenton						2,290	4,240	5,790	8,050	9,990	12,000	14,400	17,600
81	2300100	15	--	32.9	5.77	.34	713	1,070	1,320	1,660	1,910	2,170	2,440	2,810
	Little Manatee River						795	1,500	2,100	2,880	3,560	4,290	5,090	6,260
	near Fort Lonesome						730	1,160	1,510	1,980	2,330	2,750	3,150	3,790

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region A													
82	[2]2300200	16	--	9.40	5.76	0.12	215	453	667	1,000	1,300	1,650	2,040	2,640
	South Fork Little Manatee						326	638	893	1,260	1,570	1,910	2,290	2,840
	River near Duette						234	491	722	1,070	1,380	1,730	2,120	2,710
83	2300500	39	--	150	5.03	.40	2,740	5,160	7,190	10,200	12,900	15,900	19,200	24,200
	Little Manatee River						2,380	4,270	5,760	7,920	9,690	11,600	13,600	16,600
	near Wimauma						2,700	5,050	6,980	9,810	12,400	15,100	18,100	22,500
84	[2]2300700	18	--	29.1	7.01	.61	1,160	2,600	3,950	6,170	8,220	10,600	13,400	17,800
	Bullfrog Creek near						720	1,360	1,870	2,620	3,240	3,910	4,620	5,680
	Wimauma						1,060	2,260	3,280	4,850	6,330	7,800	9,660	12,200
85	2301000	28	--	135	4.96	3.09	1,450	2,830	3,990	5,760	7,290	9,000	10,900	13,800
	North Prong Alafia River						1,370	2,530	3,460	4,830	5,960	7,190	8,420	10,300
	near Keysville						1,440	2,780	3,890	5,560	7,000	8,560	10,300	12,900
86	2301300	15	--	107	4.17	3.00	825	1,510	2,070	2,890	3,580	4,330	5,150	6,350
	South Prong Alafia River						1,110	2,070	2,840	3,980	4,920	5,950	7,020	8,630
	near Lithia						878	1,630	2,270	3,200	3,960	4,840	5,740	7,120
87	[1]2301314	9	--	3.69	24.20	0	163	245	320	440	526	604	707	869
	Mizelle Creek near						244	482	676	958	1,190	1,430	1,680	2,070
	Keysville						185	312	432	618	752	906	1,060	1,340
88	2301500	46	--	335	3.45	1.16	3,060	6,580	10,000	15,900	21,700	28,800	37,500	52,000
	Alafia River at Lithia						3,360	5,940	7,980	10,900	13,400	16,100	18,800	22,900
							3,080	6,510	9,740	15,100	20,400	26,400	33,900	45,500
89	2301800	18	--	28.0	2.07	.99	567	932	1,210	1,580	1,890	2,210	2,550	3,040
	Sixmile Creek at						464	897	1,250	1,770	2,210	2,690	3,270	4,070
	Tampa						547	924	1,220	1,630	1,970	2,350	2,750	3,350

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
90	2301900	14	--	9.50	6.10	0.55	219	382	509	689	837	995	1,170	1,410
	Fox Branch near Socrum						301	591	829	1,180	1,470	1,780	2,140	2,650
							235	428	589	824	1,010	1,230	1,460	1,800
91	2302500	27	--	110	3.52	2.58	1,130	1,720	2,150	2,720	3,160	3,610	4,090	4,740
	Blackwater Creek near						1,150	2,140	2,930	4,100	5,080	6,140	7,270	8,940
	Knights						1,130	1,780	2,270	2,960	3,480	4,080	4,660	5,550
92	2303000	39	--	220	3.87	1.81	2,150	3,750	5,020	6,880	8,430	10,100	12,000	14,700
	Hillsborough River						2,240	4,040	5,480	7,570	9,300	11,200	13,100	16,000
	near Zephyrhills						2,160	3,780	5,080	6,980	8,560	10,300	12,200	14,900
93	2303100	11	--	15.0	9.80	4.42	156	232	284	351	403	456	510	584
	New River near						267	530	748	1,070	1,330	1,620	1,920	2,370
	Zephyrhills						180	300	400	541	641	778	891	1,100
94	[1]2303358	10	--	7.11	6.80	1.96	457	912	1,280	1,780	2,180	2,630	3,020	3,640
	Cypress Creek near						190	383	542	777	972	1,185	1,420	1,770
	Darby						356	683	927	1,270	1,560	1,850	2,160	2,590
95	2303400	15	--	56.0	4.60	6.00	146	307	450	676	877	1,110	1,370	1,770
	Cypress Creek near						505	978	1,370	1,940	2,420	2,950	3,490	4,320
	San Antonio						190	410	619	945	1,210	1,560	1,900	2,470
96	2303420	13	--	117	2.65	6.00	482	829	1,100	1,480	1,790	2,120	2,480	2,990
	Cypress Creek at						760	1,450	2,010	2,840	3,540	4,310	5,130	6,340
	Worthington Gardens						537	968	1,330	1,860	2,270	2,780	3,270	4,070
97	2303800	14	19	160	2.10	7.00	588	1,100	1,510	2,130	2,660	3,240	3,870	4,810
	Cypress Creek near						832	1,580	2,190	3,100	3,860	4,710	5,610	6,950
	Sulphur Springs						635	1,210	1,690	2,410	3,010	3,710	4,430	5,560

[1] Rainfall-runoff gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi²	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region A								
98	2307000	25	--	35.0	4.12	3.74	423	893	1,320	1,990	2,600	3,290	4,090	5,330
	Rocky Creek near						434	843	1,180	1,680	2,090	2,550	3,040	3,770
	Sulphur Springs						425	884	1,290	1,920	2,480	3,090	3,810	4,860
99	2307359	28	--	30.0	2.81	6.02	219	483	729	1,130	1,500	1,930	2,440	3,230
	Brooker Creek near						276	549	776	1,120	1,400	1,720	2,070	2,580
	Tarpon Springs						225	492	737	1,130	1,480	1,880	2,350	3,060
100	2307697	23	--	9.00	9.64	2.67	171	352	512	764	990	1,250	1,540	1,990
	Alligator Creek at						224	448	633	905	1,130	1,370	1,630	2,020
	Safety Harbor						178	367	535	795	1,020	1,280	1,560	2,000
101	2308889	22	--	14.0	1.71	4.33	191	328	434	585	710	844	989	1,200
	Seminole Lake Outlet						160	329	466	676	853	1,050	1,290	1,620
	near Largo						186	328	441	606	742	895	1,060	1,310
102	2310000	34	--	72.5	3.54	3.20	908	1,810	2,600	3,810	4,880	6,090	7,460	9,520
	Anclote River near Elfers						772	1,460	2,020	2,850	3,540	4,290	5,110	6,300
							893	1,760	2,500	3,630	4,620	5,700	6,940	8,730
						Region B								
103	2310240	15	--	43.0	3.60	10.20	66	172	282	478	670	907	1,190	1,670
	Jumping Gully at Loyce						138	291	424	632	817	1,100	1,260	1,620
							72	188	302	513	783	958	1,210	1,650
104	2310300	15	--	182	2.70	3.54	319	635	908	1,330	1,690	2,110	2,570	3,280
	Pithlachascotee River						612	1,220	1,740	2,520	3,210	4,260	4,790	6,060
	near New Port Richey						344	708	1,010	1,560	1,980	2,580	3,130	4,060

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Drainage area mi^2	Slope ft/mi	Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region B													
105	2310800	20	--	130	1.09	4.36	315	730	1,120	1,770	2,370	3,070	3,890	5,170
	Withlacoochee River						443	896	1,280	1,870	2,390	3,190	3,590	4,570
	near Eva						325	750	1,140	1,790	2,370	3,100	3,810	4,990
106	2312000	48	--	570	1.35	1.71	1,380	2,710	3,850	5,570	7,060	8,720	10,600	13,400
	Withlacoochee River						1,800	3,440	4,790	6,800	8,530	11,200	12,400	15,500
	at Trilby						1,390	2,750	3,900	5,680	7,190	8,970	10,800	13,700
107	2312200	20	--	145	1.75	4.40	381	841	1,260	1,940	2,550	3,260	4,080	5,330
	Little Withlacoochee River						474	954	1,360	1,980	2,530	3,360	3,790	4,810
	near Rerdell						389	855	1,270	1,950	2,550	3,280	4,000	5,180
108	2312500	39	--	810	1.24	2.40	1,590	3,050	4,250	6,050	7,570	9,250	11,100	13,800
	Withlacoochee River						1,960	3,680	5,070	7,130	8,890	11,600	12,400	16,000
	at Croom						1,610	3,090	4,300	6,160	7,710	9,530	11,300	14,200
109	2312640	15	--	40	2.10	6.27	94	148	187	239	280	323	367	428
	Jumper Creek Canal						170	361	528	790	1,020	1,390	1,580	2,040
	near Bushnell						101	172	222	322	387	490	584	737
110	2312720	13	--	1,520	1.80	3.31	1,480	2,110	2,540	3,080	3,490	3,900	4,310	4,860
	Withlacoochee River at						2,550	4,650	6,310	8,740	10,800	13,900	15,400	18,900
	Wysong Dam at Carlson						1,590	2,450	3,010	4,120	4,780	5,830	6,730	8,150
111	2313000	47	--	1,825	.86	4.95	2,340	3,920	5,100	6,740	8,060	9,450	10,900	13,000
	Withlacoochee River						2,360	4,260	5,740	7,900	9,720	12,500	13,700	16,900
	near Holder						2,340	3,940	5,140	6,840	8,210	9,750	11,200	13,500
112	[2]2313400	14	--	220	1.30	3.50	221	472	700	1,060	1,380	1,750	2,170	2,810
	Waccasassa River near						697	1,380	1,960	2,820	3,580	4,740	5,330	6,725
	Bronson						255	570	839	1,370	1,770	2,360	2,930	3,860

[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region B													
113	2314200	15	--	26.0	6.00	1.00	755	1,490	2,120	3,060	3,880	4,800	5,820	7,340
	Tenmile Creek at Lebanon						290	640	954	1,450	1,900	2,590	2,980	3,870
	Station						675	1,290	1,860	2,540	3,250	4,020	4,700	5,870
114	2315500	51	--	2,430	.57	.31	7,670	14,100	19,000	25,600	30,900	36,200	41,700	49,300
	Suwannee River at						7,870	14,300	19,400	26,800	33,100	42,600	46,800	57,500
	White Springs						7,680	14,100	19,000	25,700	31,100	36,800	42,300	50,300
115	2315550	18	--	2,630	.60	.37	8,110	13,800	18,200	24,300	29,300	34,500	40,100	48,000
	Suwannee River at						8,000	14,500	19,600	27,000	33,300	42,800	47,000	57,700
	Suwannee Springs						8,100	13,900	18,400	24,900	30,100	36,400	41,900	50,800
116	[2]2317630	13	31	1,720	1.80	0	6,360	11,000	14,600	19,600	23,700	28,100	32,800	39,400
	Alapaha River near Jasper						7,920	14,700	20,100	28,000	34,800	45,100	49,800	61,400
							6,550	11,600	15,500	21,600	26,400	32,600	38,000	46,700
117	2319000	47	51	2,120	1.51	.23	9,510	19,000	27,4300	40,100	51,400	64,200	78,700	101,000
	Withlacoochee River						7,580	13,900	18,900	26,200	32,400	41,700	45,900	56,500
	near Pinetta						9,420	18,600	26,700	38,500	49,200	61,100	73,400	92,800
118	2319500	51	--	6,970	.66	.27	18,500	32,800	44,000	60,000	73,100	87,200	102,000	124,000
	Suwannee River at						16,200	28,000	37,200	50,100	61,000	77,500	84,300	102,000
	Ellaville						18,400	32,500	43,600	59,000	71,900	86,100	99,700	121,000
119	[2]2320000	10	--	7,330	.61	.27	19,900	34,900	46,500	63,100	76,700	90,300	107,000	130,000
	Suwannee River at						16,700	28,900	38,300	51,600	62,700	79,600	86,600	105,000
	Luraville						19,300	33,400	44,500	59,000	71,700	86,700	98,100	118,000
120	2320500	47	51	7,880	.57	.30	16,400	27,400	35,700	47,200	56,600	66,500	77,000	92,000
	Suwannee River at						17,200	29,600	39,200	52,700	64,000	80,100	88,200	107,000
	Branford						16,400	27,500	35,900	47,700	57,300	68,000	78,400	94,000

[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region B													
121	2320700 Santa Fe River near Graham	21	--	94.9	1.54	13.26	511	1,070	1,560	2,320	2,990	3,750	4,600	5,880
							202	410	587	858	1,100	1,460	1,650	2,100
							471	949	1,380	1,920	2,470	3,040	3,560	4,430
122	2321000 New River near Lake Butler	22	--	191	2.95	.03	2,380	5,670	8,850	14,100	19,100	24,900	31,700	42,300
							1,820	3,700	5,330	7,800	9,980	13,300	15,000	19,000
							2,330	5,390	8,330	12,600	19,900	21,800	26,500	34,200
123	2321500 Santa Fe River at Worthington Springs	46	--	575	3.12	2.64	4,700	9,640	13,900	20,200	25,600	31,700	38,300	48,000
							1,500	2,900	3,960	5,600	7,020	9,190	10,200	12,800
							4,480	8,960	12,900	17,800	22,600	27,400	32,200	39,500
124	[2]2321600 Olustee Creek near Lulu	15	--	49.1	3.50	.04	857	1,780	2,600	3,860	4,960	6,220	7,630	9,750
							736	1,590	2,360	3,560	4,650	6,300	7,210	9,280
							842	1,750	2,560	3,780	4,880	6,240	7,490	9,580
125	[2]2321700 Swift Creek near Lake Butler	21	--	46.0	1.85	8.67	497	857	1,130	1,520	1,830	2,170	2,520	3,030
							157	331	482	718	928	1,250	1,430	1,830
							450	761	1,020	1,320	1,610	1,920	2,190	2,640
126	[2]2321800 Olustee Creek near Providence	11	--	163	5.00	.88	2,620	4,530	6,000	8,080	9,760	11,600	13,500	16,200
							1,010	2,060	2,960	4,320	5,530	7,360	8,310	10,500
							2,260	3,830	5,160	6,640	8,170	9,880	11,200	13,500
127	2322000 Santa Fee River near High Springs	41	--	868	2.33	1.90	3,460	7,260	10,500	15,500	19,800	24,600	29,900	37,800
							2,270	4,260	5,870	8,250	10,300	13,400	14,800	18,400
							3,390	7,000	10,100	14,500	18,400	22,800	27,000	33,600
128	2322500 Santa Fe River near Fort White	48	--	1,017	1.48	1.73	4,120	6,870	8,940	11,800	14,100	16,500	19,100	22,800
							2,620	4,890	6,720	9,410	11,700	15,200	16,800	20,900
							4,050	6,730	8,790	11,600	13,900	16,400	18,800	22,500

[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
	Region B													
129	2323000	25	29	9,390	0.55	0.49	17,100	28,000	36,100	47,300	56,300	65,800	76,000	90,300
	Suwannee River near Bell						17,300	29,600	38,900	52,100	63,000	79,700	86,400	104,000
							17,100	28,200	36,400	48,100	57,400	68,300	78,200	93,400
130	2323500	35	48	9,640	.51	.54	17,300	27,700	35,500	46,400	55,200	64,500	74,500	88,700
	Suwannee River near						17,200	29,300	38,500	51,500	62,300	78,700	85,300	103,000
	Wilcox						17,300	27,800	35,700	47,000	56,000	66,400	76,200	91,200
131	2324000	28	--	350	2.42	.53	2,000	3,970	5,650	8,230	10,500	13,000	15,900	20,200
	Steinhatchee River near						1,950	3,840	5,440	7,820	9,910	13,100	14,700	18,400
	Cross City						2,000	3,960	5,630	8,170	10,400	13,000	15,700	19,800
132	2324400	23	--	60.0	2.39	.04	422	922	1,380	2,120	2,800	3,580	4,490	5,890
	Fenholloway River						840	1,800	2,660	3,990	5,200	7,020	8,020	10,300
	near Foley						446	996	1,490	2,370	3,130	4,120	5,140	6,800
133	2324500	32	--	120	3.10	.37	637	1,390	2,080	3,220	4,260	5,490	6,920	9,160
	Fenholloway River at						1,050	2,170	3,150	4,650	5,980	8,000	9,070	11,500
	Foley						656	1,440	2,160	3,380	4,460	5,830	7,260	9,590
134	2326000	28	--	198	2.33	.85	571	1,180	1,720	2,550	3,300	4,150	5,110	6,570
	Econfina River near						1,160	2,350	3,360	4,890	6,230	8,280	9,330	11,800
	Perry						599	1,260	1,840	2,810	3,630	4,690	5,840	7,480
135	[1]2326261	8	--	13.9	8.70	1.07	248	529	751	1,060	1,310	1,560	1,790	2,130
	Little Aucilla River						187	424	642	990	1,310	1,800	2,080	2,720
	near Cherry Lake						234	498	720	1,030	1,310	1,660	1,920	2,410
136	[2]2326300	16	--	90.7	3.20	3.12	286	667	1,030	1,640	2,220	2,890	3,690	4,950
	Little Aucilla River						411	847	1,220	1,800	2,320	3,100	3,520	4,490
	near Greenville						298	693	1,060	1,680	2,240	2,950	3,640	4,790

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: System-atic	Years of record: His-toric	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region B								
137	2326500	28	--	747	2.31	3.00	1,890	4,190	6,310	9,730	12,800	16,400	20,600	27,000
	Aucilla River at						1,670	3,150	4,350	6,120	7,630	9,950	11,000	13,700
	Lamont						1,870	4,080	6,090	8,190	11,800	15,000	18,200	23,200
						Region C								
138	[1]2326598	9	--	2.54	42.60	0.80	319	652	910	1,250	1,520	1,790	2,025	2,380
	Caney Creek near						190	381	539	771	978	1,180	1,400	1,730
	Monticello						280	553	755	1,030	1,270	1,520	1,750	2,090
139	2326900	21	--	535	2.04	2.20	1,810	3,040	4,000	5,360	6,470	7,670	8,970	10,800
	St. Marks River near						3,770	5,770	7,250	9,460	11,300	13,000	15,500	18,500
	Newport						1,980	3,370	4,480	6,080	7,320	8,620	10,100	20,300
140	[2]2327050	14	--	51.1	5.20	.37	1,190	2,480	3,650	5,530	7,260	9,280	11,600	15,300
	Sopchoppy River near						1,100	1,980	2,680	3,740	4,660	5,640	6,740	8,310
	Arran						1,170	2,360	3,360	4,920	6,360	7,990	9,860	12,700
141	2327100	18	--	102	4.88	.18	2,030	3,680	5,030	7,060	8,800	10,700	12,900	16,100
	Sopchoppy River near						1,980	3,650	5,030	7,180	9,100	11,200	13,600	17,100
	Sopchoppy						2,020	3,670	5,030	7,090	8,870	10,800	13,100	16,300
142	2329000	53	--	1,140	2.41	.98	6,860	13,100	18,400	26,400	33,200	40,800	49,300	61,900
	Ochlockonee River						9,250	16,700	21,000	29,300	36,800	45,200	55,100	69,600
	near Havana						6,970	13,300	18,600	26,700	33,500	41,200	49,900	66,600
143	2329500	28	--	237	6.20	.21	4,260	10,100	15,800	25,800	35,400	47,100	61,300	84,400
	Little River near Quincy						4,320	8,270	11,700	17,100	22,300	28,000	34,700	44,900
							4,270	9,850	15,100	24,000	32,600	43,000	55,400	75,500
144	[2]2329600	14	--	305	5.90	.36	5,470	14,600	24,400	42,600	61,100	84,700	114,000	165,000
	Little River near						5,040	9,520	13,400	19,500	25,300	31,700	39,300	50,900
	Midway						5,390	13,300	20,800	33,700	46,900	63,100	82,800	116,000

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region C								
145	[1]2329700	13	--	9.46	26.80	0.20	826	1,530	2,130	2,950	3,630	4,400	5,120	6,270
	Rocky Comfort Creek						538	1,110	1,610	2,370	3,080	3,830	4,660	5,930
	near Quincy						762	1,420	1,970	2,750	3,450	4,210	4,970	6,160
146	2330000	50	--	1,700	1.95	1.85	9,230	18,100	26,200	39,200	51,300	65,500	82,300	109,000
	Ochlockonee River						10,100	16,100	20,800	28,100	34,500	41,500	49,800	61,500
	near Bloxham						9,280	17,900	25,700	37,800	49,200	62,400	78,000	103,000
147	[2]2330050	14	--	28.1	11.90	1.17	1,240	3,210	5,310	9,140	13,000	17,900	24,100	34,500
	Telogia Creek near						782	1,420	1,930	2,680	3,340	4,010	4,760	5,830
	Greensboro						1,140	2,680	4,070	6,330	8,650	11,400	14,800	20,200
148	2330100	25	--	126	5.07	.21	2,930	5,530	7,770	11,200	14,300	17,700	21,700	27,700
	Telogia Creek near						2,380	4,400	6,090	8,730	11,100	13,700	16,700	21,200
	Bristol						2,870	5,360	7,460	10,700	13,600	16,800	20,600	26,300
149	[2]2330200	18	--	23.2	4.47	.01	443	871	1,250	1,850	2,380	3,010	3,730	4,840
	New River at Vilas						591	1,060	1,440	1,990	2,460	2,960	3,500	4,270
							462	903	1,290	1,880	2,400	3,000	3,670	4,690
150	2330300	14	--	81.7	4.51	.04	1,700	3,100	4,280	6,070	7,630	9,390	11,400	14,400
	New River near Wilma						1,660	3,060	4,210	5,990	7,580	9,300	11,300	14,100
							1,690	3,090	4,260	6,050	7,610	9,360	11,400	14,300
151	[2]2330400	14	--	157	3.90	.01	2,470	3,830	4,840	6,240	7,370	8,570	9,860	11,700
	New River near Sumatra						2,710	5,000	6,920	9,920	12,600	15,600	19,100	24,300
							2,510	4,060	5,320	7,170	8,660	10,300	12,000	14,600
152	[2]2358600	18	--	24.9	19.27	.29	975	2,320	3,670	6,040	8,340	11,200	14,700	20,400
	Flat Creek near						1,030	2,080	2,990	4,420	5,750	7,170	8,780	11,200
	Chattahoochee						983	2,270	3,510	5,590	7,600	10,000	12,900	17,600

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region C								
153	[1]2358998	9	--	2.04	48.90	0	312	638	859	1,200	1,470	1,770	2,040	2,470
	Holliman Branch near						202	434	639	951	1,240	1,540	1,860	2,360
	Altha						280	567	773	1,090	1,370	1,670	1,970	2,430
154	2359000	43	66	781	1.61	.60	4,490	7,200	9,430	12,800	15,800	19,100	23,000	28,900
	Chipola River						6,270	10,500	13,800	19,000	23,600	28,700	34,700	43,300
	near Altha						4,590	7,430	9,810	13,400	16,600	20,100	24,200	30,400
155	[2]2359300	18	--	25.0	11.82	.01	1,250	1,830	2,250	2,820	3,270	3,750	4,250	4,960
	Sandy Creek near						915	1,810	2,580	3,760	4,840	6,000	7,310	9,290
	Panama City						1,200	1,830	2,320	3,030	3,610	4,220	4,870	5,800
156	[2]2359350	17	--	40.5	13.02	3.44	751	1,060	1,280	1,570	1,800	2,030	2,280	2,620
	Econfina Creek near						778	1,270	1,640	2,150	2,580	3,000	3,450	4,060
	Compass Lake						755	1,100	1,350	1,700	1,980	2,250	2,540	2,940
157	2359450	17	--	70.2	10.40	2.00	985	1,290	1,490	1,750	1,940	2,140	2,330	2,600
	Econfina Creek						1,370	2,380	3,160	4,330	5,340	6,380	7,550	9,200
	near Fountain						1,030	1,450	1,770	2,220	2,530	2,850	3,170	3,620
158	2359500	43	--	122	5.61	2.50	1,310	1,830	2,200	2,710	3,120	3,550	4,010	4,660
	Econfina Creek near						1,580	2,540	3,260	4,300	5,180	6,080	7,070	8,430
	Bennett						1,330	1,880	2,290	2,870	3,320	3,790	4,300	5,010
159	[2]2359550	16	--	67.2	9.10	0	1,710	2,640	3,350	4,340	5,140	6,000	6,930	8,270
	Bear Creek near						1,870	3,690	5,260	7,750	10,100	12,600	15,500	20,000
	Youngstown						1,730	2,820	3,730	5,080	6,180	7,350	8,630	10,500
160	[1]2365237	8	--	5.09	15.20	.40	396	689	921	1,220	1,430	1,630	1,820	2,090
	Fowler Branch						247	469	647	906	1,130	1,360	1,600	1,940
	near Leonia						348	606	804	1,070	1,290	1,510	1,720	2,020

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi²	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region C								
161	2365500	51	--	3,499	2.00	0.50	31,500	50,600	66,200	89,700	110,000	133,000	160,000	200,000
	Choctawhatchee River						24,000	42,400	58,200	84,300	109,000	137,000	171,000	225,000
	at Caryville						31,000	50,000	65,400	89,100	110,000	133,000	161,000	202,000
162	[2]2365700	18	--	80.7	9.47	2.97	2,730	4,870	6,680	9,430	11,800	14,600	17,700	22,500
	Sandy Creek at						1,290	2,120	2,740	3,630	4,390	5,160	6,000	7,150
	Ponce DeLeon						2,450	4,190	5,500	7,430	9,220	11,300	13,500	16,900
163	2366000	28	--	386	3.80	.80	3,480	5,850	7,750	10,500	12,900	15,500	18,400	22,700
	Holmes Creek at						4,680	8,240	11,200	15,700	19,800	24,300	29,500	37,200
	Vernon						3,580	6,110	8,190	11,300	13,900	16,800	20,000	24,800
164	2366500	48	50	4,384	1.72	1.00	31,900	50,800	65,900	88,200	107,000	129,000	153,000	189,000
	Choctawhatchee River						24,500	41,400	55,500	78,400	99,500	124,000	153,000	197,000
	near Bruce						31,400	50,000	64,800	87,100	106,000	128,000	153,000	190,000
165	[1]2366859	8	--	1.87	30.00	0	146	251	349	487	581	661	752	893
	Pate Branch near						155	319	457	662	845	1,030	1,230	1,520
	Freeport						148	272	387	555	682	799	929	1,120
166	2367000	26	--	65.6	11.10	0	2,390	4,290	5,910	8,380	10,600	13,100	15,900	20,300
	Alaqua Creek near						1,980	3,980	5,730	8,520	11,200	14,000	17,400	22,500
	DeFuniak Springs						2,340	4,250	5,880	8,410	10,700	13,300	16,200	20,700
167	2367310	12	--	27.6	15.22	.01	387	659	881	1,210	1,500	1,810	2,170	2,710
	Juniper Creek at						1,090	2,220	3,210	4,760	6,200	7,760	9,540	12,300
	SH85 near Niceville						476	893	1,290	1,910	2,410	2,940	3,550	4,490
168	2368000	40	--	624	3.31	.03	8,340	14,900	20,500	29,100	36,700	45,400	55,300	70,600
	Yellow River at						7,880	14,700	20,600	30,200	39,100	49,300	61,400	80,100
	Milligan						8,310	14,900	20,500	29,200	37,000	45,900	56,100	71,800

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region C								
169	[1]2368300	13	--	7.77	48.30	0.50	307	528	752	1,100	1,360	1,590	1,880	2,350
	Baggett Creek near						535	1,130	1,670	2,490	3,270	4,080	5,000	6,410
	Milligan						341	632	939	1,420	1,790	2,140	2,560	3,230
170	2368500	27	--	123	8.55	.20	3,040	5,750	8,140	11,900	15,300	19,300	23,900	31,100
	Shoal River near						2,860	5,570	7,920	11,700	15,200	19,000	23,500	30,400
	Mossy Head						3,020	5,730	8,110	11,900	15,300	19,200	23,800	31,000
171	2369000	40	--	474	4.04	.20	7,560	12,500	16,500	22,300	27,200	32,700	38,700	47,600
	Shoal River near						6,500	12,100	16,900	24,700	31,900	40,000	49,700	64,400
	Crestview						7,480	12,500	16,500	22,600	27,800	33,600	40,000	49,500
172	2370000	28	--	205	3.59	0	4,310	8,820	13,000	20,000	26,600	34,500	44,000	59,200
	Blackwater River						3,280	6,040	8,360	12,000	15,300	19,000	23,300	29,700
	near Baker						4,200	8,410	12,200	18,300	24,100	31,100	39,300	52,400
173	[1]2370015	8	--	1.45	75.60	0	150	336	486	686	836	992	1,120	1,320
	Muddy Branch near						180	402	602	909	1,200	1,500	1,820	2,330
	Beaver Creek						158	357	528	774	976	1,180	1,380	1,680
174	2370500	39	--	237	6.03	0	5,150	10,200	14,900	22,600	29,900	38,600	49,100	66,100
	Big Coldwater Creek						4,510	8,770	12,500	18,500	24,200	30,500	38,100	49,700
	near Milton						5,100	10,100	14,600	22,000	29,100	37,400	47,500	63,600
175	2370700	21	--	58.7	11.50	.20	625	1,510	2,450	4,170	5,920	8,160	11,000	15,900
	Pond Creek near						1,740	3,440	4,910	9,220	9,380	11,700	14,400	18,500
	Milton						710	1,720	2,800	4,970	6,560	8,840	11,700	16,400
176	[2]2370750	18	--	2.95	50.20	0	100	365	741	1,610	2,690	4,310	6,680	11,500
	Hurricane Branch						276	601	891	1,340	1,760	2,200	2,680	3,430
	near Milton						116	400	771	1,540	2,420	3,640	5,320	8,500

[1] Rainfall-runoff gaging station.
[2] Crest-stage partial record gaging station.

Table 6.--A comparison of station, regional, and weighted T-year flood estimates--Continued

[Discharge-frequency relationships for each gaging station are presented as follows: Top line--log-Pearson Type III analysis; Middle line--regression equations; Bottom line--weighted or best estimate of T-year flood]

Map No.	Station number and name	Years of record: Systematic	Years of record: Historic	Basin characteristics: Drainage area mi^2	Basin characteristics: Slope ft/mi	Basin characteristics: Lake area in percent	Discharge, in cubic feet per second, for recurrence interval, in years: 2	5	10	25	50	100	200	500
						Region C								
177	2375500	44	50	3,817	2.17	0.20	39,000	64,700	86,100	118,000	147,000	179,000	216,000	272,000
	Escambia River near						28,500	52,200	73,000	108,000	141,000	181,000	229,000	304,000
	Century						38,200	63,600	84,700	117,000	146,000	179,000	218,000	276,000
178	2376000	26	--	75.3	11.90	0	2,650	6,640	11,000	19,000	27,400	38,200	52,100	76,300
	Pine Barren Creek						2,280	4,620	6,700	10,000	13,200	16,700	20,700	27,100
	near Barth						2,610	6,330	10,200	16,800	23,900	32,700	43,800	62,800
179	[1]2376079	8	--	8.81	23.51	.22	967	2,240	3,390	5,090	6,460	7,890	9,250	11,400
	Carpenter Creek at						480	974	1,400	2,040	2,640	3,260	3,940	4,980
	Pensacola						799	1,700	2,410	3,440	4,400	5,400	6,420	7,990
180	2376300	21	--	49.0	11.00	0	1,940	3,770	5,420	8,080	10,500	13,400	16,800	22,100
	Brushy Creek near						1,550	3,100	4,440	6,550	8,530	10,700	13,100	16,900
	Walnut Hill						1,890	3,650	5,220	7,710	10,000	12,700	15,900	20,800
181	2376500	37	--	394	5.51	0	6,880	11,700	15,700	21,600	26,800	32,600	39,100	49,000
	Perdido River near						6,620	12,900	18,400	27,500	36,100	45,900	57,600	75,900
	Barrineau Park						6,860	11,800	16,000	22,300	27,900	34,200	41,300	52,100
182	[1]2376551	8	--	.92	78.30	0	125	259	358	492	615	719	818	971
	Churchhouse Branch						125	278	415	621	814	1,010	1,220	1,550
	near Barrineau Park						125	264	379	544	694	832	971	1,190

[1] Rainfall-runoff gaging station.

Equation 8 or 9 can be used to adjust the regional estimate at the ungaged site with the weighted estimate from the gaged site.

$$Q_u = Q_{ru}\left[\left(\frac{Q_{wt}}{Q_r}-1\right)\cdot\left(\frac{2A_g-A_u}{A_g}\right)+1\right] \quad \text{For site downstream from gage.} \tag{8}$$

$$Q_u = Q_{ru}\left[\left(\frac{Q_{wt}}{Q_r}-1\right)\cdot\left(\frac{2A_u-A_g}{A_g}\right)+1\right] \quad \text{For site upstream from gage.} \tag{9}$$

where

Q_u = Adjusted estimate for ungaged site, in cubic feet per second;

Q_{ru} = Regional estimate for ungaged site, in cubic feet per second;

Q_{wt} = Weighted estimate of the T-year flood at the gaged site, in cubic feet per second;

Q_r = Regional estimate at gaged site, in cubic feet per second;

A_u = Drainage area for ungaged site, in square miles;

A_g = Drainage area for gaged site, in square miles.

1. For example--determine the 50-year flood for Ortega River at I-295, 7 miles downstream from 02246300 Ortega River near Jacksonville (map No. 40). The contributing drainage is in Region A (fig. 1). At the gaged site, station map No. 40, the contributing drainage area is 30.90 square miles, the slope is 2.41 feet per mile, and the lake area is 0.26 percent of the drainage area.

2. The contributing drainage area at the ungaged site, planimetered from U.S. Geological Survey quadrangle maps, is 50.7-square miles. The slope is 4.3 feet per mile. The lake area is 0.20 percent of the drainage area.

3. The regional estimate of the 50-year flood in Region A is computed using the appropriate equation from table 1, as follows:

$$Q_{ru} = 496\ DA^{0.690}\ SL^{0.234}\ (LK + 3.0)^{-0.705}$$

$$Q_{50} = 496\ (50.7)^{0.690}\ (4.3)^{0.234}\ (0.20 + 3.0)^{-0.705}$$

$$Q_{50} = 4{,}610\ ft^3/s$$

4. Compute the drainage area ratio to determine if the ungaged site is more than half but less than twice the drainage area of the gaged site.

$$r = A_g/A_u$$

$$r = 30.9/50.7$$

$$r = 0.61$$

Ratio is within acceptability and can be used to adjust the estimate at the ungaged site to the gaged site.

5. Use equation 8 to adjust the regional estimate at the ungaged site. Values for Q_{wt} and Q_r are from table 6.

$$Q_u = Q_{ru} \left[\left(\frac{Q_{wt}}{Q_r} - 1 \right) \cdot \left(\frac{2A_g - A_u}{A_g} \right) + 1 \right]$$

$$Q_{50} = 4{,}610 \left[\left(\frac{2740}{2830} - 1 \right) \cdot \left(\frac{2(30.9) - 50.7}{30.9} \right) + 1 \right]$$

Q_{50} = 4,560 cubic feet per second

LIMITATIONS OF TECHNIQUE

Consideration should be given to the following limitations when applying the regional regression equations:

1. Regression equations, shown in tables 1, 2, and 3, were developed using basin characteristics within the ranges shown below. The relationship of the regression equations outside these ranges is not known.

Basin characteristics	Range		
	Region A	Region B	Region C
Contributing drainage area	1.83 to 3,066 mi^2	13.9 to 9,640 mi^2	0.92 to 4,384 mi^2
Slope	0.15 to 24.20 ft/mi	--	1.61 to 78.30 ft/mi
Lake area	0 to 28.16 percent	0 to 13.26 percent	0 to 3.44 percent

2. In areas of karst topography, some basins may contain closed depressions and sinkholes which do not contribute to direct surface runoff. Karst areas are more likely to be found in Region B. When the drainage area is determined from 7½ minute topographic maps, any area containing sinkholes or depressions (noncontributing area) should be subtracted from the total drainage area. All basins used in the regression analysis were adjusted, as necessary, to contributing drainage area.

3. Regional equations are not applicable where manmade changes have a significant effect on flood runoff. Flood runoff can be affected by regulation from dams and reservoirs, levees, diversion canals, strip mines, and basins that have significant urban development.

SUMMARY

Regional flood estimating equations were developed using flood-peak data and basin characteristics for 182 gaging stations in Florida in a multiple linear regression analysis. Floods can be estimated for recurrence intervals ranging from 2 to 500 years for natural-flow streams. The regional relationships can also be used to improve flood estimates at gaged sites by weighting the log-Pearson Type III estimate with the regression estimate.

The basin characteristics used in the regression equations are not the only factors that influence the magnitude of floods in Florida. However, they represent the best combination of parameters for explaining peak flows with the least number of variables and smallest standard error.

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*U.S. GOVERNMENT PRINTING OFFICE: 1984-746-138/10001 Region 4.