Prepared in cooperation with the
Florida Department of Transportation

Magnitude and Frequency of Floods for Rural Streams in Florida, 2006

Scientific Investigations Report 2011–5034

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

Front cover:

Large photograph: USGS hydrographer Mark Stephens measuring streamflow over the road at Withlacoochee River near Pinetta, Florida, using acoustic Doppler current profiler during the flood of April 2009. Photograph by Erik Ohlson, USGS, April 8, 2009.

Small photograph: USGS hydrographer Erik Ohlson measuring streamflow through a culvert on Highway 90 at the Suwannee River at Ellaville, Florida, gage during the flood of April 2009. Photograph by Rachel Pawlitz, USGS, April 11, 2009.

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By Richard J. Verdi and Joann F. Dixon

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U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

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Conversion Factors and Datums

Inch/Pound to SI

Multiply	By	To obtain
Length		
inch	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Area		
square mile (mi ²)	2.590	square kilometer (km ²)
Flow rate		
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)
Hydraulic gradient		
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:
 $^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

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

Elevation, as used in this report, refers to distance above the vertical datum.

Abbreviations and Acronyms

DEM	Digital Elevation Models
GIS	Geographic Information System
GLS	generalized least squares
NED	National Elevation Dataset
NHD	National Hydrography Dataset
QA/QC	quality assurance and quality control
R ²	root mean square error, coefficient of determination
USGS	U.S. Geological Survey

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Abstract

Methods for estimating the magnitude of floods for selected percent chance exceedance probabilities are presented for ungaged streams in Florida that are not substantially affected by regulation, channelization, or urban development. Flood-frequency flows also are presented for 275 Florida streamgages used in the regional regression analysis. Regression relations used generalized least-squares regression techniques to estimate flood magnitude and frequency on ungaged streams as a function of basin drainage area and a storage factor. These regression equations were developed for four different hydrologic regions in Florida. The flood regions were delineated based on plotted residuals, previous flood-frequency studies, and geologic, physiographic, and drainage-area maps. The methods used in this report are based on flood-frequency characteristics for 305 streamgages including 275 in Florida and 30 in the adjacent states of Georgia and Alabama, all having at least 10 years of record through September 2006. For the larger streams outside the limits of the regression equations—the Apalachicola River and Suwannee River at Ellaville and below—the report includes graphical relations of peak flow to drainage area.

Introduction

Engineers rely on flood-frequency statistics to aid in the design and location of bridges, culverts, embankments, dams, and other structures near streams and rivers. These data are required for flood-insurance rates and for flood-plain management (Hedgecock and Feaster, 2007).

The Florida Department of Transportation needs accurate flood-frequency information to efficiently design bridges and drainage structures in Florida. To meet this need, the U.S. Geological Survey (USGS), in cooperation with the Florida Department of Transportation, conducted a study to update previous flood-frequency estimates given in several reports based on peak-flow data collected through September 2006 from streamgages (modified from Hedgecock and Feaster, 2007).

Purpose and Scope

The purpose of this report is to update previously published flood-frequency information for Florida by providing methods for estimating the magnitude and frequency of floods at ungaged streams. The report also presents frequency estimates of peak flow using data collected through September 2006 at streamgages. This report includes: (1) regional equations for estimating the magnitude and frequency of peak flows on rural ungaged streams in Florida; (2) estimates of the magnitude of floods at the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance levels for 305 streamgages in Florida, Georgia, and Alabama; (3) techniques used to develop regression equations to estimate the magnitude of floods on rural ungaged sites in Florida; (4) the accuracy and limitations of these equations; (5) example applications of the methods; and (6) comparisons of the data and results in this report with previously published studies.

Previous Studies

This report supersedes previous USGS reports estimating the magnitude and frequency of flooding in Florida. Earlier USGS studies describing flood-frequency relations throughout the State include reports completed by Pride (1958), Barnes and Golden (1966), Rabon (1971), Seijo and others (1979), Bridges (1982), Giese and Franklin (1996), and Hammett and DelCharco (2005). Most of the general organization, content, equations, and explanatory material contained within this Florida report are consistent with the discussions and language used for three similar reports from Alabama (Hedgecock and Feaster, 2007), Georgia (Gotvald and others, 2009), and South Carolina (Feaster and others, 2009). Data and additional discussion unique to the magnitude and frequency of floods in Florida have been inserted where applicable with the original USGS report sources accredited or shown as “modified from.”

Pride (1958) conducted a study estimating and regionalizing floods in Florida using peak-flow data through 1953 based on calendar year from 146 streamgages. Flood-frequency relations for the 146 streamgages were defined by graphical means. The State was divided into two flood regions based on

geometric similarities in flood-frequency graphs. Composite frequency curves were developed for both regions that defined ratios to determine recurrence intervals up to the 2-percent chance exceedance probability (50-year flood) based on the mean annual flood for that station. Pride (1958) recognized that flood-water storage in lakes and marshes could substantially lower flood magnitudes at some locations; thus, Pride's study included a method for adjusting flood magnitudes by accounting for attenuation resulting from flood-water storage in drainage areas upstream from selected streamgages.

Barnes and Golden (1966) analyzed flood-frequency relations throughout the United States based on peak flows for each water year (October 1 through September 30) through 1961. The evaluation included streamgages from all of Florida, and parts of Mississippi, Alabama, and Georgia. There were 132 streamgages in Florida used in this analysis, and each streamgage had 5 or more years of record. The method and technique employed by Barnes and Golden (1966) was similar to the one used by Pride (1958) and is commonly referred to as the index-flood method (Dalrymple, 1960). Barnes and Golden (1966) subdivided the southern Atlantic and eastern Gulf of Mexico States into four hydrologic flood regions. Florida was included in all four regions. Flood flows for up to the 2-percent chance exceedance probability (50-year flood) were determined, as well as methodology for reducing flood flows for drainage areas where lakes and swamps provide water storage.

Rabon (1971) made the first attempt to use multiple-regression analysis as a way to regionalize flood-frequency relations in Florida. Rabon's investigation used 145 streamgages throughout the State with a variety of flow characteristics, such as average and low flows and each had a minimum of 10 years of record. The annual peak flows for the period of record up to water year 1970 for each gage were mathematically fitted to a log-Pearson Type III distribution curve as a means to estimate magnitudes and frequencies of floods up to the 2-percent chance exceedance probability (50-year flood). Rabon subdivided Florida into two hydrologic flood regions.

Seijo and others (1979) evaluated peak flows from 64 streamgages throughout west-central Florida using the guidelines set forth by the U.S. Water Resources Council (1976) in Bulletin 17. A Pearson Type III distribution curve was fitted to the logarithms of annual peak-flow data for the period of record through 1976 for each streamgage. West-central Florida was subdivided into three flood regions, and flood-frequency equations were developed for each region using multiple regression analysis. Seijo and others (1979) reported the average standard error of estimate of the regional equations was 43.5 percent.

Bridges (1982) evaluated annual peak-flow data for the period of record through water year 1978 for each of the 182 streamgages considered throughout Florida. Of the 182 streamgages evaluated, 159 were long-term streamgages with 10 to 53 years of record and the remaining 23 streamgages were rainfall-runoff streamgages with 7 to 17 years of record.

Bridges' (1982) analysis used guidelines presented in U.S. Water Resources Council (1977) Bulletin 17A. Multiple-regression analysis was used to develop equations for three geographic regions for Florida. Three basin characteristics within Regions A and C were determined to be statistically significant in describing the variability in flood flows: (1) contributing drainage area, (2) channel slope, and (3) the percentage of drainage area covered by lakes. Two basin characteristics were determined to be statistically significant in describing the variability in flood flows for Region B: (1) contributing drainage area and (2) the percentage of drainage area covered by lakes. The average standard error of estimate for the regional equations as developed by Bridges (1982) was 56 percent.

Giese and Franklin (1996) updated the flood-frequency relations for 32 streamgages in the boundaries of the Suwannee River Water Management District using period-of-record annual peak flows through water year 1994. Their analysis followed guidelines presented in U.S. Water Resources Council (1982) Bulletin 17B to generate log-Pearson Type III distribution curves for each gage. The assumption was made that the regional regression equation for area of study in the District was the same as presented in report by Bridges (1982). The average standard error of estimate of the regional equation for this region as developed by Bridges (1982) and used by Giese and Franklin (1996) was 62 percent.

Hammett and DelCharco's (2005) investigation evaluated annual peak flows from 94 streamgages in west-central Florida; 75 of the streamgages were within the boundaries of the Southwest Florida Water Management District and the remaining 19 were along the border. Data for each streamgage consisted of at least 10 years of record and included period-of-record annual peak flows through water year 2001. Similar to the Giese and Franklin (1996) study, Hammett and DelCharco (2005) followed guidelines presented in U.S. Water Resources Council (1982) Bulletin 17B in their analysis to generate log-Pearson Type III distribution curves for each station. Additionally, they used multiple-regression analysis to develop equations for four regions in west-central Florida. Three basin characteristics were determined to be statistically significant in describing the variability in flood flows throughout regions 2, 3, and 4 in west-central Florida: (1) contributing drainage area, (2) channel slope, and (3) the percentage of drainage area covered by lakes. Two basin characteristics that were statistically significant in describing the variability in flood flows throughout Region 1 are: (1) contributing drainage area, and (2) the percentage of drainage area covered by lakes. The average standard error of prediction for the regional equations as developed by Hammett and DelCharco (2005) was 58 percent.

Description of Study Area

This study included all of Florida and covered an area of approximately 58,560 square miles (mi²) within three U.S.

Environmental Protection Agency level III ecoregions—Southeastern Plains, Southern Coastal Plain, and Southern Florida Coastal Plain (fig. 1; Griffith and others, 2008). The ecoregions in Florida represent areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. Additionally, these ecoregions provide a spatial framework for research, assessment, management, and monitoring of ecosystems and their components. The relatively flat topography of Florida ranges from sea level to the highest known natural point of 345 feet (ft) at Britton Hill near Paxton (Walton County in northwest Florida, fig. 1). Hills and rolling hills are the predominant features in the panhandle and northern parts of the State, whereas the swamps and wetlands of the Everglades prevail in the south (Pride and Crooks, 1962). The wide range of water bodies in Florida include

thousands of lakes and ponds, more than 50 river systems, 33 first magnitude springs (flow greater than 100 cubic feet per second (ft³/s), more than any other state), and numerous bays and estuaries. The St. Johns River is the longest river in Florida, measuring 273 miles (mi) in length. Water bodies comprise 4,424 mi² of the 58,560 mi² total area of Florida (Florida Office of Cultural and Historical Programs, [undated], accessed August 30, 2005, at <http://dhr.dos.state.fl.us/facts/stats/quick/>). Replenishment of the water bodies occur in multiple ways, but most often from rainfall runoff. Other replenishment sources are flow from the upward movement of groundwater springflow into surface streams, including some that originate in Georgia or Alabama. Water loss occurs through evaporation, transpiration, water use, and flow into the Gulf of Mexico or the Atlantic Ocean (Pride and Crooks, 1962).

Figure 1. Location of the study area and ecoregions in Florida.

Data Compilation

The first step in the regionalization of flood-frequency estimates for streams is the compilation of all peak-flow data from streamgages with at least 10 years of annual peak-flow record. The annual peak-flow record is reviewed for quality assurance and quality control (QA/QC) and for homogeneity, which implies relatively constant watershed and climatic conditions during the period of record. Once peak-flow records are compiled and reviewed, basin characteristics must be determined for each streamgage.

Annual Peak Flows

Annual peak flow is the highest instantaneous flow recorded at a site for an independent flood event during the water year. Occasionally, the annual peak flow is not the maximum for the year. In such cases, the maximum flow occurs at midnight at the beginning or end of the water year, on a recession from or rise toward a higher peak in an adjoining water year.

Streamgages with annual peak-flow record are either continuous-record or crest-stage stations. At continuous-record stations, measured parameters, such as the surface-water elevation (or stage) of a stream are recorded at fixed time intervals, typically at 15-, 30-, or 60-minute intervals. At crest-stage stations, only the highest stage that occurs between site visits is recorded. Regardless of the type of gage, measurements of flow are made by field personnel throughout the range of recorded stages, and a relation between stage and flow (known as a rating) is developed for the streamgage. This rating is used to determine flows for all recorded stages at a streamgage.

Streamgages in Florida and in adjacent parts of Alabama and Georgia that monitor Florida streams were evaluated for possible inclusion in this investigation. Streamgages were only considered for the analysis if 10 or more years of peak-flow data were available in the record, and if peak flows were not substantially affected by trends, dam regulation, flood-retarding reservoirs, tides, urbanization, or channelization. These stations were then reviewed for QA/QC using the tests as outlined in Ryberg (2008). The QA/QC analysis determined that 305 stations were appropriate for the study, consisting of 275 in Florida, 21 in Georgia, and 9 in Alabama.

Basin Characteristics

Peak-flow information can be estimated for ungaged locations through multiple-regression analysis that relates peak-flow characteristics (such as the 1-percent chance exceedance flow) to selected physical and climatic basin characteristics for gaged drainage basins. Basin characteristics for this study were generated using geographical information system (GIS) techniques. Basin boundaries were determined from the National Elevation Dataset (NED) Digital Elevation Models (DEMs) at 10-meter horizontal resolution (U.S. Geological Survey, 1999a). To improve basin boundary delineations, processes were completed to make the DEM conform to stream locations defined in the National Hydrography Dataset (NHD) (U.S. Geological Survey, 1999b) (modified from Gotvald and others, 2009).

Basin characteristics were used as potential explanatory variables in the regression analyses based on theoretical hydrologic relation to flood flows and the ability to obtain a measurement of the basin characteristics by using digital datasets and GIS technology (modified from Gotvald and others, 2009). The following nine basin characteristics were tested for statistical significance in the regression analysis:

1. Drainage area (DRNAREA), in square miles:
The area that contributes to surface runoff.
2. Elevation (ELEV), in feet:
The mean basin elevation, in feet above National Geodetic Vertical Datum of 1929 (NGVD 29).
3. Forest (FOREST), in percent:
The area of forest, expressed as percent, of the contributing drainage area.
4. Lake area (LKAREA), in percent:
The surface area of lakes and ponds expressed as a percentage of the contributing drainage area.
5. Swamps (WETLAND), in percent:
The surface area of swamps expressed as a percentage of the contributing drainage area.
6. Storage (STORAGE), in percent:
The surface area of lakes, ponds, and swamps expressed as a percentage of the contributing drainage area.

Trout Creek near Sulphur Springs, Florida, on the downstream side of the bridge during the flood of September 7, 2004. Stage was 43.01 ft and the flow rate was 1,610 ft³/s. Photograph by USGS.

7. 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.
8. Mean annual precipitation (PRECIP), in inches.
9. Average precipitation event size, in inches per day, over an 18-year mean.

Table 1 describes the basin characteristics considered for use in regional regression analysis, including the parameter name, units of measure, method, and source data.

Estimation of Flood Magnitude and Frequency at Gaged Stations

A flood-frequency relation is the relation of annual peak flow to probability of exceedance or recurrence interval (Hedgercock and Feaster, 2007). Previous USGS reports published flood-frequency flows in terms of the T-year event based on the recurrence interval for that flood quantile (for example, the “50-year flood”). While the T-year recurrence interval flood is statistically expected to occur, on average,

Table 1. Basin characteristics considered for use in the regional regression analysis (modified from Gotvald and others, 2009).

[DEM, Digital Elevation Models; NHD, National Hydrography Dataset]

Name	Units	Method	Source data
Drainage area	Square miles	ArcGIS ArcHydro derived using watershed boundary, DEM, NHDPlus hydrography, and gaging stations	National Elevation Dataset, 10- and 30-meter resolution (http://ned.usgs.gov/#), NHDPlus hydrography, (http://www.horizon-systems.com/nhdplus/), Watershed, http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/index.html , NHDPlus hydrography and gaging stations, (http://www.horizon-systems.com/nhdplus/)
Elevation	Feet	Area-weighted average	National Elevation Dataset, 10- and 30-meter resolution (http://ned.usgs.gov/#)
Forest	Percent	(Forested area/drainage area)*100	National Land-Cover Dataset 2001 30-meter resolution (http://www.mrlc.gov/index.php).
Lake	Percent	(Lake area/drainage area)*100	National Land-Cover Dataset 2001 30-meter resolution (http://www.mrlc.gov/index.php).
Swamps	Percent	(Swamp area/drainage area)*100	National Land-Cover Dataset 2001 30-meter resolution (http://www.mrlc.gov/index.php).
Storage	Percent	((Lake area + Swamp area)/drainage area)*100	National Land-Cover Dataset 2001 30-meter resolution (http://www.mrlc.gov/index.php).
Channel slope	Feet per mile	ArcGIS ArcHydro derived using the difference in the DEM elevation at points along the main channel within the drainage area at 10 percent and 85 percent then divided by the length between those points	ArcGIS ArcHydro calculated using DEM and Archydro derived channel length, defined in the drainage area source data.
Mean annual precipitation	Inches	Area-weighted average	DATMET, Daily Surface Weather and Climatological Summaries (http://www.daymet.org/climateSummary.jsp)
Average precipitation event size, in inches per day, over an 18-year mean	Inches	Area-weighted average	DATMET, Daily Surface Weather and Climatological Summaries (http://www.daymet.org/climateSummary.jsp)

once during the T-year period, it may occur multiple times during the period, or not at all (modified from Gotvald and others, 2009).

Because of the potential for misinterpretation, terminology associated with flood-frequency estimates has shifted from the T-year recurrence interval flood to the P-percent chance exceedance flood. The use of percent chance exceedance flood is recommended because it conveys the probability of a flood of a given magnitude being equaled or exceeded in a given year (Gotvald and others, 2009). For example, a 1-percent chance exceedance flood (formerly known as the “100-year flood”) corresponds to the flow magnitude that has a probability of 0.01 of being equaled or exceeded in a given year. That is, a flow with an annual exceedance probability of 0.01 has a 1 percent chance of being equaled or exceeded in a given year. The T-year recurrence interval and exceedance probability are the mathematical inverses of one another; therefore, a flood with an exceedance probability of 0.01 (1-percent chance exceedance) has a recurrence interval of $1/0.01$ or 100 years. Thus, the P-percent chance exceedance is computed as the inverse of the T-year recurrence interval multiplied by 100. A 100-year T-year recurrence interval is equivalent to a 1-percent chance exceedance ($1/100$ -year recurrence interval $\times 100 = 1$ -percent chance exceedance). A 25-year recurrence interval is equivalent to a 4-percent chance exceedance ($1/25$ -year recurrence interval $\times 100 = 4$ -percent chance exceedance), and so forth (modified from Feaster and others, 2009). Therefore, the P-percent chance exceedance is computed as follows:

$$P = \left(\frac{1}{T} \right) \times 100 \quad , \quad (1)$$

where

P is the percent chance exceedance
 T is the T-year recurrence interval

Table 2. T-year recurrence intervals with corresponding annual exceedance probabilities and P-percent chance exceedance for flood-frequency discharge estimates (modified from Gotvald and others, 2009).

T-year recurrence interval	Annual exceedance probability	P-percent chance exceedance
2	0.50	50
5	0.20	20
10	0.10	10
25	0.04	4
50	0.02	2
100	0.01	1
200	0.005	0.5
500	0.002	0.2

The T-year recurrence intervals with corresponding annual exceedance probabilities and P-percent chance exceedance are described in table 2.

Log-Pearson Type III Flood-Frequency Analysis

The flood-frequency relation for a stream having at least 10 years of record can be defined by fitting a theoretical frequency distribution curve to the logarithms of annual peak flows. Bulletin 17B (U.S. Water Resources Council, 1982) recommends fitting a Pearson Type III distribution to the logarithms of annual peak flows as the consistent method for determining flood magnitudes and frequencies. This technique, most commonly referred to as the log-Pearson Type III flood-frequency analysis, is generally accepted as the standard technique by most Federal and State agencies (Hedgecock and Feaster, 2007, eq. 1).

The log-Pearson Type III distribution is defined by the equation:

$$\log Q_p = M_x + K_p S_x \quad , \quad (2)$$

where

Q_p is the P-percent chance exceedance flow, in cubic feet per second;
 M_x is the mean of the logarithms of the water-year peak flows;
 K_p is a Pearson Type III factor for a skew coefficient (G) computed from the logarithms of the water-year peak flows and a selected percent chance exceedance P ; and
 S_x is the standard deviation of the logarithms of the water-year peak flows.

The computer program PeakFQWin version 5.2 developed by the USGS was used to compute flood-frequency estimates for the streamgages considered for this study and the results are included in appendix 1. PeakFQWin automates many of the analysis procedures recommended in Bulletin 17B (U.S. Water Resources Council, 1982), including identifying and adjusting for outliers and historical periods, weighting station skews and generalized skews, and fitting a log-Pearson Type III distribution curve to the annual peak-flow data (Flynn and others, 2006; Feaster and others, 2009).

Skew Coefficient

The skew coefficient is a measure of asymmetry of the probability distribution of a set of annual peak flows. The skew coefficient is strongly influenced by the presence of outliers and is sensitive to extreme events (Feaster and others, 2009). For example, an inaccurate estimate of the asymmetry of the flood-frequency distribution for an individual station can result if a single high event has occurred in a relatively

short period of record. Thus, the skew coefficient is considered a less reliable estimator than the mean and standard deviation of a population statistic for an individual site, because of its significant variability between samples. Several procedures have been introduced to improve the reliability of the sample skew coefficient in estimating the population skew. Bulletin 17B (U.S. Water Resources Council, 1982) recommends weighting the skew coefficient computed for an individual station with a generalized skew coefficient that represents the average skew for nearby stations. The weighting procedure recommended in Bulletin 17B (U.S. Water Resources Council, 1982) is different than those in Bulletin 17 (U.S. Water Resources Council, 1976) or Bulletin 17A (U.S. Water Resources Council, 1977) and tends to reduce the influence of the generalized skew and increase the influence of the station skew (Hammett and DelCharco, 2005).

Program PeakFQ software allows the user to weight the station skew coefficient with the generalized skew coefficient to compute the log-Pearson Type III flood-frequency curve for a station, as recommended in Bulletin 17B (U.S. Water Resources Council, 1982). The generalized skew coefficient used for this study was determined from Bulletin 17B (U.S. Water Resources Council, 1982, pl. 1). The weighted skew combines the station and generalized skews by weighting them in inverse proportion to their mean-square errors. Because the mean-square error of the station skew increases as the length of record decreases, weighted skew coefficients for stations with short periods of record can be substantially adjusted by generalized skews. For stations with longer periods of record, the station skew has the greater importance in the computation of a weighted skew coefficient (Hammett and DelCharco, 2005). The log-Pearson Type III flood-frequency curves presented in appendix 1 represent computations based on weighted skew coefficients.

Regional Flood-Frequency Regression Analysis

A regional regression analysis was used to mathematically relate basin characteristics to estimates of flood magnitude and frequency at streamgaging stations. Explanatory variables for the regional regression analysis were related to the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows that had been calculated using Bulletin 17B (U.S. Water Resources Council, 1982) criteria. Equations computed from the regression analyses can then be used to calculate estimates of flood flows at sites where basin characteristics are known, but flow data are unavailable or insufficient (less than 10 years of available data at the gage).

All possible combinations of explanatory variables were investigated to determine which basin characteristics were most statistically significant in relation to peak flows. Preliminary regression models were evaluated by examining the root mean-square error, coefficient of determination (R^2)

for each model, and the significance level of the independent variables. Based on the investigation of all possible combinations of explanatory variables, contributing drainage area (DRNAREA, eq. 2) was determined to be the most influential variable followed by the percent of total surface area covered by storage (STORAGE, eq. 2), which includes lakes, ponds, and swamps. Hammett and DelCharco (2005), Bridges (1982), and Seijo and others (1979) determined that contributing drainage area was the most influential variable in their respective studies; however, each of these investigators concluded that channel slope and lake area were significant factors at the 0.05 significance level. The regression analysis for this study included storage, rather than lakes (which does not include the surface area covered by swamps). Additionally, the channel slope variable improved the regression analysis by less than 1 percent, and thus, was not a final variable included in this study considering the relatively flat topography of Florida.

Log transformations were used for the variables in the regressions, which is an identical technique employed in previous studies. Throughout the State, there were several gages where the percent of storage was zero; therefore, it was not possible to transform that characteristic without the addition of a constant for all sites, similar to what was done in previous studies. Adding a small constant is a common practice when applying log transformations to datasets with some zero values, according to Haan (1977). Hammett and DelCharco (2005) and Bridges (1982) each added constants of 3.0 or 0.6 for the lake variable depending on which geographic region the site was located. For this study, a constant of 1.0 was added to all storage values in the four hydrologic flood regions (pl. 1).

Multiple-regression techniques were used to delineate the four hydrologic flood regions defined in Florida (pl. 1). These regions were defined based on the plotted residuals from the multiple-regression analysis. In addition, data from previous flood-frequency studies, and geologic, physiographic, and drainage-area maps were also consulted to help better define these regions.

Generalized Least-Squares Regression Analysis

Generalized least-squares regression methods, as described by Stedinger and Tasker (1985), were used to determine final regional P-percent chance exceedance flow regression equations with the computer program GLSNET developed by the USGS. An investigation by Tasker and Stedinger (1989) showed that model error from an ordinary least-squares regression can be reduced by using a generalized least-squares (GLS) regression, which takes into account the time-sampling error of flood-flow characteristics and the correlation of flood-flow characteristics between nearby stations. In GLS analysis, the total prediction error is partitioned into model error and sampling error, thus making it possible to identify errors due to inadequacies of model formulation compared with deficiencies in the database (Hammett and DelCharco, 2005).

Accuracy and Limitations of Flood-Frequency Estimates

Empirical results from regression equations are not exact. Regression equations are statistical models that are interpreted and applied within the limits of the data and with the understanding that the results are best-fit estimates with an associated scatter or variance. The development and use of a regression equation raises questions about how well the predicted values are representative of true values. Errors in the model (that is, differences between the predicted and observed values) can be examined to determine parameters that describe the accuracy of a regression equation, which depends on both the model error and the sampling error. Model error measures the ability of a set of explanatory variables to estimate the values of peak-flow characteristics calculated from the station records that were used to develop the equation. The model error depends on the number and predictive power of the explanatory variables in a regression equation. Sampling error measures the ability of a finite number of stations with a finite number of recorded annual peak flows to describe the true characteristics of the entire peak-flow record for a station. The sampling error depends on the number and record length of stations used in the analysis, and decreases as the number of stations and record lengths increase (modified from Gotvald and others, 2009).

A measure of uncertainty in a regression equation estimate for a site, i , is the variance of prediction, $V_{p,i}$. The $V_{p,i}$ is the sum of the model error variance and sampling error variance and is computed using the following equation (Gotvald and others, 2009):

$$V_{p,i} = \gamma^2 + MSE_{s,i} \quad (3)$$

where

γ^2 is the model error variance; and
 $MSE_{s,i}$ is the sampling mean square error for the site, i ,

Assuming that the explanatory variables for the gaged stations in a regression analysis are representative of all stations in the region, the average accuracy of prediction for a regression equation can be determined by computing the average variance of prediction, AVP, for n number of stations (Gotvald and others, 2009):

$$AVP = \gamma^2 + \left(\frac{1}{n}\right) \sum_{i=1}^n MSE_{s,i} \quad (4)$$

where variables are as previously defined.

Traditionally, accuracy of a flood-frequency relation has been expressed two ways—the mean standard error of estimate, SEE, or as the mean standard error of prediction, SEP. The SEE is a measure of how well the regression equation fits the data used to derive the relation and is often referred to

as the model error. The SEE is computed using the following equation (Gotvald and others, 2009):

$$SE_E = 100 \left[10^{2.3026(\gamma^2)} - 1 \right]^{0.5} \quad (5)$$

where

SE_E is the mean standard error of estimate, in percent; and
 γ^2 is the model error variance.

The standard error of prediction, SEP, is the square root of the mean square error of prediction and is a measure of how well the regression equation estimates flood flows when applied to ungaged basins. The SEP is calculated using the following equation (Gotvald and others, 2009):

$$SE_P = 100 \left[10^{2.3026(AVP)} - 1 \right]^{0.5} \quad (6)$$

where

SE_P is the mean standard error of prediction, in percent; and
 AVP is the average variance of prediction.

The regression equations and errors presented in table 3 (eq. 7-38) are only applicable when the equations are used for sites where the values of basin characteristics fall within the range of values used to develop the equations. Extrapolating the regression equations for use in watersheds that have characteristics outside the valid range would produce flood-flow estimates with unpredictable errors. A constant of 1.0 is added to storage when using the regression equations defined in table 3 for the reasons previously discussed. Table 4 describes the valid ranges of basin characteristics for each hydrologic region, as defined in this study. Figure 2 shows the distribution of drainage area and storage. For example, Region 3 has an apparent outlier with 91 percent storage, but the limiting value for the region is 48 percent storage. A regression of drainage area alone versus the 1-percent chance exceedance shows the point plots within the general trend of the data; therefore, the site was left in the regression. However, there is not enough data in the range to verify it truly works, so that is the reason for limiting the valid range for storage to 48 percent.

Regression equations 7-38 are shown on table 3 (7-38)

Previous USGS flood-frequency reports expressed the accuracy of the regional regression equations in terms of equivalent length of record (in years), which is an estimate of the number of years of station data needed at an ungaged site to produce peak-flow estimates with accuracy equal to that of the associated regression equation. The equivalent length-of-record concept can sometimes misconstrue the relation between flood-frequency estimates and associated variances.

Table 3. Regression equations for geographic regions in Florida.

[n, number of stations used in analysis. Table includes equations 7-38 referenced in the text]

Exceedance probability (percent)	Regression equations	Equation number	Standard error of prediction (percent)	Standard error of estimate (percent)	Equivalent length of record (years)	Average sampling error (log units)	Average model error (log units)	Average variance of prediction (log units)
Region 1 (n=77)								
50	$Q=127A^{0.656}(ST+I)^{-0.098}$	7	43	42	2.68	0.0018	0.0307	0.0325
20	$Q=248A^{0.662}(ST+I)^{-0.189}$	8	40	39	4.84	0.0019	0.0262	0.0281
10	$Q=357A^{0.666}(ST+I)^{-0.239}$	9	42	40	6.19	0.0022	0.0287	0.0309
4	$Q=528A^{0.671}(ST+I)^{-0.293}$	10	47	45	7.26	0.0028	0.0353	0.0381
2	$Q=684A^{0.675}(ST+I)^{-0.328}$	11	52	50	7.69	0.0034	0.0418	0.0452
1	$Q=864A^{0.679}(ST+I)^{-0.362}$	12	57	55	7.92	0.0040	0.0493	0.0533
0.5	$Q=1072A^{0.683}(ST+I)^{-0.392}$	13	62	60	8.02	0.0046	0.0576	0.0622
0.2	$Q=1395A^{0.688}(ST+I)^{-0.430}$	14	70	67	8.03	0.0055	0.0700	0.0755
Region 2 (n=83)								
50	$Q=101A^{0.617}(ST+I)^{-0.211}$	15	58	57	1.79	0.0026	0.0529	0.0555
20	$Q=184A^{0.620}(ST+I)^{-0.212}$	16	53	51	2.70	0.0024	0.0443	0.0467
10	$Q=253A^{0.621}(ST+I)^{-0.215}$	17	52	50	3.69	0.0025	0.0427	0.0452
4	$Q=353A^{0.621}(ST+I)^{-0.221}$	18	53	51	4.94	0.0027	0.0435	0.0462
2	$Q=435A^{0.621}(ST+I)^{-0.226}$	19	54	52	5.73	0.0030	0.0455	0.0485
1	$Q=525A^{0.621}(ST+I)^{-0.231}$	20	56	54	6.34	0.0033	0.0485	0.0518
0.5	$Q=622A^{0.621}(ST+I)^{-0.236}$	21	59	56	6.80	0.0036	0.0523	0.0559
0.2	$Q=764A^{0.620}(ST+I)^{-0.244}$	22	63	60	7.19	0.0041	0.0584	0.0625
Region 3 (n=76)								
50	$Q=72.7A^{0.741}(ST+I)^{-0.589}$	23	87	85	0.99	0.0048	0.1023	0.1071
20	$Q=164A^{0.704}(ST+I)^{-0.587}$	24	62	60	2.07	0.0031	0.0588	0.0619
10	$Q=250A^{0.686}(ST+I)^{-0.592}$	25	56	54	3.23	0.0028	0.0486	0.0514
4	$Q=390A^{0.668}(ST+I)^{-0.601}$	26	53	52	4.77	0.0028	0.0444	0.0472
2	$Q=517A^{0.656}(ST+I)^{-0.608}$	27	53	52	5.74	0.0030	0.0444	0.0474
1	$Q=664A^{0.646}(ST+I)^{-0.616}$	28	54	52	6.52	0.0032	0.0459	0.0491
0.5	$Q=833A^{0.638}(ST+I)^{-0.625}$	29	56	54	7.11	0.0034	0.0482	0.0516
0.2	$Q=1094A^{0.629}(ST+I)^{-0.638}$	30	59	56	7.68	0.0038	0.0522	0.0560
Region 4 (n=69)								
50	$Q=171A^{0.628}(ST+I)^{-0.401}$	31	36	35	4.15	0.0017	0.0218	0.0235
20	$Q=321A^{0.618}(ST+I)^{-0.395}$	32	39	38	4.86	0.0020	0.0250	0.0270
10	$Q=447A^{0.614}(ST+I)^{-0.396}$	33	43	41	5.54	0.0024	0.0293	0.0317
4	$Q=636A^{0.610}(ST+I)^{-0.401}$	34	48	46	6.19	0.0030	0.0365	0.0395
2	$Q=797A^{0.609}(ST+I)^{-0.406}$	35	53	50	6.48	0.0035	0.0427	0.0462
1	$Q=975A^{0.608}(ST+I)^{-0.411}$	36	57	55	6.64	0.0040	0.0496	0.0536
0.5	$Q=1171A^{0.608}(ST+I)^{-0.416}$	37	62	59	6.71	0.0046	0.0571	0.0617
0.2	$Q=1461A^{0.609}(ST+I)^{-0.424}$	38	69	66	6.70	0.0054	0.0681	0.0735

Table 4. Valid ranges of basin characteristics for the regional regression equations.[mi², square miles]

Basin characteristic	Minimum in region	Maximum in region
Region 1		
Drainage area (mi ²)	0.14	4385
Storage (percent)	0.00	44.29
Region 2		
Drainage area (mi ²)	0.06	2647
Storage (percent)	0.00	74.33
Region 3		
Drainage area (mi ²)	0.41	3244
Storage (percent)	0.18	48.04
Region 4		
Drainage area (mi ²)	0.20	2833
Storage (percent)	0.00	34.12

Using variances provides a more accurate characterization of the underlying uncertainty of the various flow estimates.

Weighting of Log-Pearson Type III and Regression Analyses

Flood estimates at streamgages for a selected exceedance probability can be determined by weighting the regional and station flood estimates for the specified exceedance probability using the variance of prediction for each of the two estimates. The variance of prediction can be considered as a measure of the uncertainty in either the streamgage flow estimate or the regional regression results. If the two estimates are assumed to be independent and are weighted in inverse proportion to the associated variances, the variance of the weighted estimate will be less than the variance of either of the independent estimates.

The variance of prediction corresponding to the streamgage-flow estimate from the log-Pearson Type III analysis is computed using the asymptotic formula given in

Figure 2. Distribution of drainage area and storage for the four hydrologic regions in Florida.

Cohn and others (2001) with the addition of the mean-squared error of generalized skew (Griffis and others, 2004). This variance varies as a function of the length of record and the fitted log-Pearson Type III distribution parameters (mean, standard deviation, and weighted skew). The variance of prediction for the streamgage flow estimate generally decreases with length of record and the quality of the log-Pearson Type III distribution fit. The variance of prediction values for the streamgage-flow estimates for the 275 streamgages in Florida are shown in appendix 2. The variance of prediction from the regression equations is a function of the regression equations and the values of the independent variables used to develop the flow estimate from the regression equations. This variance generally increases as the values of the independent move further from the mean values of the independent variables. Once the variances have been computed, the two independent-flow estimates can be weighted using the following equation (Feaster and others, 2009; Gotvald and others, 2009):

$$\log Q_{P(g)w} = \frac{V_{p,P(g)r} \log Q_{P(g)s} + V_{p,P(g)s} \log Q_{P(g)r}}{V_{p,P(g)s} + V_{p,P(g)r}}, \quad (39)$$

where

- $Q_{P(g)w}$ is the weighted estimate of peak flow for any P-percent chance exceedance for a gaged station, in cubic feet per second;
- $V_{p,P(g)r}$ is the variance of prediction at the gaged station derived from the regression equation for the selected P-percent chance exceedance, in log units;

- $Q_{P(g)s}$ is the estimate of peak flow at the gaged station from the log-Pearson Type III analysis for the selected P-percent chance exceedance, in cubic feet per second;
- $V_{p,P(g)s}$ is the variance of prediction at the gaged station from the log-Pearson Type III analysis for the selected P-percent chance exceedance, in log units; and
- $Q_{P(g)r}$ is the peak-flow estimate for the P-percent chance exceedance at the gaged station derived from the applicable regression equation, in cubic feet per second.

When the variance of prediction corresponding to one of the estimates is high, the uncertainty also is high, so the weight for that estimate is relatively small. Conversely, when the variance of prediction is low, the uncertainty also is low, so the weight is correspondingly large. The variance of prediction associated with the weighted estimate, $V_{p,P(g)w}$, is computed using the following equation (Feaster and others, 2009; Gotvald and others, 2009):

$$V_{p,P(g)w} = \frac{V_{p,P(g)s} V_{p,P(g)r}}{V_{p,P(g)s} + V_{p,P(g)r}}, \quad (40)$$

where variables are as previously defined.

Weighted flood-flow estimates for the 305 streamgages used in this study are presented in appendix 1, along with the log-Pearson Type III distribution and regression results.

Aerial view near the Alapaha River near Jennings, Florida, during the flood of April 2009. Photograph by the Fish and Wildlife Commission.

Estimation of Flood Magnitude and Frequency at Ungaged Stations

Peak-flow estimates have been calculated for 275 streamgages in Florida, 21 in Georgia, and 9 in Alabama for the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows. However, flood-flow estimates are frequently needed for locations on a stream where little (less than 10 years of data) to no-flow data are available. Flood-flow estimates for these streams can be derived by directly applying the regional regression equations (table 3) for the respective hydrologic regions (pl. 1).

Methods for improved flood-frequency estimates for an ungaged site near a gaged site on the same stream with more than 10 years of peak-flow data were presented by Sauer (1974). To obtain a weighted peak-flow estimate ($Q_{P(u)w}$) for P-percent chance exceedance at the ungaged site, the weighted peak-flow estimate for a downstream or upstream gaged site ($Q_{P(g)w}$) must first be determined using equation 39. The weighted peak-flow estimate for the ungaged site ($Q_{P(u)w}$) is then computed using the following equation:

$$Q_{P(u)w} = \left[\left(\frac{2\Delta A}{A_{(g)}} \right) + \left(1 - \frac{2\Delta A}{A_{(g)}} \right) \left(\frac{Q_{P(g)w}}{Q_{P(g)r}} \right) \right] Q_{P(u)r} \quad (41)$$

where

$Q_{P(u)w}$ is the weighted estimate of peak flow for the selected P-percent chance exceedance at the ungaged site, in cubic feet per second;
 ΔA is the absolute value of the difference between

the drainage areas of the gaged site and the ungaged site, in square miles;

$A_{(g)}$ is the drainage area for the gaged site, in square miles; and

$Q_{P(u)r}$ is the peak-flow estimate derived from the applicable regional equations for the selected P-percent chance exceedance at the ungaged site, in cubic feet per second.

Use of this equation gives full weight to the regression equation estimates when the drainage area for the ungaged site is equal to 0.5 or 1.5 times the drainage area for the gaged site, and increasing weight to the gaged site estimates as the ratio of the drainage area approaches 1. The weighting procedure must not be applied when the drainage-area ratio for the ungaged site and gaged site is less than 0.5 or greater than 1.5 (Feaster and others, 2009; Gotvald and others, 2009).

An example of the application of the procedure described in this section is the following computation of the weighted 1-percent chance exceedance flow for a hypothetical ungaged site on the New River located above the USGS station near Sumatra, Florida (station number 02330400, site 255, pl. 1) (Gotvald and others, 2009):

1. Calculate the value of $Q_{1\%(g)w}$ ($Q_{1\%(g)w} = 7,010 \text{ ft}^3/\text{s}$);
2. Obtain the drainage areas for both the gaged and ungaged sites ($A_g = 151 \text{ mi}^2$, and $A_u = 115 \text{ mi}^2$);
3. Obtain the storage factor for both the gaged and ungaged sites ($ST_g = 43.03$, and $ST_u = 30.1$);
4. Compute $Q_{1\%(u)r}$ for the ungaged site using equation 12 ($((864 * (115^{0.679}))(31.1^{-0.362})) = 6,240 \text{ ft}^3/\text{s}$;

Table 5. Comparison of Bulletin 17B (U.S. Water Resources Council, 1982) flood-discharge estimates from this investigation with Bulletin 17 (U.S. Water Resources Council, 1976) or Bulletin 17A (U.S. Water Resources Council, 1977) estimates from previous investigations.

[N, number of years of record used in the analysis]

Investigator	Flood discharge (in cubic feet per second) P-percent chance exceedance								
	N	50	20	10	4	2	1	0.5	0.2
02300000 Manatee River near Bradenton, Florida; map number 136									
This investigation (2011)	27	2,420	4,530	6,240	8,770	10,900	13,200	15,800	19,500
Bridges (1982)	27	2,410	4,520	6,260	8,840	11,000	13,400	16,100	20,100
Seijo and others (1979)	27	2,360	4,490	6,340	9,230	11,800	14,800	18,200	23,500
02322500 Santa Fe River near Fort White, Florida; map number 212									
This investigation (2011)	75	3,860	6,610	8,720	11,700	14,100	16,700	19,400	23,400
Bridges (1982)	47	4,120	6,870	8,940	11,800	14,100	16,500	19,100	22,800
Seijo and others (1979)	45	4,170	7,060	9,340	12,600	15,400	18,300	21,600	26,400
02297100 Joshua Creek at Nocatee, Florida; map number 120									
This investigation (2011)	56	1,760	3,180	4,380	6,260	7,930	9,860	12,100	15,500
Bridges (1982)	28	1,920	3,570	4,930	6,950	8,660	10,500	12,600	15,700
Seijo and others (1979)	26	1,960	3,710	5,240	7,630	9,770	12,200	15,100	19,500

5. Compute $Q_{1\%(g)r}$ for the gaged site using equation 12 ($Q_{1\%(g)r}=6,640 \text{ ft}^3/\text{s}$);
6. Compute ΔA , where $\Delta A = 151 - 115 = 36 \text{ mi}^2$;
7. Compute the weighted estimate for the ungaged site, $Q_{p(u)w}$, using equation 41 ($Q_{1\%(u)w} = [(2 \cdot 36)/151 + ((1 - (2 \cdot 36)/151)) \cdot (7,010/6,640)] \cdot 6,240 = 6,420 \text{ ft}^3/\text{s}$).

For an ungaged site that is located between two gaged stations on the same stream, two flow estimates can be made using the methods and criteria outlined in this section. In addition to evaluating the differences in hydrologic region make-up of the two gaged stations in comparison to the ungaged site, hydrologic judgment may be necessary to determine which of the two estimates is most appropriate. Other factors may need consideration when evaluating the two estimates, including the differences in the length of record for the two gaged stations and the hydrologic conditions that existed during the data collection period for each gaged station. For example, does the time series represent a climatic period that was predominately wet or dry? (Modified from Gotvald and others, 2009.)

Sites on Streams that Cross Flood Region or State Boundaries

For streams that cross flood region boundaries, flood magnitudes can be estimated by weighting the flood estimate by the percentage of basin drainage area in each flood region. First, the flood estimate is computed as if the total drainage area lies in each flood region. Next, the flood estimates are

weighted on the percentage of drainage area in each flood region. The same procedure applies to sites on streams that cross state boundaries where different methods are used for estimating flood magnitudes.

Comparison with Previous Analyses

Estimates of flood flows for three stations used in this investigation are compared to estimates presented by Bridges (1982) and Seijo and others (1979) to illustrate the effects of changes in methodology, regression equations, and record length (tables 5, 6, and 7). Manatee River near Bradenton was chosen for comparative purposes and, because the site was discontinued in 1966, the same period of record was used in all three investigations. Santa Fe River near Fort White and Joshua Creek at Nocatee each have substantially longer lengths of record now than when they were analyzed in the Bridges (1982) and Seijo and others (1979) reports, and these sites were chosen as representing sites with additional data for analysis in the present study.

Table 5 shows the effects of both additional records and changes in methods during the last 30 years of estimating flood flows using log-Pearson Type III analyses. Manatee River near Bradenton, for example, has 27 years of annual peak-flow data and all three investigations used this same period of record. This investigation used the U.S. Water Resources Council (1982) Bulletin 17B guidelines to compute flood flow. The investigation by Bridges (1982) used the guidelines presented in Bulletin 17A (U.S. Water Resources Council, 1977). The work by Seijo and others (1979) used the guidelines presented in Bulletin 17 (U.S. Water Resources

Table 6. Comparison of regression equation flood-discharge estimates from this investigation with regression equation flood-discharge estimates from previous investigations.

[N, number of years of record used in the analysis]

Investigator	Flood discharge (in cubic feet per second) P-percent chance exceedance								
	N	50	20	10	4	2	1	0.5	0.2
02300000 Manatee River near Bradenton, Florida; map number 136									
This investigation (2011)	27	1,570	2,850	3,890	5,380	6,660	8,050	9,590	11,900
Bridges (1982)	27	1,640	2,990	4,060	5,610	6,890	8,280	9,740	11,900
Seijo and others (1979)	27	1,810	3,360	4,690	6,760	8,600	10,700	13,100	16,900
02322500 Santa Fe River near Fort White, Florida; map number 212									
This investigation (2011)	75	4,190	7,780	10,700	14,700	17,900	21,300	24,900	29,700
Bridges (1982)	47	2,620	4,890	6,720	9,410	11,700	15,200	16,800	20,900
Seijo and others (1979)	45	4,050	6,900	9,200	12,600	15,400	18,600	22,100	27,400
02297100 Joshua Creek at Nocatee, Florida; map number 120									
This investigation (2011)	56	2,040	3,670	5,010	6,940	8,590	10,400	12,400	15,300
Bridges (1982)	28	2,180	3,910	5,290	7,280	8,930	10,700	12,600	15,400
Seijo and others (1979)	26	2,670	4,900	6,800	9,730	12,300	15,300	18,700	23,900

Council, 1976), which used only a generalized skew, rather than a map skew weighted with the station skew (Hammett and DelCharco, 2005). Comparing this study with the Bridges (1982) study shows less than a 1-percent difference in estimated flood flows at the 2-percent chance exceedance level, less than 2-percent difference at the 0.5- and 1-percent chance exceedance levels, and less than 3-percent difference at the 0.2-percent chance exceedance level. The report by Seijo and others (1979) shows a much wider variance in results because the study utilized only a generalized skew over the weighted skew. For example, at the 0.2-percent chance exceedance, the difference between the Seijo and others (1979) study and this study is about 17 percent. At the 50-percent chance exceedance, the difference is less than 3 percent.

Table 6 shows the differences in the regressions estimates derived by the three studies. The differences in regression estimates are attributed to the evolution in methods, longer lengths of record, changes in geographic groupings, and changes in explanatory variables used in the equations. This study used contributing drainage area and percent covered by storage as explanatory variables. Bridges (1982) and Seijo and others (1979) each used contributing drainage area, channel slope, and percent covered by lakes in their investigations. Seijo and others (1979) used soil index as an additional variable in their regression equations.

Table 7 shows the weighted flood-discharge flow estimates derived in this study compared to those from Bridges (1982) and Seijo and others (1979). The difference in weighted estimates at Manatee River near Bradenton can be attributed to the differences in methodology, lengths of record, and several additional high-water events that have occurred since the Bridges (1982) and Seijo and others (1979) investigations. The Seijo and others (1979) investigation has a noticeable

overestimation of flows at all three example locations, which is probably the reflection of different methods used during their study.

Effects of Flood Distribution and Magnitude in the Peak-Flow Dataset

Table 8 shows a comparison of the weighted flood-flow estimates from this investigation with the weighted estimates from the Bridges (1982) investigation. The comparison shows the effects of flood distribution and magnitude throughout the dataset at three selected stations. The weighted estimates from Bridges (1982) investigation and this investigation at Choctawhatchee River near Bruce (station number 02366500, map number 278, pl. 1) indicate little change in distribution or magnitudes of floods during the period of record at the site. The estimates are within 2 percent of the previously published data and the new data. Flood magnitudes appear to be evenly distributed with no high outliers during the 76-year period of systematic record. The peak-flow data are available online as supplemental data at <https://pubs.usgs.gov/sir/2011/5034>.

The weighted estimates for Little River near Quincy (station number 02329500; map number 243, pl. 1) show the effects of a dataset where large magnitude floods occurred in the early part of the systematic record. The current study estimates approximately 7 percent less water now than was estimated in the Bridges (1982) investigation for the 1-percent chance exceedance probability. An analysis of the peak-flow data indicates that of the top five floods at the site, only two have occurred since 1978 (the end of the period of analysis for the Bridges (1982) investigation)—one in 1984 (rank 5;

Table 7. Comparison of weighted flood-discharge estimates from this investigation with weighted estimates from previous investigations.

[N, number of years of record used in the analysis]

Investigator	Flood discharge (in cubic feet per second) P-percent chance exceedance								
	N	50	20	10	4	2	1	0.5	0.2
02300000 Manatee River near Bradenton, Florida; map number 136									
This investigation (2011)	27	2,260	4,200	5,740	7,900	9,680	11,500	13,600	16,600
Bridges (1982)	27	2,290	4,240	5,790	8,050	9,990	12,000	14,400	17,600
Seijo and others (1979)	27	2,300	4,230	5,880	8,390	10,700	13,300	16,200	20,900
02322500 Santa Fe River near Fort White, Florida; map number 212									
This investigation (2011)	75	3,860	6,640	8,800	11,900	14,400	17,100	20,000	24,200
Bridges (1982)	47	4,050	6,730	8,790	11,600	13,900	16,400	18,800	22,500
Seijo and others (1979)	45	4,160	7,040	9,320	12,600	15,400	18,400	21,700	26,700
02297100 Joshua Creek at Nocatee, Florida; map number 120									
This investigation (2011)	56	1,780	3,210	4,440	6,350	8,030	9,960	12,100	15,500
Bridges (1982)	28	1,950	3,620	4,990	7,010	8,710	10,500	12,600	15,600
Seijo and others (1979)	26	2,020	3,940	5,600	8,240	10,600	13,200	16,300	21,000

16,200 ft³/s) and one in 1991 (rank 4; 18,700 ft³/s). However, the top three floods were substantially larger in magnitude and most likely influenced the results published in 1982, because of a relatively short period of record used in the analysis at that time. The top ranking flood occurred in 1969 (45,600 ft³/s); second ranking flood occurred in 1965 (25,400 ft³/s); and the third ranking flood occurred in 1960 (23,300 ft³/s). The peak-flow data are available online as supplemental data at <https://pubs.usgs.gov/sir/2011/5034>.

The weighted estimates for the Yellow River at Milligan (station number 02368000, map number 283, pl. 1) show the effects of a dataset where large magnitude floods occur in the latter part of the systematic record. The current investigation estimates approximately 45 percent more water now than was estimated in the Bridges (1982) investigation for the 1-percent chance exceedance probability. An analysis of the peak-flow data indicates four of the top five floods at the site have occurred since the Bridges (1982) investigation—all in the 1990s. Until 1978 (the end of the period of analysis for the Bridges (1982) investigation), the largest flood during the systematic record was 38,600 ft³/s, recorded in 1975 (rank 4 of the top 5). Since then, however, four more large floods have occurred, three of which are substantially larger than that of 1975. The top three ranking floods in the systematic record occurred in 1999 (rank 1; 82,800 ft³/s), 1998 (rank 2; 55,600 ft³/s), and 1990 (rank 3; 51,500 ft³/s). The peak-flow data are available online as supplemental data at <https://pubs.usgs.gov/sir/2011/5034>.

Flood-Frequency Analysis for Large Streams

Flood-frequency relations for streamgages along the main stem of the Apalachicola River and Suwannee River at Ellaville and below (figs. 3–4) were not determined using the regional flood-frequency analysis, because the drainage areas of these sites are substantially larger than the maximum drainage areas for the streamgages used in the regional analyses. Additionally, the streamgages on the Apalachicola River are subject to regulation at Jim Woodruff Dam at Lake Seminole (pl. 1). Where the data analysis indicated it was appropriate, however, relations of flood magnitudes to drainage area were determined for selected exceedance probabilities. The flood-frequency relations for each river are summarized in the following sections. The estimated flood-frequency flows were based on log-Pearson Type III analyses of peak-flow data at the gaged sites on the streams, as described by the Bulletin 17B (U.S. Water Resources Council, 1982) guidelines, and are listed in appendix 3. Visual and graphical inspection of the data for each analysis indicated that a log-Pearson Type III distribution was a reasonable fit for the frequency curves published in this report.

Because the gages along the Apalachicola River have been affected by regulation of flows from Jim Woodruff Dam since 1957 (when the dam was constructed), trend analyses for the annual peak flows were performed to test if regulated patterns have changed with time. Trend analyses also were performed at the gages along the Suwannee River at Ellaville and below to test whether flow patterns have changed with time within the basin. Trends in regulations and flow were examined using Kendall's tau trend analysis and cumulative

Table 8. Comparison of weighted flood-discharge estimates from this investigation with weighted estimates from the Bridges (1982) investigation.

[N, number of years of record used in the analysis]

Investigator	Flood discharge (cubic feet per second) P-percent chance exceedance								
	N	50	20	10	4	2	1	0.5	0.2
02366500 Choctawhatchee River near Bruce, Florida; map number 278									
This investigation (2011)	76	31,300	49,000	63,600	85,800	106,000	128,000	154,000	194,000
Bridges (1982)	48	31,400	50,000	64,800	87,100	106,000	128,000	153,000	190,000
Percent change		0	-2	-2	-1	0	0	1	2
02329500 Little River near Quincy, Florida; map number 243									
This investigation (2011)	41	4,250	9,370	14,300	22,600	30,600	40,000	51,200	69,400
Bridges (1982)	28	4,270	9,850	15,100	24,000	32,600	43,000	55,400	75,500
Percent change		0	-5	-5	-6	-6	-7	-8	-8
02368000 Yellow River at Milligan, Florida; map number 283									
This investigation (2011)	66	8,520	17,300	25,600	39,200	51,900	66,600	83,700	111,000
Bridges (1982)	40	8,310	14,900	20,500	29,200	37,000	45,900	56,100	71,800
Percent change		3	16	25	34	40	45	49	55

plots of weekday daily-mean flows (single-mass curves, Helsel and Hirsch, 1995). Analysis plots included: (1) cumulated ratio of 90- to 50-percentile daily-value streamflow by water year, (2) cumulated weekday 50-percentile streamflow by water year, (3) cumulated water-year mean weekday streamflow, (4) cumulated water-year mean weekend streamflow, (5) cumulated ratio of 10- to 50-percentile streamflow by climatic year, and (6) cumulated weekday 50-percentile streamflow by climatic year. The single-mass curve is a basic analytical tool showing a plot of cumulative values against time. The slope of the single-mass curve represents the constant of proportionality between the two quantities (Searcy and Hardison, 1960). A break in the slope of the curve would indicate a sudden change in the proportionality constant. This analysis is particularly useful for regulated streams, because it can determine whether or not regulation has remained consistent throughout the regulation period.

Flood magnitudes for selected exceedance probabilities can be estimated by using figures 3–4 by reading the flow scale for the known drainage areas. Peak-flow data at selected sites on these large streams are included in appendix 3 of this report. The curves in figures 3–4 have been drawn as straight lines connecting the plotted data points. These linear representations do not infer that flood estimates or drainage area varies uniformly along the stream. The exceedance probability flood estimates at multiple streamgages along a stream will vary as a result of several factors, including length of record, concurrent period of record, and intervening tributaries. Additionally, the

location of the storm causing a flood will impact flood estimates. If, for example, a storm was located in the lower part of a basin, the streamgages in the upper half of the basin would not record the runoff associated with the storm. Consequently, it is conceivable that a flood of record at a lower gage may not necessarily be a flood of record at an upper streamgage. As a result of these factors, exceedance probability flood estimates between two streamgages on the same stream may not be completely linear. However, linearly interpolating between two streamgages with relatively similar lengths of record can provide a reasonable estimate of flood magnitudes between the two streamgages (Hedgecock and Feaster, 2007).

Apalachicola River

The relation of flood flow to drainage area for selected exceedance probabilities for the Apalachicola River is shown in figure 3 (Hedgecock and Feaster, 2007). Flow patterns at all streamgages along the Apalachicola River are impacted by regulation predominantly from Jim Woodruff Dam. Trend assessments, using Kendall's tau and single-mass curves, were made for the entire period of record from 1920 through 2006 for the Apalachicola River at Chattahoochee (station number 02358000, pl. 1). Neither of the tests indicated a trend in the data for the high-flow regime. Trend assessments also were made for the period from 1957 through 2006, which is the period of regulated peaks. Kendall's tau statistic indicated a slightly negative trend in the peak-flow data; however, this

Figure 3. Relation of flood streamflow to drainage area for selected streamgaging stations and P-percent chance exceedance for the Apalachicola River in Florida.

trend is most likely the result of the drought that persisted through much of the last decade of record. Single-mass curve results show a decreasing trend. Additionally, an analysis of the daily mean flows shows a difference in the pattern of daily mean flows after about 1980. This could be because the late 1960s and 1970s was a relatively wet period in the south-east and not just an issue of changing regulation patterns. A peak-flow analysis using only the regulated peaks from 1957 through 2006 indicates that the log-Pearson Type III distribution provides a reasonable fit of the data. The results for selected exceedance probabilities are shown in appendix 3. The results displayed herein assume that similar regulation patterns will continue in the future.

Trend assessments were made for Apalachicola River near Blountstown (station number 02358700, pl. 1). Similar to the results at the Chattahoochee streamgauge, Kendall's tau statistic and the single-mass curves indicate a slightly negative trend in the data. Again, this is assumed to be predominantly the result of the drought that occurred during most of the last decade. Additionally, similar to the data at Chattahoochee, daily-mean flow patterns at the Blountstown streamgauge changed after about 1980 and are most likely attributed to the change in climatic conditions previously discussed. A peak-flow analysis using the regulated peaks from 1958 through 2006 provides a reasonable fit of the data. The results for selected exceedance probabilities are shown in appendix 3. The results displayed herein assume that similar regulation patterns will continue in the future.

Assessments were made for the Apalachicola River near Sumatra (station number 02359170, pl. 1) for the period of record from 1978 through 2006. An analysis of the daily mean flows shows that 2000 through 2006 was a particularly dry period, similar to the Chattahoochee and Blountstown streamgages. Trend assessments were performed using Kendall's tau statistic, which provided a value of 0.051. A value of less than 0.05 indicates a trend in the data. Similar to the Chattahoochee and Blountstown streamgages, the drought years at the end of the record are the most probable reason for Kendall's tau indicating a negative trend at the 0.05 significance level. A peak-flow analysis using the regulated peaks from 1978 through 2006 provides a reasonable fit of the data. The results for selected exceedance probabilities are shown in appendix 3. The results displayed herein assume that similar regulation patterns will continue in the future.

Suwannee River

The relation of flood flow to drainage area for selected exceedance probabilities for the Suwannee River is shown in figure 4. Flood flows for selected exceedance probabilities for the Suwannee River near Benton (station number 02315000, map number 188, pl. 1), at White Springs (station number 02315500, map number 190, pl. 1), and at Suwannee Springs (station number 02315550, map number 191, pl. 1) are given in appendix 1. These flows are the log-Pearson Type III analysis, the regional flood equation estimates, and the

Figure 4. Relation of flood streamflow to drainage area for selected streamgaging stations and P-percent chance exceedance for the Suwannee River in Florida.

weighted estimates between these two calculations. The flood flows shown on figure 4 are those of the log-Pearson Type III analysis and are based on the period of record from 1973 and 1976 through 2002 at Benton, 1907 through 1908 and 1928 through 2006 at White Springs, and 1961 through 1964 and 1966 through 1996 at Suwannee Springs.

For the Suwannee River at Ellaville (station number 02319500, pl. 1), a trend test using Kendall's tau trend analysis and single-mass curves for the entire period of record from 1928 through 2006 indicated no change in flow patterns. A log-Pearson Type III analysis was performed for the period of record and the resulting flood flows for selected exceedance probabilities are provided in appendix 3.

For the Suwannee River at Branford (station number 02320500, pl. 1), a trend test using Kendall's tau trend analysis and single-mass curves for the entire period of record from 1928 and 1932 through 2006 indicated no change in flow patterns. A log-Pearson Type III analysis was performed for the period of record and the resulting flood flows for selected exceedance probabilities are provided in appendix 3.

For the Suwannee River near Wilcox (station number 02323500, pl. 1), a trend test using Kendall's tau trend

analysis and single-mass curves for the entire period of record from 1928, 1931, 1942, and 1944 through 2006 indicated no change in flow patterns. A log-Pearson Type III analysis was performed for the period of record and the resulting flood flows for selected exceedance probabilities are provided in appendix 3.

Generally, rainfall from a storm equally dispersed throughout a basin means that flood magnitudes will increase along with increasing drainage area. This is not the case in the Suwannee River between Luraville (station number 02320000, pl. 1) and Branford (station number 02320500, pl. 1). A decrease in flood magnitude exists that could be due to peak attenuation as cross-sectional area increases in a downstream direction. A large part of the attenuation is through transient stream losses to springs which effectively become sinks at periods of high stream levels. The same phenomenon of peak attenuation occurs between Worthington Springs (station number 02321500, map number 204, pl. 1) and High Springs on the Santa Fe River (station number 02322000, map number 209, pl. 1; Giese and Franklin, 1996).

Rising floodwaters affect wildlife habitats and often cause species to seek safety in unfamiliar environments.

Above: View of a reflector sign near a road near the Suwannee River near Ellaville, Florida, gage during the flood of April 2009. Ants are maneuvering up the sign to avoid drowning in the floodwaters. Photograph by Mark Stephens, USGS.

Above: An emu observes standing water and USGS surveying equipment after a heavy rain event in south Florida (circa 1999–2000). Photographs by Richard Verdi, USGS.

Summary

Flood flows for selected exceedance probabilities were determined for 275 streamgages on natural streams in Florida using the log-Pearson Type III frequency distribution. The data for these sites in Florida and 30 additional sites in parts of the adjacent States of Georgia and Alabama were used to develop regional flood-frequency relations that can be used to estimate flood flows for the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance probabilities for ungaged, unregulated streams in Florida.

Multiple-regression techniques were used to define four hydrologic regions having similar flood characteristics and to develop predictive equations relating peak flow to specified drainage-basin characteristics. The flood regions were delineated based on plotted residuals, previous flood-frequency studies, and geologic, physiographic, and drainage-area maps. The most significant variable determined for predicting flood flows in Florida was drainage area, followed by storage. Generalized least-squares regression methods were used to define the regression coefficients used in the predictive equations and both the model and prediction errors.

The regional flood-frequency relations can be applied to streams in Florida that are not significantly affected by backwater, regulation, urbanization, or channelization. Methods are presented in this report for determining flood flows for selected exceedance probabilities on ungaged and gaged streams. On large streams where the regional flood-frequency relations do not apply, flood flows for 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance probabilities are estimated from graphical relations of flood flows and drainage areas for the Apalachicola River and Suwannee River at Ellaville and below.

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Appendixes and Supplemental Data

Data for gaging stations in Florida (modified from Hedgecock and Feaster, 2007).

The following appendix tables contain peak stage and discharge data for streamflow gaging stations in Alabama. The tables contain a brief description of the gage location, type of gage, gage datum (if known), drainage area in square miles, historical data and explanatory remarks. Elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

The tables of peak stages and discharges show only the annual maximums. The qualification codes in the tables correspond to the peak data codes as used in the U.S. Geological Survey National Water Information System (NWIS). The following qualification codes apply to the discharge columns:

- ¹ discharge is a maximum daily average;
 - ² discharge is an estimate;
 - ⁴ discharge is less than indicated value, which is the minimum recordable discharge at this site;
 - ⁵ discharge affected to unknown degree by regulation or diversion;
 - ⁶ discharge affected by regulation or diversion;
 - ⁷ discharge is an historic peak;
 - ^A year of occurrence is unknown or not exact;
 - ^B month or day of occurrence is unknown or not exact;
 - ^E only maximum peak available for this year.
- The following qualification codes apply to the gage height columns:
- ¹ gage height affected by backwater;
 - ² gage height not the maximum for the year;
 - ³ gage height at different data or at different site and datum;
 - ⁵ gage height is an estimate.

The following abbreviations apply to the tables:

--, date or data not available; ft, feet; ft³/s, cubic feet per second; mi, mile; mi², square miles.

The supplemental data for this report includes full descriptions of the streamgages used in this study, such as location, datum information, period of record, and any special remarks associated with the streamgage (historic flood information, for example). Additionally, the peak-flow data are included. These data are available online at <https://pubs.usgs.gov/sir/2011/5034>.

The drainage area data presented in appendixes 1 and 3 are those as defined by the use of GIS analysis for this project. The drainage area data presented in the supplemental data are those as historically derived and published in the National Water Information System (NWIS).

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 1.

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02327100	229	Sopchoppy River near Sopchoppy, Fla.	105	43.3	46	2440	3780	4700	5880	6770	7660	8560	9770
02327350 ^a	230	Ochlocknee River Tributary near Coolidge, Ga.	1.98	0.30	42	1850	2640	3200	3940	4560	5160	5820	6710
						2420	3710	4600	5710	6560	7390	8220	9340
						205	377	516	717	885	1070	1270	1550
02327355 ^a	231	Ochlocknee River (State Road 188) near Coolidge, Ga.	256.03	0.65	26	142	306	449	675	866	1090	1330	1710
						197	367	505	708	880	1070	1290	1600
						4000	7900	11300	16800	21700	27300	33800	43900
02327415 ^a	232	Little Ochlocknee River (State Road 111) near Moultrie, Ga.	44.87	1.00	24	3370	6520	9120	13000	16200	19700	23600	29400
						3930	7710	10900	15900	20100	24800	30000	37700
						1600	3160	4550	6790	8840	11200	14000	18500
02327500 ^a	233	Ochlocknee River near Thomasville, Ga.	559.15	0.60	50	1080	2160	3080	4470	5630	6930	8370	10500
						1480	2860	4020	5760	7240	8860	10700	13500
						5740	11000	15700	23000	29700	37400	46300	60200
02327550 ^a	234	Barnetts Creek near Meigs, Ga.	14.96	0.50	21	5480	10400	14500	20400	25400	30700	36600	45500
						5730	11000	15600	22700	29100	36300	44300	56600
						826	1710	2480	3680	4720	5900	7230	9230
02327700 ^a	235	Barnetts Creek near Thomasville, Ga.	106.69	0.90	27	529	1090	1570	2310	2920	3620	4390	5570
						771	1570	2240	3230	4050	4950	5930	7380
						2840	6200	9430	14900	20000	26200	33700	45700
02327860 ^a	236	Popple Branch at State Route 179 near Whigham, Ga.	1.66	2.20	26	1860	3670	5180	7450	9340	11400	13700	17200
						2650	5550	8050	11800	14900	18300	22000	27400
						167	295	401	560	698	854	1030	1290
02327900 ^a	237	Wolf Creek near Whigham, Ga.	18.47	1.70	27	129	279	411	618	794	996	1220	1570
						161	292	403	577	729	906	1110	1410
						1130	2020	2750	3800	4680	5650	6700	8240
						616	1260	1820	2660	3370	4160	5050	6390
						1100	1970	2680	3680	4510	5420	6400	7850

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02328000 ^a	238	Tired Creek near Cairo, Ga.	58.2	2.00	36	2370	4930	7450	11800	16100	21500	28200	39600
						1300	2600	3690	5340	6710	8250	9940	12500
						2300	4700	6920	10400	13500	17000	21000	26900
02329000	239	Ochlocknee River near Havana, Fla.	1140	1.73	81	7480	14200	19700	27700	34400	41600	49400	60800
						11700	21700	30500	44300	57000	71600	88700	115000
						7640	14600	20300	28900	36300	44500	53800	67500
02329180	240	Megginnis Arm Tributary at Tallahassee, Fla.	1.44	0.41	11	271	328	366	414	450	486	523	574
						156	296	419	609	781	976	1200	1550
						267	326	369	427	474	525	579	656
02329354	241	Attapulgus Creek Tributary near Jamieson, Fla.	1.03	0.00	11	91.1	184	267	398	517	654	811	1060
						130	253	365	540	699	883	1100	1430
						101	207	305	461	603	768	963	1260
02329490	242	Willacoochee Creek near Quincy, Fla.	64.9	0.10	15	1380	2510	3470	4940	6240	7700	9370	11900
						1940	3860	5620	8440	11100	14200	17900	23600
						1460	2790	4000	5960	7780	9930	12500	16400
02329500	243	Little River near Quincy, Fla.	237	0.24	41	4220	9480	14800	24100	33400	45100	59600	84100
						4490	8880	12900	19400	25500	32700	41200	54700
						4250	9370	14300	22600	30600	40000	51200	69400
02329534	244	Quincy Creek at State Hwy 267 at Quincy, Fla.	16.9	1.10	19	704	1180	1590	2260	2860	3590	4440	5820
						753	1400	1960	2830	3610	4500	5520	7080
						709	1220	1680	2420	3110	3930	4890	6380
02329558	245	St. Matthews Church Branch near Quincy, Fla.	0.515	0.00	11	73.2	105	128	159	183	209	235	273
						82.0	160	230	338	437	551	682	862
						74.0	112	142	187	225	268	316	387
02329559	246	Littman Branch near Quincy, Fla.	0.270	2.90	11	25.8	36.4	43.4	52.2	58.7	65.2	71.7	80.3
						47.0	81.0	108	147	181	217	257	316
						27.2	40.1	49.4	61.9	71.8	82.3	93.6	109

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02329600	247	Little River near Midway, Fla.	305	0.46	42	5000	11300	17800	29100	40500	54700	72500	103000
						5220	10200	14700	22000	28700	36600	46000	60700
						5040	11100	17000	26800	36100	47100	60200	81200
02329700	248	Rocky Comfort Creek near Quincy, Fla.	9.37	0.09	17	628	1400	2220	3740	5310	7370	10000	14800
						547	1070	1550	2310	3010	3830	4780	6270
						609	1280	1900	2910	3850	4960	6250	8340
02329877	249	Ocklawaha Creek near Wetumpka, Fla.	28.9	3.19	15	616	1110	1530	2190	2780	3450	4230	5440
						1000	1750	2380	3320	4140	5050	6080	7620
						665	1240	1750	2540	3250	4060	5000	6410
02330000	250	Ochlockonee River near Bloxham, Fla.	1720	2.84	78	9510	18100	25900	38500	50300	64400	81100	108000
						14800	26700	37000	52800	67200	83500	103000	132000
						9710	18600	26800	40200	52700	67600	85400	113000
02330050	251	Telogia Creek near Greensboro, Fla.	27.8	1.49	22	1430	3060	4690	7570	10400	14100	18700	26500
						1030	1890	2630	3770	4790	5940	7270	9290
						1350	2680	3850	5650	7270	9100	11200	14500
02330100	252	Telogia Creek near Bristol, Fla.	128	6.66	53	2760	5210	7340	10700	13600	17000	20900	27000
						2510	4200	5570	7560	9290	11200	13300	16400
						2740	5110	7110	10100	12700	15600	18800	23600
02330150	253	Ochlockonee River near Smith Creek, Fla.	2100	5.25	11	14800	27300	36900	50100	60600	71500	82900	98800
						16000	27800	37600	52300	65600	80200	97200	123000
						15100	27400	37100	50800	62400	74800	88600	109000
02330200	254	New River at Vilas, Fla.	24.7	35.11	22	520	923	1270	1820	2320	2900	3580	4640
						732	1050	1280	1590	1840	2080	2350	2710
						539	944	1270	1750	2150	2570	3030	3680
02330400	255	New River near Sumatra, Fla.	151	43.03	32	2530	3650	4440	5480	6300	7150	8030	9260
						2360	3370	4090	5060	5960	6640	7500	8670
						2520	3630	4410	5440	6260	7090	7960	9170

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02356510	256	South Mosquito Creek Tributary near Hardaway, Fla.	0.290	0.00	11	30.9	46.5	57.9	73.6	86.1	99.4	114	134
						56.0	109	157	230	297	373	460	596
						33.0	53.7	71.3	97.9	121	148	178	223
02356640 ^a	257	Spring Creek (U.S. 27) at Colquitt, Ga.	283	0.10	24	3250	6330	9020	13200	17000	21300	26200	33800
						2340	4220	5630	7480	9100	10800	12400	14700
						3050	5720	7820	10700	13100	15600	18000	21600
02357000 ^a	258	Spring Creek near Iron City, Ga.	468	0.20	65	4370	8740	12200	17100	21100	25300	29600	35600
						3330	5940	7890	10400	12600	15000	17100	20200
						4250	8390	11600	15800	19200	22500	25700	30200
02358600	259	Flat Creek near Chattahoochee, Fla.	24.9	0.22	21	1050	2100	3120	4910	6680	8920	11700	16500
						1030	2010	2900	4310	5610	7130	8910	11700
						1050	2070	3050	4650	6170	7970	10100	13600
02358800	260	Chipola River at Oakdale, Fla.	565	7.30	12	3430	5100	6190	7540	8520	9470	10400	11600
						6600	11000	14700	20000	24600	29700	35500	44000
						3690	5660	7060	8920	10400	11900	13600	15800
02358946	261	Mockingbird Run near Cypress, Fla.	0.565	0.00	11	16.8	87.3	210	545	1020	1780	3000	5680
						87.0	170	244	360	465	586	726	942
						51.3	145	237	385	520	678	860	1150
02358998	262	Holliman Branch near Altha, Fla.	1.92	0.00	18	297	539	743	1050	1320	1630	1980	2500
						195	382	551	817	1060	1340	1670	2180
						280	502	689	974	1230	1520	1850	2360
02359000	263	Chipola River near Altha, Fla.	833	6.74	72	4630	7310	9460	12600	15400	18400	21900	27100
						8570	14500	19300	26400	32700	39600	47500	59200
						4690	7500	9840	13400	16600	20200	24300	30600
02359300	264	Sandy Creek near Panama City, Fla.	28.4	10.03	22	1300	1930	2360	2920	3340	3760	4200	4780
						903	1450	1870	2470	2980	3520	4120	4970
						1280	1890	2310	2860	3290	3720	4180	4810

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02359350	265	Econfina Creek near Compass Lake, Fla.	40.6	9.38	18	739	1040	1240	1500	1700	1900	2100	2380
						1150	1850	2410	3190	3870	4580	5380	6520
						758	1090	1320	1640	1890	2160	2450	2850
02359450	266	Econfina Creek near Fountain, Fla.	70.2	11.24	17	997	1300	1480	1710	1870	2030	2180	2380
						1620	2580	3330	4390	5300	6260	7330	8850
						1010	1340	1550	1820	2030	2240	2460	2750
02359500	267	Econfina Creek near Bennett, Fla.	122	8.29	68	1300	1800	2180	2710	3140	3620	4120	4870
						2390	3910	5140	6900	8430	10100	11900	14600
						1310	1840	2240	2840	3350	3920	4550	5490
02359550	268	Bear Creek near Youngstown, Fla.	57.1	8.69	24	2030	3290	4290	5750	6990	8370	9900	12200
						1440	2350	3070	4100	4980	5920	6970	8500
						1980	3160	4070	5380	6470	7660	8960	10900
02361000 ^b	269	Choctawhatchee River near Newton, Ala.	686	6.80	75	8870	16500	23800	36400	48800	64300	83700	117000
						—	—	—	—	—	—	—	—
						8910	16600	23700	35000	45600	58500	74300	101000
02364500 ^b	270	Pea River near Samson, Ala.	1180	6.30	49	12300	19800	25800	34900	42800	51600	61600	76900
						—	—	—	—	—	—	—	—
						12400	20500	27300	37600	45900	55100	65400	80700
02365200	271	Choctawhatchee River near Pittman, Fla.	3180	2.20	13	27300	44500	56900	73600	86400	99700	113000	132000
						22500	41500	58200	84200	108000	136000	168000	217000
						26500	43900	57200	76000	91600	109000	128000	155000
02365237	272	Fowler Branch near Leonia, Fla.	5.12	0.00	19	381	559	686	855	988	1130	1270	1480
						371	732	1060	1580	2060	2620	3270	4290
						380	572	720	934	1120	1320	1540	1870
02365310 ^b	273	Grants Branch Tributary near Fadgette, Ala.	1.44	0.00	10	367	650	878	1210	1490	1800	2130	2630
						—	—	—	—	—	—	—	—
						324	539	700	943	1160	1400	1660	2040

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02365470	274	Wrights Creek at State Highway 177-A near Bonifay, Fla.	151	6.73	13	2060	3340	4420	6060	7520	9200	11100	14200
						2790	4670	6190	8400	10300	12400	14800	18300
						2140	3590	4850	6780	8490	10400	12700	16000
02365500	275	Choctawhatchee River at Caryville, Fla.	3510	2.92	75	23300	36500	48400	67900	86300	108000	136000	180000
						23500	42600	59100	84600	108000	134000	165000	213000
						23300	36800	49100	69700	89300	113000	142000	188000
02365700	276	Sandy Creek at Ponce De Leon, Fla..	116	4.67	30	2900	5380	7640	11300	14800	19000	24000	32200
						2420	4160	5590	7710	9580	11600	14000	17400
						2860	5170	7160	10200	12900	16000	19500	24800
02366000	277	Holmes Creek at Vernon, Fla.	393	7.87	36	3950	6710	8850	11900	14400	17000	19900	24100
						5160	8570	11300	15300	18900	22600	27000	33300
						4020	6860	9090	12300	15000	18000	21200	26000
02366500	278	Choctawhatchee River near Bruce, Fla.	4380	4.69	76	31400	49200	63700	85600	105000	127000	152000	190000
						26200	46000	62800	88100	111000	137000	167000	212000
						31300	49000	63600	85800	106000	128000	154000	194000
02366859	279	Pate Branch near Freeport, Fla.	1.88	0.00	19	169	274	357	479	581	694	820	1010
						192	376	543	806	1050	1330	1650	2150
						171	287	386	541	679	840	1030	1310
02367000	280	Alaqua Creek near Defuniak Springs, Fla.	65.8	0.29	26	2360	4270	5940	8590	11000	13800	17100	22300
						1930	3780	5460	8130	10600	13500	16900	22300
						2320	4190	5840	8470	10900	13700	17000	22300
02367006	281	Alaqua Creek near Portland, Fla.	83.8	1.35	15	2620	4830	6700	9560	12100	14900	18200	23100
						2130	3960	5560	8030	10300	12800	15800	20300
						2530	4600	6340	8990	11400	14000	17100	21700
02367800 ^b	282	Yellow River near Wing, Ala.	461	5.70	12	6350	10400	14100	20200	25900	32900	41300	55400
						—	—	—	—	—	—	—	—
						6700	11900	16500	23300	28700	35000	42000	52600

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent					
						50	20	10	4	2	0.2
02368000	283	Yellow River at Milligan, Fla.	624	3.88	66	8590	17900	27300	44400	61900	164000
						7410	13000	17800	24900	31300	59100
						8520	17300	25600	39200	51900	111000
02368300	284	Baggett Creek near Milligan, Fla.	7.75	0.84	18	320	460	561	697	804	1200
						458	857	1210	1750	2230	4390
						327	488	614	800	956	1620
02368326	285	Caney Creek Tributary No. 2 near Caney Creek Tower near Paxton, Fla.	0.190	0.00	11	51.2	105	154	235	309	667
						43.0	83.0	118	173	223	445
						48.7	95.8	137	201	259	520
02368329	286	Caney Creek Tributary No. 1 near Paxton, Fla.	0.140	0.00	11	91.5	150	200	280	351	692
						31.0	67.0	96.0	141	185	361
						79.7	122	157	211	260	482
02368500	287	Shoal River near Mossy Head, Fla.	123	6.98	34	3100	5830	8090	11500	14400	26500
						2430	4050	5350	7250	8900	15600
						3030	5560	7580	10500	12900	22500
02369000	288	Shoal River near Crestview, Fla.	474	5.10	68	7720	13400	18300	25900	32700	63600
						6060	10400	14000	19400	24200	44400
						7660	13200	17900	25100	31400	58900
02369500	289	Yellow River near Holt, Fla.	1220	2.90	18	8520	12800	16500	22100	27200	51200
						11800	21200	29300	41700	53000	103000
						8710	13700	18400	26300	33600	69400
02369800 ^b	290	Blackwater River near Bradley, Ala.	87.7	0.80	36	2450	5540	8600	13800	18900	45100
						—	—	—	—	—	—
						2500	5440	8000	11800	15200	31900
02370000	291	Blackwater River near Baker, Fla.	206	4.37	52	4450	9090	13400	20700	27600	61900
						3550	6140	8300	11500	14400	26500
						4370	8680	12500	18400	23600	46400

Appendix 1. Flood-frequency estimates using PeakEQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02370200	292	Big Juniper Creek near Munson, Fla.	34.5	0.48	10	1080	2140	3140	4850	6500	8520	11000	15100
						1250	2400	3440	5070	6570	8300	10300	13500
						1120	2240	3280	4970	6540	8380	10500	14000
02370500	293	Big Coldwater Creek near Milton, Fla.	240	0.89	60	5830	11800	17400	27100	36400	47900	62000	85400
						4340	8270	11800	17300	22400	28300	35200	46000
						5720	11300	16500	24800	32600	41600	52300	69400
02370700	294	Pond Creek near Milton, Fla.	58.7	0.87	27	621	1490	2450	4330	6360	9110	12800	19600
						1730	3270	4630	6760	8700	10900	13500	17600
						752	1880	3110	5320	7470	10100	13200	18300
02370750	295	Hurricane Branch near Milton, Fla.	2.85	0.13	23	119	439	896	1970	3310	5340	8320	14400
						250	485	697	1030	1330	1680	2090	2720
						159	462	775	1290	1770	2330	2980	4010
02372500 ^b	296	Conecuh River near Andalusia, Ala.	1340	7.90	58	13800	23300	31000	42100	51500	61800	73200	90100
						—	—	—	—	—	—	—	—
						13800	23700	31800	43400	52900	63300	74800	91600
02374500 ^b	297	Murder Creek near Evergreen, Ala.	176	1.80	67	3440	7030	10600	16700	22800	30400	39800	56000
						—	—	—	—	—	—	—	—
						3490	7130	10600	16000	21000	27100	34500	46800
02374970 ^b	298	Sizemore Creek near Robinsville, Ala.	79.4	2.10	12	4610	7220	9290	12300	14900	17700	20800	25500
						—	—	—	—	—	—	—	—
						3940	5970	7520	9860	11900	14200	16800	20600
02375000 ^b	299	Big Escambia Creek at Flomaton, Ala.	330	4.10	37	7180	13100	18600	27800	36700	47700	61000	83400
						—	—	—	—	—	—	—	—
						7060	12600	17400	24500	31000	38800	48200	63100
02375500	300	Escambia River near Century, Fla.	3840	2.04	73	38200	58900	74400	95800	113000	132000	152000	180000
						25600	47400	66700	96800	125000	157000	194000	253000
						37800	58500	74000	95900	114000	134000	155000	187000

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 1.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates; —, no data]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (per-cent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02376000	301	Pine Barren Creek near Barth, Fla.	74.7	0.28	42	3180	7420	11700	19400	27000	36500	48200	68100
						2100	4120	5950	8880	11600	14800	18500	24400
						3010	6640	10000	15400	20300	26000	32500	43000
02376033	302	Escambia River near Molino, Fla.	4150	2.60	26	37600	60700	80800	113000	143000	178000	220000	288000
						26500	48400	67600	97200	124000	156000	192000	248000
						36800	59100	78400	109000	137000	170000	209000	271000
02376079	303	Carpenter Creek at Pensacola, Fla.	8.81	0.22	13	679	1260	1780	2620	3400	4320	5410	7160
						519	1010	1450	2150	2780	3520	4380	5720
						645	1180	1650	2400	3090	3890	4830	6310
02376300	304	Brushy Creek near Walnut Hill, Fla.	52.2	2.02	34	2330	4240	5840	8260	10400	12700	15400	19400
						1530	2760	3820	5430	6870	8500	10400	13200
						2240	4020	5480	7620	9460	11500	13800	17200
02376500	305	Perdido River at Barrineau Park, Fla.	394	8.60	66	7640	14000	19300	27600	34900	43300	52800	67500
						5130	8450	11100	15000	18400	22000	26200	32200
						7400	13300	18100	25300	31500	38300	45800	57200

^aCharacteristics are from Gotvald and others, 2009.

^bCharacteristics are from Hedgecock and Feaster, 2007.

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02228500	1	North Prong St. Marys River at Moniac, Ga.	131	64.4	63	1350	2620	3700	5350	6780	8390	10200	12900
						847	1560	2130	2900	3500	4130	4790	5670
						1320	2550	3560	5000	6160	7380	8670	10400
02229000	2	Middle Prong St. Marys River at Taylor, Fla.	126	23.3	38	985	1840	2420	3140	3640	4120	4560	5120
						1020	1880	2570	3520	4260	5060	5900	7000
						987	1840	2430	3170	3720	4270	4820	5550
02230000	3	Turkey Creek at Maccleddy, Fla.	21.0	8.02	27	850	1320	1650	2110	2460	2840	3230	3780
						415	761	1040	1440	1750	2090	2450	2950
						827	1280	1600	2020	2350	2690	3060	3560
02230500	4	South Prong St. Marys River at Glen St. Mary, Fla.	156	5.86	23	2190	3900	5190	6930	8300	9720	11200	13200
						1520	2800	3850	5300	6470	7740	9080	10900
						2130	3780	5000	6630	7880	9190	10500	12400
02231000	5	St. Marys River near Maccleddy, Fla.	707	27.4	80	5550	11100	16000	23800	30700	38600	47800	61900
						2860	5290	7250	9920	12000	14300	16600	19700
						5440	10700	15200	21800	27000	32600	38500	46700
02231230	6	Pigeon Creek at Boulogne, Fla.	9.36	19.8	11	339	494	598	730	829	927	1030	1160
						212	387	529	724	879	1050	1220	1460
						329	484	590	729	838	953	1070	1240
02231250	7	Little St. Mary's River near Hilliard, Fla.	20.0	7.38	30	622	1110	1510	2120	2650	3250	3930	4960
						410	752	1030	1420	1730	2070	2420	2920
						608	1070	1440	1980	2410	2870	3370	4080
02231253	8	St Marys River near Gross, Fla.	1360	18.5	13	7740	10500	12400	14900	16900	19000	21100	24200
						4640	8610	11800	16200	19700	23400	27300	32500
						7610	10300	12300	15100	17300	19800	22400	26100
02231268	9	Alligator Creek at Callahan, Fla.	15.0	13.4	23	338	537	686	893	1060	1240	1430	1700
						306	561	767	1050	1280	1530	1780	2140
						336	539	694	914	1100	1300	1510	1820

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02231280	10	Thomas Creek near Crawford, Fla.	30.5	4.55	40	822	1840	2820	4500	6110	8070	10400	14300
						580	1070	1460	2020	2470	2950	3470	4190
						800	1720	2540	3730	4670	5640	6700	8130
02244320	52	Middle Haw Creek near Korona, Fla.	72.9	24.2	27	717	1280	1750	2440	3040	3700	4440	5560
						721	1330	1810	2480	3010	3580	4170	4970
						717	1290	1750	2450	3030	3670	4350	5330
02244420	53	Little Haw Creek near Seville, Fla.	93.0	24.4	51	486	856	1120	1480	1750	2020	2290	2660
						837	1540	2110	2880	3500	4150	4840	5770
						496	878	1160	1550	1880	2220	2580	3080
02244473	54	Rice Creek near Springside, Fla.	43.2	24.9	30	793	1480	2000	2690	3230	3780	4340	5090
						519	953	1300	1780	2160	2570	2990	3570
						769	1430	1910	2540	3000	3470	3940	4570
02245050	55	Etonia Creek at Bardin, Fla.	219	15.0	24	672	1140	1500	2010	2430	2890	3380	4080
						1560	2890	3960	5430	6600	7860	9180	11000
						706	1230	1670	2360	2990	3700	4490	5670
02245140	56	Simms Creek near Bardin, Fla.	46.9	14.6	30	825	1450	1910	2520	2980	3460	3940	4590
						608	1120	1530	2100	2550	3040	3550	4250
						810	1420	1870	2460	2910	3370	3850	4500
02245255	57	Deep Creek near Hastings, Fla.	20.7	11.4	32	204	403	573	831	1060	1310	1590	2010
						385	706	966	1330	1620	1930	2250	2800
						214	426	614	909	1170	1450	1780	2560
02245260	58	Deep Creek at Spuds, Fla.	51.7	7.07	15	907	1420	1800	2320	2730	3160	3620	4260
						742	1370	1870	2580	3150	3760	4410	5300
						895	1420	1810	2360	2820	3310	3840	4600
02245400	59	South Fork Black Creek near Camp Blanding, Fla.	33.8	6.70	25	453	945	1420	2220	3000	3950	5120	7040
						577	1060	1450	2000	2440	2920	3420	4120
						464	962	1420	2150	2770	3450	4190	5240

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02245470	60	Greens Creek near Penney Farms, Fla.	14.9	0.18	25	614	1120	1560	2290	2970	3780	4740	6300
						516	948	1310	1820	2240	2710	3200	3920
						607	1100	1520	2160	2710	3330	4000	5000
02245500	61	South Fork Black Creek near Penney Farms, Fla.	136	5.49	67	2710	5370	7680	11200	14400	17900	22000	28100
						1410	2600	3570	4930	6020	7200	8450	10200
						2650	5180	7270	10300	12700	15200	17800	21600
02246000	62	North Fork Black Creek near Middleburg, Fla.	177	9.28	76	3860	7140	9630	13000	15700	18400	21300	25100
						1510	2780	3820	5250	6390	7630	8930	10700
						3750	6910	9250	12300	14500	16700	18900	21700
02246150	63	Big Davis Creek at Bayard, Fla.	13.3	17.2	43	239	467	650	913	1130	1360	1610	1960
						271	496	678	929	1130	1340	1570	1880
						241	469	653	916	1130	1360	1600	1940
02246200	64	Durbin Creek near Durbin, Fla.	36.7	28.7	33	540	1090	1610	2490	3330	4360	5610	7680
						456	837	1140	1560	1890	2250	2620	3120
						534	1060	1520	2220	2780	3400	4050	4960
02246300	65	Ortega River at Jacksonville, Fla.	31.6	1.51	39	865	1660	2330	3360	4260	5270	6410	8120
						700	1290	1770	2460	3020	3620	4270	5190
						855	1620	2260	3200	3960	4790	5690	6970
02246460	66	Williamson Creek at Cedar Hills, Fla.	0.920	0.00	19	146	185	208	235	255	273	291	315
						96.0	175	240	335	413	499	591	726
						146	184	209	239	261	284	308	340
02246497	67	Mccoey Creek at Jacksonville, Fla.	3.51	0.00	13	657	805	891	990	1060	1120	1180	1260
						219	401	824	770	949	1150	1360	1660
						644	792	889	979	1050	1120	1190	1290
02246522	68	Red Bay Branch Tributary at Jacksonville, Fla.	0.429	0.00	12	124	228	316	448	563	693	839	1060
						60.0	109	150	209	257	310	368	452
						112	197	260	344	408	478	554	663

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02246600	69	Trout River at Dinsmore, Fla.	19.0	11.6	25	440	789	1100	1600	2070	2620	3280	4350
						364	668	914	1260	1530	1820	2130	2560
						435	775	1070	1510	1880	2290	2730	3370
02246828	70	Pablo Creek at Jacksonville, Fla.	28.1	27.1	29	483	906	1230	1690	2050	2430	2820	3370
						391	717	979	1340	1620	1930	2240	2680
						476	887	1200	1630	1960	2300	2650	3130
02246832	71	Cedar Swamp Creek near Jacksonville, Fla.	4.26	34.3	19	151	259	338	443	525	609	695	813
						117	212	289	395	478	567	660	787
						148	254	331	434	515	598	685	805
02246900	72	Moultrie Creek at State Highway 207 near St. Augustine, Fla.	17.0	22.8	31	369	691	917	1200	1400	1600	1790	2020
						298	545	744	1020	1240	1470	1710	2040
						363	678	900	1180	1380	1570	1770	2030
02247000	73	Moultrie Creek near St. Augustine, Fla.	24.4	19.2	25	619	983	1150	1290	1360	1410	1440	1470
						384	705	964	1320	1600	1910	2220	2660
						585	969	1130	1300	1440	1610	1770	1980
02247200	74	Fish Swamp Outlet near Summer Haven, Fla.	4.62	34.8	29	92.2	223	355	580	797	1060	1380	1890
						122	223	303	414	501	594	692	824
						95.5	223	342	522	668	821	984	1200
02247480	75	Tiger Bay Canal near Daytona Beach, Fla.	27.0	49.3	25	143	236	295	365	412	456	496	545
						337	618	843	1150	1390	1640	1910	2270
						151	254	319	409	483	561	642	755
02247510	76	Tomoka River near Holly Hill, Fla.	76.8	38.1	42	751	1430	1970	2740	3360	4020	4720	5710
						679	1250	1710	2330	2820	3340	3880	4610
						747	1420	1950	2680	3270	3880	4510	5380
02247600	77	Little Tomoka River near Ormond Beach, Fla.	10.0	29.5	21	146	232	297	390	466	549	639	769
						203	372	507	693	839	996	1160	1380
						148	240	315	427	526	636	756	932

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02248000	78	Spruce Creek near Samsula, Fla.	33.4	37.2	55	559	776	914	1080	1210	1320	1440	1600
						408	749	1020	1400	1690	2000	2330	2770
						557	775	916	1090	1220	1350	1480	1660
02313400	183	Waccasassa River near Bronson, Fla.	220	7.00	23	282	614	887	1280	1590	1920	2270	2740
						1820	3360	4610	6350	7750	9250	10800	13000
						365	799	1200	1890	2550	3320	4180	5470
02314200	184	Tenmile Creek at Lebanon Station, Fla.	26.0	32.0	29	607	1250	1840	2820	3730	4810	6100	8160
						361	661	902	1230	1490	1770	2060	2450
						581	1150	1620	2280	2780	3290	3840	4560
02314500 ^a	185	Suwannee River at Fargo, Ga.	113	52.2	73	3890	7180	9600	12800	15300	17700	20200	23500
						5770	10100	13300	17400	21000	24700	28100	33100
						4010	7370	9870	13200	16000	18700	21500	25400
02314600 ^a	186	Suwanoochee Creek at Dupont, Ga.	93.7	47.0	25	738	1280	1680	2200	2600	3000	3400	3940
						1150	2120	2860	3850	4710	5640	6480	7760
						761	1330	1760	2340	2810	3310	3820	4550
02314700 ^a	187	Suwanoochee Creek at State Road 187 near Thelma, Ga.	195	30.0	25	1120	1840	2390	3150	3770	4440	5160	6180
						1850	3360	4500	6000	7320	8730	9980	11900
						1150	1910	2520	3390	4130	4960	5860	7160
02315000	188	Suwannee River near Benton, Fla.	2100	41.0	28	5780	11000	15100	20700	25300	30100	35100	42100
						5140	9550	13100	17900	21600	25600	29700	35200
						5720	10800	14800	20200	24500	28900	33400	39600
02315200	189	Deep Creek near Suwannee Valley, Fla.	77.6	0.00	14	661	1120	1500	2080	2600	3200	3880	4940
						1480	2730	3770	5260	6490	7830	9280	11300
						708	1270	1820	2740	3630	4670	5830	7590
02315500	190	Suwannee River at White Springs, Fla.	2430	33.4	81	7240	13200	17500	23000	27100	31100	35100	40300
						5870	10900	15000	20400	24700	29300	34100	40400
						7190	13100	17400	22900	26900	31000	35000	40300

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02315550	191	Suwannee River at Suwannee Springs, Fla.	2650	31.5	35	7230	11700	15000	19400	22900	26400	30200	35300
						6270	11700	16000	21800	26400	31400	36500	43300
						7190	11700	15100	19600	23300	27100	31200	36900
02317500 ^a	192	Alapaha River at Statenville, Ga.	1340	0.800	79	5660	10200	13700	18500	22400	26400	30600	36500
						6630	11600	15200	19800	23900	28100	31800	37500
						5690	10200	13800	18600	22500	26600	30700	36600
02317600 ^a	193	Little River near Statenville, Ga.	239	40.0	23	2170	4290	5930	8200	9990	11800	13700	16300
						2110	3820	5100	6790	8270	9840	11300	13400
						2160	4230	5820	7960	9640	11300	13000	15400
02317620	194	Alapaha River near Jennings, Fla.	1660	7.47	13	7830	13400	17400	22800	27000	31300	35700	4170
						6240	11600	16000	22000	26800	32000	37500	045000
						7640	13100	17200	22700	27000	31500	36300	42900
02317630	195	Alapaha River near Jasper, Fla.	1720	1.61	32	6680	11200	14700	19900	24300	29200	34500	42300
						8180	15200	21000	29200	35800	43000	50700	61300
						6730	11400	15200	21000	26100	31800	38000	48500
02317748 ^a	196	Withlacoochee River near Bemiss, Ga.	498	7.20	25	4730	9740	14000	20500	26000	32200	39000	49000
						4270	7900	10800	14700	18100	21700	25400	30800
						4710	9620	13700	19900	24900	30400	36200	44500
02318000 ^a	197	Little River near Adel, Ga.	577	0.800	42	5380	9200	12000	15900	18900	22100	25400	29900
						3890	6940	9250	12300	14900	17700	20200	24000
						5330	9120	11900	15700	18600	21700	24800	29100
02318500 ^a	198	Withlacoochee River near Quitman, Ga.	1490	0.700	36	7850	15200	21600	31300	39800	49400	60300	76700
						8450	15200	20400	27600	33600	40000	46400	55800
						7890	15200	21500	30700	38500	47100	56300	69800
02318600 ^a	199	Okapilco Creek near Berlin, Ga.	108	1.00	22	2200	3910	5370	7630	9640	12000	14600	18800
						1900	3750	5290	7610	9530	11700	14000	17600
						2190	3900	5370	7630	9630	11900	14500	18500

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02318700 ^a	200	Okapilco Creek at State Road 33 near Quitman, Ga.	272	0.00	27	3700	7420	10600	15600	20000	25000	30500	39000
						3440	6660	9310	13300	16500	20100	24100	30000
						3650	7230	10200	14700	18600	22800	27300	34100
02319000	201	Withlacoochee River near Pinetta, Fla.	2150	3.32	76	10600	20700	29300	42400	53800	66700	81100	103000
						8430	15700	21700	30000	36600	43900	51600	62200
						10500	20400	28800	41100	51300	62400	74400	91500
02320700	202	Santa Fe River near Graham, Fla.	93.5	33.3	41	460	921	1290	1830	2270	2730	3220	3920
						788	1450	1980	2710	3280	3880	4520	5370
						477	955	1350	1930	2420	2950	3520	4320
02321000	203	New River near Lake Butler, Fla.	189	12.7	37	2620	5460	7680	10700	13100	15400	17900	21100
						1480	2730	3740	5130	6240	7440	8700	10400
						2500	5130	7100	9590	11300	13000	14600	16700
02321500	204	Santa Fe River at Worthington Springs, Fla.	608	16.5	75	4170	8580	12100	17000	20900	24900	29100	34800
						2880	5340	7330	10100	12200	14500	17000	20200
						4100	8390	11700	16300	19600	23000	26400	30900
02321600	205	Olustee Creek near Lulu, Fla.	50.2	1.51	19	725	1460	2110	3140	4080	5160	6420	8370
						932	1720	2360	3280	4020	4830	5700	6920
						746	1500	2160	3180	4060	5020	6070	7600
02321700	206	Swift Creek near Lake Butler, Fla.	46.0	30.7	25	477	782	1020	1360	1650	1960	2300	2800
						517	949	1300	1770	2150	2550	2970	3530
						479	793	1050	1420	1740	2090	2470	3020
02321800	207	Olustee Creek near Providence, Fla.	163	9.28	12	2850	4320	5310	6580	7530	8480	9440	10700
						1430	2640	3630	4990	6080	7250	8490	10200
						2720	4120	5070	6280	7210	8170	9180	10600
02321975	208	Santa Fe River at U.S. Highway 441 near High Springs, Fla.	958	13.1	10	1690	6110	11500	22100	33100	47300	64900	94300
						4000	7410	10200	14000	17000	20200	23700	28300
						2550	6790	10700	16200	20300	24600	29200	35200

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drain-age area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02322000	209	Santa Fe River near High Springs, Fla.	965	13.0	41	3560	7300	10300	14600	18100	21700	25600	30900
						4020	7450	10200	14100	17100	20400	23800	28400
						3590	7310	10300	14500	17900	21400	25100	30100
02322016	210	Blues Creek near Gainsville, Fla.	7.21	2.53	10	124	221	298	411	504	607	718	881
						262	479	658	911	1120	1340	1580	1910
						139	259	368	539	694	866	1050	1330
02322049	211	Bad Dog Branch near Alachua, Fla.	0.530	1.60	11	29.7	73.0	118	196	274	371	490	688
						56.0	101	139	193	236	284	335	408
						35.3	82.3	127	195	250	311	376	469
02322500	212	Santa Fe River near Fort White, Fla.	1020	12.3	75	3860	6610	8720	11700	14100	16700	19400	23400
						4190	7780	10700	14700	17900	21300	24900	29700
						3860	6640	8800	11900	14400	17100	20000	24200
02324000	213	Steinhatchee River near Cross City, Fla.	350	62.8	56	2050	3870	5340	7480	9250	11200	13300	16300
						1560	2880	3940	5360	6460	7640	8870	10500
						2030	3810	5230	7230	8820	10500	12200	14600
02324400	214	Fenholloway River near Foley, Fla.	60.0	99.3	51	334	703	1060	1650	2220	2920	3760	5130
						478	877	1190	1620	1950	2300	2670	3140
						341	716	1070	1640	2150	2720	3340	4220
02324500	215	Fenholloway River at Foley, Fla.	120	74.3	49	543	1120	1680	2660	3620	4810	6290	8770
						778	1430	1950	2660	3200	3780	4390	5180
						553	1140	1720	2660	3500	4450	5490	6980
02325000	216	Fenholloway River near Perry Fla.	160	64.0	32	589	983	1260	1630	1920	2200	2500	2890
						959	1770	2410	3280	3960	4680	5430	6420
						602	1020	1320	1750	2110	2490	2890	3460
02326000	217	Econfina River near Perry, Fla.	198	13.5	56	632	1210	1640	2190	2600	3010	3420	3940
						1500	2770	3800	5220	6340	7560	8830	10600
						658	1260	1720	2360	2880	3450	4050	4900

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02326250	218	Aucilla River near Aucilla, Fla.	353	12.1	11	2020 2190 2030	2990 4050 3080	3650 5560 3840	4480 7640 4880	5090 9300 5740	5700 11100 6650	6310 13000 7610	7120 15500 8940
02326261	219	Little Aucilla River near Cherry Lake, Fla.	15.4	0.940	17	109 474 150	284 869 397	473 1200 676	821 1660 1160	1180 2040 1600	1630 2460 2100	2200 2900 2640	3190 3530 3420
02326300	220	Little Aucilla River near Greenville, Fla.	87.0	9.95	12	483 958 527	872 1770 1000	1200 2420 1440	1710 3330 2160	2160 4050 2810	2670 4840 3540	3260 5660 4330	4160 6790 5480
02326372	221	Palmer Mill Branch at Monticello, Fla.	0.480	0.00	15	141 64.0 135	213 117 204	259 160 248	315 224 302	354 276 341	392 333 381	429 394 422	476 485 478
02326500	222	Aucilla River at Lamont, Fla.	748	15.5	41	1820 3310 1960	4650 6140 4820	7210 8430 7390	11100 11600 11200	14400 14100 14300	17900 16700 17500	21700 19500 20800	27000 23300 25300
02326512	223	Aucilla River near Scanlon, Fla.	822	15.5	23	2000 3510 2050	3220 6510 3410	4230 8940 4640	5750 12300 6640	7080 14900 8520	8600 17700 10700	10300 20700 13100	13000 24700 16800
02326574	224	Ward Creek Tributary near Monticello, Fla.	0.059	0.00	11	6.00 18.0 7.44	12.4 32.0 16.2	18.3 44.0 25.0	27.9 61.0 39.6	36.6 75.0 52.9	46.7 90.0 67.8	58.6 107 84.3	77.2 132 109
02326595	225	Halls Run near Miccosukee, Fla.	0.095	0.00	11	20.4 24.0 21.0	38.8 43.0 39.7	53.8 59.0 55.2	75.9 82.0 78.0	94.6 101 97.2	115 122 118	137 144 141	170 177 174
02326598	226	Caney Creek near Monticello, Fla.	2.54	0.00	13	235 179 224	504 328 451	753 451 635	1160 629 893	1540 775 1100	1980 936 1310	2500 1110 1550	3330 1360 1890

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 2.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent						
						50	20	10	4	2	1	0.5
02326838	227	Lafayette Creek, Miccosukee Rd (No. 28) Tallahassee, Fla.	9.78	0.55	14	332	724	1130	1860	2600	3550	4770
						376	689	949	1320	1620	1960	2310
						339	715	1060	1570	1980	2440	2930
02326900	228	St. Marks River near Newport, Fla.	530	8.40	48	1900	2860	3510	4350	4980	5610	6240
						3020	5590	7690	10600	12900	15400	18000
						1920	2910	3610	4540	5300	6110	6960

^aCharacteristics are from Gotvald and others, 2009.

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02234100	28	Deep Creek near Osteen, Fla.	140	30.8	17	803	1470	1950	2570	3020	3470	3910	4480
						369	698	957	1320	1610	1920	2240	2690
						764	1360	1770	2250	2580	2910	3230	3670
02234500	29	St. Johns River near Sanford, Fla.	2480	26.8	13	6460	9570	11600	14200	16000	17800	19600	22000
						3360	5720	7450	9800	11600	13400	15300	17900
						6320	9280	11200	13500	15200	16800	18500	20800
02235000	30	Wekiva River near Sanford, Fla.	188	16.6	71	829	1130	1340	1600	1790	1990	2180	2460
						653	1220	1670	2310	2820	3350	3930	4750
						829	1130	1340	1610	1820	2040	2260	2580
02235200	31	Blackwater Creek near Cassia, Fla.	115	20.4	45	295	446	558	714	839	972	1120	1320
						403	768	1060	1480	1810	2160	2540	3070
						296	452	573	751	905	1080	1270	1540
02236000	32	St. Johns River near Deland, Fla.	2960	25.6	73	7190	10300	12300	14800	16600	18500	20300	22600
						3930	6640	8620	11300	13300	15400	17600	20600
						7160	10200	12200	14700	16500	18300	20100	22500
02236120	33	Deep Creek near Barberville, Fla.	35.4	27.8	26	220	424	604	888	1140	1440	1780	2310
						141	281	395	560	695	838	992	1210
						216	408	567	796	982	1180	1390	1690
02236125	34	St. Johns River at Astor, Fla.	3240	25.8	12	9890	12200	13500	14900	15900	16800	17700	18700
						4190	7050	9140	12000	14100	16200	18500	21700
						9800	12000	13300	14800	15800	16800	17800	19000
02236350	35	Green Swamp Run near Eva, Fla.	43.0	41.0	27	56.1	109	150	207	251	297	344	408
						131	258	361	509	628	754	888	1070
						58.4	117	166	242	308	383	466	585
02236500	36	Big Creek near Clermont, Fla.	68.1	43.90	48	87.7	207	306	446	555	667	780	931
						177	343	476	665	816	975	1140	1370
						90.8	215	319	474	602	738	881	1080

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02236700	37	Little Creek near Clermont, Fla.	14.7	43.0	25	69.9 57.0 68.7	166 118 158	248 168 231	367 242 329	464 302 403	566 366 478	671 435 554	816 531 658
02237000	38	Palatlakaha River near Mascotte, Fla.	185	39.2	12	188 395 205	390 739 441	553 1010 646	783 1380 954	968 1680 1210	1160 1990 1490	1360 2310 1780	1640 2760 2190
02239000	39	Ocklawaha River near Ocala, Fla.	1020	31.0	38	938 1600 944	1390 2810 1410	1680 3720 1720	2040 4960 2130	2290 5910 2450	2540 6890 2790	2790 7920 3140	3110 9340 3630
02240000	40	Ocklawaha River near Conner, Fla.	1200	30.4	59	2040 1820 2150	2880 3180 2890	3420 4190 3430	4060 5580 4100	4520 6640 4590	4970 7720 5080	5400 8880 5580	5960 10500 6250
02240500	41	Ocklawaha River at Eureka, Fla.	1370	28.3	37	2620 2090 2610	3900 3640 3890	4760 4790 4760	5840 6370 5870	6650 7560 6720	7450 8790 7580	8240 10100 8460	9300 11900 9670
02240902	42	Prairie Creek near Gainesville, Fla.	112	18.6	23	174 415 190	429 792 472	652 1090 726	984 1520 1120	1260 1870 1450	1550 2240 1810	1860 2630 2190	2280 3190 2730
022409424	43	Moore's Pond Tributary near Micanopy, Fla.	0.410	0.180	11	6.60 34.0 11.1	25.0 79.0 43.0	48.4 123 82.8	95.2 195 155	145 260 223	210 337 304	293 425 396	433 562 538
02240950	44	Hogtown Creek near Gainesville, Fla.	18.5	6.98	20	566 186 545	946 378 882	1250 541 1130	1710 786 1460	2100 992 1720	2530 1220 2000	3010 1460 2400	3740 1820 2740
02240954	45	Hogtown Creek near Arredondo, Fla.	41.2	5.56	31	304 378 306	531 745 541	704 1050 728	944 1510 1000	1140 1890 1240	1340 2300 1500	1550 2760 1800	1850 3420 2230

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02264051	90	Black Lake Outlet at S-101a at Buena Vista, Fla.	0.585	6.65	20	61.9	78.7	90.1	105	116	128	140	157
02264100	91	Bonnet Creek near Vineland, Fla.	51.9	28.0	40	474	773	973	1220	1400	1570	1740	1960
						187	366	511	721	890	1070	1260	1530
						465	755	946	1180	1340	1500	1660	1870
02264495	92	Shingle Creek at Campbell, Fla.	180	15.4	36	984	1380	1640	1980	2220	2460	2700	3030
						655	1230	1680	2330	2840	3390	3980	4810
						980	1380	1650	1990	2260	2530	2820	3220
02266200	93	Whittenhorse Creek near Vineland, Fla.	12.4	39.6	40	26.8	53.7	74.1	101	122	143	164	192
						53.0	110	157	226	284	345	410	502
						27.5	56.0	78.7	112	141	174	209	260
02266300	94	Reedy Creek near Vineland, Fla.	84.6	35.2	46	441	800	1100	1560	1970	2430	2950	3740
						235	454	628	875	1070	1280	1500	1810
						436	780	1060	1450	1760	2100	2450	2950
02266480	95	Davenport Creek near Loughman, Fla.	43.0	29.0	37	105	181	240	324	393	468	549	666
						159	315	441	623	771	928	1100	1330
						106	185	250	350	438	538	649	813
02269000	96	Kissimmee River below Lake Kissimmee near Lake Wales, Fla.	1610	29.3	39	2530	4830	6700	9440	11700	14200	16900	20800
						2320	4000	5250	6950	8240	9560	11000	12900
						2520	4780	6560	9040	11000	13000	15000	17800
02269520	97	Livingston Creek near Frostproof, Fla.	117	24.8	16	262	408	515	661	778	900	1030	1210
						366	697	959	1330	1630	1950	2280	2760
						265	423	551	745	915	1110	1310	1620
02269720	98	Morgan Hole Creek near Avon Park, Fla.	14.3	0.470	30	718	1120	1370	1660	1850	2040	2200	2410
						416	852	1240	1830	2340	2920	3580	4560
						710	1110	1360	1670	1900	2130	2370	2720

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02270500	99	Arbuckle Creek near De Soto City, Fla.	386	17.4	67	1500	2720	3730	5240	6540	7990	9610	12000
						1080	1960	2650	3620	4370	5170	6020	7220
						1500	2700	3670	5070	6220	7450	8760	10600
02271500	100	Josephine Creek near De Soto City, Fla.	114	22.4	57	363	659	884	1200	1440	1700	1980	2350
						380	724	997	1390	1700	2030	2390	2880
						364	661	890	1210	1470	1750	2040	2460
02272000	105	Istokpoga Canal near Cornwell, Fla.	624	91.0	35	856	1450	1840	2320	2640	2950	3240	3600
						597	1070	1420	1900	2260	2620	3000	3500
						847	1440	1820	2280	2600	2900	3200	3580
02293694	106	Peace Creek Drainage Canal near Dundee, Fla.	58.0	32.7	13	115	203	266	348	409	470	531	611
						186	363	505	709	874	1050	1230	1490
						119	217	295	409	506	612	724	886
02293986	107	Peace Creek Drainage Canal near Alturas, Fla.	160	21.2	25	537	981	1370	1970	2510	3140	3870	5010
						504	949	1300	1800	2200	2620	3060	3690
						534	979	1360	1930	2420	2940	3510	4330
02293987	108	Peace Creek Drainage Canal near Wahneta, Fla.	163	20.9	16	484	700	842	1020	1150	1280	1400	1570
						513	965	1320	1830	2230	2660	3120	3750
						485	710	868	1080	1260	1440	1640	1920
02294068	109	Lulu Lake Outlet at Eloise, Fla.	23.0	44.2	25	52.7	113	165	243	309	382	460	574
						79.0	159	225	320	420	481	568	691
						54.1	118	174	260	334	415	502	626
02294650	110	Peace River at Bartow, Fla.	378	19.8	66	947	1680	2280	3160	3910	4740	5660	7020
						948	1800	2430	3320	4010	4740	5510	6600
						948	1680	2280	3170	3920	4740	5630	6920
02294898	111	Peace River at Fort Meade, Fla.	454	18.1	33	907	1480	1900	2480	2950	3440	3960	4690
						1190	2150	2900	3940	4760	5610	6530	7810
						912	1500	1950	2610	3160	3760	4410	5360

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02295013	112	Bowlegs Creek near Fort Meade, Fla.	58.3	13.5	21	407	622	773	969	1120	1270	1430	1640
						306	597	835	1180	1460	1770	2100	2560
						404	621	777	991	1160	1350	1550	1840
02301900	153	Fox Branch near Socum, Fla.	9.23	4.88	42	251	558	850	1340	1800	2350	3000	4050
						133	277	402	594	757	937	1140	1430
						245	526	770	1120	1410	1710	2040	2510
02301990	154	Hillsborough River above Crystal Springs near Zephyrhills, Fla.	82.0	6.02	21	547	1270	1940	3020	4000	5120	6410	8370
						604	1160	1620	2300	2850	3450	4100	5050
						552	1250	1860	2760	3490	4260	5090	6270
02302260	155	Itchepakesassa Creek at S-582 near Knights, Fla.	32.0	5.70	14	485	583	641	707	753	796	838	890
						309	615	873	1260	1580	1930	2310	2870
						484	584	645	721	779	838	898	982
02302500	156	Blackwater Creek near Knights, Fla.	110	4.72	56	1080	1760	2320	3160	3880	4700	5630	7040
						847	1610	2240	3160	3910	4720	5620	6920
						1080	1760	2320	3160	3890	4700	5630	7010
02303000	157	Hillsborough River near Zephyrhills, Fla.	205	4.62	67	2000	3690	5090	7200	9030	11100	13400	16800
						1360	2530	3470	4850	5950	7150	8460	10400
						1990	3640	4990	6940	8560	10300	12200	14900
02303205	158	Baker Creek at McIntosh Road near Antioch, Fla.	21.7	6.13	15	246	443	604	845	1050	1280	1540	1920
						223	451	645	935	1180	1440	1740	2160
						245	444	612	870	1100	1340	1630	2040
02303350	159	Trout Creek near Sulphur Springs, Fla.	20.6	9.69	33	382	839	1230	1820	2330	2880	3470	4330
						170	344	490	709	892	1090	1310	1620
						365	772	1090	1510	1810	2110	2420	2840
02303358	160	Cypress Creek near Darby, Fla.	7.29	2.94	17	172	528	889	1480	2000	2580	3220	4140
						141	297	434	645	827	1030	1260	1590
						166	450	690	1010	1250	1500	1770	2140

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02303400	161	Cypress Creek near San Antonio, Fla.	58.8	15.0	44	125	348	574	952	1300	1710	2170	2880
02303420		Cypress Creek at Worthington Gardens, Fla.	122	20.1	41	290	566	791	1120	1390	1670	1980	2420
						132	368	605	991	1330	1690	2090	2640
						365	782	1140	1680	2130	2630	3180	3960
02303800		Cypress Creek near Sulphur Springs, Fla.	168	21.1	43	423	805	1110	1540	1890	2260	2650	3210
						367	784	1140	1650	2080	2520	3000	3660
						522	1100	1560	2200	2720	3250	3800	4560
02306289		Lake Magdalene Outlet near Lutz, Fla.	2.26	11.0	21	524	983	1350	1860	2270	2700	3170	3810
						522	1090	1540	2150	2630	3110	3610	4290
						9.60	40.9	82.6	168	259	378	529	781
02307200		Brooker Creek at Van Dyke Rd near Citrus Park, Fla.	5.47	13.6	26	31.0	68.0	100	151	194	243	296	373
						12.6	48.9	89.9	158	216	278	345	440
						35.1	69.4	100	151	197	252	316	418
02309848		South Branch Anclothe River near Odessa, Fla.	17.1	15.2	37	53.0	112	164	242	309	382	461	576
						35.7	72.8	109	170	229	297	375	493
						97.5	215	315	464	589	724	869	1080
02309980		Anclothe River near Odessa, Fla.	62.7	15.6	11	116	236	337	487	612	748	894	1100
						98.3	217	318	468	595	731	878	1090
						796	1460	2030	2890	3640	4490	5450	6910
02310000		Anclothe River near Elfers, Fla.	68.9	15.0	62	299	582	811	1150	1420	1710	2020	2470
						736	1250	1600	2060	2400	2760	3160	3730
						776	1580	2300	3400	4390	5510	6780	8720
02310147		Hollin Creek near Tarpon Springs, Fla.	8.31	11.1	24	326	633	882	1240	1540	1850	2190	2670
						761	1520	2140	3000	3680	4360	5070	6040
						87.0	143	188	253	309	370	437	537
						81.0	169	245	359	456	562	678	846
						86.8	145	193	269	337	415	503	637

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 3.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02310240	170	Jumping Gully at Loyce, Fla.	43.0	11.1	32	33.6	132	250	468	683	941	1240	1710
						272	537	755	1080	1340	1630	1930	2380
						46.8	183	349	663	955	1290	1640	2140
02310300	171	Pithlachascotee River near New Port Richey, Fla.	182	9.69	44	265	569	854	1320	1760	2280	2890	3860
						851	1590	2180	3040	3720	4450	5240	6370
						276	614	954	1560	2140	2820	3600	4800
02310800	172	Withlacoochee River near Eva, Fla.	130	44.8	35	226	573	907	1450	1940	2510	3150	4120
						282	535	733	1010	1230	1460	1700	2040
						230	568	874	1320	1680	2030	2400	2890
02310947	173	Withlacoochee River near Cumpresco, Fla.	267	38.3	39	934	1700	2230	2900	3390	3850	4300	4870
						525	971	1310	1790	2170	2560	2970	3530
						918	1660	2160	2770	3190	3590	3980	4480
02311500	174	Withlacoochee River near Dade City, Fla.	390	30.2	29	1120	2420	3540	5220	6670	8250	9990	12500
						797	1450	1950	2650	3200	3760	4360	5190
						1100	2300	3240	4500	5420	6320	7230	8430
02312000	175	Withlacoochee River at Trilby, Fla.	595	34.8	76	1350	2650	3700	5200	6420	7730	9120	11100
						1010	1800	2410	3240	3880	4540	5240	6200
						1340	2620	3620	5000	6070	7160	8260	9740
02312180	176	Little Withlacoochee River near Tarrytown, Fla.	85.0	37.0	40	295	801	1250	1890	2400	2910	3430	4110
						229	442	611	852	1040	1250	1460	1760
						289	750	1120	1580	1870	2140	2390	2710
02312200	177	Little Withlacoochee River at Rerdell, Fla.	132	48.0	48	375	894	1350	2020	2580	3170	3810	4690
						274	521	713	984	1200	1420	1650	1970
						370	858	1260	1790	2180	2540	2890	3340
02312500	178	Withlacoochee River at Croom, Fla.	819	33.6	67	1510	2970	4100	5670	6910	8200	9520	11300
						1300	2300	3060	4090	4890	5700	6570	7750
						1510	2940	4040	5520	6640	7760	8890	10400

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02231342	11	Fort Drum Creek at Sunshine State Parkway near Fort Drum, Fla.	52.6	10.6	29	647	1010	1250	1530	1730	1920	2100	2330
						771	1410	1930	2670	3290	3960	4700	5770
						657	1040	1290	1610	1850	2100	2350	2690
02231396	12	Blue Cypress Creek near Fellsmere, Fla.	105	18.1	10	1840	2670	3240	3980	4540	5110	5690	6480
						973	1780	2420	3330	4090	4910	5810	7110
						1470	2500	3080	3840	4430	5060	5720	6650
02231458	13	Wolf Creek near Kenansville, Fla.	8.60	31.6	11	113	251	367	535	672	818	970	1180
						163	306	422	584	718	861	1020	1240
						133	273	389	557	694	839	996	1210
02231565	14	Crabgrass Creek near Holopaw, Fla.	30.2	20.9	14	554	994	1360	1900	2360	2880	3460	4330
						422	779	1070	1480	1810	2180	2580	3140
						521	935	1270	1750	2140	2580	3050	3730
02231600	15	Jane Green Creek near Deer Park, Fla.	258	15.9	53	2120	4350	6400	9730	12800	16500	20800	27600
						1800	3250	4420	6060	7440	8930	10600	13000
						2080	4200	6070	8920	11400	14100	17200	21700
02232000	16	St. Johns River near Melbourne, Fla.	905	29.0	60	2930	5780	8120	11500	14300	17400	20700	25400
						3140	5630	7600	10300	12700	15100	17900	21800
						2950	5770	8060	11400	14100	17000	20100	24600
02232155	17	Pennywash Creek near Deer Park, Fla.	17.4	7.9	12	505	886	1200	1680	2090	2550	3080	3870
						427	789	1080	1510	1870	2250	2670	3290
						485	858	1160	1610	2000	2420	2880	3570
02232200	18	Wolf Creek near Deer Park, Fla.	24.6	6.77	50	977	1880	2680	3930	5050	6340	7820	10100
						562	1030	1420	1970	2440	2950	3500	4310
						926	1770	2480	3500	4390	5330	6370	7910
02232400	19	St. Johns River near Cocoa, Fla.	1330	29.9	53	3270	5940	7720	9860	11400	12700	14000	15600
						3960	7060	9520	12900	15800	18900	22300	27300
						3330	6010	7830	10100	11700	13400	15000	17200

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02232450	20	Jim Creek near Christmas, Fla.	22.7	16.2	25	704	1270	1770	2560	3300	4160	5180	6820
						389	719	986	1370	1680	2020	2400	2930
						649	1150	1560	2160	2670	3210	3830	4730
02232500	21	St. Johns River near Christmas, Fla.	1470	29.5	71	4150	6760	8470	10500	12000	13400	14700	16300
						4230	7540	10200	13800	16900	20200	23800	29100
						4160	6790	8530	10700	12200	13800	15300	17300
02233001	22	Econlockhatchee River at Magnolia Ranch near Bithlo, Fla.	35.3	34.1	29	192	343	445	569	656	739	816	912
						385	712	974	1340	1650	1970	2330	2830
						214	374	487	639	758	885	1020	1190
02233102	23	Econlockhatchee River Tributary near Bithlo, Fla.	1.83	15.8	20	65.2	143	218	346	468	618	800	1100
						81.0	153	212	296	366	441	522	638
						69.1	146	216	324	420	524	640	810
02233200	24	Little Econlockhatchee River near Union Park, Fla.	27.1	14.6	47	478	876	1160	1540	1820	2100	2380	2740
						452	834	1140	1580	1950	2350	2780	3400
						475	873	1160	1540	1840	2140	2440	2860
02233475	25	Little Econlockhatchee River at State Road 434 near Oviedo, Fla.	72.9	11.0	10	1140	1620	1930	2320	2610	2890	3170	3540
						933	1700	2330	3210	3960	4760	5650	6940
						1110	1630	1990	2450	2810	3200	3590	4140
02233500	26	Econlockhatchee River near Chuluota, Fla.	240	12.7	71	2550	4470	5960	8050	9750	11600	13500	16200
						1870	3370	4590	6300	7750	9300	11000	13600
						2500	4400	5860	7900	9540	11300	13100	15800
02234000	27	St. Johns River above Lake Harney near Geneva, Fla.	1950	27.4	25	6340	8680	10200	11900	13200	14400	15600	17100
						5200	9230	12400	16900	20600	24600	29100	35600
						6280	8710	10200	12200	13600	15000	16500	18400
02249007	79	Eau Gallie River at Heather Glen Creek at Melbourne, Fla.	3.80	0.750	15	373	637	860	1200	1500	1850	2240	2850
						316	587	813	1150	1430	1740	2090	2600
						362	626	847	1180	1480	1800	2180	2730

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
002249500	80	Crane Creek at Melbourne, Fla.	10.8	2.25	20	295	540	722	969	1160	1360	1560	1830
						475	876	1210	1690	2100	2550	3050	3770
						325	590	796	1090	1340	1610	1900	2310
002249518	81	Crane Creek at U.S. Highway 1 at Melbourne, Fla.	20.8	2.22	18	690	1040	1320	1710	2030	2390	2770	3350
						720	1320	1820	2540	3150	3820	4560	5660
						693	1080	1380	1850	2240	2700	3200	3960
002250000	82	Turkey Creek near Palm Bay, Fla.	95.5	2.52	11	1120	1710	2100	2600	2960	3320	3680	4140
						1810	3270	4460	6200	7680	9290	11100	13800
						1220	1910	2400	3090	3640	4240	4870	5770
002251000	83	South Prong St. Sebastian River near Sebastian, Fla.	39.4	3.71	20	1380	1900	2240	2640	2940	3230	3520	3900
						923	1690	2310	3210	3980	4820	5740	7100
						1350	1890	2240	2690	3020	3370	3730	4230
002251500	84	North Prong Saint Sebastian Creek near Micco, Fla.	28.5	16.4	20	575	1220	1780	3650	3400	4250	5200	6610
						446	823	1130	1560	1920	2310	2730	3350
						537	1100	1560	2220	2770	3330	3950	4830
002256000	85	Fisheating Creek near Venus, Fla.	188	11.0	11	1980	3740	5110	7020	8550	10200	11800	14200
						1690	3060	4160	5720	7050	8470	10000	12400
						1880	3510	4780	6520	7940	9420	11000	13300
002256500	86	Fisheating Creek at Palmdale, Fla.	311	12.1	75	3070	5960	8370	12000	15000	18400	22000	27500
						2240	4030	5470	7510	9230	11100	13200	16200
						3000	5800	8090	11400	14100	17100	20200	24800
002273000	102	Kissimmee R at S-65e near Okeechobee, Fla.	2830	23.2	35	5290	10700	15000	21200	26100	31300	36700	44300
						7020	12400	16700	22600	27700	33100	39100	47900
						5550	10900	15300	21400	26400	31700	37400	45300
002293000	103	Orange River near Fort Myers, Fla.	60.0	8.6	11	827	1690	2500	3870	5160	6730	8630	11700
						904	1650	2260	3130	3860	4650	5520	6790
						853	1670	2390	3460	4400	5410	6540	8230

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02293050	104	Orange River at Buckingham near Fort Myers, Fla.	70.0	8.6	18	621	1080	1470	2060	2580	3170	3840	4880
02293400	105	Alligator Creek near Punta Gorda, Fla.	27.1	6.4	13	709	1220	1650	2330	2940	3650	4480	5770
						608	1120	1530	2130	2640	3180	3780	4660
						688	1190	1610	2250	2810	3430	4120	5160
02295420	113	Payne Creek near Bowling Green, Fla.	116	6.1	32	1000	1980	2830	4150	5300	6610	8100	10400
						1540	2780	3800	5250	6480	7810	9290	11500
						1070	2100	2990	4380	5590	6950	8470	10800
02295630	114	Thompson Branch near Wauchula, Fla.	5.92	0.00	21	285	430	530	661	762	865	970	1110
						522	963	1330	1880	2350	2870	3450	4320
						302	464	584	757	897	1060	1230	1470
02295637	115	Peace River at Zolfo Springs, Fla.	790	12.8	74	4080	7240	10000	14300	18300	22900	28300	36800
						3940	7040	9510	13000	16000	19200	22700	27900
						4080	7230	9960	14200	17900	22200	27100	34600
02296260	116	Charlie Creek near Crewsville, Fla.	142	19.0	26	1200	2680	4080	6360	8480	11000	13900	18400
						1160	2100	2860	3930	4830	5790	6850	8390
						1190	2520	3700	5430	6910	8460	10200	12700
02296500	117	Charlie Creek near Gardner, Fla.	326	9.76	57	2070	3640	4980	7070	8960	11200	13700	17700
						2500	4490	6090	8370	10300	12400	14700	18100
						2100	3690	5070	7230	9160	11400	13900	17800
02296750	118	Peace River at Arcadia, Fla.	1330	10.5	77	6410	11400	15900	23000	29500	37300	46400	61000
						5890	10400	14100	19200	23600	28400	33700	41500
						6380	11400	15700	22500	28600	35600	43500	55800
02297088	119	Hawthorn Creek at CR760-A near Nocatee, Fla.	44.0	2.90	24	1160	1870	2390	3110	3680	4280	4900	5790
						1070	1940	2660	3710	4590	5560	6630	8220
						1150	1880	2430	3190	3820	4510	5240	6320

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02297100	120	Joshua Creek at Nocatee, Fla.	129	3.21	57	1760	3180	4380	6260	7930	9860	12100	15500
						2040	3670	5010	6940	8590	10400	12400	15300
						1780	3210	4440	6350	8030	9960	12100	15500
02297155	121	Horse Creek near Myakka Head, Fla.	36.8	5.13	29	822	1550	2190	3200	4120	5190	6440	8400
						795	1460	1990	2770	3430	4140	4930	6090
						818	1530	2150	3090	3910	4820	5850	7390
02297251	122	Horse Creek near Limestone, Fla.	130	7.23	23	980	2480	3970	6460	8790	11500	14700	19700
						1560	2830	3850	5320	6560	7910	9400	11600
						1140	2590	3930	5980	7750	9660	11800	14800
02297310	123	Horse Creek near Arcadia, Fla.	206	7.12	57	2110	4140	5890	8540	10900	13400	16400	20700
						2100	3780	5140	7090	8740	10500	12500	15400
						2100	4110	5800	8320	10500	12800	15400	19200
02297320	124	Horse Creek near Nocatee, Fla.	217	7.28	22	2490	4960	7160	10700	13900	17600	21900	28700
						2150	3870	5270	7260	8950	10800	12800	15800
						2420	4680	6610	9440	11900	14500	17400	21800
02298123	125	Prairie Creek near Fort Ogden, Fla.	233	14.4	34	1830	2860	3610	4630	5450	6310	7220	8500
						1750	3160	4300	5900	7250	8700	10300	12700
						1830	2880	3660	4750	5650	6610	7660	9170
02298202	126	Shell Creek near Punta Gorda, Fla.	373	10.4	36	2840	4670	6000	7790	9170	10600	12100	14100
						2660	4780	6480	8890	10900	13100	15600	19200
						2820	4680	6040	7900	13600	10900	12600	14900
02298608	127	Myakka River at Myakka City, Fla.	121	8.81	33	1970	3830	5600	8600	11500	15100	19400	26800
						1390	2520	3440	4750	5850	7050	8370	10300
						1880	3570	5050	7280	9240	11300	13700	17300
02298760	128	Howard Creek near Sarasota, Fla.	16.4	0.870	18	514	1280	2040	3310	4500	5900	7550	10100
						771	1410	1940	2730	3400	4130	4940	6150
						599	1330	2000	3040	3930	4900	5980	7580

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02298830	129	Myakka River near Sarasota, Fla.	229	8.87	70	1960	3610	5050	7340	9400	11800	14600	19000
						2070	3730	5070	6980	8600	10300	12300	15100
						1960	3610	5050	7290	9280	11500	14100	18000
02298928	130	Tributary to Myakka River near Venice, Fla.	0.200	0.00	10	181	432	669	1050	1400	1810	2270	2980
						62.0	119	166	238	299	366	440	548
						107	229	327	460	573	683	807	985
02299120	131	Deer Prairie Slough at Power Line near North Port, Fla.	24.7	16.5	10	302	438	531	651	742	834	929	1060
						406	752	1030	1430	1760	2110	2500	3060
						315	476	595	763	897	1050	1200	1430
02299160	132	Deer Prairie Slough near North Port Charlotte, Fla.	27.1	16.0	12	248	542	799	1190	1530	1910	2320	2930
						436	805	1100	1530	1880	2260	2680	3280
						311	633	911	1330	1690	2080	2510	3120
02299410	133	Big Slough Canal near Myakka City, Fla.	35.6	9.40	27	518	1190	1880	3100	4310	5840	7740	10900
						630	1160	1590	2200	2710	3270	3880	4770
						542	1180	1780	2720	3540	4450	5460	6970
02299800	134	Phillippe Creek at Sarasota, Fla.	45.0	0.79	20	991	2040	3080	4920	6740	9050	11200	16900
						1480	2680	3680	5140	6390	7770	9300	11600
						1080	2210	3280	5010	6570	8360	10400	13500
02299950	135	Manatee River near Myakka Head, Fla.	69.5	3.84	40	1930	3450	4700	6580	8200	10000	12000	15100
						1300	2370	3240	4490	5560	6720	8010	9910
						1860	3320	4490	6190	7630	9180	10900	13400
02300000	136	Manatee River near Bradenton, Fla.	95.9	4.03	27	2420	4530	6240	8770	10900	13200	15800	19500
						1570	2850	3890	5380	6660	8050	9590	11900
						2260	4200	5740	7900	9680	11500	13600	16600
02300018	137	Gamble Creek near Parrish, Fla.	50.8	4.01	13	1260	3150	5200	9040	13100	18300	25100	37000
						1060	1920	2630	3660	4530	5480	6520	8070
						1170	2480	3620	5260	6680	8150	9820	12300

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02300032	138	Braden River near Lorraine, Fla.	29.3	2.12	19	1260	2110	2760	3660	4410	5200	6050	7260
						904	1650	2270	3160	3930	4760	5690	7060
						1200	2030	2660	3550	4290	5080	5940	7200
02300034	139	Hickory Hammock Creek near Lorraine, Fla.	2.70	0.400	14	126	203	256	323	373	423	472	537
						279	520	721	1020	1270	1550	1860	2320
						145	238	306	406	485	576	672	810
02300035	140	Cooper Creek at University Parkway near Sarasota, Fla.	9.75	5.11	14	137	210	260	324	371	418	466	529
						346	642	884	1240	1530	1850	2200	2720
						157	247	313	410	487	575	668	802
02300037	141	Cedar Creek near Sarasota, Fla.	0.940	3.22	13	91.6	152	199	266	321	380	444	537
						92.0	175	243	344	428	520	620	764
						91.6	157	209	286	351	423	502	618
02300038	142	Rattlesnake Slough near Sarasota, Fla.	3.99	2.27	14	143	296	436	664	874	1120	1410	1870
						253	473	654	920	1140	1390	1660	2050
						171	348	509	767	991	1250	1541	1970
02300039	143	Nonsense Creek near Bradenton, Fla.	1.14	0.44	14	195	436	644	958	1220	1520	1830	2290
						160	301	419	595	744	909	1090	1360
						181	381	548	786	984	1190	1410	1740
02300100	144	Little Manatee River near Fort Lonesome, Fla.	39.9	6.37	44	694	1190	1590	2210	2750	3360	4060	5110
						777	1420	1950	2700	3340	4030	4800	5910
						699	1200	1630	2280	2840	3490	4220	5310
02300200	145	South Fork Little Manatee River near Duette, Fla.	8.58	6.71	46	304	550	732	976	1170	1360	1560	1830
						291	541	745	1040	1290	1560	1850	2280
						303	549	733	983	1180	1390	1600	1910
02300500	146	Little Manatee River near Wimauma, Fla.	154	6.27	68	2650	5220	7530	11300	14700	18700	23400	30900
						1830	3310	4500	6210	7670	9250	11000	13600
						2570	5010	7140	10400	13200	16200	19700	24900

Appendix 1. Flood-frequency estimates using PeakFQ version 5.2 for Region 4.—Continued

[mi², square miles; peak-flow data: top line, log-Pearson Type III distribution; middle line, regression equation estimates; bottom line, weighted estimates]

Station number	Map number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
						50	20	10	4	2	1	0.5	0.2
02300530	147	Cypress Creek near Wimauma, Fla.	7.81	17.8	11	243	388	502	667	806	960	1130	1380
						192	358	494	686	846	1020	1200	1470
						233	381	500	673	820	982	1160	1420
02300700	148	Bullfrog Creek near Wimauma, Fla.	30.0	2.89	47	1130	2260	3280	4940	6460	8260	10400	13700
						840	1540	2110	2940	3650	4420	5270	6520
						1090	2150	3070	4470	5680	7000	8490	10700
02301000	149	North Prong Alafia River at Keysville, Fla.	114	9.96	54	1700	3330	4730	6880	8760	10900	13300	16900
						1280	2330	3180	4380	5400	6500	7710	9480
						1650	3210	4470	6430	8060	9800	11700	14500
02301300	150	South Prong Alafia River near Lithia, Fla.	111	19.7	44	733	1350	1860	2610	3250	3950	4720	5870
						978	1780	2430	3340	4110	4930	5830	7130
						754	1390	1920	2710	3380	4130	4950	6160
02301350	151	Little Alafia River near Hopewell, Fla.	8.36	0.00	14	496	858	1110	1420	1650	1870	2080	2360
						649	1190	1650	2320	2910	3550	4260	5330
						528	917	1200	1590	1890	2220	2570	3050
02301500	152	Alafia River at Lithia, Fla.	317	12.8	74	2620	5520	8560	14200	20000	27700	37700	55600
						2220	4000	5430	7450	9160	11000	13000	16000
						2580	5340	8020	12400	16440	20900	26200	34200

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W
Region 1																	
02327100	229	0.0014	0.0012	0.0014	0.0013	0.0018	0.0016	0.0030	0.0025	0.0045	0.0036	0.0064	0.0050	0.0090	0.0067	0.0131	0.0094
02327350	230	0.0028	0.0024	0.0032	0.0025	0.0042	0.0032	0.0071	0.0050	0.0100	0.0069	0.0152	0.0092	0.0210	0.0118	0.0306	0.0158
02327355	231	0.0054	0.0039	0.0066	0.0043	0.0095	0.0055	0.0166	0.0082	0.0250	0.0110	0.0361	0.0141	0.0500	0.0174	0.0728	0.0226
02327415	232	0.0057	0.0041	0.0073	0.0046	0.0106	0.0059	0.0191	0.0088	0.0289	0.0117	0.0419	0.0149	0.0582	0.0183	0.0850	0.0236
02327500	233	0.0025	0.0022	0.0032	0.0026	0.0047	0.0035	0.0085	0.0056	0.0128	0.0078	0.0186	0.0103	0.0258	0.0131	0.0376	0.0175
02327550	234	0.0080	0.0051	0.0090	0.0052	0.0120	0.0063	0.0201	0.0090	0.0299	0.0118	0.0429	0.0150	0.0594	0.0184	0.0865	0.0237
02327700	235	0.0068	0.0046	0.0085	0.0050	0.0122	0.0064	0.0216	0.0093	0.0326	0.0122	0.0471	0.0155	0.0653	0.0189	0.0952	0.0243
02327860	236	0.0037	0.0029	0.0047	0.0034	0.0069	0.0045	0.0123	0.0070	0.0186	0.0096	0.0270	0.0124	0.0375	0.0156	0.0547	0.0204
02327900	237	0.0040	0.0031	0.0046	0.0033	0.0063	0.0043	0.0108	0.0065	0.0161	0.0088	0.0232	0.0116	0.0320	0.0145	0.0466	0.0192
02328000	238	0.0044	0.0033	0.0060	0.0040	0.0094	0.0055	0.0179	0.0086	0.0279	0.0115	0.0412	0.0148	0.0579	0.0182	0.0855	0.0236
02329000	239	0.0016	0.0015	0.0018	0.0016	0.0024	0.0020	0.0039	0.0032	0.0058	0.0045	0.0084	0.0061	0.0116	0.0081	0.0169	0.0111
02329180	240	0.0009	0.0009	0.0013	0.0012	0.0022	0.0018	0.0042	0.0034	0.0067	0.0050	0.0099	0.0069	0.0140	0.0092	0.0208	0.0127
02329354	241	0.0138	0.0069	0.0166	0.0070	0.0234	0.0085	0.0407	0.0117	0.0610	0.0148	0.0879	0.0182	0.1216	0.0218	0.1771	0.0276
02329490	242	0.0072	0.0048	0.0091	0.0052	0.0133	0.0066	0.0237	0.0097	0.0358	0.0127	0.0519	0.0160	0.0720	0.0194	0.1051	0.0249
02329500	243	0.0047	0.0035	0.0062	0.0041	0.0093	0.0055	0.0171	0.0084	0.0262	0.0112	0.0382	0.0144	0.0532	0.0178	0.0780	0.0230
02329534	244	0.0040	0.0031	0.0059	0.0040	0.0099	0.0057	0.0204	0.0091	0.0330	0.0123	0.0499	0.0158	0.0714	0.0194	0.1074	0.0250
02329558	245	0.0036	0.0028	0.0046	0.0033	0.0067	0.0045	0.0121	0.0069	0.0183	0.0095	0.0265	0.0123	0.0368	0.0154	0.0538	0.0203
02329559	246	0.0035	0.0028	0.0038	0.0029	0.0051	0.0037	0.0085	0.0056	0.0126	0.0077	0.0182	0.0102	0.0252	0.0129	0.0367	0.0173
02329600	247	0.0047	0.0035	0.0062	0.0041	0.0092	0.0054	0.0170	0.0083	0.0260	0.0112	0.0380	0.0143	0.0529	0.0177	0.0775	0.0230
02329700	248	0.0110	0.0061	0.0155	0.0068	0.0249	0.0087	0.0488	0.0122	0.0770	0.0156	0.1145	0.0192	0.1620	0.0229	0.2405	0.0288
02329877	249	0.0068	0.0046	0.0089	0.0051	0.0013	0.0012	0.0248	0.0098	0.0380	0.0129	0.0555	0.0163	0.0774	0.0198	0.1134	0.0254
02330000	250	0.0015	0.0014	0.0021	0.0018	0.0032	0.0026	0.0060	0.0044	0.0094	0.0063	0.0137	0.0086	0.0192	0.0112	0.0283	0.0152
02330050	251	0.0076	0.0049	0.0104	0.0056	0.0164	0.0073	0.0315	0.0108	0.0491	0.0140	0.0725	0.0175	0.1020	0.0211	0.1506	0.0268
02330100	252	0.0023	0.0020	0.0029	0.0023	0.0042	0.0032	0.0075	0.0051	0.0113	0.0072	0.0163	0.0096	0.0226	0.0122	0.0330	0.0164
02330150	253	0.0115	0.0063	0.0115	0.0590	0.0143	0.0069	0.0235	0.0096	0.0350	0.0126	0.0509	0.0159	0.0711	0.0194	0.1045	0.0249

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation; %, percent]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G
02368326	285	0.0140	0.0070	0.0176	0.0072	0.0256	0.0088	0.0457	0.0120	0.0690	0.0153	0.0998	0.0187	0.1385	0.0223	0.2020	0.0281
02368329	286	0.0064	0.0044	0.0094	0.0053	0.0157	0.0072	0.0323	0.0108	0.0522	0.0142	0.0789	0.0178	0.1129	0.0216	0.1696	0.0274
02368500	287	0.0036	0.0029	0.0042	0.0031	0.0058	0.0040	0.0100	0.0062	0.0149	0.0084	0.0214	0.0111	0.0296	0.0140	0.0431	0.0186
02369000	288	0.0013	0.0012	0.0018	0.0016	0.0028	0.0023	0.0053	0.0040	0.0082	0.0058	0.0120	0.0079	0.0168	0.0103	0.0248	0.0141
02369500	289	0.0027	0.0023	0.0042	0.0031	0.0074	0.0048	0.0167	0.0082	0.0281	0.0116	0.0439	0.0151	0.0642	0.0188	0.0986	0.0245
02369800	290	0.0056	0.0040	0.0070	0.0044	0.0101	0.0057	0.0179	0.0086	0.0270	0.0114	0.0391	0.0145	0.0542	0.0179	0.0790	0.0231
02370000	291	0.0029	0.0024	0.0038	0.0029	0.0057	0.0040	0.0104	0.0064	0.0159	0.0088	0.0232	0.0116	0.0323	0.0146	0.0473	0.0193
02370200	292	0.0136	0.0069	0.0188	0.0074	0.0296	0.0092	0.0569	0.0127	0.0888	0.0160	0.1312	0.0196	0.1846	0.0233	0.2728	0.0292
02370500	293	0.0024	0.0020	0.0032	0.0026	0.0051	0.0037	0.0097	0.0061	0.0151	0.0085	0.0223	0.0113	0.0313	0.0144	0.0462	0.0191
02370700	294	0.0082	0.0051	0.0116	0.0059	0.0187	0.0078	0.0369	0.0113	0.0583	0.0147	0.0869	0.0182	0.1231	0.0219	0.1831	0.0277
02370750	295	0.0219	0.0085	0.0285	0.0085	0.0426	0.0101	0.0780	0.0135	0.1190	0.0168	0.1732	0.0203	0.2412	0.0240	0.3531	0.0299
02372500	296	0.0014	0.0013	0.0018	0.0016	0.0026	0.0022	0.0046	0.0036	0.0070	0.0052	0.0101	0.0070	0.0140	0.0092	0.0204	0.0126
02374500	297	0.0022	0.0019	0.0031	0.0024	0.0049	0.0036	0.0096	0.0060	0.0150	0.0085	0.0223	0.0113	0.0314	0.0144	0.0466	0.0192
02374970	298	0.0049	0.0036	0.0067	0.0043	0.0104	0.0058	0.0197	0.0089	0.0306	0.0120	0.0451	0.0152	0.0632	0.0187	0.0932	0.0242
02375000	299	0.0028	0.0023	0.0041	0.0031	0.0069	0.0045	0.0141	0.0076	0.0227	0.0105	0.0343	0.0138	0.0491	0.0173	0.0736	0.0226
02375500	300	0.0008	0.0007	0.0010	0.0009	0.0014	0.0013	0.0025	0.0022	0.0038	0.0032	0.0055	0.0044	0.0076	0.0059	0.0111	0.0083
02376000	301	0.0051	0.0037	0.0065	0.0042	0.0095	0.0056	0.0172	0.0084	0.0260	0.0112	0.0378	0.0143	0.0525	0.0177	0.0767	0.0229
02376033	302	0.0025	0.0022	0.0038	0.0029	0.0067	0.0044	0.0144	0.0077	0.0239	0.0108	0.0368	0.0142	0.0534	0.0178	0.0812	0.0233
02376079	303	0.0085	0.0053	0.0116	0.0059	0.0181	0.0077	0.0344	0.0111	0.0535	0.0143	0.0787	0.0178	0.1105	0.0215	0.1629	0.0272
02376300	304	0.0032	0.0026	0.0040	0.0030	0.0057	0.0040	0.0100	0.0062	0.0150	0.0085	0.0216	0.0112	0.0300	0.0141	0.0437	0.0187
02376500	305	0.0016	0.0014	0.0021	0.0018	0.0031	0.0025	0.0056	0.0042	0.0086	0.0060	0.0125	0.0081	0.0173	0.0105	0.0254	0.0143
Region 2																	
02228500	1	0.0021	0.0019	0.0025	0.0022	0.0035	0.0029	0.0060	0.0044	0.0082	0.0059	0.0114	0.0075	0.0154	0.0094	0.0219	0.0122
02229000	2	0.0043	0.0036	0.0031	0.0027	0.0034	0.0029	0.0063	0.0048	0.0104	0.0070	0.0162	0.0094	0.0235	0.0120	0.0354	0.0154
02230000	3	0.0022	0.0020	0.0026	0.0023	0.0036	0.0030	0.0061	0.0047	0.0091	0.0064	0.0131	0.0083	0.0181	0.0104	0.0264	0.0134
02230500	4	0.0049	0.0041	0.0049	0.0040	0.0062	0.0047	0.0101	0.0067	0.0150	0.0088	0.0218	0.0110	0.0305	0.0136	0.0448	0.0170
02231000	5	0.0018	0.0017	0.0022	0.0020	0.0031	0.0027	0.0054	0.0043	0.0081	0.0058	0.0117	0.0077	0.0162	0.0097	0.0236	0.0127
02231230	6	0.0042	0.0036	0.0045	0.0037	0.0060	0.0046	0.0099	0.0067	0.0147	0.0086	0.0212	0.0109	0.0293	0.0133	0.0428	0.0167
02231250	7	0.0033	0.0029	0.0042	0.0035	0.0061	0.0047	0.0110	0.0071	0.0167	0.0093	0.0242	0.0116	0.0336	0.0142	0.0491	0.0176
02231253	8	0.0020	0.0019	0.0028	0.0024	0.0042	0.0035	0.0080	0.0057	0.0123	0.0078	0.0181	0.0100	0.0253	0.0124	0.0373	0.0158
02231268	9	0.0029	0.0026	0.0034	0.0030	0.0049	0.0039	0.0085	0.0060	0.0127	0.0079	0.0183	0.0101	0.0253	0.0124	0.0369	0.0157

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W
02231280	10	0.0049	0.0040	0.0060	0.0047	0.0087	0.0060	0.0155	0.0088	0.0233	0.0110	0.0337	0.0134	0.0466	0.0160	0.0680	0.0195
02244320	52	0.0038	0.0033	0.0046	0.0038	0.0066	0.0050	0.0117	0.0074	0.0176	0.0096	0.0254	0.0119	0.0352	0.0144	0.0512	0.0178
02244420	53	0.0022	0.0020	0.0021	0.0019	0.0025	0.0022	0.0041	0.0034	0.0062	0.0048	0.0091	0.0065	0.0129	0.0084	0.0191	0.0112
02244473	54	0.0047	0.0039	0.0043	0.0036	0.0051	0.0041	0.0084	0.0060	0.0128	0.0080	0.0189	0.0102	0.0267	0.0128	0.0396	0.0162
02245050	55	0.0036	0.0031	0.0042	0.0035	0.0058	0.0045	0.0100	0.0067	0.0150	0.0087	0.0216	0.0110	0.0299	0.0134	0.0435	0.0168
02245140	56	0.0037	0.0032	0.0036	0.0030	0.0044	0.0036	0.0071	0.0053	0.0107	0.0071	0.0156	0.0092	0.0220	0.0116	0.0324	0.0148
02245255	57	0.0046	0.0038	0.0052	0.0041	0.0071	0.0052	0.0120	0.0075	0.0178	0.0096	0.0256	0.0125	0.0354	0.0145	0.0515	0.0179
02245260	58	0.0041	0.0035	0.0049	0.0040	0.0069	0.0051	0.0119	0.0075	0.0178	0.0096	0.0256	0.0119	0.0354	0.0145	0.0515	0.0179
02245400	59	0.0063	0.0050	0.0084	0.0059	0.0128	0.0077	0.0238	0.0109	0.0365	0.0133	0.0534	0.0158	0.0746	0.0184	0.1095	0.0219
02245470	60	0.0041	0.0035	0.0058	0.0045	0.0092	0.0062	0.0179	0.0095	0.0281	0.0120	0.0417	0.0145	0.0588	0.0173	0.0872	0.0208
02245500	61	0.0022	0.0020	0.0025	0.0022	0.0035	0.0030	0.0060	0.0046	0.0090	0.0063	0.0130	0.0082	0.0180	0.0104	0.0261	0.0134
02246000	62	0.0018	0.0016	0.0017	0.0016	0.0050	0.0018	0.0033	0.0029	0.0050	0.0040	0.0074	0.0055	0.0103	0.0073	0.0153	0.0098
02246150	63	0.0035	0.0030	0.0036	0.0030	0.0045	0.0036	0.0074	0.0054	0.0110	0.0072	0.0159	0.0093	0.0222	0.0116	0.0325	0.0149
02246200	64	0.0044	0.0037	0.0059	0.0046	0.0091	0.0062	0.0171	0.0093	0.0264	0.0117	0.0388	0.0142	0.0543	0.0169	0.0799	0.0204
02246300	65	0.0033	0.0029	0.0040	0.0033	0.0055	0.0043	0.0096	0.0065	0.0143	0.0085	0.0206	0.0107	0.0285	0.0132	0.0415	0.0165
02246460	66	0.0009	0.0009	0.0010	0.0010	0.0013	0.0012	0.0022	0.0020	0.0033	0.0029	0.0048	0.0039	0.0066	0.0052	0.0096	0.0071
02246497	67	0.0011	0.0010	0.0011	0.0010	0.0014	0.0013	0.0023	0.0021	0.0034	0.0030	0.0050	0.0041	0.0069	0.0054	0.0101	0.0074
02246522	68	0.0095	0.0068	0.0116	0.0074	0.0165	0.0090	0.0289	0.0119	0.0433	0.0141	0.0625	0.0164	0.0865	0.0191	0.1260	0.0225
02246600	69	0.0039	0.0034	0.0055	0.0043	0.0089	0.0061	0.0174	0.0094	0.0275	0.0119	0.0408	0.0144	0.0578	0.0172	0.0857	0.0208
02246828	70	0.0047	0.0039	0.0046	0.0038	0.0057	0.0044	0.0094	0.0064	0.0140	0.0084	0.0204	0.0106	0.0245	0.0132	0.0419	0.0166
02246832	71	0.0051	0.0042	0.0052	0.0041	0.0065	0.0049	0.0107	0.0070	0.0160	0.0090	0.0231	0.0114	0.0322	0.0139	0.0473	0.0173
02246900	72	0.0052	0.0043	0.0040	0.0033	0.0044	0.0036	0.0078	0.0056	0.0127	0.0079	0.0196	0.0104	0.0283	0.0131	0.0425	0.0166
02247000	73	0.0074	0.0056	0.0021	0.0019	0.0047	0.0038	0.0155	0.0088	0.0266	0.0117	0.0384	0.0141	0.0499	0.0164	0.0633	0.0191
02247200	74	0.0084	0.0062	0.0098	0.0066	0.0136	0.0080	0.0232	0.0108	0.0347	0.0131	0.0499	0.0154	0.0690	0.0181	0.1005	0.0215
02247480	75	0.0042	0.0036	0.0041	0.0034	0.0034	0.0029	0.0062	0.0048	0.0102	0.0069	0.0159	0.0093	0.0231	0.0119	0.0347	0.0153
02247510	76	0.0034	0.0029	0.0034	0.0029	0.0043	0.0035	0.0070	0.0052	0.0105	0.0070	0.0152	0.0090	0.0212	0.0114	0.0311	0.0146
02247600	77	0.0030	0.0027	0.0038	0.0032	0.0056	0.0044	0.0100	0.0067	0.0152	0.0088	0.0220	0.0111	0.0306	0.0136	0.0447	0.0170
02248000	78	0.0006	0.0006	0.0007	0.0006	0.0009	0.0008	0.0014	0.0013	0.0021	0.0019	0.0031	0.0027	0.0043	0.0036	0.0063	0.0051
02313400	183	0.0097	0.0069	0.0086	0.0060	0.0101	0.0067	0.0167	0.0091	0.0256	0.0115	0.0380	0.0141	0.0540	0.0168	0.0804	0.0204
02314200	184	0.0054	0.0044	0.0068	0.0051	0.0099	0.0066	0.0178	0.0095	0.0270	0.0118	0.0391	0.0142	0.0543	0.0169	0.0793	0.0204
02314500	185	0.0019	0.0017	0.0017	0.0016	0.0020	0.0018	0.0033	0.0028	0.0050	0.0040	0.0074	0.0056	0.0106	0.0074	0.0157	0.0100

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50% chance exceed-ance		20% chance exceed-ance		10% chance exceed-ance		4% chance exceed-ance		2% chance exceed-ance		1% chance exceed-ance		0.5% chance exceed-ance		0.2% chance exceed-ance	
		G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W
02314600	186	0.0043	0.0037	0.0041	0.0034	0.0050	0.0040	0.0081	0.0058	0.0123	0.0077	0.0180	0.0100	0.0253	0.0124	0.0374	0.0158
02314700	187	0.0030	0.0027	0.0036	0.0031	0.0050	0.0040	0.0087	0.0061	0.0130	0.0080	0.0187	0.0102	0.0259	0.0126	0.0377	0.0159
02315000	188	0.0051	0.0042	0.0050	0.0040	0.0062	0.0047	0.0101	0.0068	0.0152	0.0088	0.0220	0.0111	0.0308	0.0136	0.0454	0.0171
02315200	189	0.0057	0.0046	0.0078	0.0056	0.0122	0.0075	0.0234	0.0109	0.0365	0.0133	0.0538	0.0158	0.0757	0.0185	0.1117	0.0220
02315500	190	0.0017	0.0016	0.0014	0.0013	0.0016	0.0015	0.0028	0.0024	0.0043	0.0036	0.0065	0.0050	0.0093	0.0067	0.0139	0.0092
02315550	191	0.0022	0.0020	0.0024	0.0021	0.0031	0.0027	0.0052	0.0041	0.0077	0.0056	0.0111	0.0074	0.0154	0.0094	0.0224	0.0123
02317500	192	0.0015	0.0014	0.0015	0.0014	0.0019	0.0018	0.0032	0.0027	0.0047	0.0038	0.0068	0.0052	0.0095	0.0068	0.0139	0.0092
02317600	193	0.0072	0.0055	0.0066	0.0050	0.0079	0.0056	0.0129	0.0079	0.0197	0.0101	0.0290	0.0126	0.0410	0.0153	0.0609	0.0189
02317620	194	0.0075	0.0057	0.0076	0.0055	0.0094	0.0064	0.0155	0.0088	0.0231	0.0110	0.0335	0.0134	0.0467	0.0161	0.0687	0.0196
02317630	195	0.0025	0.0022	0.0031	0.0027	0.0046	0.0037	0.0081	0.0058	0.0123	0.0078	0.0178	0.0099	0.0247	0.0123	0.0361	0.0156
02317748	196	0.0068	0.0053	0.0073	0.0054	0.0095	0.0064	0.0158	0.0089	0.0234	0.0110	0.0337	0.0134	0.0467	0.0160	0.0682	0.0195
02318000	197	0.0023	0.0021	0.0024	0.0021	0.0031	0.0026	0.0051	0.0040	0.0075	0.0055	0.0108	0.0073	0.0151	0.0093	0.0220	0.0122
02318500	198	0.0038	0.0033	0.0045	0.0037	0.0062	0.0047	0.0107	0.0070	0.0160	0.0091	0.0230	0.0113	0.0319	0.0138	0.0464	0.0172
02318600	199	0.0044	0.0037	0.0059	0.0045	0.0089	0.0061	0.0166	0.0091	0.0255	0.0115	0.0373	0.0140	0.0521	0.0166	0.0764	0.0202
02318700	200	0.0056	0.0046	0.0065	0.0049	0.0088	0.0061	0.0151	0.0086	0.0225	0.0108	0.0323	0.0132	0.0447	0.0158	0.0651	0.0193
02319000	201	0.0018	0.0017	0.0021	0.0019	0.0029	0.0025	0.0050	0.0040	0.0074	0.0055	0.0107	0.0072	0.0148	0.0092	0.0216	0.0121
02320700	202	0.0040	0.0034	0.0040	0.0033	0.0049	0.0039	0.0080	0.0058	0.0120	0.0076	0.0175	0.0098	0.0245	0.0122	0.0361	0.0156
02321000	203	0.0055	0.0045	0.0047	0.0038	0.0053	0.0042	0.0090	0.0062	0.0140	0.0084	0.0211	0.0108	0.0302	0.0135	0.0452	0.0170
02321500	204	0.0025	0.0023	0.0023	0.0020	0.0027	0.0024	0.0044	0.0036	0.0068	0.0051	0.0100	0.0069	0.0142	0.0090	0.0211	0.0119
02321600	205	0.0078	0.0059	0.0095	0.0065	0.0135	0.0080	0.0237	0.0109	0.0355	0.0132	0.0512	0.0156	0.0709	0.0182	0.1033	0.0216
02321700	206	0.0029	0.0026	0.0034	0.0030	0.0054	0.0042	0.0096	0.0065	0.0145	0.0086	0.0210	0.0108	0.0291	0.0133	0.0424	0.0166
02321800	207	0.0047	0.0039	0.0050	0.0040	0.0064	0.0048	0.0105	0.0069	0.0156	0.0089	0.0225	0.0112	0.0312	0.0137	0.0457	0.0171
02321975	208	0.0560	0.0167	0.0566	0.0149	0.0710	0.0154	0.1164	0.0173	0.1735	0.0187	0.2514	0.0205	0.3508	0.0229	0.5152	0.0260
02322000	209	0.0045	0.0038	0.0042	0.0035	0.0051	0.0040	0.0083	0.0059	0.0125	0.0078	0.0184	0.0101	0.0259	0.0126	0.0383	0.0160
02322016	210	0.0104	0.0072	0.0121	0.0076	0.0166	0.0090	0.0283	0.0118	0.0422	0.0140	0.0607	0.0163	0.0840	0.0189	0.1223	0.0224
02322049	211	0.0224	0.0115	0.0272	0.0116	0.0385	0.0130	0.0672	0.0156	0.1008	0.0174	0.1452	0.0194	0.2009	0.0218	0.2926	0.0250
02322500	212	0.0012	0.0012	0.0014	0.0013	0.0019	0.0017	0.0032	0.0027	0.0047	0.0038	0.0067	0.0052	0.0093	0.0067	0.0136	0.0091
02324000	213	0.0023	0.0021	0.0025	0.0022	0.0033	0.0028	0.0055	0.0043	0.0082	0.0059	0.0118	0.0077	0.0164	0.0098	0.0239	0.0128
02324400	214	0.0032	0.0028	0.0042	0.0034	0.0062	0.0047	0.0114	0.0073	0.0174	0.0095	0.0253	0.0119	0.0352	0.0144	0.0516	0.0179
02324500	215	0.0031	0.0028	0.0043	0.0035	0.0067	0.0050	0.0128	0.0078	0.0200	0.0102	0.0295	0.0127	0.0414	0.0154	0.0611	0.0189
02325000	216	0.0028	0.0025	0.0028	0.0024	0.0035	0.0030	0.0057	0.0044	0.0085	0.0060	0.0123	0.0079	0.0172	0.0101	0.0253	0.0132

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	chance exceed- ance	
Region 3																	
02326000	217	0.0029	0.0026	0.0024	0.0022	0.0027	0.0024	0.0046	0.0038	0.0073	0.0054	0.0111	0.0074	0.0159	0.0096	0.0239	0.0128
02326250	218	0.0047	0.0039	0.0049	0.0040	0.0063	0.0048	0.0104	0.0069	0.0155	0.0089	0.0224	0.0112	0.0311	0.0137	0.0455	0.0171
02326261	219	0.0163	0.0097	0.0200	0.0101	0.0286	0.0116	0.0504	0.0145	0.0758	0.0164	0.1094	0.0186	0.1515	0.0211	0.2207	0.0244
02326300	220	0.0086	0.0063	0.0111	0.0072	0.0164	0.0089	0.0298	0.0121	0.0454	0.0143	0.0660	0.0167	0.0917	0.0193	0.1341	0.0227
02326372	221	0.0040	0.0035	0.0037	0.0031	0.0044	0.0036	0.0072	0.0053	0.0110	0.0072	0.0162	0.0094	0.0230	0.0118	0.0341	0.0152
02326500	222	0.0080	0.0060	0.0070	0.0052	0.0080	0.0057	0.0134	0.0080	0.0207	0.0104	0.0310	0.0130	0.0443	0.0158	0.0661	0.0194
02326512	223	0.0028	0.0025	0.0040	0.0034	0.0064	0.0048	0.0126	0.0078	0.0198	0.0102	0.0295	0.0127	0.0417	0.0154	0.0619	0.0190
02326574	224	0.0150	0.0092	0.0181	0.0096	0.0256	0.0111	0.0445	0.0139	0.0667	0.0159	0.0961	0.0181	0.1330	0.0207	0.1936	0.0240
02326595	225	0.0119	0.0079	0.0133	0.0080	0.0177	0.0093	0.0297	0.0120	0.0440	0.0142	0.0633	0.0165	0.0876	0.0191	0.1276	0.0225
02326598	226	0.0136	0.0087	0.0164	0.0091	0.0232	0.0106	0.0403	0.0135	0.0604	0.0156	0.0870	0.0178	0.1204	0.0203	0.1754	0.0237
02326838	227	0.0126	0.0082	0.0176	0.0094	0.0279	0.0115	0.0540	0.0147	0.0846	0.0168	0.1254	0.0190	0.1768	0.0215	0.2618	0.0248
02326900	228	0.0011	0.0011	0.0012	0.0011	0.0016	0.0014	0.0026	0.0023	0.0038	0.0032	0.0056	0.0044	0.0077	0.0059	0.0113	0.0080
Region 3																	
02234100	28	0.0083	0.0070	0.0070	0.0055	0.0079	0.0058	0.0133	0.0080	0.0209	0.0103	0.0315	0.0126	0.0452	0.0149	0.0676	0.0180
02234500	29	0.0041	0.0037	0.0041	0.0035	0.0051	0.0041	0.0083	0.0059	0.0124	0.0077	0.0180	0.0097	0.0251	0.0118	0.0370	0.0147
02235000	30	0.0004	0.0004	0.0005	0.0005	0.0007	0.0007	0.0012	0.0012	0.0018	0.0017	0.0027	0.0024	0.0037	0.0032	0.0054	0.0044
02235200	31	0.0011	0.0011	0.0014	0.0014	0.0021	0.0019	0.0038	0.0032	0.0050	0.0040	0.0084	0.0060	0.0117	0.0077	0.0171	0.0105
02236000	32	0.0006	0.0006	0.0006	0.0006	0.0008	0.0008	0.0013	0.0012	0.0019	0.0018	0.0028	0.0024	0.0039	0.0033	0.0056	0.0046
02236120	33	0.0050	0.0045	0.0062	0.0051	0.0091	0.0065	0.0162	0.0090	0.0245	0.0111	0.0355	0.0132	0.0492	0.0154	0.0718	0.0182
02236125	34	0.0012	0.0012	0.0012	0.0012	0.0015	0.0014	0.0024	0.0022	0.0037	0.0031	0.0054	0.0043	0.0075	0.0056	0.0111	0.0076
02236350	35	0.0059	0.0052	0.0055	0.0045	0.0065	0.0050	0.0107	0.0070	0.0162	0.0090	0.0239	0.0112	0.0338	0.0134	0.0501	0.0164
02236500	36	0.0061	0.0054	0.0048	0.0041	0.0054	0.0044	0.0094	0.0064	0.0150	0.0086	0.0230	0.0110	0.0332	0.0134	0.0498	0.0164
02236700	37	0.0114	0.0091	0.0096	0.0071	0.0110	0.0074	0.0185	0.0097	0.0289	0.0119	0.0435	0.0141	0.0622	0.0164	0.0931	0.0194
02237000	38	0.0162	0.0120	0.0147	0.0095	0.0174	0.0098	0.0286	0.0119	0.0437	0.0138	0.0646	0.0158	0.0914	0.0180	0.1358	0.0207
02239000	39	0.0014	0.0014	0.0014	0.0013	0.0017	0.0016	0.0027	0.0024	0.0041	0.0034	0.0060	0.0046	0.0084	0.0061	0.0123	0.0820
02240000	40	0.0007	0.0007	0.0007	0.0007	0.0008	0.0008	0.0014	0.0013	0.0021	0.0019	0.0030	0.0026	0.0042	0.0036	0.0062	0.0050
02240500	41	0.0014	0.0014	0.0015	0.0014	0.0019	0.0017	0.0031	0.0027	0.0046	0.0038	0.0067	0.0051	0.0093	0.0066	0.0136	0.0088
02240902	42	0.0134	0.0104	0.0114	0.0080	0.0131	0.0082	0.0219	0.0105	0.0342	0.0127	0.0514	0.0149	0.0735	0.0171	0.1099	0.0200
022409424	43	0.0547	0.0250	0.0556	0.0180	0.0699	0.0169	0.1146	0.0172	0.1707	0.0181	0.2472	0.1932	0.3447	0.0210	0.5060	0.0233
02240950	44	0.0039	0.0036	0.0051	0.0043	0.0076	0.0057	0.0139	0.0082	0.0212	0.0104	0.0308	0.0125	0.0429	0.0147	0.0628	0.0176
02240954	45	0.0033	0.0031	0.0035	0.0031	0.0046	0.0038	0.0076	0.0055	0.0113	0.0072	0.0162	0.0091	0.0225	0.0112	0.0329	0.0140

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W
02241900	46	0.0056	0.0050	0.0062	0.0050	0.0083	0.0060	0.0139	0.0082	0.0207	0.0102	0.0297	0.0123	0.0411	0.0145	0.0599	0.0174
02242451	47	0.0869	0.0302	0.0672	0.0191	0.0745	0.0172	0.1307	0.0176	0.2114	0.0185	0.3249	0.0197	0.4697	0.0213	0.7057	0.0236
02243000	48	0.0030	0.0028	0.0030	0.0027	0.0037	0.0032	0.0060	0.0046	0.0090	0.0062	0.0131	0.0080	0.0182	0.0100	0.0268	0.0128
02243500	49	0.0016	0.0016	0.0021	0.0020	0.0032	0.0028	0.0058	0.0045	0.0088	0.0062	0.0128	0.0080	0.0179	0.0099	0.0262	0.0126
02243530	50	0.0048	0.0043	0.0042	0.0037	0.0050	0.0041	0.0082	0.0058	0.0126	0.0078	0.0188	0.0102	0.0267	0.0122	0.0398	0.0152
02244000	51	0.0026	0.0025	0.0023	0.0021	0.0026	0.0023	0.0044	0.0036	0.0067	0.0051	0.0101	0.0068	0.0144	0.0088	0.0215	0.0114
02262900	87	0.0024	0.0023	0.0028	0.0025	0.0037	0.0032	0.0063	0.0048	0.0094	0.0064	0.0134	0.0082	0.0186	0.0101	0.0271	0.0128
02263800	88	0.0021	0.0020	0.0023	0.0022	0.0031	0.0027	0.0052	0.0042	0.0077	0.0056	0.0111	0.0073	0.0154	0.0091	0.0225	0.0117
02264000	89	0.0062	0.0054	0.0047	0.0040	0.0052	0.0042	0.0092	0.0063	0.0149	0.0086	0.0230	0.0110	0.0332	0.0134	0.0500	0.0164
02264051	90	0.0008	0.0008	0.0012	0.0011	0.0018	0.0017	0.0036	0.0030	0.0056	0.0044	0.0082	0.0059	0.0116	0.0076	0.0172	0.0101
02264100	91	0.0022	0.0021	0.0020	0.0018	0.0023	0.0021	0.0038	0.0032	0.0058	0.0045	0.0087	0.0061	0.0123	0.0079	0.0184	0.0105
02264495	92	0.0010	0.0010	0.0011	0.0011	0.0015	0.0014	0.0026	0.0023	0.0038	0.0032	0.0054	0.0043	0.0075	0.0056	0.0110	0.0076
02266200	93	0.0046	0.0042	0.0039	0.0034	0.0044	0.0037	0.0074	0.0054	0.0117	0.0074	0.0176	0.0096	0.0252	0.0118	0.0379	0.0148
02266300	94	0.0023	0.0022	0.0029	0.0026	0.0042	0.0036	0.0076	0.0055	0.0115	0.0073	0.0166	0.0093	0.0231	0.0114	0.0337	0.0142
02266480	95	0.0025	0.0024	0.0029	0.0026	0.0040	0.0034	0.0068	0.0051	0.0102	0.0068	0.0146	0.0086	0.0202	0.0106	0.0294	0.0134
02269000	96	0.0034	0.0032	0.0038	0.0033	0.0049	0.0040	0.0082	0.0059	0.0122	0.0076	0.0176	0.0096	0.0244	0.0116	0.0356	0.0145
02269520	97	0.0038	0.0035	0.0045	0.0038	0.0063	0.0049	0.0109	0.0071	0.0164	0.0090	0.0236	0.0111	0.0326	0.0132	0.0474	0.0161
02269720	98	0.0026	0.0025	0.0020	0.0019	0.0023	0.0021	0.0040	0.0033	0.0064	0.0049	0.0098	0.0067	0.0142	0.0087	0.0214	0.0114
02270500	99	0.0016	0.0015	0.0020	0.0018	0.0028	0.0025	0.0048	0.0039	0.0073	0.0054	0.0105	0.0070	0.0145	0.0088	0.0212	0.0113
02271500	100	0.0021	0.0020	0.0021	0.0020	0.0027	0.0024	0.0044	0.0036	0.0066	0.0050	0.0095	0.0065	0.0132	0.0083	0.0194	0.0108
02272000	101	0.0033	0.0030	0.0025	0.0023	0.0028	0.0025	0.0049	0.0039	0.0079	0.0057	0.0122	0.0077	0.0177	0.0099	0.0266	0.0127
02293694	106	0.0091	0.0076	0.0082	0.0063	0.0096	0.0067	0.0159	0.0089	0.0243	0.0110	0.0360	0.0132	0.0511	0.0155	0.0761	0.0185
02293986	107	0.0043	0.0039	0.0056	0.0046	0.0085	0.0061	0.0156	0.0088	0.0239	0.0110	0.0349	0.0131	0.0487	0.0153	0.0713	0.0182
02293987	108	0.0028	0.0027	0.0030	0.0027	0.0038	0.0032	0.0062	0.0048	0.0092	0.0064	0.0013	0.0082	0.0186	0.0101	0.0272	0.0129
02294068	109	0.0080	0.0068	0.0080	0.0062	0.0100	0.0069	0.0164	0.0091	0.0244	0.0111	0.0355	0.0132	0.0495	0.0154	0.0728	0.0183
02294650	110	0.0015	0.0015	0.0018	0.0017	0.0026	0.0023	0.0046	0.0037	0.0068	0.0051	0.0098	0.0067	0.0136	0.0084	0.0198	0.0109
02294898	111	0.0022	0.0021	0.0026	0.0024	0.0035	0.0030	0.0060	0.0046	0.0090	0.0062	0.0129	0.0080	0.0178	0.0099	0.0259	0.0126
02295013	112	0.0028	0.0026	0.0030	0.0027	0.0040	0.0034	0.0067	0.0050	0.0099	0.0067	0.0143	0.0085	0.0198	0.0105	0.0288	0.0132
02301900	153	0.0046	0.0042	0.0056	0.0046	0.0079	0.0058	0.0138	0.0082	0.0410	0.0136	0.0297	0.0123	0.0411	0.0145	0.0599	0.0174
02301990	154	0.0110	0.0089	0.0118	0.0082	0.0154	0.0091	0.0256	0.0113	0.0379	0.0132	0.0546	0.0151	0.0757	0.0172	0.1106	0.0200
02302260	155	0.0008	0.0008	0.0008	0.0008	0.0011	0.0011	0.0019	0.0017	0.0028	0.0025	0.0041	0.0034	0.0056	0.0045	0.0082	0.0062

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued
[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G	chance exceed- ance	W	chance exceed- ance	G
02231565	14	0.0074	0.0042	0.0090	0.0051	0.0129	0.0067	0.0227	0.0097	0.0340	0.0127	0.0492	0.0157	0.0682	0.0192	0.0993	0.0241
02231600	15	0.0029	0.0023	0.0037	0.0028	0.0053	0.0038	0.0094	0.0061	0.0142	0.0084	0.0206	0.0109	0.0286	0.0138	0.0416	0.0181
02232000	16	0.0026	0.0020	0.0027	0.0022	0.0034	0.0027	0.0056	0.0042	0.0083	0.0059	0.0120	0.0079	0.0167	0.0103	0.0244	0.0138
02232155	17	0.0078	0.0044	0.0100	0.0054	0.0147	0.0072	0.0266	0.0104	0.0404	0.0135	0.0586	0.0165	0.0814	0.0201	0.1190	0.0252
02232200	18	0.0026	0.0021	0.0032	0.0025	0.0047	0.0035	0.0083	0.0056	0.0125	0.0077	0.0181	0.0101	0.0251	0.0129	0.0365	0.0170
02232400	19	0.0029	0.0022	0.0020	0.0017	0.0022	0.0019	0.0042	0.0034	0.0070	0.0052	0.0110	0.0074	0.0160	0.0100	0.0240	0.0137
02232450	20	0.0040	0.0028	0.0055	0.0038	0.0087	0.0054	0.0168	0.0084	0.0263	0.0114	0.0389	0.0145	0.0548	0.0179	0.0811	0.0229
02232500	21	0.0013	0.0012	0.0011	0.0010	0.0012	0.0011	0.0020	0.0018	0.0032	0.0028	0.0049	0.0040	0.0071	0.0056	0.0106	0.0080
02233001	22	0.0048	0.0033	0.0036	0.0028	0.0040	0.0031	0.0071	0.0050	0.0137	0.0082	0.0181	0.0101	0.0263	0.0132	0.0395	0.0176
02233102	23	0.0092	0.0048	0.0116	0.0058	0.0170	0.0076	0.0305	0.0109	0.0462	0.0141	0.0670	0.0171	0.0930	0.0207	0.1358	0.0258
02233200	24	0.0029	0.0023	0.0025	0.0021	0.0029	0.0024	0.0049	0.0038	0.0076	0.0055	0.0113	0.0076	0.0161	0.0100	0.0241	0.0137
02233475	25	0.0040	0.0029	0.0043	0.0031	0.0056	0.0040	0.0092	0.0060	0.0137	0.0082	0.0197	0.0106	0.0274	0.0135	0.0400	0.0177
02233500	26	0.0014	0.0012	0.0016	0.0014	0.0021	0.0018	0.0035	0.0029	0.0052	0.0041	0.0075	0.0056	0.0103	0.0074	0.0151	0.0102
02234000	27	0.0013	0.0012	0.0014	0.0012	0.0017	0.0015	0.0028	0.0024	0.0042	0.0035	0.0061	0.0048	0.0085	0.0064	0.0124	0.0089
02249007	79	0.0056	0.0036	0.0076	0.0046	0.0117	0.0064	0.0222	0.0096	0.0343	0.0127	0.0504	0.0158	0.0707	0.0194	0.1041	0.0244
02249500	80	0.0064	0.0039	0.0061	0.0040	0.0074	0.0048	0.0121	0.0070	0.0182	0.0096	0.0266	0.0124	0.0374	0.0156	0.0554	0.0202
02249518	81	0.0028	0.0022	0.0038	0.0028	0.0059	0.0041	0.0111	0.0067	0.0173	0.0093	0.0254	0.0121	0.0357	0.0152	0.0526	0.0198
02250000	82	0.0056	0.0036	0.0056	0.0038	0.0069	0.0046	0.0112	0.0068	0.0168	0.0092	0.0244	0.0119	0.0342	0.0150	0.0504	0.0195
02251000	83	0.0016	0.0014	0.0018	0.0015	0.0023	0.0020	0.0039	0.0032	0.0058	0.0045	0.0083	0.0061	0.0115	0.0080	0.0167	0.0110
02251500	84	0.0091	0.0048	0.0099	0.0053	0.0129	0.0067	0.0215	0.0095	0.0319	0.0124	0.0459	0.0153	0.0636	0.0188	0.0929	0.0237
02256000	85	0.0127	0.0056	0.0125	0.0060	0.0155	0.0073	0.0253	0.0102	0.0379	0.0132	0.0551	0.0162	0.0771	0.0198	0.1136	0.0249
02256500	86	0.0019	0.0016	0.0021	0.0018	0.0028	0.0023	0.0046	0.0036	0.0069	0.0051	0.0099	0.0069	0.0137	0.0090	0.0200	0.0123
02273000	102	0.0050	0.0033	0.0048	0.0034	0.0057	0.0040	0.0094	0.0060	0.0141	0.0083	0.0208	0.0109	0.0292	0.0139	0.0432	0.0184
02293000	103	0.0136	0.0058	0.0180	0.0070	0.0272	0.0092	0.0503	0.0127	0.0771	0.0160	0.1126	0.0191	0.0157	0.0228	0.2304	0.0280
02293050	104	0.0050	0.0033	0.0066	0.0042	0.0100	0.0058	0.0186	0.0089	0.0285	0.0118	0.0416	0.0148	0.0581	0.0183	0.0852	0.0232
02293400	105	0.0065	0.0039	0.0090	0.0051	0.0143	0.0070	0.0278	0.0105	0.0435	0.0138	0.0645	0.0170	0.0909	0.0206	0.1354	0.0258
02295420	113	0.0045	0.0031	0.0053	0.0036	0.0073	0.0048	0.0126	0.0072	0.0188	0.0098	0.0271	0.0124	0.0375	0.0156	0.0546	0.0201
02295630	114	0.0025	0.0020	0.0028	0.0023	0.0038	0.0030	0.0064	0.0047	0.0096	0.0065	0.0137	0.0086	0.0190	0.0111	0.0277	0.0148
02295637	115	0.0013	0.0011	0.0018	0.0015	0.0028	0.0023	0.0053	0.0040	0.0082	0.0059	0.0122	0.0080	0.0171	0.0104	0.0252	0.0141
02296260	116	0.0078	0.0044	0.0090	0.0051	0.0124	0.0065	0.0211	0.0094	0.0315	0.0123	0.0453	0.0153	0.0627	0.0187	0.0912	0.0236
02296500	117	0.0016	0.0014	0.0022	0.0018	0.0034	0.0027	0.0065	0.0047	0.0101	0.0067	0.0149	0.0090	0.0209	0.0117	0.0308	0.0157

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G	chance exceed- ance	G
02296750	118	0.0013	0.0011	0.0018	0.0015	0.0028	0.0023	0.0054	0.0041	0.0085	0.0060	0.0126	0.0081	0.0177	0.0106	0.0263	0.0144
02297088	119	0.0029	0.0023	0.0034	0.0026	0.0046	0.0035	0.0079	0.0054	0.0117	0.0074	0.0169	0.0097	0.0233	0.0124	0.0340	0.0164
02297100	120	0.0018	0.0015	0.0023	0.0019	0.0035	0.0028	0.0065	0.0047	0.0100	0.0067	0.0145	0.0089	0.0202	0.0115	0.0297	0.0154
02297155	121	0.0041	0.0029	0.0053	0.0036	0.0079	0.0050	0.0145	0.0078	0.0221	0.0106	0.0322	0.0134	0.0448	0.0167	0.0656	0.0215
02297251	122	0.0123	0.0055	0.0132	0.0062	0.0170	0.0076	0.0282	0.0106	0.0419	0.0137	0.0604	0.0167	0.0837	0.0202	0.1224	0.0253
02297310	123	0.0025	0.0020	0.0029	0.0023	0.0040	0.0031	0.0067	0.0048	0.0100	0.0067	0.0144	0.0089	0.0200	0.0114	0.0291	0.0152
02297320	124	0.0065	0.0039	0.0081	0.0048	0.0116	0.0063	0.0206	0.0093	0.0310	0.0122	0.0460	0.0153	0.0620	0.0186	0.0904	0.0236
02298123	125	0.0018	0.0015	0.0021	0.0018	0.0030	0.0024	0.0052	0.0040	0.0077	0.0056	0.0111	0.0075	0.0154	0.0097	0.0224	0.0132
02298202	126	0.0023	0.0018	0.0024	0.0020	0.0031	0.0025	0.0051	0.0039	0.0145	0.0084	0.0110	0.0074	0.0152	0.0097	0.0223	0.0131
02298608	127	0.0039	0.0028	0.0054	0.0037	0.0087	0.0054	0.0171	0.0085	0.0269	0.0116	0.0400	0.0146	0.0566	0.0181	0.0839	0.0231
02298760	128	0.0151	0.0060	0.0164	0.0068	0.0214	0.0084	0.0357	0.0115	0.0529	0.0146	0.0761	0.0177	0.1055	0.0213	0.1539	0.0264
02298830	129	0.0016	0.0014	0.0021	0.0018	0.0031	0.0026	0.0058	0.0043	0.0089	0.0062	0.0130	0.0083	0.0182	0.0108	0.0267	0.0145
02298928	130	0.0247	0.0071	0.0263	0.0080	0.0341	0.0099	0.0564	0.0130	0.0837	0.0163	0.1206	0.0193	0.1674	0.0230	0.2447	0.0282
02299120	131	0.0043	0.0030	0.0050	0.0035	0.0068	0.0046	0.0115	0.0069	0.0172	0.0093	0.0247	0.0119	0.0341	0.0150	0.0497	0.0194
02299160	132	0.0170	0.0063	0.0176	0.0070	0.0222	0.0086	0.0366	0.0116	0.0544	0.0148	0.0787	0.0178	0.1095	0.0214	0.1605	0.0266
02299410	133	0.0076	0.0043	0.0099	0.0053	0.0147	0.0071	0.0268	0.0104	0.0408	0.0135	0.0593	0.0166	0.0825	0.0201	0.1207	0.0252
02299800	134	0.0033	0.0025	0.0106	0.0055	0.0170	0.0076	0.0334	0.0113	0.0527	0.0146	0.0784	0.0178	0.1108	0.0215	0.1646	0.0267
02299950	135	0.0025	0.0020	0.0031	0.0025	0.0045	0.0034	0.0080	0.0054	0.0120	0.0075	0.0174	0.0099	0.0240	0.0126	0.0350	0.0167
02300000	136	0.0046	0.0031	0.0052	0.0036	0.0070	0.0046	0.0118	0.0070	0.0175	0.0094	0.0251	0.0120	0.0347	0.0151	0.0506	0.0196
02300018	137	0.0190	0.0065	0.0249	0.0079	0.0374	0.0101	0.0688	0.0136	0.1052	0.0170	0.1534	0.0200	0.2138	0.0237	0.3132	0.0289
02300032	138	0.0043	0.0030	0.0050	0.0035	0.0070	0.0046	0.0119	0.0070	0.0178	0.0095	0.0256	0.0121	0.0354	0.0152	0.0516	0.0197
02300034	139	0.0057	0.0036	0.0055	0.0037	0.0067	0.0045	0.0109	0.0066	0.0164	0.0091	0.0240	0.0117	0.0336	0.0149	0.0497	0.0194
023000355	140	0.0044	0.0031	0.0045	0.0032	0.0057	0.0040	0.0094	0.0060	0.0140	0.0083	0.0202	0.0108	0.0282	0.0137	0.0414	0.0180
02300037	141	0.0061	0.0038	0.0073	0.0045	0.0103	0.0059	0.0180	0.0087	0.0269	0.0116	0.0388	0.0144	0.0536	0.0178	0.0781	0.0226
02300038	142	0.0115	0.0053	0.0141	0.0064	0.0202	0.0082	0.0357	0.0115	0.0536	0.0147	0.0774	0.0178	0.1072	0.0213	0.1562	0.0265
02300039	143	0.0159	0.0061	0.0155	0.0066	0.0191	0.0080	0.0312	0.0110	0.0467	0.0141	0.0681	0.0172	0.0954	0.0208	0.1407	0.0260
02300100	144	0.0019	0.0016	0.0025	0.0021	0.0038	0.0030	0.0072	0.0050	0.0110	0.0071	0.0161	0.0095	0.0224	0.0122	0.0329	0.0162
02300200	145	0.0027	0.0021	0.0025	0.0021	0.0031	0.0025	0.0050	0.0039	0.0076	0.0055	0.0111	0.0075	0.0156	0.0098	0.0231	0.0134
02300500	146	0.0020	0.0017	0.0026	0.0021	0.0038	0.0030	0.0068	0.0049	0.0104	0.0069	0.0150	0.0091	0.0209	0.0117	0.0305	0.0156
02300530	147	0.0058	0.0037	0.0077	0.0046	0.0116	0.0063	0.0216	0.0095	0.0330	0.0126	0.0482	0.0156	0.0673	0.0191	0.0987	0.0241
02300700	148	0.0030	0.0023	0.0039	0.0029	0.0057	0.0040	0.0102	0.0064	0.0154	0.0088	0.0223	0.0113	0.0310	0.0143	0.0452	0.0187

Appendix 2. Variance of prediction values for gaging stations used in Florida regional regression analyses.—Continued

[USGS, U.S. Geological Survey; no., number; pl., plate; %, percent; G, computed from the Bulletin 17B analysis of the gaging station; W, weighted using equation]

USGS station no.	Map no. (pl. 1)	50%		20%		10%		4%		2%		1%		0.5%		0.2%	
		G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W
02301000	149	0.0026	0.0021	0.0030	0.0024	0.0042	0.0032	0.0072	0.0051	0.0108	0.0070	0.0156	0.0093	0.0215	0.0119	0.0313	0.0158
02301300	150	0.0027	0.0021	0.0031	0.0024	0.0042	0.0032	0.0072	0.0051	0.0108	0.0070	0.0155	0.0093	0.0215	0.0119	0.0313	0.0158
02301350	151	0.0082	0.0045	0.0069	0.0043	0.0079	0.0050	0.0133	0.0074	0.0208	0.0103	0.0313	0.0133	0.0448	0.0167	0.0671	0.0216
02301500	152	0.0022	0.0018	0.0032	0.0025	0.0053	0.0038	0.0110	0.0066	0.0177	0.0094	0.0267	0.0124	0.0383	0.0157	0.0575	0.0205

Appendix 3. Flood-frequency estimates using PeakFQ version 5.2.[mi², square miles]

Station number	Station name	Drainage area (mi ²)	Storage (percent)	Period of record (years)	Peak flow, in cubic feet per second, for indicated exceedance probability in percent							
					50	20	10	4	2	1	0.5	0.2
02358000	Apalachicola River at Chattahoochee, Fla.	17,200	2.55	50	90,500	128,000	154,000	190,000	218,000	248,000	279,000	323,000
02358700	Apalachicola River near Blountstown, Fla.	17,600	2.57	49	85,400	124,000	154,000	195,000	230,000	268,000	308,000	369,000
02359170	Apalachicola River near Sumatra, Fla.	19,200	3.36	29	79,100	118,000	145,000	181,000	209,000	237,000	266,000	306,000
02319500	Suwannee River at Ellaville, Fla.	6,970	14.64	79	18,600	32,300	42,900	57,900	70,200	83,300	97,400	118,000
02320000	Suwannee River at Luraville, Fla.	7,280	15.21	25	20,500	36,700	49,400	67,200	81,800	97,400	114,000	138,000
02320500	Suwannee River at Branford, Fla.	7,880	14.78	76	16,800	28,000	36,200	47,500	56,400	65,600	75,300	88,800
02323000	Suwannee River near Bell, Fla.	9,390	13.93	33	16,500	27,400	36,500	50,700	63,200	77,700	94,400	120,000
02323500	Suwannee River near Wilcox, Fla.	9,640	13.95	66	20,700	32,000	40,500	52,300	61,900	72,100	83,100	98,900

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