FLOOD CHARACTERISTICS OF MISSISSIPPI STREAMS

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 91-4037

Prepared in cooperation with the
MISSISSIPPI STATE HIGHWAY DEPARTMENT

FLOOD CHARACTERISTICS OF MISSISSIPPI STREAMS

By Mark N. Landers and K. Van Wilson, Jr.

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 91-4037

Prepared in cooperation with the
MISSISSIPPI STATE HIGHWAY DEPARTMENT

Jackson, Mississippi
1991

U.S. DEPARTMENT OF THE INTERIOR
MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY
Dallas L. Peck, Director

For additional information write to:

District Chief
U.S. Geological Survey
Suite 710, Federal Building
100 W. Capitol Street
Jackson, Mississippi 39269

Copies of this report can be purchased from:

U.S. Geological Survey
Books and Open-File Reports
Building 810
Box 25425, Federal Center
Denver, Colorado 80225

CONTENTS

ILLUSTRATIONS

TABLES

CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
foot per mile (ft/mi)	0.018939	meter per kilometer
square mile (mi^2)	2.590	square kilometer
cubic foot per second (ft^3/s)	0.02832	cubic meter per second

Sea Level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

FLOOD CHARACTERISTICS OF MISSISSIPPI STREAMS

by Mark N. Landers and K. Van Wilson, Jr.

ABSTRACT

Flood magnitudes for selected recurrence intervals from 2 to 500 years were determined for 330 gaged sites in the study area where annual peak-flow records have been collected. The principal study area is Mississippi; however, selected data collected in adjoining States on streams draining into or from Mississippi are also included. Flood frequency at a gaged stream site is defined by fitting the Pearson Type III probability distribution to the log-transformed annual peaks. The accuracy of the flood frequency determined for a gaged site is determined primarily by the number of years of annual peak-flow record (the sample size). Greater accuracy is achieved in the current analysis than in previous analyses because of the additional years of annual peak-flow record. Flood-frequency and basin characteristics at gaged sites were used to develop regression equations for estimating flood frequency where annual peak-flow records are not available.

Flood frequency for ungaged stream sites in Mississippi may be estimated using basin characteristics in regression equations. Regression equations were computed using the generalized-least-squares procedure rather than the ordinary-least-squares procedure used in previous regional hydrologic analyses. The generalized-least-squares procedure considers the variable error of the gaging station flood frequencies and corrects for the cross-correlation of concurrent annual peaks. When the gaging stations in the sample for regression analysis have widely varying record lengths and concurrent peak flows, which are correlated between sites, the generalized-least-squares procedure provides more accurate estimates of the regression coefficients and model error than does the ordinary-least-squares procedure. These flood-frequency equations provide managers with improved tools for estimating flood frequencies for purposes of management and design.

INTRODUCTION

The magnitude and frequency of floods are key factors in the design of bridges, highway embankments, culverts, levees, dams, and other structures near streams. Effective flood-plain management and the determination of flood insurance rates also require information on the magnitude and frequency of floods.

The Mississippi State Highway Department and the Federal Highway Administration recognize the need for adequate flood-frequency information for the safe, efficient design of drainage structures and roadways in Mississippi. Because of this need, the U.S. Geological Survey, in cooperation with the Mississippi State Highway Department, conducted a study to update previous flood-frequency reports using data collected through the 1988 water year. A water year, which is the 12-month period from October 1 to September 30, is designated by the calendar year in which it ends. Thus, the 12-month period ending September 30, 1988, is called the "1988 water year."

Purpose and Scope

The purpose of this report is to provide techniques for estimating the magnitude of floods with selected recurrence intervals from 2 to 500 years for streams in Mississippi. This report supersedes an earlier one by Colson and Hudson (1976) because of additional available data and new analytical techniques.

The principal study area is Mississippi; however, selected data collected in adjoining States on streams draining into or from Mississippi are also included (fig. 1). Estimates of flood magnitude are presented for 330 streamflow gaging stations in the study area. Regional estimating equations were developed to provide flood-frequency information at ungaged locations. The regional flood-frequency equations were developed using a new procedure, generalized-least-squares regression (Stedinger and Tasker, 1985, 1986), which better addresses statistical problems of hydrologic variables in regional hydrologic analyses than does ordinary-least-squares regression. Flood-frequency equations were developed for streams in four subgroups; three defined by geographic region and one by drainage-area magnitude. Additional equations for urban areas are presented from "Flood Characteristics of Urban Watersheds in the United States" (Sauer and others, 1983).

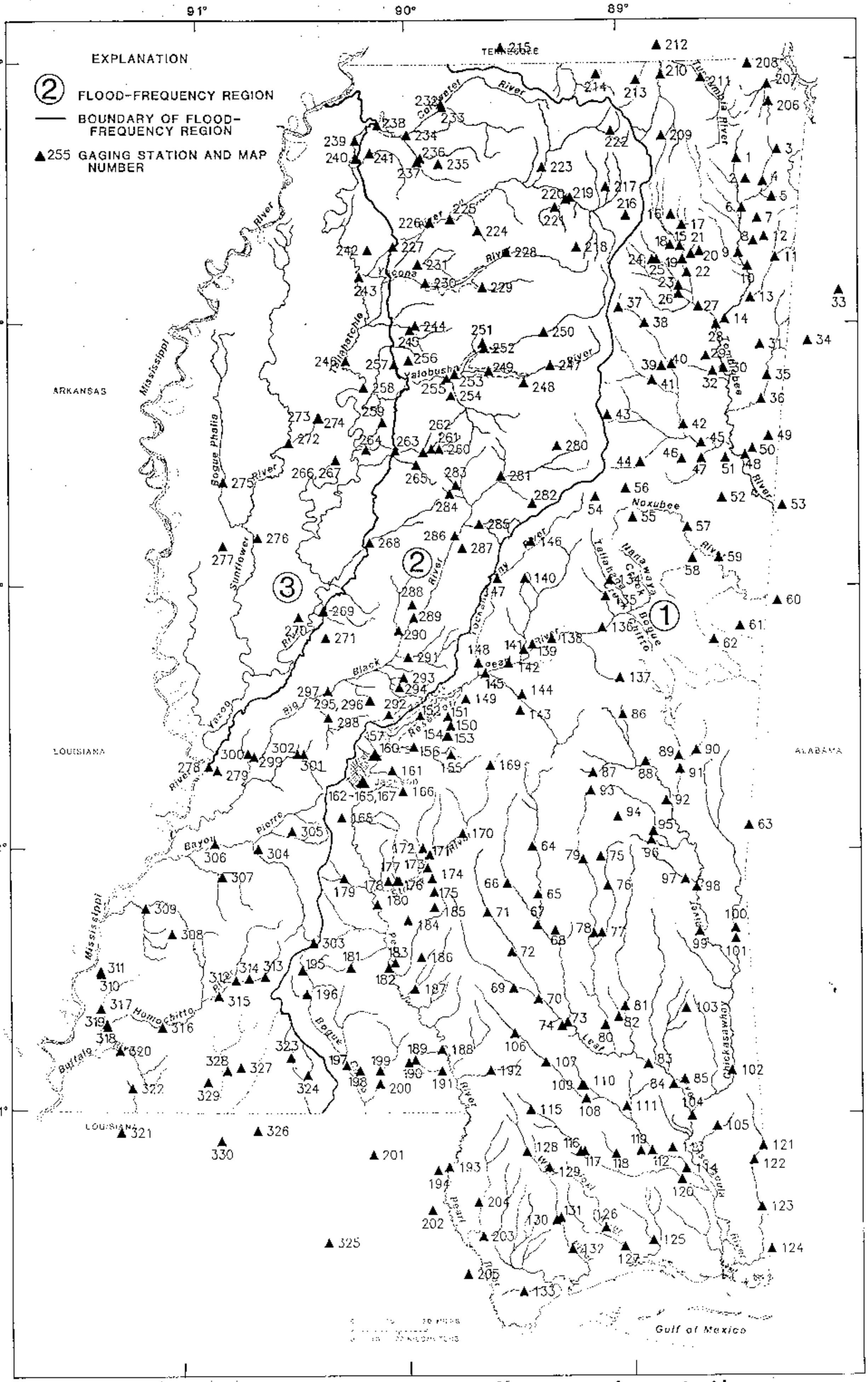


Figure 1.--Location of streamflow-gaging stations and flood-frequency regions.

General Description of Study Area

Mississippi is in the East Gulf Coastal Plain and includes parts of several physiographic districts, but the State generally may be divided into the coastal plain uplands and the lower Mississippi River Alluvial Plain, known locally as the "Delta." The transition between the coastal plain uplands and the Delta is an abrupt, dissected escarpment characterized by steep slopes and pronounced ridges rising 150 to 250 ft above the alluvial plain.

The Delta, in the northwestern part of the State, is a flat, lens-shaped basin having a maximum width of about 65 mi. The topography is a series of abandoned meander belts, oxbow lakes, and swamps. Regional drainage characteristics are broad, widely meandering stream courses trending to the southwest with low channel slopes and large amounts of depression and channel storage. Extensive levees protect all but the southern part of the alluvial plain from floodwaters of the Mississippi River.

The coastal plain uplands is composed of hilly uplands and gently undulating prairies. The maximum elevation in the State is located in the coastal plain uplands in the northeast corner of the State, where elevations reach about 806 ft above sea level.

The six major drainage basins in Mississippi are the Yazoo, Big Black, Homochitto, Tombigbee, Pascagoula, and Pearl. The Yazoo, Big Black, and Homochitto basins drain southwestward into the Mississippi River. The Tombigbee basin drains southward into the Mobile River. The Pascagoula and Pearl basins drain southward into the Gulf of Mexico.

The climate of Mississippi is controlled primarily by the proximity of the Gulf of Mexico and the prevailing southwesterly winds. These conditions contribute to a generally warm and humid climate, making Mississippi one of the two wettest States in the contiguous United States. The average annual precipitation ranges from 54 inches in the northern part of the State to about 60 inches in the southern part (Wax, 1982).

Acknowledgments

The U.S. Army Corps of Engineers and many State and local agencies are acknowledged for their cooperation in the collection of much of the data used in the study.

RECORDS OF FLOODING

Records of annual peak flow collected at streamflow-gaging stations provide the empirical basis for estimates of flood characteristics. In this study, the records were analyzed for 330 locations (fig. 1, table 1) on streams in and near Mississippi to provide a total of 8,470 years of systematic annual peak-flow records.

Systematic records represent a random sample of annual peak flows at a site, generally collected over a continuous period. The distribution of systematic peak-flow-record lengths used in the regional analyses is shown in figure 2. A minimum of 10 years of record was considered necessary for estimating flood characteristics for a gaged site.

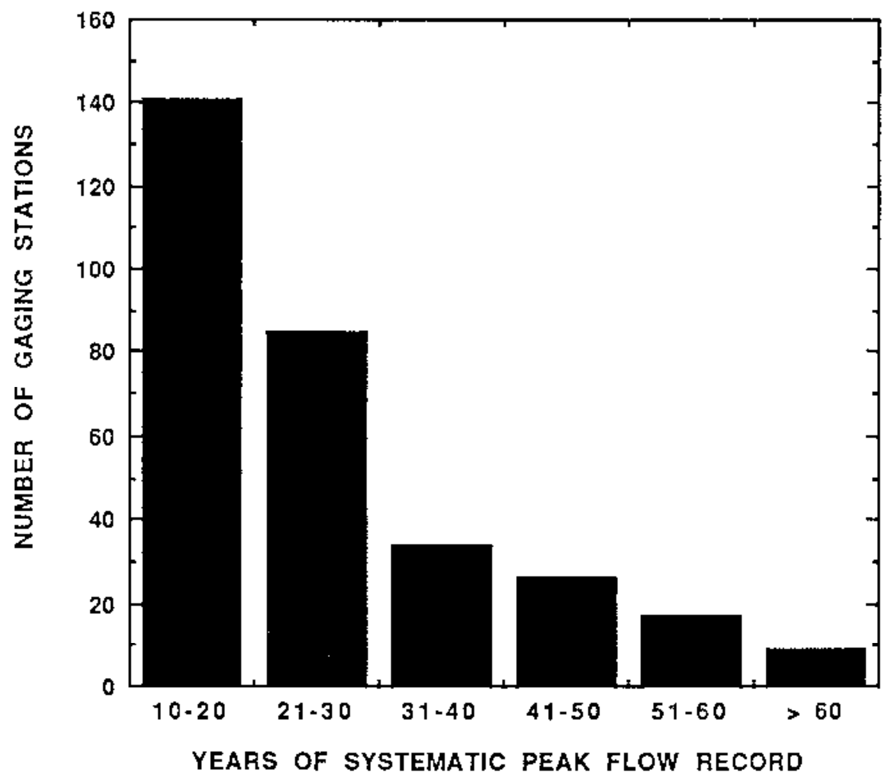


Figure 2.-- Distribution of systematic peak-flow record lengths.

Floods of unusually large magnitude often occur at a site when systematic records are not being obtained from a streamflow gage. In this study, evidence of the occurrence of unusually large floods was obtained from newspaper files, old records of stage, local historical records, diaries, and from individuals who remembered the flood or were informed by their ancestors. This flood information, referred to as historical record in this report, was used when available to extend the record of the largest floods at a site to a historical period much longer than that of the systematic record. Historical record is available for about 40 percent of the Mississippi sites having 10 or more years of systematic record.

Synthetic data (flood peaks generated from climatic records in a rainfall-runoff model) were used in the report by Colson and Hudson (1976) to extend the length of record at 89 gage sites, ranging in drainage area from 0.04 to 4.35 mi^2. Additional data have been collected since 1976, and 84 of these sites now have 10 or more years of systematic record. The synthetic and recorded flood-frequency discharges for these gages were compared using a paired Student's t-test, as described by Thomas (1987). The Student's t-tests, at the 5-percent level of significance for the 2-year to 100-year discharges, indicate that the synthetic data are statistically different from the systematic data for all except the 2-year and 5-year discharges. At the 1-percent level of significance, the difference was significant only at the 25-year and 100-year discharge. The bias of the synthetic data at the 5-percent level of significance was also reported by Colson (1986) and Thomas (1987). Therefore, the flood-frequency discharges based only on the systematic record were used in this study.

STATISTICAL CHARACTERISTICS OF ANNUAL PEAK FLOW

Statistical methods of analysis are well suited to the random nature of annual flooding. Statistical methods may be used to estimate flood frequency from a sample of recorded annual peak flows at a stream site using the assumption that the recorded sample represents the population of all the recorded and unrecorded annual peak flows. The Interagency Advisory Committee on Water Data (IACWD, 1982) recommends that the Pearson Type III distribution be used as the probability model for log-transformed annual peak-flow data. The Pearson Type III distribution requires estimates of the population mean, variance, and skew at a site. These population parameters are estimated by computing the corresponding sample parameters, based on the systematic record, as follows:

$$\overline{X} = \frac{1}{N}\sum_{i=1}^{N} X_i \tag{1}$$

$$S^2 = \frac{1}{N-1}\sum_{i=1}^{N}(X_i - \overline{X})^2 \tag{2}$$

$$G_s = \frac{N}{(N-1)\,(N-2)\,S^3}\sum_{i=1}^{N}(X_i - \overline{X})^3 \tag{3}$$

where

- $\overline{\mathbf{X}}$ is the sample mean;
- $\mathbf{S}$ is the sample standard deviation;
- $\mathbf{S^2}$ is the sample variance;
- $\mathbf{G_s}$ is the sample skew;
- $\mathbf{X_i}$ is the log-transformed annual peak flow for year i; and
- $\mathbf{N}$ is the sample size, that is, the number of years of peak-flow record for the stream site.

Previous studies of the sampling distribution of sample skew ($\mathbf{G_s}$) have shown that $\mathbf{G_s}$ is a biased estimator of the population skew and is subject to large sampling variances as compared with $\overline{\mathbf{X}}$ and $\mathbf{S^2}$. Empirical bias correction factors were computed by Wallis and others (1974) based on Monte Carlo experiments. A bias correction equation based on record length and described by Tasker and Stedinger (1986) was used by Landers (1989), and is defined as:

$$C_b = (1 + 6/N) \tag{4}$$

where C_b is the bias correction coefficient and **N** is as defined previously. Sample skew coefficients were multiplied by this bias correction coefficient and used to develop unbiased regional skew coefficients.

Tasker and Stedinger (1986) showed only minor differences between bias correction coefficients from this equation and from the empirical results of Wallis and others (1974), when **N** is greater than 20 and the absolute value of G_s is less than 1.0.

Population skew estimates are improved when computed from the weighted average of the sample and unbiased regional skew estimates for a site, as recommended by the IACWD (1982). Sample skew (G_s) is weighted inversely to its mean square error (MSE_s), and regional skew (G_r) is weighted inversely to an estimate of its sampling variance (MSE_r). The IACWD (1982) uses mean square error (MSE_r) as an estimate of the sampling variance of regional skew. Population skew then is estimated by:

$$\hat{G} = \frac{(MSE_r * G_s) + (MSE_s * G_r)}{MSE_r + MSE_s} \qquad (5)$$

where

$\hat{G}$ is an estimate of the population skew coefficient, and G_r is assumed to be unbiased so that MSE_r is equal to the sampling variance of G_r.

Further improvements in estimated population skew are obtained by using weighted methods to estimate regional skew. Regional skew for Mississippi streams was studied in detail, and was described by Landers (1989) in a report that included a comparison of estimation techniques. The selected regional estimator is an unbiased, weighted-grid skew map. Regional skew coefficients for Mississippi are discussed in the Appendix.

FLOOD-FREQUENCY ESTIMATES FROM STREAMFLOW RECORDS

Flood-frequency estimates from records of annual peak flow at 330 gaging stations were computed by fitting the three-parameter Pearson Type III distribution to the sample of log-transformed annual peak flows, as recommended by the IACWD (1982). The regional unbiased map skew developed by Landers (1989) was used with the biased station skew to provide the Water Resources Council (WRC) weighted estimation of population skew. (The existing IACWD guidelines do not recommend the unbiasing of station skew.) Computations were made using U.S. Geological Survey computer program J407, "Annual Flood Frequency Analysis Using WRC Guidelines" (Lepkin and others, 1981).

Stream basins were reviewed to determine if the basins were affected by regulation or channelization, which may violate the stationary time series assumption and make the station unrepresentative of regional flood-frequency characteristics. Data from sites in basins that were regulated or channelized during the period of record were analyzed to determine the effect of regulation or channelization (noted in table 1) on annual peak-flow records. In several basins, gages were in place prior to significant regulation or channelization. For each of these gaging stations, the period of record prior to significant regulation or channelization was used to expand the natural, regional data base. However, flood-frequency information for these gages given in table 1 represents existing conditions. Station flood-frequency values are not weighted with regional values for regulated or channelized streams.

Weighted Flood-Frequency Estimates

If two independent estimates of flood frequency are weighted in inverse proportion to their error (variance), the error of the weighted average is less than that of either estimate (IACWD, 1982). The regional flood-frequency estimates developed in this investigation are assumed to be independent of the station flood-frequency estimates. The two estimates were weighted inversely proportional to their respective time-sampling and prediction errors to obtain a best estimate of flood-frequency at each gage in accordance with Appendix 8 of Bulletin 17B (IACWD, 1982). The estimates shown in table 1 for selected recurrence intervals from 2 to 500 years are weighted estimates unless otherwise noted.

Ungaged Sites on Gaged Streams

Flood-frequency estimates from a gaged stream site may be extrapolated to an ungaged site on the same stream using drainage area ratios raised to the

0.6 power. This procedure is suggested if the drainage area at an ungaged site is within 50 percent of the drainage area at the gaged site on the same stream. This extrapolated estimate and the regional regression estimate for the ungaged site are weighted in the following equation:

$$Q_{T(w)} = 4\left(\frac{\Delta A}{A_g}\right)^2 Q_r + \left[1-4\left(\frac{\Delta A}{A_g}\right)^2\right]\left(\frac{A_u}{A_g}\right)^{0.6} Q_g \qquad (6)$$

where

$Q_{T(w)}$ is the weighted discharge, in cubic feet per second, at the ungaged site for a recurrence interval of T years;

Q_g is the weighted gage discharge, in cubic feet per second, for the selected recurrence interval, from table 1;

Q_r is the regional regression discharge, in cubic feet per second, at the ungaged site for the selected recurrence interval;

A_u is the drainage area, in square miles, at the ungaged site;

A_g is the drainage area, in square miles, at the gaged site; and

ΔA is the difference between the drainage areas at the gaged and ungaged sites.

Where the drainage area at an ungaged site differs by more than 50 percent from that at the gaged site, the regional estimate should be used. If an ungaged site is between two gaged sites on the same stream, the suggested "50 percent rule" should be applied to determine which gaged site, if either, should be used to make an adjustment to the regional estimate at the ungaged site. If the drainage area at the ungaged site is within 50 percent of that at both gaged sites, the flood-frequency estimate for the ungaged site can be interpolated logarithmically, on the basis of drainage area, between the weighted gage discharges (Q_g) from each gaged site.

Accuracy of Flood-Frequency Estimates for Gaged Stream Sites

"Streamflow characteristics can only be estimated; their true value can never be determined because there is a time-sampling error in every record of streamflow and a model error in every analytical method" (Hardison, 1969). It is important to evaluate the error associated with a given flood estimate because of the large range of accuracy that may be obtained in flood estimates using different methods. A measure of the accuracy or error of a flood estimate is necessary to evaluate the confidence or factor of safety with which it should be used, to compare and select methods of estimation, and to serve as a basis for risk analysis. Accuracy may be indicated by the variance or standard error of estimate.

Flood estimates from peak-flow records may contain errors due to: (1) any systematic measurement or computational errors, (2) use of an unrepresentative population probability distribution, or (3) errors in estimation of the population parameters defining the frequency distribution (time-sampling errors). The first source of error is addressed by quality assurance procedures in the data collection, computation, and review process. These errors generally are small and, in fact, non-systematic. The second source of error exists because the population of floods defies consistent, precise representation by any frequency distribution. The third source of errors lies in the estimation of population frequency distribution parameters for the sample data. This time-sampling error is assumed to be large, compared to the other two sources of error discussed. Time-sampling error is the only error quantified in the standard error of a flood-magnitude estimate from station peak-flow records for a recurrence interval (T). The standard error of the T-year flood estimate is the sum of errors in the estimation of the mean, the standard deviation, and the skew of the Pearson Type III distribution from the logarithms of annual peak flow for a given site. The time-sampling error is a function of the slope of the frequency curve (sample standard deviation), the estimated skewness, the recurrence interval (**T**) being estimated, and the length of record as a measure of how representative the sample may be of the population of annual peaks. Methods of computing the standard (time-sampling) error have been presented by different authors [Bobee (1973), (Hardison (1971), and Kite (1988)]. This report uses the method described by Kite (1988) to compute the time-sampling errors for each station flood-frequency estimate. These time-sampling errors are combined with the error of prediction of the regional estimator to compute the standard error of the weighted estimate. The standard error, in percent, is shown in table 1 for the corresponding weighted or station flood-flow estimates.

The standard error of estimate is an indicator of the accuracy of a flood-frequency estimate. It is the square root of the variance of estimate about the unknown, true value being estimated. When errors are normally distributed, about two-thirds of the estimates are expected to lie within one standard error greater than or less than the true value. Ninety-five percent of the estimates are expected to be within two standard errors greater than or less than the true value. In this report, standard error is reported as a percentage of the true value being estimated. Thus, if a 10-year flood of magnitude 1,000 ft^3/s has a standard error of 30 percent, the true value would be expected to be between about 700 and 1,300 ft^3/s about two-thirds of the time.

Historical Record Evaluation

Evaluation of historical record in flood-frequency analyses is complex, and the most appropriate method is not certain at this time. In this investigation, historical records are included in the computation of Pearson Type III flood-frequency estimates using the adjusted-moment method recommended by IACWD (1982) and included in the J407 computer program (Lepkin and others, 1981). The effective record length obtained from the contribution of information from the historical record is required for computing the standard error of station flood-frequency estimates and for weighting station estimates with regional flood-frequency estimates. For a given recurrence interval, the effective record length is the number of years of systematic data that would produce the same standard error as a given combination of historical and systematic data (Stedinger and Cohn, 1986). Effective record length for stations having historical records was based on results of Monte Carlo simulations by Stedinger and Cohn (1986), which were provided in a sub-routine of the generalized-least-squares regression model by Tasker and Stedinger (1989). The effective record length computed in the generalized-least-squares regression model was used in the computation of standard error.

Flood-Frequency of the Pearl River Main Stem

The Pearl River is formed by the confluence of Tallahaga Creek, Nanawaya Creek, and Bogue Chitto about 85 miles northeast of Jackson, Miss., and flows southward through Jackson and into the Gulf of Mexico (fig. 1). Upstream of Jackson, the drainage basin is average- or fan-shaped; whereas, the basin is typically elongated downstream, except where major tributaries flow into the Pearl River causing the basin shape to fan out.

The Ross Barnett Reservoir, located about 10 miles northeast of Jackson (fig. 1), is designed primarily for water supply and recreation; however, it has been used successfully to provide some flood-peak reduction. The reservoir normally is operated so that the pool is maintained at a near-constant level, and the inflow is passed through without significant attenuation. Since completion of the reservoir, the largest and third largest floods of record on the Pearl River at Jackson occurred in April 1979 and in May 1983. These flood-peak discharges at the Jackson gage, located at U.S. Highway 80 in south Jackson, were compared with discharges at State Highway 43 (Meeks Bridge) near Canton (about 12 miles upstream from the dam). The comparison indicated the May 1983 flood peak was reduced about 20 percent by the regulation of the Ross Barnett reservoir discharge, and the April 1979 flood peak may have been reduced a lesser amount. Some natural flood-peak attenuation between the gages at Meeks Bridge and at Jackson was expected due to variation in basin shape, which was indicated by adjusting the peak discharges at Meeks Bridge and at the Jackson gage for basin shape.

A basin shape coefficient developed by Wilson and Trotter (1961) was used in this report to demonstrate the effect of basin shape on flood flows along the Pearl River main stem (fig. 3). This basin shape coefficient is inversely related to the ratio of the distance that flood waters must travel divided by average width of the basin. Wilson and Trotter (1961) reported shape coefficients ranging from 0.55 to 1.48 for corresponding length-to-width ratios ranging from 13.0 to 1.50 for Mississippi streams (excluding the Delta).

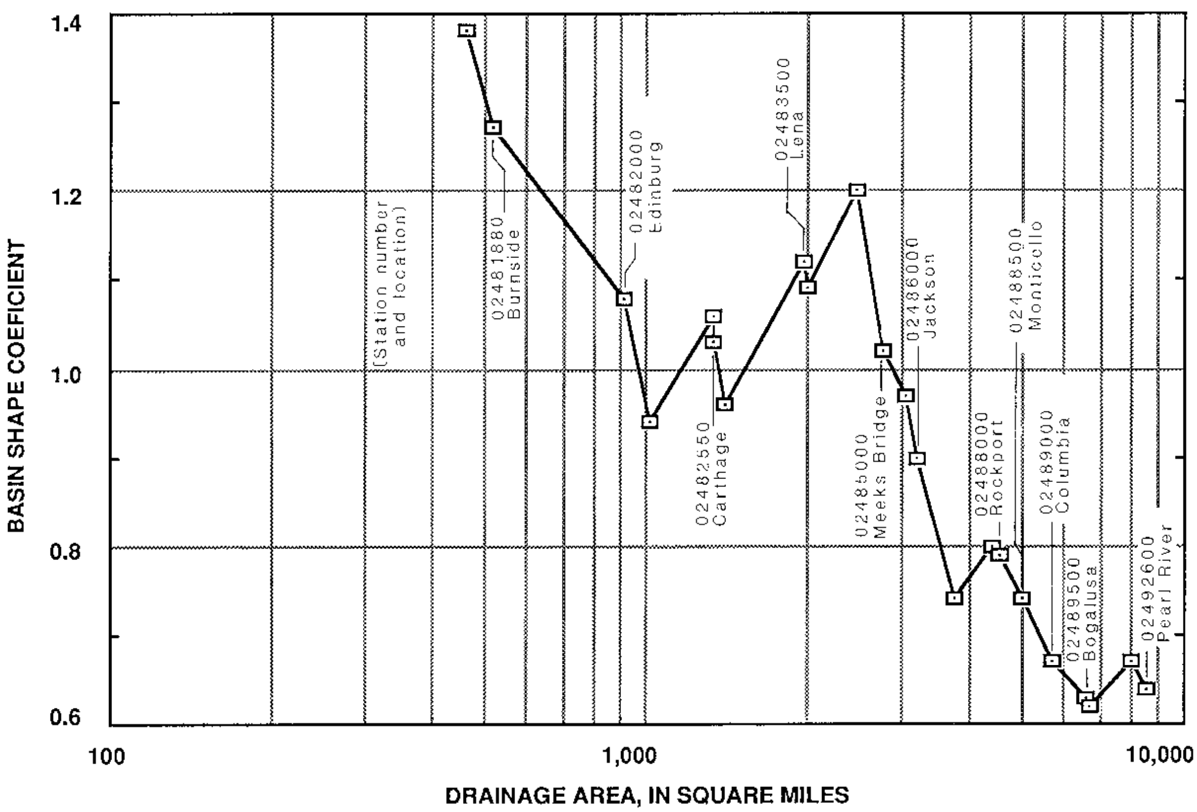


Figure 3.--Relation of basin shape coefficient to drainage area for the Pearl River main stem (method from: Wilson and Trotter, 1961).

The ratio is computed using $r = L^2/A$, where r is the ratio, **L** is the valley length, and **A** is the drainage area. For a drainage area of 1.0 mi^2, **L** for shape coefficients of 0.55 and 1.48 are 3.61 and 1.22 mi, respectively. Therefore, a larger basin shape coefficient would suggest a more fan-shaped basin; whereas, the smaller coefficient would suggest a more elongated basin with the coefficient of 1.0 for an average-shaped basin. The elongated basin would tend to provide more channel storage and dissipation of flood flows primarily because of the longer flow length.

The basin shape coefficient was determined along the Pearl River main stem from Burnside (near the confluence of Tallahaga Creek, Nanawaya Creek, and Bogue Chitto) to Pearl River, La. In this river reach, the coefficient was determined at each gaging site and at the mouth of each major tributary (fig. 3).

Flood-frequency discharges for 11 sites on the Pearl River are shown in table 1 and are plotted with drainage area in figure 4. The discharges for seven of these sites were agreed upon in 1980 by the U.S. Geological Survey and the U.S. Army Corps of Engineers, Mobile District, following the April 1979 flood. These sites were re-analyzed to include record through the 1988 water year, but analyses indicated that no revisions were warranted. For the other four sites (Burnside, Lena, Meeks Bridge, and Rockport), the records were extended using correlations with the nearest long-term station in accordance with Appendix 7 of Bulletin 17B (IACWD, 1982). The flood-frequency discharges for each site were divided by the appropriate basin-shape coefficient (fig. 3) to determine the discharges for an average-shaped basin (fig. 5).

If an estimate of a discharge for a specific frequency is needed for an ungaged site on the Pearl River, it is necessary to: (1) determine the drainage area, (2) obtain the discharge for an average-shaped basin from figure 5, and (3) multiply by the appropriate basin shape coefficient from figure 3.

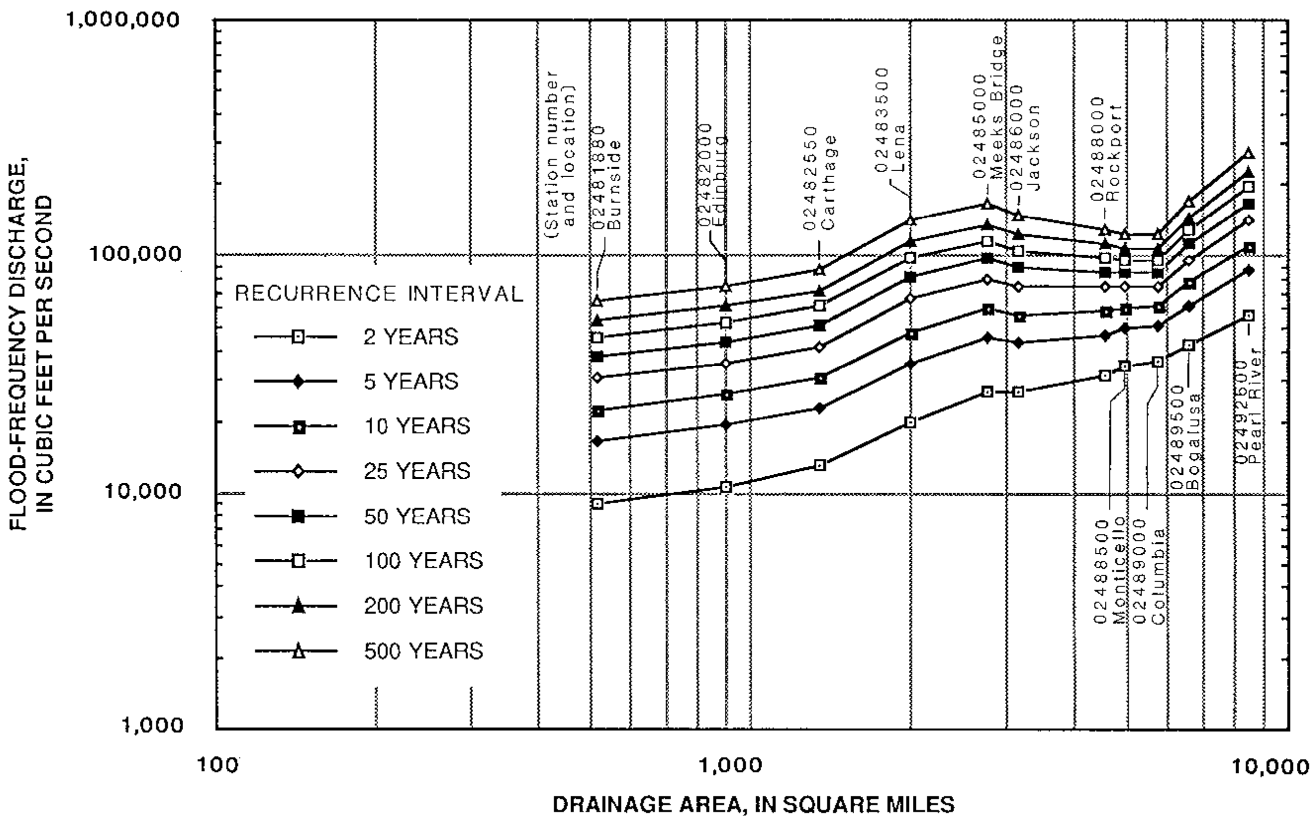


Figure 4.--Relation of flood-frequency discharge to drainage area for the Pearl River main stem.

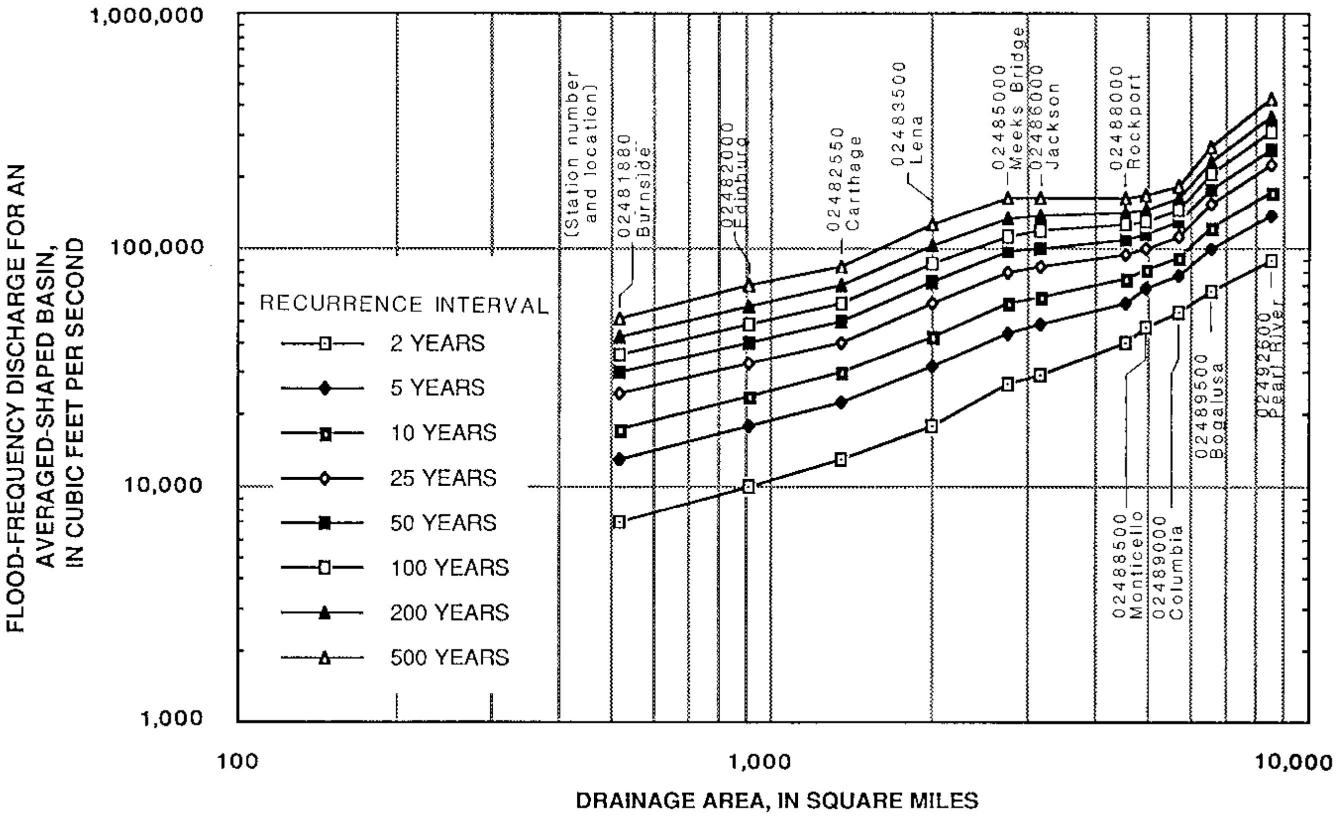


Figure 5.--Relation of flood-frequency discharge for an average-shaped basin to drainage area for the Pearl River main stem.

REGIONAL FLOOD-FREQUENCY ESTIMATES FOR RURAL STREAMS

Streamflow gaging records are available at only a small percentage of the stream sites where flood-frequency estimates are needed. Regionalization procedures are necessary to transfer flood-characteristic information from gaged to ungaged sites. Regional flood-frequency estimates also improve accuracy at a gaged site by weighting with station estimates, assuming that the station estimate is independent of the regional estimate. Regionalization procedures generally define relations between flood-frequency characteristics and explanatory drainage basin variables for gaged streams that are representative of similar streams in a specific class or region. Regionalization procedures have been the subject of much research through the years, and methods used by the U.S. Geological Survey have evolved as a result.

Graphical index-flood regionalization procedures were used by Wilson and Trotter (1961) for estimating flood magnitudes with recurrence intervals from 1.2 to 50 years for separate regions of the State. This detailed analysis included an adjustment factor for basin shape. Index-flood procedures were also presented by Patterson (1964) for streams in the lower Mississippi River basin and by Barnes and Golden (1966) for streams in the South Atlantic Slope and eastern Gulf of Mexico basins, Ogeechee River to the Pearl River, including parts of Mississippi. Continuing research by the U.S. Geological Survey led to the use of ordinary-least-squares (OLS) regression procedures to estimate T-year floods directly from drainage basin or climatic explanatory variables (Thomas and Benson, 1970). Regional T-year flood estimators for recurrence intervals from 2 to 100 years were determined using OLS procedures and were reported by Colson and Hudson (1976) for streams statewide, and by Landers (1985) for streams in the Lower Mississippi River Alluvial Plain. Recent developments in the regionalization of flood characteristics have centered on accounting for the deficiencies in the assumptions of OLS regression when applied to hydrologic variables.

Regional estimators of annual peak flood magnitude were computed in this study for recurrence intervals from 2 to 500 years. The maximum recurrence interval was 50 years in the report by Wilson and Trotter (1961) and 100 years in the report by Colson and Hudson (1976). Maximum recurrence interval is increased in this report because of changes in design standards requiring estimates of the 200-year and 500-year recurrence intervals and not because of an improvement in the confidence given to the accuracy or methods.

Generalized-Least-Squares Regression

Two significant assumptions of OLS that usually are violated when estimating T-year floods are: 1) the errors are statistically uniform (homoscedastic), and 2) the observations are statistically independent in the sample. The error of T-year flood estimates varies from stream to stream with the length of record used to make the estimates. Also, T-year flood estimates may be correlated between streams experiencing similar climatic conditions and having similar drainage basin characteristics.

A procedure for estimating regional flood frequencies recently has been proposed by Stedinger and Tasker (1985 and 1986) that uses a weighting matrix to account for the time-sampling error and the cross-correlation of flood characteristics between sites. This procedure is called generalized-least-squares regression (GLS).

Cross-correlation between observations is estimated as a function of distance between gaged sites. The correlation-distance function is estimated from gages having long, concurrent record periods and in this study, is estimated from station pairs having concurrent record periods in excess of 30 or 50 years, depending on the region within the State. GLS regression also requires matrices of the mean, standard deviation, and skew associated with the matrix of log-transformed station T-year flood estimates. The standard deviation and skew matrices should be independent of the residual errors of the regional estimators in order that the model error can be quantified from the total residual error. In this study, regional estimates of the mean and standard deviation were computed using OLS regression of station mean and standard deviation against log-transformed drainage area and slope. The independent matrix of skews was estimated by using the matrix of estimates of population skew coefficients at each station.

Because GLS procedures compute and account for the time-sampling error and cross correlation of the observed T-year values, the total error of prediction of the regression equation may be divided into time-sampling errors arising from data limitations and model error arising from model limitations. Stedinger and Tasker (1985) used Monte Carlo simulations to prove that, "In situations where the available streamflow records at gaged sites are of different and widely varying length and concurrent flows at different sites are cross-correlated, the GLS procedure provided more accurate parameter estimates, better estimates of the accuracy with which the regression model's parameters were being estimated, and almost unbiased estimates of the variance of the underlying regression model's residual errors," as compared with OLS or weighted-least-squares procedures.

Explanatory Variables

Regional flood-frequency estimators provide a means of extending the information gained at gaged locations to ungaged locations. Station T-year flood estimates were regressed on a range of potential explanatory variables including: drainage area, channel slope, channel length, mean basin elevation, basin shape factors, mean annual precipitation, and precipitation intensity. This testing was also performed on subgroups of the whole-sample group of sites, according to drainage area, region, and recurrence interval. Significant explanatory variables are drainage area, channel slope, and channel length. Logarithms of discharge have an approximately linear relation with logarithms of the selected basin characteristics, as shown in figure 6. The inverse relation of channel length, as a basin shape factor to discharge, is also illustrated in figure 6.

Regional Boundaries

An underlying assumption of regional flood-frequency relations is that the relation between T-year flood discharges and basin characteristics is similar for each stream and may be generalized for all streams represented in the data sample. This assumption was tested by comparing the regression residuals (observed value minus predicted value) between the whole-sample groups and selected subgroups. Tested subgroups were selected on the basis of major drainage basin boundaries, known regional variations in flood characteristics, and drainage area. Hypothesis tests were used to compute the probable equivalence between the whole-sample group and subgroups of the mean and median OLS regression residuals of the 10-year flood estimate.

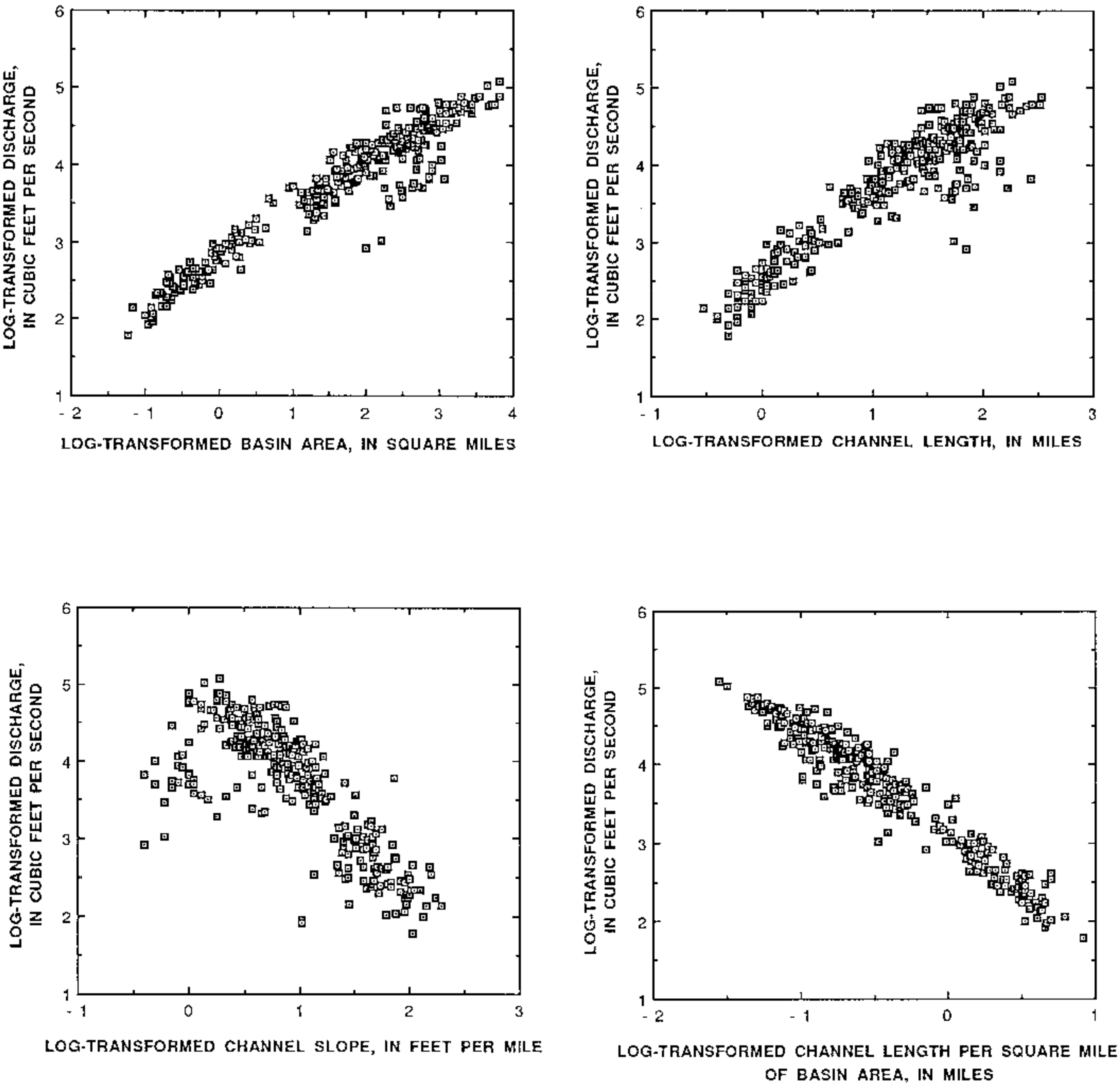


Figure 6.--Relation of the 10-year discharge to basin characteristics.

Figure 7 shows the characteristics of the OLS residuals for sites within the major drainage basin subgroups for an equation computed from the whole-sample group of sites outside the Delta region. These comparisons were also made using unweighted GLS residuals with similar results.

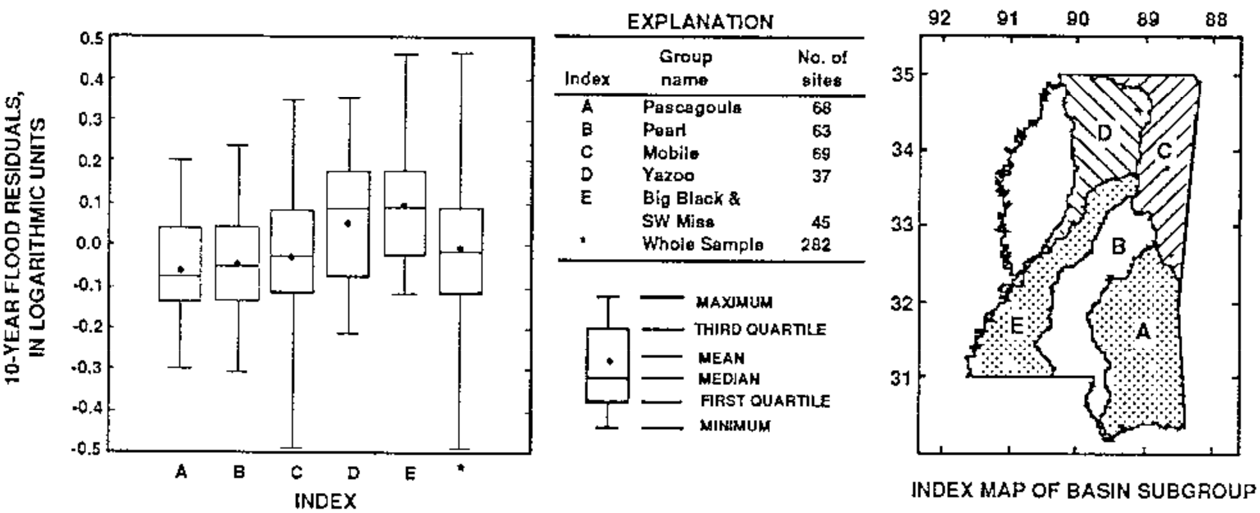


Figure 7. - - Characteristics of the 10-year flood residuals for the drainage basin subgroups and the whole-sample group of sites outside the Delta region.

Flood characteristics were determined to be non-homogeneous among four subgroups. Three of these subgroups are defined by geographic boundaries and one by drainage area magnitude. Regional flood-frequency equations were computed for each subgroup. Urbanized drainage basins were also analyzed separately.

Selection of the Appropriate Flood-Frequency Equation

Techniques for estimating the magnitude of floods with recurrence intervals from 2 to 500 years in Mississippi are provided in this report. If flood-frequency information is needed at a gaged site, it should be obtained from table 1. If the gage is not listed in table 1, the user must decide whether the appropriate estimate is obtained by weighting the station and regional estimates or from the unweighted station estimate (as when a stream is regulated or otherwise regionally unrepresentative.)

If flood-frequency information is needed at an ungaged site or if a regional estimate is needed to weight with a station estimate, then the appropriate regional flood-frequency equation must be selected. A user would select: (1) the Delta equations, if the stream is in the Delta; (2) the GT800 equations, if the stream is outside the Delta with drainage area greater than 800 square miles (GT800); or (3) the East or West equations, based on stream-site location (fig. 1). In figure 1, regions 1, 2, and 3 are the East, West, and Delta regions, respectively. The Delta and West boundary is crossed by stream basins sloping westward down the abrupt, dissected escarpment. For ungaged sites located in the Delta part of these basins, it is suggested that two discharges be estimated for each frequency by assuming all of the basin lies in each region and then averaging the discharges by areal weight. Drainage basins affected by urbanization should be estimated using the equations presented from the report by Sauer and others (1983), with the appropriate rural estimating equation.

The accuracy for each flood-frequency equation may be measured by using the standard error of prediction. The standard error of prediction for each equation is shown in table 2.

Table 2.--*Standard error of prediction for each flood-frequency regression equation*
[GT800, basins in the eastern or western regions with areas greater than 800 square miles]

Recurrence interval, in years	Standard error of prediction for each region, in percent			
	East	West	Delta	GT 800
2	34	35	34	22
5	27	31	34	19
10	26	30	36	17
25	27	31	38	16
50	29	32	38	15
100	31	34	40	15
200	34	36	42	16
500	38	39	45	17

Delta

The most significant flood-characteristic boundary in Mississippi is between the Delta and the remainder of the State. Wilson and Trotter (1961) and Landers (1985) presented this region of the State as a separate hydrologic area with a unique flood-frequency relation. Landers (1985) presented regional flood-frequency equations for recurrence intervals from 2 to 100 years, based on data from 30 gaging stations in this region in Mississippi, Louisiana, and Arkansas. Of these 30 sites, only 6 are located in Mississippi (table 1). Comparisons of the 10-year flood regression residuals of the subgroup of 30 Delta streams to the whole-sample (statewide) group of 312 streams confirm the uniqueness of the Delta region. The statistical characteristics of the residuals are shown in figure 8.

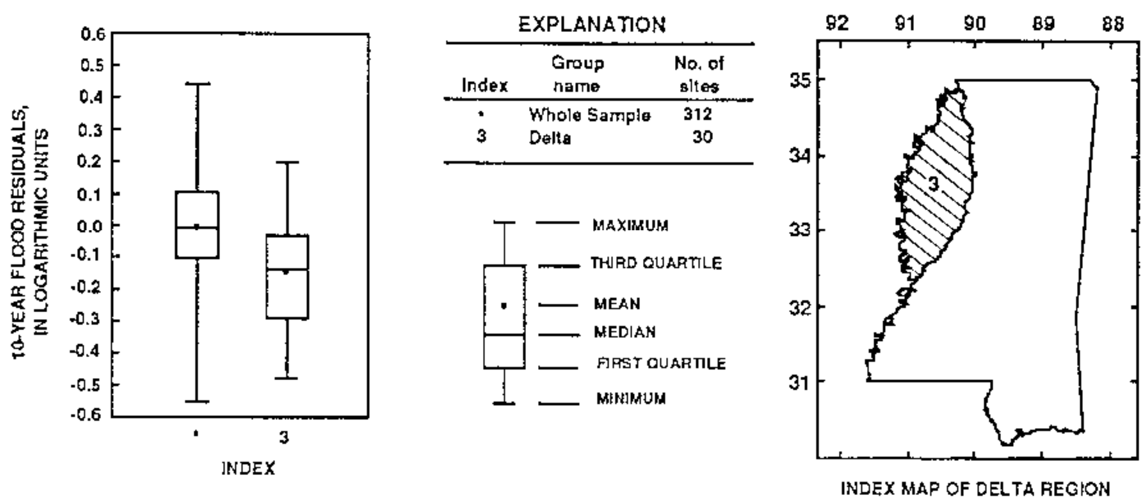


Figure 8. -- Characteristics of the 10-year flood residuals for the whole-sample (statewide) group and for the Delta region.

The null hypothesis that the mean of the residuals is equal to the whole-sample mean (zero) was rejected at a 1-percent significance level, using the Student's t-test. Significant additional data have not been collected since 1985, because 19 of these 30 sites were discontinued. Therefore, the equations from Landers (1985) are repeated here without alteration. Those equations were computed using OLS regression procedures, and were checked in this analysis. The recurrence interval was extended to 500 years using OLS regression procedures. The equations are as follows:

$$Q_2 = 171\ (A)^{0.87}\ (S)^{0.25}\ (L)^{-0.52} \tag{7}$$

$$Q_5 = 192\ (A)^{0.93}\ (S)^{0.37}\ (L)^{-0.54} \tag{8}$$

$$Q_{10} = 205\ (A)^{0.96}\ (S)^{0.42}\ (L)^{-0.56} \tag{9}$$

$$Q_{25} = 224\ (A)^{0.99}\ (S)^{0.48}\ (L)^{-0.58} \tag{10}$$

$$Q_{50} = 232\ (A)^{1.00}\ (S)^{0.52}\ (L)^{-0.57} \tag{11}$$

$$Q_{100} = 236\ (A)^{1.00}\ (S)^{0.57}\ (L)^{-0.55} \tag{12}$$

$$Q_{200} = 243\ (A)^{1.00}\ (S)^{0.60}\ (L)^{-0.54} \tag{13}$$

$$Q_{500} = 249\ (A)^{1.00}\ (S)^{0.64}\ (L)^{-0.52} \tag{14}$$

where

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

A is the contributing drainage area, in square miles;

S is the channel slope, in feet per mile, defined as the difference in altitude between points located at 10 and 85 percent of the main channel length divided by the channel length between the two points, as determined from topographic maps; and

L is the main-channel length, in miles, from the point of discharge to the drainage divide as measured in 0.1 mile increments on topographic maps. At a stream junction, the branch draining the largest area is considered the main channel.

GT800

Streams outside the Delta were analyzed for flood characteristic homogeneity over the range of drainage areas (fig. 9). Comparisons of subgroups of OLS residuals indicate that flood estimates are over-predicted on stream basins larger than about 800 mi^2 and smaller than about 1 mi^2 (fig. 10). The subgroup of basins larger than 800 mi^2 was the most statistically different. When this subgroup of 33 sites was removed, the new whole sample (249 sites) was representative of the small drainage area sites (fig. 11). Equations for sites with drainage areas greater than 800 mi^2 (GT800) were computed using GLS procedures and are as follows:

$$Q_2 = 131\,(A)^{0.97}\,(S)^{0.21}\,(L)^{-0.47} \quad (15)$$

$$Q_5 = 382\,(A)^{0.90}\,(S)^{0.22}\,(L)^{-0.48} \quad (16)$$

$$Q_{10} = 668\,(A)^{0.87}\,(S)^{0.21}\,(L)^{-0.49} \quad (17)$$

$$Q_{25} = 1260\,(A)^{0.84}\,(S)^{0.18}\,(L)^{-0.52} \quad (18)$$

$$Q_{50} = 1950\,(A)^{0.83}\,(S)^{0.15}\,(L)^{-0.55} \quad (19)$$

$$Q_{100} = 2890\,(A)^{0.83}\,(S)^{0.12}\,(L)^{-0.59} \quad (20)$$

$$Q_{200} = 4050\,(A)^{0.82}\,(S)^{0.09}\,(L)^{-0.63} \quad (21)$$

$$Q_{500} = 6070\,(A)^{0.83}\,(S)^{0.06}\,(L)^{-0.68} \quad (22)$$

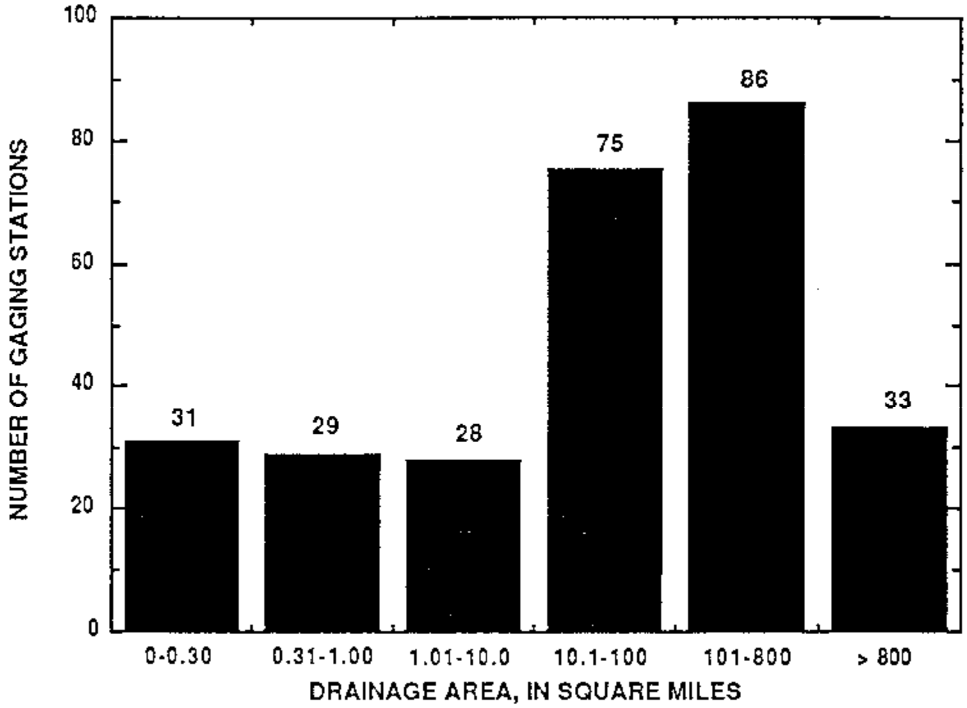
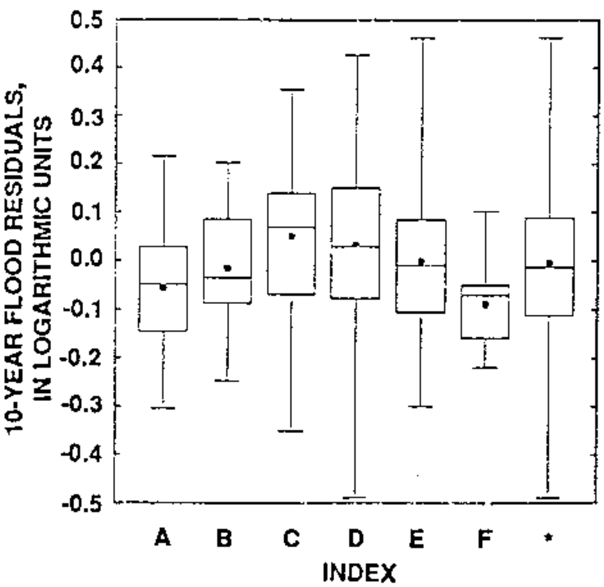


Figure 9.- Distribution of drainage area for 282 gaging stations outside the Delta region.



EXPLANATION

Index	Drainage area, in square miles	No. of sites
A	0 - 0.30	31
B	0.31 - 1.00	29
C	1.01 - 10.0	28
D	10.1 - 100	75
E	101 - 800	86
F	> 800	33
*	Whole Sample	282

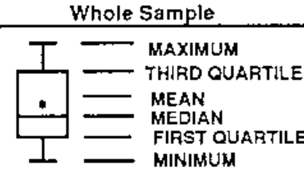
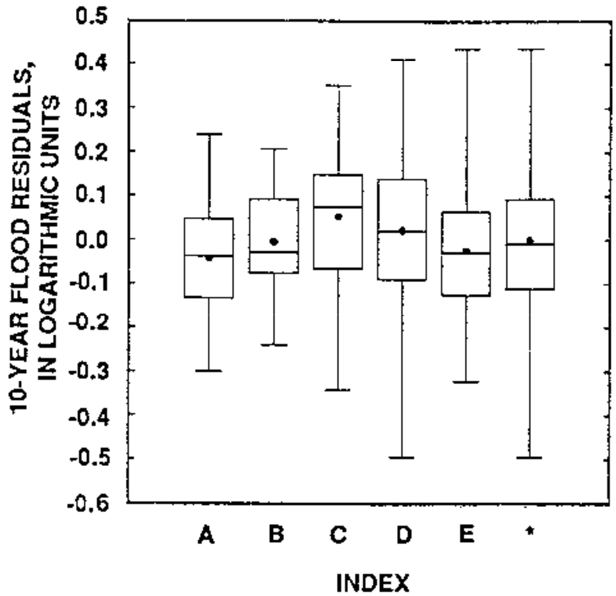


Figure 10.--Characteristics of the 10-year flood residuals for drainage area subgroups and the whole-sample group of sites outside the Delta region.



EXPLANATION

Index	Drainage area, in square miles	No. of sites
A	0 - 0.30	31
B	0.31 - 1.00	29
C	1.01 - 10.0	28
D	10.1 - 100	75
E	101 - 800	86
*	Whole Sample	249

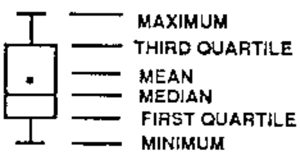


Figure 11.--Characteristics of the 10-year flood residuals for drainage area subgroups and the whole-sample group of sites outside the Delta region having drainage areas less than or equal to 800 square miles.

East

The whole sample of 249 sites for stream basins outside the Delta region and less than or equal to 800 mi^2 was also analyzed for flood-characteristic homogeneity. Residuals of the 10-year flood estimate were compared by major basin subgroup. The 10-year flood tended to be over-predicted in the Pearl, Pascagoula, and Mobile River basins (fig. 7). These basins were combined and are referred to as the East region (fig. 12). The small areas of the Hatchie and Tennessee River basins located in Mississippi were included in the East region. The null hypothesis that the mean of the residuals from the 174 sites in the East region is equal to the whole sample mean (zero) was rejected at a 1-percent significance level using the Student's t-test. Equations for the East region were computed using GLS procedures and are as follows:

$$Q_2 = 296\ (A)^{0.81}\ (S)^{0.03}\ (L)^{-0.36} \qquad (23)$$

$$Q_5 = 406\ (A)^{0.84}\ (S)^{0.07}\ (L)^{-0.35} \qquad (24)$$

$$Q_{10} = 482\ (A)^{0.85}\ (S)^{0.09}\ (L)^{-0.34} \qquad (25)$$

$$Q_{25} = 577\ (A)^{0.85}\ (S)^{0.10}\ (L)^{-0.32} \qquad (26)$$

$$Q_{50} = 648\ (A)^{0.85}\ (S)^{0.11}\ (L)^{-0.31} \qquad (27)$$

$$Q_{100} = 716\ (A)^{0.85}\ (S)^{0.11}\ (L)^{-0.30} \qquad (28)$$

$$Q_{200} = 786\ (A)^{0.85}\ (S)^{0.12}\ (L)^{-0.29} \qquad (29)$$

$$Q_{500} = 874\ (A)^{0.85}\ (S)^{0.12}\ (L)^{-0.28} \qquad (30)$$

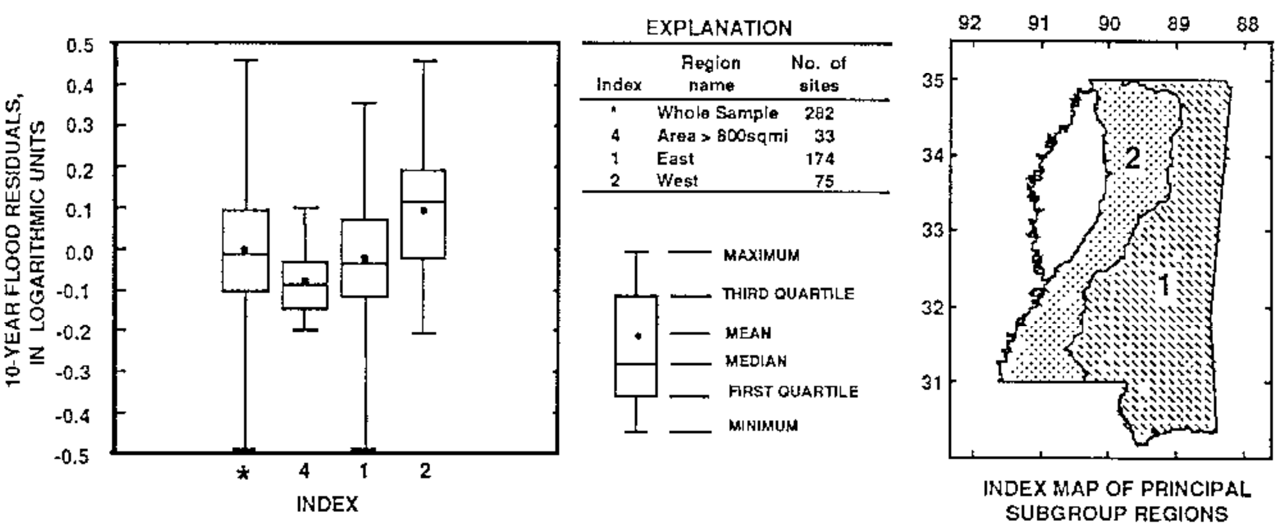


Figure 12.-- Characteristics of the 10-year flood residuals for the whole-sample group of sites outside the Delta region and for the principal subgroup regions.

West

The 10-year flood tended to be under-predicted for streams in the Yazoo (upstream of the Delta), Big Black, and southwest Mississippi drainage basins when the whole-sample of 249 sites for stream basins outside the Delta region and less than or equal to 800 mi^2 was analyzed for flood-characteristic homogeneity (fig. 7). These basins were combined and are referred to as the West region of the State (fig. 12). The null hypothesis that the mean of the residuals from the 75 sites in the West region is equal to the whole-sample mean was rejected at a 1-percent significance level using the Student's t-test. Equations for streams in the West region were computed using GLS procedures and are as follows:

$$Q_2 = 66.2 (A)^{0.88} (S)^{0.51} (L)^{-0.11} \qquad (31)$$

$$Q_5 = 94.7 (A)^{0.93} (S)^{0.51} (L)^{-0.15} \qquad (32)$$

$$Q_{10} = 122 (A)^{0.96} (S)^{0.49} (L)^{-0.19} \qquad (33)$$

$$Q_{25} = 164 (A)^{0.99} (S)^{0.47} (L)^{-0.24} \qquad (34)$$

$$Q_{50} = 197 (A)^{1.00} (S)^{0.45} (L)^{-0.26} \qquad (35)$$

$$Q_{100} = 230 (A)^{1.00} (S)^{0.44} (L)^{-0.25} \qquad (36)$$

$$Q_{200} = 262 (A)^{1.00} (S)^{0.42} (L)^{-0.25} \qquad (37)$$

$$Q_{500} = 305 (A)^{1.00} (S)^{0.41} (L)^{-0.25} \qquad (38)$$

REGIONAL FLOOD-FREQUENCY ESTIMATES FOR URBANIZED STREAMS

Data have been collected in Mississippi on eight urban streams for which the period of actual flood data has been one of relatively constant urbanization. A preliminary analysis of the flood data on four of these streams in the Jackson area was reported by Wilson (1966). Due to the limited data, equations were not developed for this report, but a comparison was made between station frequency discharges (table 1) and discharges computed from the seven-parameter equations developed by Sauer and others in 1983. Those equations were developed using all available U.S. Geological Survey urban drainage basin data throughout the United States. Seven of the Mississippi urban sites were included in this nationwide analysis, which used flood data through the 1977 water year. The seven-parameter equations and definitions, excerpted from Sauer and others (1983), are as follows:

Equation	Average standard error of prediction, in percent	
$UQ_2 = 2.35A^{0.41}SL^{0.17}(RI2+3)^{2.04}(ST+8)^{-0.65}(13\text{-}BDF)^{-0.32}IA^{0.15}RQ_2{}^{0.47}$	±38	(39)
$UQ_5 = 2.70A^{0.35}SL^{0.16}(RI2+3)^{1.86}(ST+8)^{-0.59}(13\text{-}BDF)^{-0.31}IA^{0.11}RQ_5{}^{0.54}$	±37	(40)
$UQ_{10} = 2.99A^{0.32}SL^{0.15}(RI2+3)^{1.75}(ST+8)^{-0.57}(13\text{-}BDF)^{-0.30}IA^{0.09}RQ_{10}{}^{0.58}$	±38	(41)
$UQ_{25} = 2.78A^{0.31}SL^{0.15}(RI2+3)^{1.76}(ST+8)^{-0.55}(13\text{-}BDF)^{-0.29}IA^{0.07}RQ_{25}{}^{0.60}$	±40	(42)
$UQ_{50} = 2.67A^{0.29}SL^{0.15}(RI2+3)^{1.74}(ST+8)^{-0.53}(13\text{-}BDF)^{-0.28}IA^{0.06}RQ_{50}{}^{0.62}$	±42	(43)
$UQ_{100} = 2.50A^{0.29}SL^{0.15}(RI2+3)^{1.76}(ST+8)^{-0.52}(13\text{-}BDF)^{-0.28}IA^{0.06}RQ_{100}{}^{0.63}$	±44	(44)
$UQ_{500} = 2.27A^{0.29}SL^{0.16}(RI2+3)^{1.86}(ST+8)^{-0.54}(13\text{-}BDF)^{-0.27}IA^{0.05}RQ_{500}{}^{0.63}$	±49	(45)

where

UQ_T is the urban peak discharge, in cubic feet per second, for the recurrence interval of T years;

A is the contributing drainage area, in square miles;

SL is the main channel slope, in feet per mile, measured between points which are 10 percent and 85 percent of the main channel length upstream from the study site (for sites where SL is greater than 70, 70 is used in the equations);

RI2 is rainfall intensity, in inches, for the 2-hour 2-year occurrence (U.S. Weather Bureau, 1961).

ST is basin storage, the percentage of the drainage basin occupied by lakes, reservoirs, swamps, and wetlands (in-channel storage of a temporary nature, resulting from detention ponds or roadway embankments, is not included in the computation of ST);

BDF is the basin development factor;

IA is the percentage of the drainage basin occupied by impervious surfaces, such as houses, buildings, streets, and parking lots; and

RQ_T is the peak discharge, in cubic feet per second, for an equivalent rural drainage basin in the same hydrologic area as the urban basin, and for recurrence interval of T years.

The basin development factor (BDF) describes the conditions of the drainage system. The following description of the BDF and how it is computed is a quotation from Sauer and others (1983).

> The most significant index of urbanization that results from this study is a basin development factor (BDF), which provides a measure of the efficiency of the drainage system. This parameter, which proved to be highly significant in the regression equations, can be easily determined from drainage maps and field inspections of the drainage basin. The basin is first divided into thirds. Then, within each third, four aspects of the drainage system are evaluated and each assigned a code as follows:
>
> 1. Channel improvements.--If channel improvements such as straightening, enlarging, deepening, and clearing

are prevalent for the main drainage channels and principal tributaries (those that drain directly into the main channel), then a code of 1 is assigned. Any or all of these improvements would qualify for a code of 1. To be considered prevalent, at least 50 percent of the main drainage channels and principal tributaries must be improved to some degree over natural conditions. If channel improvements are not prevalent, then a code of zero is assigned.

2. Channel linings.--If more than 50 percent of the length of the main drainage channels and principal tributaries has been lined with an impervious material, such as concrete, then a code of 1 is assigned to this aspect. If less than 50 percent of these channels is lined, then a code of zero is assigned. The presence of channel linings would obviously indicate the presence of channel improvements as well. Therefore, this is an added factor and indicates a more highly developed drainage system.

3. Storm drains, or storm sewers.--Storm drains are defined as enclosed drainage structures (usually pipes), frequently used on the second tributaries where the drainage is received directly from streets or parking lots. Many of these drains empty into open channels; however, in some basins they empty into channels enclosed as box or pipe culverts. When more than 50 percent of the secondary tributaries within a subarea (third) consists of storm drains, then a code of 1 is assigned to this aspect; if less than 50 percent of the secondary tributaries consists of storm drains, then a code of zero is assigned. It should be noted that if 50 percent or more of the main drainage channels and principal tributaries are enclosed, then the aspects of channel improvements and channel linings would also be assigned a code of 1.

4. Curb-and gutter streets.--If more than 50 percent of a subarea (third) is urbanized (covered by residential, commercial, and/or industrial development), and if more than 50 percent of the streets and highways in the subarea are constructed with curbs and gutters, then a code of 1 would be assigned to this aspect. Otherwise, it would receive a code of zero. Drainage from curb-and-gutter streets frequently empties into storm drains.

The above guidelines for determining the various drainage-system codes are not intended to be precise measurements. A certain amount of subjectivity will necessarily be involved. Field checking should be performed to obtain the best estimate. The basin development factor (**BDF**) is the sum of the assigned codes; therefore, with three subareas (thirds) per basin, and four drainage aspects to which codes are assigned in each subarea, the maximum value for a fully developed drainage system would be 12. Conversely, if the drainage system were totally undeveloped, then a **BDF** of zero would result. Such a condition does not necessarily mean that the basin is unaffected by urbanization. In fact, a basin could be partially urbanized, have some impervious area, have some improvement of secondary tributaries, and still have an assigned **BDF** of zero.

The **BDF** is fairly easy index to estimate for an existing urban basin. The 50-percent guideline will usually not be difficult to evaluate because many urban areas tend to use the same design criteria, and therefore have similar drainage aspects, throughout. Also, the **BDF** is convenient for projecting future development. Obviously, full development of the drainage system and maximum urban effects on peaks would occur when **BDF = 12**. Projections of full development or intermediate stages of development can usually be obtained from city engineers.

The nationwide equations were used to estimate the 2-year, 10-year, and 100-year floods for the eight Mississippi urban sites. Four additional basin characteristics needed in these equations are presented in table 3. The nationwide equation estimates are compared with the observed station estimates in figure 13. The comparison is also made on the basis of the root-mean-square error (**RMS**) of the estimating equation, computed as:

$$\mathrm{RMS} = \sqrt{(\overline{X})^2 + S^2} \qquad (46)$$

where $\overline{\mathbf{X}}$ is the average error and **S** is the standard deviation of the error. The root-mean-square error is considered an approximation of the standard error of prediction. Table 4 presents errors of prediction for the group of all eight sites and for the group of five sites in Jackson. For the Jackson sites, the minimum and maximum errors are significantly negative for the 2-year and both positive and negative for the 100-year recurrence interval. Average errors for the 10-year and 100-year recurrence intervals are similar to those reported for adjoining states by Sauer (1986).

Table 3.--*Additional basin characteristics for urban streams in Mississippi*

[BDF, basin development factor; RI2, rainfall intensity for the 2-hour 2-year occurrence; ST, basin storage; IA, impervious area]

Station number	Station name	BDF	RI2 (inches)	ST (percent)	IA (percent)
2473047	Gordon Creek at Hattiesburg	5	2.7	0	21
2485800	Eubanks Creek at Jackson	8	2.5	0	33
2485950	Town Creek at Jackson	7	2.5	0	29
2486100	Lynch Creek at Jackson	4	2.5	0	27
2486115	Three Mile Creek at Jackson	6	2.5	0	29
2486350	Caney Creek at Jackson	6	2.5	2	14
7289610	Bachelor Creek at Canton	2	2.4	0	10
7290910	Spanish Bayou at Natchez	4	2.6	0	27

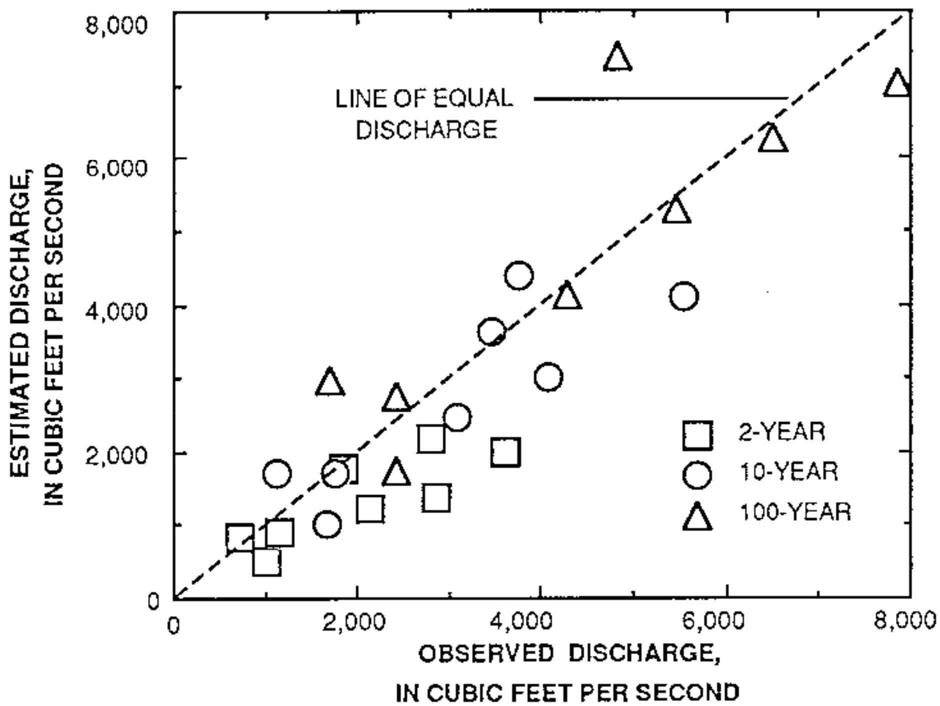


Figure 13.-- Relation of observed 2-year, 10-year, and 100-year urban peak discharge to peak discharge estimated from equation 39, 41, and 44.

Table 4.--*Errors of prediction using the seven-parameter nationwide equations for urbanized streams in Mississippi*

		Errors of prediction, in percent				
Sites	Recurrence interval, in years	Minimum	Maximum	Average	Standard deviation	Root-mean square error
All	2	-52	+14	-28	±24	±37
(8 sites)	10	-39	+50	-6	±29	±29
	100	-29	+73	+11	±34	±36
Jackson	2	-52	-23	-42	±12	±44
(5 sites)	10	-39	+16	-19	±21	±28
	100	-29	+54	+2	±31	±31

With the limited data, the Student's t-test, at the 1-percent level of significance, indicates that the negative error for the 2-year recurrence interval is statistically significant when considering only the Jackson sites. However, for all sites combined, no bias in using the seven-parameter equations is proven. The **RMS** error for the 2-, 10-, and 100-year discharges for all eight sites (table 4) is somewhat lower than ±38, ±38, and ±44 percent, respectively, as reported in the nationwide study (Sauer and others, 1983); however, when considering only the Jackson sites, the **RMS** is higher for the 2-year discharge.

The seven-parameter nationwide equations can be used to estimate flood frequencies for an ungaged urbanized stream in Mississippi. However, the limited data, especially in Jackson, indicate that the 2-year to 10-year discharges may be significantly underestimated using the nationwide equations. This emphasizes the need for more peak runoff data for urbanized areas in Jackson and throughout Mississippi.

LIMITATIONS OF REGIONAL FLOOD-FREQUENCY ESTIMATES

Limitations always exist for an estimate obtained from a regional flood-frequency equation. The most significant known limitations are listed in the following sections. To avoid introducing large errors in estimates, the user should become aware of possible basin projects which may alter flood flows.

Rural Streams

The following limitations should be observed when using the regional equations in this report for estimating flood-frequency discharges on a rural Mississippi stream because the equations:

- are not considered to be representative for basins outside the range of characteristics (explanatory variables) in the sample set for each region (table 5);

- should not to be used for sites where a significant part of the basin is affected by regulation and (or) channelization;

- do not apply to estuarine sites near the mouths of coastal streams at which unusual flood discharges result from hurricane tides flowing into or out of storage;

- should be used with caution near the mouths of streams draining into larger streams because the larger stream may cause critical stages and discharges at the recurrence interval in question; or

- may not be fully representative of the steep loess "bluff" hills, bordering parts of the Delta, and the flat coastal region of the State, extending roughly 20 mi inland from the Gulf of Mexico, due to the limited data in these areas.

Table 5.--*Characteristics of explanatory variables used in regression calculations for basins in the East and West regions with areas less than or equal to 800 square miles, basins in the Delta, and basins in the East or West regions with areas greater than 800 square miles (GT800)*

[Area, in square miles; Channel slope, in feet per mile; Channel length, in miles]

Region	Basin characteristic	Mean	Median	Minimum	Maximum
East					
	Area	146	40.3	0.10	799
	Channel slope	25.4	10.2	1.5	170
	Channel length	23.0	12.2	0.4	123
West					
	Area	131	35.3	0.06	654
	Channel slope	28.8	10.9	2.3	192
	Channel length	18.2	12.3	0.3	70.7
Delta					
	Area	389	300	0.11	1,170
	Channel slope	2.1	1.0	0.4	10.6
	Channel length	65.7	56.0	0.5	269
GT800					
	Area	2,368	1,650	831	6,590
	Channel slope	2.1	1.8	0.7	4.4
	Channel length	134	110	49.1	338

Urbanized Streams

The seven-parameter nationwide equations for estimating flood-frequency discharges on an urbanized Mississippi stream apply when the basin and climatic variables are within the following ranges:

- **A** -- 0.2 to 100 mi^2
- **SL** -- 3.0 to 70 ft/mi
- **RI2** -- 0.2 to 2.8 in
- **ST** -- 0 to 11 percent
- **BDF** -- 0 to 12
- **IA** -- 3 to 50 percent

The maximum value for **SL** for use in the equations is 70 ft/mi; although numerous drainage basins used in the development of the equations had **SL** values up to 500 ft/mi. If values for the variables are outside these ranges, the standard error may be considerably higher than for sites where all variables are within the specified range (Sauer and others, 1983).

SUMMARY

This report provides techniques for estimating the magnitude of floods with recurrence intervals from 2 to 500 years for streams in Mississippi. Estimates of flood magnitude are presented for 330 streamflow-gaging stations. Flood-frequency discharges for seven of the eleven streamflow-gaging stations on the Pearl River, which were agreed upon in 1980 by the U.S. Geological Survey and the U.S. Army Corps of Engineers, Mobile District, are included. A graphical relation of flood-frequency discharge to drainage area for the Pearl River main stem, with an adjustment for basin shape, is also presented.

Regression analyses were used to define relations between flood-frequency characteristics and explanatory drainage basin variables for 282 rural streamflow-gaging stations, which are representative of similar streams in a specific class or region. To improve accuracy of the regression equations, the State was divided into four subgroups, three defined by geographic boundaries and one by drainage area magnitude. Generalized-least-squares regression, which defines more accurate estimates of regression coefficients and model error than ordinary-least-squares regression, was used in the analyses of three subgroups. The Delta subgroup was analyzed using ordinary-least-squares regression, and because relatively little data have been collected since 1985, previously published equations are presented with extension to 500 years. The regression analyses indicated that size of drainage area, slope of the main channel, and length of the main channel were the most significant basin characteristics that affect the magnitude and frequency of floods for all four subgroups. Regression equations presented for the four subgroups may be used to estimate the magnitude and frequency of floods for ungaged rural stream sites in the State. If the drainage area at an ungaged site is within 50 percent of the drainage area at a gaged site on the same stream, the flood-frequency estimate can be extrapolated using the flood frequency at the gaged site weighted with the regional estimate at the ungaged site using equation 6.

Only eight sites were available for which the period of record was one of relatively constant urbanization. For these sites, a comparison was made between frequency discharges computed from the record and discharges computed from the seven-parameter nationwide equations described previously. When considering only the five sites in Jackson, the 2-year discharge appears to be under-estimated using the nationwide equations; however, for all sites combined, no bias in using the nationwide equations is proven. Therefore, the seven-parameter nationwide equations are presented and can be used to estimate the magnitude and frequency of floods for an ungaged urban stream in the State.

REFERENCES

Barnes, H.H., Jr., and Golden, H.G., 1966, Magnitude and frequency of floods in the United States, Part 2B, South Atlantic Slope and Eastern Gulf of Mexico Basins, Ogeechee River to Pearl River: U.S. Geological Survey Water-Supply Paper 1674, 409 p.

Bobee, Bernard, 1973, Sample error of T-year events computed by fitting a Pearson type 3 distribution, Water Resources Research, v. 9, chap. 5, p. 1264-1270.

Colson, B.E., 1986, Comparison of flood frequency estimates from synthetic and observed data on small drainage areas in Mississippi: U.S. Geological Survey Water-Resources Investigations Report 86-4034, 23 p.

Colson, B.E., and Hudson, J.W., 1976, Flood frequency of Mississippi streams: Mississippi State Highway Department, RO-76-014-PR, 34 p.

Fisher, R.A., 1931, The moments of the distribution of normal samples of measures of departure from normality: Proceedings of the Royal Society of London, v. 130, p. 16-28.

Hardison, C.H., 1969, Accuracy of streamflow characteristics: U.S. Geological Survey Professional Paper 650-D, p. D210-D214.

-----1971, Prediction error of regression estimates of streamflow characteristics at ungaged sites: U.S. Geological Survey Professional Paper 750-C, p. 228-236.

Interagency Advisory Committee on Water Data, 1982, Bulletin 17B, Guidelines for determining floodflow frequency: U.S. Geological Survey, Office of Water Data Coordination, Reston, Va., 28 p.

Kite, G.W., 1988, Frequency and risk analysis in hydrology: Water Resources Publications, Denver, Colo., chap. 9, 10, and 15.

Landers, M.N., 1985, Floodflow frequency of streams in the alluvial plain of the lower Mississippi River in Mississippi, Arkansas, and Louisiana: U.S. Geological Survey Water-Resources Investigations Report 85-4150, 21 p.

-----1989, Regional skew coefficients for flood-frequency analysis of Mississippi streams: Proceedings of 19th Mississippi Water Resources Conference, March 14-15, 1989, Jackson, Miss., p. 66-70.

Lepkin, W.D., DeLapp, M.M., Kirby, W.H., and Wilson, T.A., 1981, WATSTORE User's Guide, Volume 4, U.S. Geological Survey Open-File Report 79-1336-I, p. C-1 to C-57.

Patterson, J.L., 1964, Magnitude and frequency of floods in the United States, Part 7, Lower Mississippi River Basin: U.S. Geological Survey Water-Supply Paper 1681, 636 p.

Sauer, V.B., 1986, New studies of urban flood frequency in the southeastern United States *in* Hydraulics and Hydrology, Transportation Research Record 1073: Transportation Research Board, National Research Council, p. 10-15.

Sauer, V.B., Thomas, W.O., Jr., Stricker, V.A, and Wilson, K.V., Sr., 1983, Flood characteristics of urban watersheds in the United States: U.S. Geological Survey Water-Supply Paper 2207, 63 p.

Stedinger, J.R., and Cohn, T.A., 1986, Flood frequency analysis with paleoflood information: Water Resources Research, v. 22, no. 5, p. 785-793.

Stedinger, J.R., and Tasker, G.D., 1985, Regional hydrologic analysis 1: ordinary, weighted and generalized least squares compared: Water Resources Research, vol. 21, no. 9, p. 1421-1432.

-----1986, Regional hydrologic analysis 2: model error estimators, estimation of sigma and log-Pearson type 3 distribution: Water Resources Research, v. 22, no. 10, p. 1487-1499.

Tasker, G.D., and Stedinger, J.R., 1986, Regional skew with weighted LS regression: Journal of Water Resources Planning and Management, v. 112, no. 2, p. 225-237.

-----1989, An operational GLS model for hydrologic regression: Journal of Hydrology, v. 111, p. 361-375.

Thomas, D.M., and Benson, M.A., 1970, Generalization of streamflow characteristics from drainage-basin characteristics: U.S. Geological Survey Water-Supply Paper 1975, 55 p.

Thomas, W.O., Jr., 1987, Comparison of flood-frequency estimates based on observed and model-generated peak flows: Proceedings of the International Symposium on Flood Frequency and Risk Analyses, May 14-17, 1986, Louisiana State University, Baton Rouge, La., p. 149-161.

Tung, Y.K., and Mays, L.W., 1981, Generalized skew coefficients for flood frequency analysis: Water Resources Bulletin, v. 17, no. 2, p. 262-269.

U.S. Weather Bureau, 1961, Rainfall frequency atlas of the United States: U.S. Department of Commerce Technical Paper no. 40, 61 p.

Wallis, J.R., Matalas, N.C., and Slack, J.R., 1974, Just a moment!: Water Resources Research, v. 10, no. 2, p. 217-219.

Wax, C.L., 1982, Atlas of the climatic water balance in Mississippi: normals and variability, 1951-80: Water Resources Research Institute Bulletin, Mississippi State University, 82 p.

Wilson, K.V., Sr., 1966, Flood frequency of streams in Jackson, Mississippi: U.S. Geological Survey open-file report, 6 p.

Wilson, K.V., Sr., and Trotter, I.L., 1961, Floods in Mississippi, magnitude and frequency: U.S. Geological Survey open-file report, 326 p.

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations
[Notes are explained at end of table; sd, standard deviation; IACWD, Interagency Advisory Committee on Water Data; sqmi, square miles; ft/mi, feet per mile; mi, miles; region: (1) East, (2) West, (3) Delta, (4) GT800 , basins in the East or West regions with areas greater than 800 sqmi]

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
1	2429900	Big Brown Creek near Booneville, MS note: * mean= 3.270; sd= 0.245; skew= -0.400 region 1 area= 27.1sqmi; slope= 15.7ft/mi; length= 10.1mi	1953-88	1,940 10	3,070 9	3,850 10	4,870 12	5,680 14	6,460 17	7,330 20	8,370 23
2	2429949	Little Brown Creek near New Site, MS note: * mean= 3.318; sd= 0.366; skew= 0.027 region 1 area= 42.2sqmi; slope= 9.6ft/mi; length= 12.4mi	1974-85	2,260 20	4,390 19	6,080 20	8,160 23	9,750 25	11,200 28	12,900 30	14,900 34
3	2429980	Pollard Mill Branch at Paden, MS note: * mean= 2.269; sd= 0.290; skew= 0.068 region 1 area= 2.01sqmi; slope= 38.1ft/mi; length= 2.8mi	1967-87	212 14	399 14	567 16	812 19	1,020 22	1,200 24	1,420 27	1,670 31
4	2430000	Mackeys Creek near Dennis, MS note: *bi mean= 3.377; sd= 0.294; skew= 0.140 region 1 area= 66.9sqmi; slope= 8.2ft/mi; length= 17.5mi	1939-79	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
5	2430085	Red Bud Creek near Moores Mill, MS note: * mean= 2.878; sd= 0.203; skew= 0.005 region 1 area= 15.7sqmi; slope= 22.7ft/mi; length= 6.1mi	1975-88	840 13	1,380 13	1,850 14	2,590 17	3,230 20	3,870 23	4,590 25	5,450 29
6	2430500	Tombigbee River near Marietta, MS note: *abgj mean= 4.015; sd= 0.210; skew= 0.261 region 1 area= 308 sqmi; slope= 6.1ft/mi; length= 24.1mi	1938-51 1968-77 1955	12,000 --	20,000 --	27,300 --	41,000 --	52,500 --	64,500 --	-- --	100,000 --
7	2430615	Mud Creek near Fairview, MS note: c mean= 2.759; sd= 0.123; skew= -0.196 region 1 area= 11.1sqmi; slope= 17.7ft/mi; length= 3.6mi	1976-88	614 8	821 8	975 9	1,210 11	1,420 14	1,640 16	1,880 18	2,170 22
8	2430880	Cummings Creek near Fulton, MS note: c mean= 2.795; sd= 0.226; skew= 0.359 region 1 area= 19.1sqmi; slope= 8.5ft/mi; length= 7.0mi	1975-88	761 15	1,430 16	2,110 18	3,170 21	4,030 24	4,840 27	5,740 30	6,780 34
9	2431000	Tombigbee River near Fulton, MS note: *abgj mean= 4.260; sd= 0.249; skew= -0.021 region 1 area= 612 sqmi; slope= 3.5ft/mi; length= 42.2mi	1929-88	19,900 --	30,300 --	38,900 --	52,500 --	64,000 --	78,000 --	-- --	122,000 --
10	2431500	Tombigbee River at Beans Ferry near Fulton, MS note: *abgj mean= 4.236; sd= 0.189; skew= 0.050 region 1 area= 706 sqmi; slope= 2.9ft/mi; length= 49.7mi	1938-47 1927	21,200 --	31,900 --	41,300 --	56,000 --	68,400 --	83,500 --	-- --	130,000 --
11	2432500	Bull Mountain Creek at Tremont, MS note: * mean= 3.710; sd= 0.301; skew= -0.003 region 1 area= 136 sqmi; slope= 8.2ft/mi; length= 33.6mi	1941-64 1973-83	5,060 14	9,000 14	12,100 16	16,200 18	19,300 21	22,400 24	26,000 27	30,300 31
12	2432900	Red Boot Creek near Fulton, MS note: * mean= 1.812; sd= 0.194; skew= 0.149 region 1 area= 0.13sqmi; slope= 89.3ft/mi; length= 0.8mi	1955-75	65 10	96 11	121 13	154 16	181 18	206 21	236 24	269 28

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
13	2433000	Bull Mountain Creek near Smithville, MS note: * mean= 4.016; sd= 0.325; skew= -0.073 region 1 area= 336 sqmi; slope= 1.9ft/mi; length= 69.9mi	1941-88 1927	10,100 11	18,100 11	24,100 12	31,700 15	37,300 18	42,900 20	49,100 23	57,100 27
14	2433500	Tombigbee River at Bigbee, MS note: *abgj mean= 4.473; sd= 0.234; skew= 0.080 region 4 area= 1,230 sqmi; slope= 1.8ft/mi; length= 79.0mi	1937-58 1964-88 1927,62	30,000 --	43,000 --	58,000 --	80,000 --	99,000 --	121,000 --	-- --	183,000 --
15	2434000	Town Creek at Tupelo, MS note: * mean= 3.918; sd= 0.210; skew= 0.061 region 1 area= 111 sqmi; slope= 8.2ft/mi; length= 20.2mi	1939-46 1949-88	8,030 7	12,000 8	14,900 9	18,500 12	21,300 14	24,200 16	27,400 19	31,500 22
16	2434250	Tishomingo Creek near Saltillo, MS note: * mean= 3.474; sd= 0.166; skew= 0.084 region 1 area= 30.1sqmi; slope= 11.8ft/mi; length= 16.0mi	1950-63	2,810 11	3,910 11	4,700 13	5,730 16	6,570 19	7,390 21	8,380 24	9,550 28
17	2434500	Euclautubba Creek at Saltillo, MS note: * mean= 3.447; sd= 0.162; skew= 0.091 region 1 area= 19.1sqmi; slope= 9.7ft/mi; length= 9.2mi	1949-75	2,690 8	3,680 9	4,350 10	5,180 13	5,840 15	6,480 18	7,220 20	8,140 24
18	2435012	Truck Stop Ditch near Tupelo, MS note: * mean= 2.218; sd= 0.187; skew= -0.011 region 1 area= 0.22sqmi; slope= 46.2ft/mi; length= 0.7mi	1955-72	159 10	224 11	268 12	319 15	359 18	395 20	438 23	486 27
19	2435020	Town Creek at Eason Boulevard at Tupelo, MS note: * mean= 4.094; sd= 0.237; skew= -0.197 region 1 area= 233 sqmi; slope= 6.9ft/mi; length= 24.6mi	1971-88	11,800 13	18,500 13	23,200 14	29,000 16	33,500 19	37,800 22	42,700 24	48,800 28
20	2435300	Cow Pike Pass near Tupelo, MS note: * mean= 2.103; sd= 0.147; skew= 0.298 region 1 area= 0.14sqmi; slope= 52.9ft/mi; length= 0.6mi	1955-83	122 8	163 9	190 10	225 13	253 16	278 19	308 21	344 25
21	2435400	Clear Branch near Tupelo, MS note: * mean= 2.201; sd= 0.203; skew= 0.145 region 1 area= 0.75sqmi; slope= 47.5ft/mi; length= 1.6mi	1955-83	161 9	249 10	320 12	422 15	508 17	590 20	686 23	799 26
22	2435500	Town Creek near Verona, MS note: * mean= 4.152; sd= 0.244; skew= 0.275 region 1 area= 271 sqmi; slope= 6.2ft/mi; length= 27.6mi	1941-61	13,000 12	20,700 13	26,400 15	33,600 19	39,200 21	44,600 24	51,100 27	59,000 31
23	2435800	Coonewah Creek at Shannon, MS note: * mean= 3.732; sd= 0.244; skew= 0.193 region 1 area= 53.1sqmi; slope= 9.7ft/mi; length= 20.8mi	1952-85 1939	4,930 11	7,650 12	9,520 13	11,800 17	13,500 19	15,100 22	17,100 25	19,500 29
24	2435920	Cotton Gin Branch near Tupelo,MS note: * mean= 2.075; sd= 0.221; skew= -0.092 region 1 area= 0.30sqmi; slope= 40.7ft/mi; length= 1.1mi	1955-76	120 11	183 11	229 13	287 15	334 18	375 20	425 23	481 27

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
25	2435930	Shell Creek near Tupelo, MS note: * mean= 1.900; sd= 0.203; skew= 0.478 region 1 area= 0.20sqmi; slope= 28.3ft/mi; length= 0.8mi	1955-84	78 9	120 10	154 12	203 16	243 19	279 22	322 25	371 29
26	2436000	Chiwapa Creek at Shannon, MS note: *abg mean= 4.188; sd= 0.192; skew= 0.027 region 1 area= 145 sqmi; slope= 7.4ft/mi; length= 24.0mi	1950-88	13,100 7	19,100 7	23,200 9	28,600 12	32,800 14	37,100 17	41,600 20	47,700 24
27	2436500	Town Creek near Nettleton, MS note: * mean= 4.451; sd= 0.197; skew= 0.615 region 1 area= 620 sqmi; slope= 6.9ft/mi; length= 38.2mi	1940-88 1927	26,200 7	39,200 8	49,300 10	63,100 14	74,200 17	85,500 20	98,500 23	116,000 27
28	2437000	Tombigbee River near Amory, MS note: *abgj mean= 4.568; sd= 0.238; skew= 0.281 region 4 area= 1,930 sqmi; slope= 1.8ft/mi; length= 83.0mi	1938-88 1927 1892	38,600 --	62,900 --	83,000 --	113,000 --	140,000 --	170,000 --	-- --	260,000 --
29	2437300	Mattubby Creek near Aberdeen, MS note: * mean= 3.845; sd= 0.206; skew= -0.500 region 1 area= 92.2sqmi; slope= 6.6ft/mi; length= 20.1mi	1952-88 1937	7,020 8	10,200 8	12,200 8	14,400 10	16,000 12	17,500 15	19,100 17	21,100 20
30	2437500	Tombigbee River at Aberdeen, MS note: *abgj mean= 4.465; sd= 0.264; skew= 0.180 region 4 area= 2,170 sqmi; slope= 1.8ft/mi; length= 101.0mi	1909-82 1983 1892	33,000 --	53,700 --	70,000 --	96,900 --	120,000 --	145,000 --	-- --	220,000 --
31	2437550	Nichols Creek tributary near Quincy, MS note: * mean= 2.178; sd= 0.208; skew= 0.090 region 1 area= 0.54sqmi; slope= 90.4ft/mi; length= 1.3mi	1966-88	154 11	238 11	305 13	399 16	478 19	550 21	638 24	736 28
32	2437600	James Creek at Aberdeen, MS note: * mean= 3.524; sd= 0.205; skew= -0.062 region 1 area= 28.4sqmi; slope= 71.8ft/mi; length= 9.4mi	1963-88 1961 1948	3,250 10	4,850 10	6,010 11	7,510 14	8,730 16	9,880 19	11,300 21	12,900 25
33	2438000	Buttahatchee River below Hamilton, AL note: * mean= 4.192; sd= 0.203; skew= -0.270 region 1 area= 277 sqmi; slope= 6.2ft/mi; length= 44.8mi	1951-88	15,200 8	22,100 8	26,700 9	32,000 11	35,900 13	39,800 15	43,900 18	49,200 21
34	2439000	Buttahatchee River near Sulligent, AL note: * mean= 4.135; sd= 0.266; skew= -0.453 region 1 area= 472 sqmi; slope= 4.8ft/mi; length= 64.0mi	1929-85	14,000 9	22,600 8	28,400 8	35,600 11	40,800 13	46,000 15	51,600 18	58,500 21
35	2439400	Buttahatchee River near Aberdeen, MS note: * mean= 4.279; sd= 0.266; skew= -0.439 region 1 area= 799 sqmi; slope= 4.1ft/mi; length= 83.6mi	1967-88	18,800 13	30,800 12	39,000 13	49,300 15	57,000 18	64,700 21	73,500 24	84,300 28
36	2439500	Buttahatchee River near Caledonia, MS note: * mean= 4.189; sd= 0.283; skew= -0.178 region 4 area= 831 sqmi; slope= 3.9ft/mi; length= 93.1mi	1929-32 1938-51	15,100 13	25,900 13	34,100 13	44,100 13	52,900 13	62,500 14	66,200 15	80,700 16

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
37	2439800	Cowbell Creek near Houlka, MS note: * mean= 2.222; sd= 0.203; skew= -0.088 region 1 area= 0.46sqmi; slope= 25.7ft/mi; length= 0.9mi	1955-76	169 10	252 10	311 12	388 14	449 17	506 19	570 22	646 26
38	2439980	Chuquatonchee Creek near Okalona, MS note: * mean= 3.604; sd= 0.252; skew= 0.425 region 1 area= 68.5sqmi; slope= 8.8ft/mi; length= 13.4mi	1964-88 1951,53	3,850 13	6,500 14	8,710 16	11,700 20	14,000 22	16,200 25	18,800 28	21,800 32
39	2439997	Chuquatonchee Creek tributary near Trebloc, MS note: * mean= 2.504; sd= 0.114; skew= -0.118 region 1 area= 0.74sqmi; slope= 50.0ft/mi; length= 1.4mi	1966-84	317 6	397 7	448 8	512 9	562 11	609 13	662 15	726 18
40	2440000	Chuquatonchee Creek near Egypt, MS note: * mean= 3.971; sd= 0.269; skew= -0.104 region 1 area= 167 sqmi; slope= 6.1ft/mi; length= 27.2mi	1950-88	9,040 10	14,900 11	19,000 12	24,300 14	28,200 17	32,000 19	36,300 22	41,700 26
41	2440400	Houlka Creek near McCondy, MS note: * mean= 3.990; sd= 0.250; skew= 0.130 region 1 area= 189 sqmi; slope= 5.1ft/mi; length= 25.8mi	1963-88	9,240 11	14,900 12	19,100 14	24,500 17	28,600 20	32,700 22	37,400 25	43,300 29
42	2440500	Chuquatonchee Creek near West Point, MS note: * mean= 4.225; sd= 0.258; skew= -0.090 region 1 area= 505 sqmi; slope= 1.8ft/mi; length= 44.8mi	1941-88	16,500 9	26,800 9	34,100 10	43,700 13	51,000 15	58,300 18	66,200 20	76,500 24
43	2440600	Line Creek near Mabon, MS note: * mean= 3.216; sd= 0.267; skew= 0.159 region 1 area= 4.76sqmi; slope= 32.2ft/mi; length= 5.3mi	1952-88	1,470 11	2,310 11	2,850 13	3,420 16	3,850 19	4,220 22	4,710 24	5,270 28
44	2440800	Trim Cane Creek near Starkville, MS note: * mean= 3.696; sd= 0.186; skew= -0.462 region 1 area= 44.9sqmi; slope= 13.8ft/mi; length= 13.8mi	1952-88 1940	4,960 6	6,960 7	8,170 8	9,550 9	10,500 11	11,500 14	12,500 16	13,700 19
45	2441000	Tibbee Creek near Tibbee, MS note: * mean= 4.469; sd= 0.276; skew= -0.611 region 4 area= 926 sqmi; slope= 3.8ft/mi; length= 54.8mi	1940-88 1929-30 1927	29,100 9	47,600 8	59,100 8	71,300 9	81,600 11	94,100 12	101,000 13	123,000 15
46	2441220	Sand Creek tributary near Mayhew, MS note: * mean= 2.242; sd= 0.233; skew= -0.357 region 1 area= 0.44sqmi; slope= 13.4ft/mi; length= 1.1mi	1966-88	177 11	269 11	329 12	400 14	453 17	500 19	553 22	614 26
47	2441300	Catalpa Creek at Mayhew, MS note: * mean= 3.860; sd= 0.267; skew= -0.077 region 1 area= 98.0sqmi; slope= 9.1ft/mi; length= 17.2mi	1963-87	6,850 13	11,200 13	14,200 14	17,900 17	20,700 19	23,400 22	26,600 25	30,400 29
48	2441500	Tombigbee River at Columbus, MS note: *abgj mean= 4.699; sd= 0.243; skew= 0.214 region 4 area= 4,460 sqmi; slope= 1.4ft/mi; length= 143.0mi	1892-99 1900-88	58,100 --	94,200 --	124,000 --	168,000 --	207,000 --	279,000 --	-- --	400,000 --

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
49	2443000	Luxapallila Creek at Steens, MS	1940-88	7,030	10,200	12,600	15,800	18,500	21,300	24,300	28,400
		note: * mean= 3.845; sd= 0.185; skew= -0.019		6	7	8	10	12	14	16	19
		region 1 area= 309 sqmi; slope= 5.8ft/mi; length= 56.9mi									
50	2443500	Luxapallila Creek near Columbus, MS	1973-88	17,100	26,800	33,200	41,200	47,700	54,100	61,300	70,100
		note: * mean= 4.218; sd= 0.243; skew= -0.585	1968-69	11	9	10	12	15	18	20	24
		region 1 area= 715 sqmi; slope= 9.0ft/mi; length= 65.2mi	1961-65								
51	2443605	Mayo Slough tributary near Columbus, MS	1965-75	158	215	253	300	337	370	410	454
		note: * mean= 2.211; sd= 0.164; skew= -0.138		12	12	13	15	18	21	23	27
		region 1 area= 0.24sqmi; slope= 46.0ft/mi; length= 0.7mi									
52	2443700	Cedar Creek near Brooksville, MS	1965-84	321	395	440	493	533	572	614	665
		note: * mean= 2.513; sd= 0.107; skew= -0.055		6	6	7	9	11	13	15	18
		region 1 area= 0.49sqmi; slope= 21.9ft/mi; length= 0.9mi									
53	2444000	Coal Fire Creek near Pickensville, AL	1955-80	2,800	5,710	8,340	12,100	15,000	17,900	21,100	25,100
		note: * mean= 3.410; sd= 0.342; skew= 0.181		15	15	17	20	23	26	29	33
		region 1 area= 126 sqmi; slope= 5.5ft/mi; length= 36.4mi									
54	2447220	Bogue Fallah tributary near Ackerman, MS	1966-84	128	214	276	351	410	460	522	588
		note: * mean= 2.085; sd= 0.288; skew= -0.326		15	14	15	17	20	23	26	30
		region 1 area= 0.34sqmi; slope= 67.5ft/mi; length= 1.1mi									
55	2447280	Lawson Branch near Betheden, MS	1965-77	292	501	649	818	945	1,050	1,190	1,330
		note: * mean= 2.467; sd= 0.328; skew= -0.219		19	18	18	21	23	26	29	33
		region 1 area= 1.09sqmi; slope= 32.0ft/mi; length= 2.0mi									
56	2447340	Cypress Creek tributary at Bradley, MS	1966-77	148	253	330	426	501	564	644	727
		note: * mean= 2.127; sd= 0.306; skew= -0.280		18	17	18	20	23	26	29	33
		region 1 area= 0.60sqmi; slope= 27.9ft/mi; length= 1.9mi									
57	2447500	Noxubee River near Brooksville, MS	1940-73	9,380	18,300	25,500	35,000	42,100	49,300	57,300	67,400
		note: * mean= 3.968; sd= 0.361; skew= -0.047	1979	14	14	15	18	21	23	26	30
		region 1 area= 446 sqmi; slope= 3.4ft/mi; length= 65.5mi									
58	2447800	Hashuqua Creek near Macon, MS	1951-70	3,320	6,640	9,440	13,100	15,900	18,500	21,700	25,300
		note: * mean= 3.511; sd= 0.358; skew= 0.218	1976,79	17	17	19	22	24	27	30	34
		region 1 area= 96.2sqmi; slope= 11.9ft/mi; length= 28.0mi									
59	2448000	Noxubee River near Macon, MS	1929-32	13,200	25,000	34,700	48,200	58,700	69,500	81,400	97,100
		note: * mean= 4.123; sd= 0.334; skew= 0.035	1939-88	11	11	13	15	18	21	23	27
		region 1 area= 768 sqmi; slope= 2.5ft/mi; length= 90.6mi	1892,1927								
60	2448500	Noxubee River near Geiger, AL	1929-88	11,900	20,200	27,000	35,800	43,900	53,100	58,300	73,500
		note: * mean= 4.102; sd= 0.271; skew= 0.446		8	9	11	12	13	13	14	16
		region 4 area= 1,100 sqmi; slope= 0.7ft/mi; length= 140.0mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
61	2448620	Flat Scooba Creek tributary near Scooba, MS	1967-88	130	201	260	345	416	481	559	646
		note: * mean= 2.117; sd= 0.194; skew= 0.387		10	11	13	17	20	22	25	30
		region 1 area= 0.44sqmi; slope= 44.0ft/mi; length= 1.0mi									
62	2467100	Hamilton Branch near Dekalb, MS	1965-77	339	475	573	698	800	892	1,010	1,130
		note: * mean= 2.543; sd= 0.171; skew= 0.018		11	12	13	16	19	21	24	28
		region 1 area= 0.97sqmi; slope= 45.8ft/mi; length= 1.7mi									
63	2469672	Little Okatubba Creek near Quitman, MS	1966-84	804	1,210	1,520	1,910	2,230	2,530	2,890	3,300
		note: * mean= 2.913; sd= 0.207; skew= -0.003		11	12	13	16	18	21	24	28
		region 1 area= 4.35sqmi; slope= 41.2ft/mi; length= 3.5mi									
64	2471100	Leaf River near Raleigh, MS	1940-43	4,700	8,490	11,400	15,200	18,200	21,100	24,300	28,300
		note: * mean= 3.667; sd= 0.319; skew= -0.123	1957-88	12	12	13	16	19	21	24	28
		region 1 area= 143 sqmi; slope= 3.3ft/mi; length= 39.8mi	1856,1900								
65	2471250	Leaf River near Taylorsville, MS	1968-88	9,380	13,800	18,000	24,700	30,600	36,700	43,600	52,400
		note: * mean= 3.989; sd= 0.167; skew= 0.706	1961	8	10	12	16	20	23	26	30
		region 1 area= 459 sqmi; slope= 3.3ft/mi; length= 57.4mi	1856,1900								
66	2471500	Oakohay Creek at Mize, MS	1942-49	5,380	9,180	12,200	16,600	20,000	23,500	27,400	32,300
		note: * mean= 3.728; sd= 0.265; skew= 0.055	1968-88	12	12	14	17	19	22	25	29
		region 1 area= 185 sqmi; slope= 4.3ft/mi; length= 36.1mi	1961								
67	2472000	Leaf River near Collins, MS	1939-88	14,000	23,400	31,200	42,700	52,100	62,000	73,000	87,700
		note: * mean= 4.160; sd= 0.247; skew= 0.307	1900	8	9	11	14	17	20	23	26
		region 1 area= 743 sqmi; slope= 3.0ft/mi; length= 68.7mi	1856								
68	2472160	Big Creek tributary near Laurel, MS	1966-84	128	175	207	247	279	308	343	382
		note: * mean= 2.117; sd= 0.163; skew= -0.003		9	9	11	13	16	18	21	24
		region 1 area= 0.17sqmi; slope= 82.0ft/mi; length= 0.6mi									
69	2472420	Bouie Creek near Sanford, MS	1968-88	7,190	13,800	19,500	26,600	32,000	37,000	43,100	50,300
		note: * mean= 3.878; sd= 0.329; skew= 0.518	1961	16	17	19	22	25	28	31	35
		region 1 area= 262 sqmi; slope= 7.1ft/mi; length= 40.4mi									
70	2472500	Bouie Creek near Hattiesburg, MS	1939-88	5,960	11,700	17,200	25,500	32,100	38,500	45,900	55,000
		note: * mean= 3.795; sd= 0.313; skew= 0.651	1900	11	12	15	19	22	25	28	32
		region 1 area= 304 sqmi; slope= 6.5ft/mi; length= 51.0mi									
71	2472700	Okatoma Creek tributary at Mt. Olive, MS	1965-77	112	200	270	353	419	470	540	608
		note: * mean= 2.038; sd= 0.293; skew= 0.403		17	18	20	23	25	28	31	35
		region 1 area= 0.33sqmi; slope= 63.0ft/mi; length= 1.0mi									
72	2472810	Okatoma Creek tributary no.2 near Collins, MS	1967-84	128	201	255	317	367	406	461	515
		note: * mean= 2.136; sd= 0.245; skew= 0.391		13	14	17	20	23	26	29	33
		region 1 area= 0.21sqmi; slope= 82.0ft/mi; length= 0.7mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
73	2473000	Leaf River at Hattiesburg, MS note: * mean= 4.418; sd= 0.240; skew= 0.444 region 4 area= 1,750 sqmi; slope= 2.5ft/mi; length= 111.0mi	1905-88 1900	25,000 6	40,900 7	54,000 9	71,600 10	86,500 11	103,000 12	111,000 13	137,000 15
74	2473047	Gordon Creek at Hattiesburg, MS note: dg mean= 3.282; sd= 0.195; skew= 0.556 region 1 area= 8.83sqmi; slope= 21.9ft/mi; length= 7.3mi	1969-88	1,840 9	2,740 11	3,470 14	4,540 20	5,460 26	6,500 32	7,660 39	9,430 49
75	2473460	Tallahala Creek at Waldrup, MS note: * mean= 3.702; sd= 0.271; skew= 0.129 region 1 area= 102 sqmi; slope= 4.1ft/mi; length= 24.6mi	1969-88 1961	4,820 13	8,070 14	10,500 16	13,700 19	16,100 22	18,500 24	21,200 27	24,500 31
76	2473480	Tallahattah Creek near Waldrup, MS note: * mean= 3.217; sd= 0.343; skew= 0.098 region 1 area= 30.4sqmi; slope= 11.0ft/mi; length= 13.0mi	1965-88	1,710 16	3,280 16	4,560 17	6,220 20	7,500 23	8,670 26	10,100 29	11,700 33
77	2473500	Tallahala Creek at Laurel, MS note: * mean= 3.751; sd= 0.343; skew= -0.078 region 1 area= 238 sqmi; slope= 3.2ft/mi; length= 56.6mi	1938-88 1900,20	5,740 11	10,900 11	15,100 13	20,800 15	25,300 18	29,800 20	34,700 23	41,100 27
78	2473610	Tallahala Creek tributary no.2 at Laurel, MS note: *d mean= 2.684; sd= 0.170; skew= 0.115 region 1 area= 1.52sqmi; slope= 24.8ft/mi; length= 3.0mi	1974-84	480 13	670 14	802 17	974 23	1,110 28	1,240 35	1,380 41	1,580 51
79	2473850	Tallahoma Creek tributary at Lake Como, MS note: * mean= 3.050; sd= 0.186; skew= -0.001 region 1 area= 3.21sqmi; slope= 31.5ft/mi; length= 3.4mi	1964-88	1,060 9	1,490 10	1,780 11	2,100 14	2,360 16	2,580 18	2,870 21	3,200 25
80	2474500	Tallahala Creek near Runnelstown, MS note: * mean= 3.915; sd= 0.259; skew= 0.355 region 1 area= 612 sqmi; slope= 2.5ft/mi; length= 102.0mi	1940-88 1900,20	8,100 9	14,100 10	19,400 12	27,600 15	34,500 18	41,900 21	50,100 24	61,100 28
81	2474600	Bogue Homo near Richton, MS note: * mean= 3.891; sd= 0.240; skew= 0.307 region 1 area= 344 sqmi; slope= 3.7ft/mi; length= 64.9mi	1971-88 1941-43	7,590 12	12,700 14	17,000 16	23,100 19	28,100 22	33,100 24	38,800 27	45,900 32
82	2474650	Buck Creek near Runnelstown, MS note: * mean= 3.371; sd= 0.195; skew= 0.046 region 1 area= 20.8sqmi; slope= 13.5ft/mi; length= 11.8mi	1951-88	2,290 8	3,340 8	4,080 10	5,040 12	5,800 15	6,530 17	7,380 19	8,430 23
83	2474740	Leaf River at Beaumont, MS note: * mean= 4.556; sd= 0.225; skew= 0.480 region 4 area= 3,010 sqmi; slope= 2.2ft/mi; length= 153.0mi	1941-61 1972-76 1900	34,600 11	54,800 12	71,300 13	90,700 13	108,000 14	128,000 14	134,000 15	164,000 17
84	2475000	Leaf River near McLain, MS note: * mean= 4.577; sd= 0.226; skew= 0.345 region 4 area= 3,500 sqmi; slope= 1.9ft/mi; length= 169.0mi	1940-88 1900,38	36,700 8	57,900 8	74,800 10	96,200 11	115,000 12	135,000 13	143,000 14	176,000 16

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
85	2475050	Waterfall Branch near McLain, MS note: * mean= 2.457; sd= 0.215; skew= 0.253 region 1 area= 0.65sqmi; slope= 73.3ft/mi; length= 1.0mi	1955-88	277 9	424 10	534 12	679 15	796 17	901 20	1,030 23	1,180 27
86	2475220	Little Rock Creek tributary near Little Rock, MS note: * mean= 1.707; sd= 0.402; skew= 0.305 region 1 area= 0.22sqmi; slope= 170 ft/mi; length= 0.7mi	1965-84	64.0 19	141 19	210 20	294 23	360 25	409 28	478 31	541 35
87	2475350	Tarlow Creek near Newton, MS note: * mean= 3.262; sd= 0.135; skew= 0.099 region 1 area= 16.1sqmi; slope= 12.5ft/mi; length= 7.0mi	1953-70 1979	1,800 8	2,390 8	2,800 10	3,380 12	3,850 14	4,330 17	4,850 19	5,520 23
88	2475500	Chunky River near Chunky, MS note: * mean= 3.934; sd= 0.321; skew= 0.158 region 1 area= 369 sqmi; slope= 5.3ft/mi; length= 39.8mi	1939-88	8,570 11	16,300 12	22,900 13	32,300 16	40,000 19	47,500 22	56,200 25	67,200 29
89	2476000	Okatibbee Creek near Meridian, MS note: *bi mean= 3.680; sd= 0.380; skew= 0.163 region 1 area= 235 sqmi; slope= 3.5ft/mi; length= 46.1mi	1938-72	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
90	2476500	Sowashee Creek at Meridian, MS note: * mean= 3.437; sd= 0.294; skew= 0.128 region 1 area= 52.1sqmi; slope= 12.0ft/mi; length= 11.2mi	1936-45 1949-88	2,750 10	4,960 11	6,820 13	9,420 16	11,500 18	13,600 21	16,000 24	19,000 28
91	2476600	Okatibbee Creek at Arundel, MS note: ag mean= 3.749; sd= 0.269; skew= 0.300 region 1 area= 342 sqmi; slope= 3.5ft/mi; length= 51.3mi	1969-88 1961	5,430 15	9,330 18	12,600 22	17,600 30	22,000 38	27,100 47	32,900 57	41,800 72
92	2477000	Chickasawhay River at Enterprise, MS note: * mean= 4.179; sd= 0.285; skew= 0.011 region 4 area= 918 sqmi; slope= 4.4ft/mi; length= 58.0mi	1905-88 1900 1871	15,500 7	27,500 8	37,700 8	52,800 10	66,600 11	82,000 12	91,500 13	115,000 15
93	2477050	Souenlovie Creek near Baxter, MS note: * mean= 2.706; sd= 0.170; skew= 0.231 region 1 area= 1.14sqmi; slope= 46.5ft/mi; length= 1.7mi	1964-88	485 8	674 9	804 11	968 14	1,100 16	1,220 19	1,370 22	1,540 25
94	2477090	Powers Creek near Rose Hill, MS note: * mean= 2.436; sd= 0.168; skew= 0.307 region 1 area= 0.45sqmi; slope= 107 ft/mi; length= 1.1mi	1964-84	260 9	360 10	431 12	521 15	596 18	663 21	748 23	842 27
95	2477100	Souenlovie Creek near Pachuta, MS note: * mean= 3.713; sd= 0.437; skew= -0.015 region 1 area= 174 sqmi; slope= 4.6ft/mi; length= 35.1mi	1956-70 1938,49 1900	5,340 20	10,900 19	15,100 20	20,200 23	23,900 25	27,400 28	31,500 31	36,500 35
96	2477150	Pachuta Creek at Pachuta, MS note: * mean= 3.266; sd= 0.407; skew= -0.039 region 1 area= 23.2sqmi; slope= 14.5ft/mi; length= 11.9mi	1952-70 1938,49	1,800 19	3,450 19	4,660 20	6,050 22	7,110 25	8,030 27	9,200 30	10,500 34

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent) 2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
97	2477330	Shubuta Creek near Shubuta, MS note: * mean= 3.526; sd= 0.344; skew= 0.033 region 1 area= 75.5sqmi; slope= 7.1ft/mi; length= 28.1mi	1963-88	3,290 16	6,150 16	8,360 17	11,200 20	13,200 22	15,200 25	17,600 28	20,400 32
98	2477350	Chickasawhay River at Shubuta, MS note: * mean= 4.286; sd= 0.299; skew= 0.257 region 4 area= 1,460 sqmi; slope= 2.4ft/mi; length= 99.6mi	1905-64 1972-88 1900	19,200 9	34,600 10	47,600 11	64,200 12	78,400 13	93,800 13	101,000 14	126,000 16
99	2477500	Chickasawhay River near Waynesboro, MS note: * mean= 4.217; sd= 0.245; skew= 0.374 region 4 area= 1,650 sqmi; slope= 2.1ft/mi; length= 120.0mi	1937-88 1900	16,600 9	28,300 9	39,000 11	54,700 12	68,800 13	84,100 13	91,100 14	114,000 16
100	2477990	Buckatunna Creek near Denham, MS note: * mean= 3.795; sd= 0.209; skew= 0.179 region 1 area= 492 sqmi; slope= 3.0ft/mi; length= 82.8mi	1972-88	6,500 12	10,700 13	14,500 14	20,400 18	25,400 20	30,600 23	36,500 26	44,000 30
101	2478000	Buckatunna Creek at Denham, MS note: * mean= 3.907; sd= 0.204; skew= 0.641 region 1 area= 505 sqmi; slope= 2.9ft/mi; length= 87.8mi	1938-49 1900,20 1951,61,79	7,890 12	12,900 13	17,700 16	25,300 20	31,500 23	37,800 26	44,900 29	53,700 33
102	2478500	Chickasawhay River at Leakesville, MS note: * mean= 4.374; sd= 0.216; skew= 0.519 region 4 area= 2,690 sqmi; slope= 1.6ft/mi; length= 184.0mi	1938-88 1900,16	23,100 7	36,500 8	48,400 10	65,300 11	80,500 12	96,800 13	104,000 14	128,000 16
103	2478600	Granny Branch at Piave, MS note: * mean= 2.369; sd= 0.193; skew= -0.165 region 1 area= 0.69sqmi; slope= 47.8ft/mi; length= 1.2mi	1967-84	236 11	346 11	423 12	521 14	602 17	676 19	762 22	860 26
104	2479000	Pascagoula River at Merrill, MS note: * mean= 4.836; sd= 0.218; skew= 0.249 region 4 area= 6,590 sqmi; slope= 1.9ft/mi; length= 184.0mi	1905-88 1900	62,800 6	97,000 6	123,000 7	157,000 9	186,000 10	218,000 11	233,000 12	283,000 14
105	2479040	Big Creek near Lucedale, MS note: * mean= 2.978; sd= 0.429; skew= 0.117 region 1 area= 21.2sqmi; slope= 22.0ft/mi; length= 6.0mi	1952-70	1,290 20	2,780 19	4,130 20	5,840 23	7,140 25	8,270 28	9,660 31	11,200 35
106	2479094	Blown Pine Creek near Hattiesburg, MS note: * mean= 2.532; sd= 0.362; skew= 0.353 region 1 area= 1.92sqmi; slope= 31.9ft/mi; length= 3.3mi	1966-77 1955,83	337 20	628 20	843 21	1,090 24	1,280 26	1,430 29	1,650 31	1,860 36
107	2479100	Black Creek near Purvis, MS note: * mean= 3.511; sd= 0.315; skew= 0.497 region 1 area= 171 sqmi; slope= 6.2ft/mi; length= 35.6mi	1957-70 1974	3,650 18	7,550 19	11,200 20	16,200 23	20,000 26	23,600 28	27,700 31	32,500 35
108	2479130	Black Creek near Brooklyn, MS note: * mean= 3.957; sd= 0.230; skew= 0.815 region 1 area= 355 sqmi; slope= 4.7ft/mi; length= 56.3mi	1971-88 1961	8,440 13	14,200 14	19,400 17	26,800 21	32,700 24	38,300 27	44,900 30	52,700 34

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent) 2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
109	2479138	Walls Creek tributary near Brooklyn, MS	1966-77	146	245	316	395	459	508	580	648
		note: * mean= 2.197; sd= 0.298; skew= 0.429	1983	18	18	20	23	25	28	31	35
		region 1 area= 0.37sqmi; slope= 61.2ft/mi; length= 1.3mi									
110	2479140	Walls Creek near Brooklyn, MS	1951-70	1,280	2,830	4,050	5,430	6,450	7,340	8,480	9,710
		note: * mean= 3.050; sd= 0.480; skew= 0.345		21	21	22	24	27	29	32	36
		region 1 area= 22.6sqmi; slope= 12.0ft/mi; length= 11.0mi									
111	2479155	Cypress Creek near Janice, MS	1967-88	3,200	5,620	7,650	10,200	12,200	14,000	16,100	18,600
		note: * mean= 3.537; sd= 0.273; skew= 0.693	1959	13	15	17	21	24	27	30	34
		region 1 area= 52.6sqmi; slope= 9.1ft/mi; length= 12.1mi									
112	2479160	Black Creek near Wiggins, MS	1972-88	12,900	21,100	28,400	38,800	46,900	55,100	64,500	76,000
		note: * mean= 4.146; sd= 0.226; skew= 0.792	1959,61	12	14	17	21	24	27	30	34
		region 1 area= 701 sqmi; slope= 3.0ft/mi; length= 103.0mi	1916								
113	2479165	Mosquito Branch at Benndale, MS	1955-77	74	135	185	250	303	347	403	467
		note: * mean= 1.859; sd= 0.291; skew= 0.288		14	15	17	20	23	25	28	32
		region 1 area= 0.22sqmi; slope= 96.7ft/mi; length= 1.0mi									
114	2479170	Black Creek near Benndale, MS	1959-70	11,700	21,000	28,600	38,700	46,600	54,400	63,400	74,700
		note: * mean= 4.081; sd= 0.291; skew= 0.198	1949	17	17	19	22	24	27	30	34
		region 1 area= 753 sqmi; slope= 2.5ft/mi; length= 123.0mi									
115	2479180	Red Creek at Lumberton, MS	1951-70	993	2,070	3,020	4,200	5,090	5,860	6,810	7,840
		note: * mean= 2.961; sd= 0.363; skew= 0.458		18	18	20	23	25	28	31	35
		region 1 area= 15.7sqmi; slope= 13.9ft/mi; length= 7.4mi									
116	2479187	Red Creek tributary near Wiggins, MS	1966-84	114	187	237	294	338	372	421	470
		note: * mean= 2.089; sd= 0.287; skew= 0.366		15	16	18	21	24	26	29	34
		region 1 area= 0.22sqmi; slope= 48.0ft/mi; length= 1.0mi									
117	2479190	Red Creek near Wiggins, MS	1952-70	4,980	9,000	12,600	17,600	21,500	25,200	29,600	34,800
		note: * mean= 3.704; sd= 0.273; skew= 0.474	1916,28	13	15	17	20	23	26	29	33
		region 1 area= 177 sqmi; slope= 5.0ft/mi; length= 32.0mi	1948								
118	2479200	Flint Creek near Wiggins, MS	1957-68	--	--	--	--	--	--	--	--
		note: *bi mean= 3.125; sd= 0.279; skew= 0.403	1948,53	--	--	--	--	--	--	--	--
		region 1 area= 24.9sqmi; slope= 13.4ft/mi; length= 8.3mi	1954								
119	2479260	Bluff Creek tributary near Waites Crossing, MS	1966-77	368	576	711	856	970	1,060	1,190	1,320
		note: * mean= 2.616; sd= 0.275; skew= 0.111	1955	17	17	18	23	24	26	29	33
		region 1 area= 0.82sqmi; slope= 31.7ft/mi; length= 1.1mi									
120	2479300	Red Creek at Vestry, MS	1959-88	8,690	14,500	19,500	27,100	33,200	39,400	46,400	55,300
		note: * mean= 3.962; sd= 0.233; skew= 0.614		10	12	14	18	21	24	27	32
		region 1 area= 441 sqmi; slope= 2.9ft/mi; length= 76.1mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
121	2479500	Escatawpa River near Wilmer, AL	1946-75	9,440	15,700	21,200	29,800	36,800	44,100	52,200	62,600
		note: * mean= 3.985; sd= 0.227; skew= 0.488		10	11	14	17	20	23	26	30
		region 1 area= 511 sqmi; slope= 2.7ft/mi; length= 55.0mi									
122	2479560	Escatawpa River near Agricola, MS	1974-86	11,100	17,600	23,400	32,200	39,400	46,600	54,700	64,800
		note: * mean= 4.061; sd= 0.190; skew= 0.570		12	14	16	20	23	26	29	33
		region 1 area= 562 sqmi; slope= 2.7ft/mi; length= 61.1mi									
123	2479600	Escatawpa River near Hurley, MS	1958-70	9,850	16,100	21,700	30,300	37,300	44,400	52,400	62,500
		note: * mean= 3.987; sd= 0.205; skew= 0.291		13	14	16	19	22	25	28	32
		region 1 area= 646 sqmi; slope= 2.5ft/mi; length= 77.7mi									
124	2480150	Franklin Creek near Grand Bay, AL	1959-79	983	1,910	2,710	3,820	4,690	5,490	6,430	7,500
		note: * mean= 2.944; sd= 0.321; skew= 0.094		16	16	17	20	23	26	29	33
		region 1 area= 16.7sqmi; slope= 13.5ft/mi; length= 7.8mi									
125	2480500	Tuxachanie Creek near Biloxi, MS	1953-88	4,770	7,660	10,100	13,400	15,900	18,300	21,200	24,700
		note: * mean= 3.719; sd= 0.230; skew= 0.833	1906,48	9	11	14	18	21	24	28	32
		region 1 area= 92.4sqmi; slope= 6.8ft/mi; length= 26.1mi									
126	2481000	Biloxi River at Wortham, MS	1953-88	4,910	6,740	8,050	9,840	11,200	12,800	14,400	16,600
		note: * mean= 3.699; sd= 0.156; skew= 0.138	1948	6	7	8	11	13	15	17	20
		region 1 area= 96.2sqmi; slope= 7.3ft/mi; length= 29.6mi									
127	2481130	Biloxi River near Lyman, MS	1964-88	10,700	16,000	20,200	25,900	30,600	35,200	40,700	47,400
		note: * mean= 4.068; sd= 0.193; skew= 0.662	1957	9	11	14	18	21	24	27	31
		region 1 area= 251 sqmi; slope= 6.0ft/mi; length= 38.2mi									
128	2481400	Wolf River near Poplarville, MS	1952-71	2,310	4,690	6,980	10,000	12,300	14,300	16,700	19,400
		note: * mean= 3.364; sd= 0.312; skew= 0.867		16	17	19	23	26	28	31	36
		region 1 area= 71.0sqmi; slope= 8.1ft/mi; length= 20.6mi									
129	2481450	Murder Creek near Poplarville, MS	1952-70	1,340	2,340	3,310	4,710	5,780	6,720	7,860	9,110
		note: * mean= 3.157; sd= 0.238; skew= 1.082	1916,48	12	14	17	22	25	28	31	35
		region 1 area= 21.6sqmi; slope= 16.8ft/mi; length= 10.9mi	1836,76								
130	2481500	Wolf River at Lyman, MS	1945-48	7,310	12,500	16,900	22,600	27,000	31,200	36,300	42,200
		note: * mean= 3.902; sd= 0.252; skew= 0.674	1965-70	17	18	20	23	26	28	31	36
		region 1 area= 253 sqmi; slope= 5.4ft/mi; length= 47.6mi	1961								
131	2481505	Mill Creek tributary near Lizana, MS	1967-77	527	815	1,050	1,350	1,600	1,800	2,080	2,350
		note: * mean= 2.748; sd= 0.205; skew= 0.542		14	16	18	21	24	27	30	34
		region 1 area= 2.29sqmi; slope= 46.1ft/mi; length= 2.2mi									
132	2481510	Wolf River near Landon, MS	1971-88	9,470	13,400	16,500	20,900	24,600	28,500	32,900	38,500
		note: * mean= 3.993; sd= 0.163; skew= 0.283		9	10	12	15	18	21	23	27
		region 1 area= 308 sqmi; slope= 4.9ft/mi; length= 60.4mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
133	2481670	Bayou La Croix near Clermont Harbor, MS	1960-70	1,800	2,930	3,920	5,330	6,410	7,460	8,580	9,980
		note: * mean= 3.239; sd= 0.203; skew= 0.424		15	16	18	21	24	27	30	34
		region 1 area= 38.0sqmi; slope= 1.5ft/mi; length= 10.9mi									
134	2481810	Talahaga Creek near Noxapater, MS	1953-70	2,950	5,520	7,490	9,900	11,700	13,400	15,500	17,800
		note: * mean= 3.478; sd= 0.348; skew= 0.148	1974,79	17	17	19	22	24	27	30	34
		region 1 area= 58.6sqmi; slope= 6.7ft/mi; length= 19.0mi									
135	2481840	Noxapater Creek near Noxapater, MS	1952-70	1,800	3,320	4,600	6,300	7,590	8,790	10,200	11,900
		note: * mean= 3.252; sd= 0.299; skew= 0.363	1979	15	16	18	21	24	27	30	34
		region 1 area= 35.3sqmi; slope= 6.7ft/mi; length= 14.1mi									
136	2481880	Pearl River at Burnside, MS	1981-88	9,040	16,500	22,400	30,900	37,900	45,500	53,800	65,600
		note: fg mean= 3.951; sd= 0.314; skew= -0.100	1935,38	9	9	11	14	17	20	24	29
		region 1 area= 520 sqmi; slope= 1.9ft/mi; length= 47.6mi	1939,62,79								
137	2481900	Coonshuck Creek tributary near House, MS	1965-77	97	157	201	257	303	341	390	439
		note: * mean= 1.963; sd= 0.251; skew= -0.173	1979	15	15	16	18	21	24	27	30
		region 1 area= 0.20sqmi; slope= 97.8ft/mi; length= 0.6mi									
138	2482000	Pearl River at Edinburg, MS	1909-88	10,700	19,300	26,100	35,800	43,800	52,500	61,800	75,200
		note: *g mean= 4.023; sd= 0.309; skew= -0.100	1902	9	9	10	14	17	20	24	29
		region 4 area= 904 sqmi; slope= 1.3ft/mi; length= 76.3mi	1878								
139	2482100	Indian Branch near Edinburg, MS	1965-84	313	521	680	892	1,070	1,220	1,410	1,620
		note: * mean= 2.468; sd= 0.259; skew= -0.177		13	13	14	17	19	22	25	29
		region 1 area= 1.91sqmi; slope= 27.1ft/mi; length= 2.5mi									
140	2482310	Lobutcha Creek tributary at Wamba, MS	1964-84	359	549	680	839	964	1,070	1,210	1,350
		note: * mean= 2.566; sd= 0.229; skew= -0.092		12	12	13	16	18	21	24	28
		region 1 area= 0.94sqmi; slope= 38.3ft/mi; length= 1.3mi									
141	2482500	Lobutcha Creek near Carthage, MS	1938-70	6,210	11,800	16,200	22,200	26,800	31,400	36,500	42,900
		note: * mean= 3.767; sd= 0.345; skew= -0.209	1979	14	13	14	17	19	22	25	29
		region 1 area= 309 sqmi; slope= 2.2ft/mi; length= 57.7mi									
142	2482550	Pearl River near Carthage, MS	1962-88	13,200	23,100	30,900	42,100	51,300	61,300	72,000	87,500
		note: *fg mean= 4.117; sd= 0.293; skew= -0.050	1932,38-39	14	15	17	22	27	33	39	48
		region 4 area= 1,350 sqmi; slope= 1.4ft/mi; length= 97.5mi	1874,1900,02								
143	2482900	Tallabogue Creek tributary near Harpersville, MS	1965-77	52	93	126	170	206	236	273	310
		note: * mean= 1.617; sd= 0.299; skew= -0.228		18	17	17	20	23	25	28	32
		region 1 area= 0.12sqmi; slope= 131 ft/mi; length= 0.4mi									
144	2483000	Tuscolameta Creek at Walnut Grove, MS	1939-88	10,400	17,300	22,600	29,700	35,300	41,000	47,200	55,100
		note: * mean= 4.000; sd= 0.271; skew= -0.238	1900,02	9	9	10	12	15	17	19	23
		region 1 area= 411 sqmi; slope= 4.1ft/mi; length= 35.4mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent) 2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
145	2483500	Pearl River near Lena, MS	1937-53	20,000	35,600	48,100	66,200	81,400	98,000	116,000	143,000
		note: *fg mean= 4.302; sd= 0.296; skew= 0.000	1962,74	16	17	20	27	33	40	47	59
		region 4 area= 1,980 sqmi; slope= 1.3ft/mi; length= 110.0mi	1902								
146	2483890	Yockanookany River tributary near McCool, MS	1965-88	142	252	330	421	490	546	618	692
		note: * mean= 2.147; sd= 0.333; skew= -0.179		15	15	16	18	21	24	27	31
		region 1 area= 0.34sqmi; slope= 51.3ft/mi; length= 1.0mi									
147	2484000	Yockanookany River near Kosciusko, MS	1938-88	6,930	12,200	16,600	22,900	28,100	33,400	39,300	47,100
		note: * mean= 3.837; sd= 0.280; skew= 0.090	1933	9	10	11	14	17	19	22	26
		region 1 area= 303 sqmi; slope= 3.3ft/mi; length= 37.1mi									
148	2484500	Yockanookany River near Ofahoma, MS	1938-88	7,540	12,900	17,200	23,600	28,800	34,300	40,200	48,200
		note: * mean= 3.871; sd= 0.267; skew= 0.021		9	9	11	14	16	18	21	25
		region 1 area= 469 sqmi; slope= 2.2ft/mi; length= 73.9mi									
149	2484600	Coffee Bogue near Ludlow, MS	1971-87	3,570	5,400	6,760	8,620	10,100	11,600	13,300	15,300
		note: * mean= 3.555; sd= 0.203; skew= -0.054		12	12	13	16	19	21	24	28
		region 1 area= 77.0sqmi; slope= 3.8ft/mi; length= 23.5mi									
150	2484750	Red Cane Creek tributary near Pisgah, MS	1965-88	61	91	113	142	166	187	212	240
		note: * mean= 1.779; sd= 0.201; skew= -0.064		10	10	11	14	16	19	22	25
		region 1 area= 0.10sqmi; slope= 73.3ft/mi; length= 0.4mi									
151	2484760	Fannesgusha Creek near Sand Hill, MS	1971-88	3,140	5,310	7,000	9,230	11,000	12,600	14,500	16,800
		note: * mean= 3.499; sd= 0.265; skew= 0.040		14	14	16	19	21	24	27	31
		region 1 area= 52.3sqmi; slope= 7.8ft/mi; length= 12.2mi									
152	2485000	Pearl River at Meeks Bridge near Canton, MS	1938-63	27,100	45,600	60,000	80,700	97,700	116,000	136,000	166,000
		note: *fg mean= 4.435; sd= 0.267; skew= 0.050	1979,83	13	14	16	22	27	32	39	47
		region 4 area= 2,760 sqmi; slope= 1.1ft/mi; length= 144.0mi	1933								
153	2485380	Hollybush Creek tributary no.1 near Pisgah, MS	1965-84	227	308	362	431	486	538	597	666
		note: * mean= 2.357; sd= 0.155; skew= -0.100		8	9	10	12	14	17	19	22
		region 1 area= 0.59sqmi; slope= 23.0ft/mi; length= 1.2mi									
154	2485385	Hollybush Creek tributary no.2 near Pisgah, MS	1965-77	149	209	250	302	343	380	425	474
		note: * mean= 2.183; sd= 0.175; skew= -0.078		11	12	13	16	18	21	24	27
		region 1 area= 0.25sqmi; slope= 53.6ft/mi; length= 0.7mi									
155	2485392	Clear Creek tributary near Pelahatchie, MS	1965-84	84	116	138	167	191	213	238	267
		note: * mean= 1.921; sd= 0.165; skew= -0.092		9	9	10	13	15	17	20	23
		region 1 area= 0.12sqmi; slope= 141 ft/mi; length= 0.5mi									
156	2485500	Pelahatchie Creek near Fannin, MS	1938-39	6,790	12,600	17,000	22,300	26,200	30,000	34,300	39,500
		note: * mean= 3.825; sd= 0.359; skew= -0.222	1950-65	19	17	18	21	23	26	29	33
		region 1 area= 206 sqmi; slope= 3.5ft/mi; length= 32.6mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
157	2485650	Purple Creek near Jackson, MS note: dg mean= 3.366; sd= 0.186; skew= -0.003 region 1 area= 6.12sqmi; slope= 16.2ft/mi; length= 6.5mi	1952-88	1,160 8	1,670 9	2,010 10	2,460 13	2,800 16	3,140 20	3,490 23	3,970 28
158	2485690	Hanging Moss Creek tributary near Tougaloo, MS note: * mean= 2.680; sd= 0.241; skew= 0.103 region 1 area= 3.56sqmi; slope= 20.9ft/mi; length= 4.9mi	1952-68	480 13	782 14	1,020 16	1,340 19	1,590 21	1,820 24	2,100 27	2,420 31
159	2485700	Hanging Moss Creek at Jackson, MS note: *bdg mean= 3.386; sd= 0.162; skew= 0.022 region 1 area= 16.8sqmi; slope= 12.6ft/mi; length= 7.4mi	1953-88	2,430 7	3,330 8	3,930 9	4,690 12	5,260 14	5,830 17	6,410 20	7,190 25
160	2485800	Eubanks Creek at Jackson, MS note: dg mean= 3.333; sd= 0.121; skew= 0.182 region 1 area= 5.19sqmi; slope= 23.9ft/mi; length= 3.4mi	1953-88	2,140 5	2,710 6	3,090 7	3,560 9	3,910 12	4,260 14	4,620 17	5,090 20
161	2485900	Neely Creek near Brandon, MS note: * mean= 2.492; sd= 0.301; skew= 0.301 region 1 area= 1.09sqmi; slope= 40.1ft/mi; length= 1.4mi	1964-84	303 15	533 16	710 17	920 21	1,080 23	1,220 26	1,390 29	1,570 33
162	2485950	Town Creek at Jackson, MS note: dg mean= 3.447; sd= 0.098; skew= 0.104 region 1 area= 11.4sqmi; slope= 14.2ft/mi; length= 6.7mi	1953-84 1914,21 1885	2,790 4	3,380 5	3,750 6	4,190 8	4,510 9	4,820 11	5,120 13	5,520 16
163	2486000	Pearl River at Jackson, MS note: ag mean= 4.430; sd= 0.252; skew= 0.050 region 4 area= 3,170 sqmi; slope= 1.0ft/mi; length= 177.0mi	1900-88 1874,81	26,800 6	43,800 7	56,800 8	75,000 11	90,000 13	106,000 16	123,000 19	148,000 23
164	2486100	Lynch Creek at Jackson, MS note: dg mean= 3.558; sd= 0.145; skew= 0.000 region 1 area= 12.1sqmi; slope= 15.5ft/mi; length= 6.5mi	1953-88	3,620 6	4,790 7	5,550 8	6,490 10	7,180 12	7,860 15	8,540 17	9,450 21
165	2486115	Three Mile Creek at Jackson, MS note: dg mean= 2.999; sd= 0.181; skew= -0.271 region 1 area= 1.05sqmi; slope= 44.4ft/mi; length= 1.8mi	1962-78 1981-88	1,020 9	1,420 9	1,680 10	1,990 13	2,210 16	2,420 19	2,620 23	2,890 27
166	2486240	Richland Creek tributary near Brandon, MS note: * mean= 1.692; sd= 0.257; skew= -0.187 region 1 area= 0.12sqmi; slope= 60.5ft/mi; length= 0.6mi	1966-77	55 16	90 16	117 17	151 19	179 22	202 25	232 27	262 31
167	2486350	Cany Creek at Jackson, MS note: dg mean= 3.459; sd= 0.119; skew= 0.012 region 1 area= 8.38sqmi; slope= 19.8ft/mi; length= 5.4mi	1961-77	2,870 9	3,620 10	4,080 11	4,650 15	5,050 18	5,450 22	5,830 26	6,340 32
168	2486690	Rhodes Creek near Terry, MS note: * mean= 3.220; sd= 0.269; skew= -0.133 region 1 area= 21.0sqmi; slope= 11.1ft/mi; length= 12.0mi	1948-69 1973	1,660 13	2,760 13	3,570 14	4,620 17	5,440 20	6,210 22	7,110 25	8,180 29

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent) 2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
169	2487230	Strong River near Morton, MS note: * mean= 3.321; sd= 0.245; skew= 0.118 region 1 area= 16.2sqmi; slope= 10.7ft/mi; length= 5.6mi	1959-69 1974-75	1,970 15	3,120 15	3,970 17	5,000 20	5,810 23	6,550 25	7,440 28	8,460 32
170	2487300	Strong River near Puckett, MS note: * mean= 3.780; sd= 0.307; skew= 0.232 region 1 area= 248 sqmi; slope= 2.6ft/mi; length= 44.1mi	1955-88 1950	5,990 12	11,000 13	15,400 15	21,300 18	25,900 21	30,400 24	35,600 27	42,100 31
171	2487500	Strong River at D'Lo, MS note: * mean= 3.923; sd= 0.239; skew= 0.200 region 1 area= 425 sqmi; slope= 2.4ft/mi; length= 61.7mi	1929-88 1900	8,280 7	13,500 8	17,800 10	24,000 13	29,200 15	34,700 18	40,800 20	49,100 24
172	2487600	Dabbs Creek near D'Lo, MS note: * mean= 3.326; sd= 0.245; skew= 0.551 region 1 area= 57.2sqmi; slope= 4.5ft/mi; length= 29.3mi	1948-69 1980	2,060 12	3,520 14	4,830 16	6,710 20	8,190 23	9,640 26	11,300 29	13,300 33
173	2487620	Riles Creek near Mendenhall, MS note: * mean= 3.310; sd= 0.341; skew= 0.222 region 1 area= 25.5sqmi; slope= 13.9ft/mi; length= 12.0mi	1949-50 1954-70 1974	1,930 17	3,560 17	4,810 19	6,290 22	7,410 24	8,430 27	9,710 30	11,100 34
174	2487670	Boggans Ditch near Mendenhall, MS note: * mean= 2.340; sd= 0.337; skew= -0.072 region 1 area= 0.91sqmi; slope= 71.1ft/mi; length= 1.3mi	1955-84	231 14	432 14	591 15	795 18	953 21	1,090 23	1,260 26	1,440 30
175	2487690	Baking Powder Draw near Prentiss, MS note: * mean= 2.053; sd= 0.467; skew= -0.316 region 1 area= 0.82sqmi; slope= 63.9ft/mi; length= 1.3mi	1955-77	159 20	339 18	486 19	671 21	814 24	928 26	1,070 29	1,220 33
176	2487710	Barrets Branch near Pinola, MS note: * mean= 2.388; sd= 0.334; skew= 0.039 region 1 area= 0.88sqmi; slope= 47.1ft/mi; length= 2.1mi	1955-77	240 16	429 16	569 17	732 20	860 23	964 25	1,100 28	1,240 32
177	2487750	Big Creek near Pinola, MS note: * mean= 3.356; sd= 0.278; skew= 0.300 region 1 area= 45.9sqmi; slope= 6.2ft/mi; length= 22.0mi	1948-69	2,210 14	3,860 15	5,200 16	6,990 20	8,380 23	9,720 25	11,300 28	13,100 32
178	2487770	Bradleys Ditch near Pinola, MS note: * mean= 2.335; sd= 0.222; skew= -0.037 region 1 area= 0.54sqmi; slope= 27.5ft/mi; length= 2.7mi	1955-77 1983	207 11	309 11	377 12	459 15	522 18	578 20	647 23	726 27
179	2487900	Copiah Creek near Hazlehurst, MS note: * mean= 3.680; sd= 0.338; skew= 0.284 region 1 area= 47.4sqmi; slope= 10.7ft/mi; length= 12.1mi	1955-88 1950,53	4,290 13	7,710 14	10,100 16	12,900 20	14,900 22	16,700 25	19,100 28	21,700 32
180	2488000	Pearl River at Rockport, MS note: *fg mean= 4.506; sd= 0.203; skew= 0.100 region 4 area= 4,560 sqmi; slope= 1.0ft/mi; length= 242.0mi	1938-51 1985-88 1900,79,83 1874	31,800 11	47,400 13	58,700 15	73,900 20	85,900 25	98,600 30	112,000 36	131,000 44

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
181	2488340	Small Pine Ditch near Monticello, MS	1955-77	116	172	211	261	299	335	377	424
	note: *	mean= 2.072; sd= 0.201; skew= -0.011	1980-84	9	10	11	14	16	19	21	25
	region 1	area= 0.16sqmi; slope= 126 ft/mi; length= 0.5mi									
182	2488500	Pearl River near Monticello, MS	1924-88	35,000	50,200	60,800	74,900	85,800	97,100	109,000	125,000
	note: *g	mean= 4.547; sd= 0.183; skew= 0.100	1900,02	6	6	7	10	12	15	17	21
	region 4	area= 4,990 sqmi; slope= 1.0ft/mi; length= 273.0mi	1874								
183	2488510	Roadside Park Ditch near Monticello, MS	1955-77	118	178	224	287	339	385	442	505
	note: *	mean= 2.077; sd= 0.203; skew= 0.199	1983	10	11	13	16	18	21	24	28
	region 1	area= 0.25sqmi; slope= 103 ft/mi; length= 0.8mi									
184	2488540	New Hebron Gulley at New Hebron, MS	1965-77	493	952	1,290	1,650	1,940	2,170	2,480	2,790
	note: *	mean= 2.684; sd= 0.414; skew= 0.129	1957,83	21	20	21	23	26	28	31	35
	region 1	area= 2.50sqmi; slope= 44.7ft/mi; length= 2.2mi									
185	2488550	Coines Draw near Prentiss, MS	1955-84	99	224	324	440	529	595	687	775
	note: *	mean= 1.904; sd= 0.487; skew= 0.113		19	19	20	23	25	28	31	35
	region 1	area= 0.34sqmi; slope= 96.4ft/mi; length= 0.8mi									
186	2488680	Plum Ditch near Prentiss, MS	1955-76	79	139	189	256	310	356	414	474
	note: *	mean= 1.876; sd= 0.284; skew= 0.158	1983	14	14	16	19	22	24	27	31
	region 1	area= 0.23sqmi; slope= 90.9ft/mi; length= 0.9mi									
187	2488700	Whitesand Creek near Oak Vale, MS	1966-88	4,350	8,940	12,600	17,200	20,600	23,800	27,700	32,200
	note: *	mean= 3.628; sd= 0.407; skew= 0.080		18	18	19	22	24	27	30	34
	region 1	area= 130 sqmi; slope= 8.7ft/mi; length= 30.8mi									
188	2489000	Pearl River near Columbia, MS	1905-86	36,300	51,100	61,500	75,300	86,000	97,100	109,000	125,000
	note: *g	mean= 4.564; sd= 0.174; skew= 0.150		5	6	7	9	11	13	16	19
	region 4	area= 5,720 sqmi; slope= 1.0ft/mi; length= 326.0mi	1874,1900								
189	2489030	Elmers Draw near Columbia, MS	1955-88	355	585	754	959	1,120	1,260	1,430	1,630
	note: *	mean= 2.571; sd= 0.269; skew= 0.165		11	12	13	17	19	22	25	29
	region 1	area= 0.91sqmi; slope= 68.6ft/mi; length= 1.4mi									
190	2489160	Kokomo Draw at Kokomo, MS	1955-77	353	629	835	1,080	1,270	1,420	1,620	1,840
	note: *	mean= 2.560; sd= 0.317; skew= 0.185	1983	15	15	17	20	23	25	28	32
	region 1	area= 1.26sqmi; slope= 42.2ft/mi; length= 1.5mi									
191	2489200	Ten Mile Creek near Columbia, MS	1953-70	2,110	4,340	6,090	8,190	9,790	11,200	13,000	14,900
	note: *	mean= 3.298; sd= 0.419; skew= 0.114		20	19	21	23	25	28	31	35
	region 1	area= 38.5sqmi; slope= 16.8ft/mi; length= 13.8mi									
192	2489240	Lower Little Creek near Baxterville, MS	1961-70	3,810	7,690	10,800	14,600	17,500	20,100	23,300	26,700
	note: *	mean= 3.492; sd= 0.395; skew= -0.079		23	21	21	24	26	28	31	35
	region 1	area= 81.5sqmi; slope= 13.1ft/mi; length= 11.2mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent) 2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
193	2489500	Pearl River near Bogalusa, LA	1938-88	42,500	62,600	77,200	97,000	113,000	129,000	147,000	172,000
		note: *g mean= 4.634; sd= 0.196; skew= 0.150		7	8	9	13	16	19	22	27
		region 4 area= 6,570 sqmi; slope= 1.0ft/mi; length= 338.0mi									
194	2490105	Bogue Lusa Creek at Bogalusa, LA	1964-85	2,450	4,900	6,980	9,820	12,000	14,200	16,600	19,500
		note: * mean= 3.345; sd= 0.351; skew= 0.001		16	16	18	20	23	26	28	32
		region 1 area= 72.7sqmi; slope= 9.6ft/mi; length= 21.4mi									
195	2490250	Bogue Chitto near Brookhaven, MS	1953-70	2,260	4,050	5,330	6,810	7,900	8,920	10,100	11,600
		note: * mean= 3.380; sd= 0.346; skew= 0.074		18	18	19	22	24	27	30	34
		region 1 area= 28.3sqmi; slope= 6.3ft/mi; length= 10.6mi									
196	2490300	Big Creek at Bogue Chitto, MS	1952-70	3,300	5,900	7,820	10,100	11,900	13,500	15,400	17,600
		note: * mean= 3.532; sd= 0.331; skew= -0.062		16	16	17	20	23	25	28	32
		region 1 area= 55.1sqmi; slope= 5.8ft/mi; length= 16.2mi									
197	2490500	Bogue Chitto near Tylertown, MS	1945-88	13,300	24,700	33,300	43,900	51,600	59,100	67,400	77,700
		note: * mean= 4.120; sd= 0.349; skew= -0.313	1936	12	12	12	15	18	20	23	27
		region 1 area= 492 sqmi; slope= 3.3ft/mi; length= 59.2mi									
198	2490550	Middle Fork Hickory Flat near Tylertown, MS	1953-84	466	746	944	1,180	1,370	1,530	1,730	1,950
		note: * mean= 2.694; sd= 0.258; skew= 0.160		11	12	14	17	19	22	25	29
		region 1 area= 1.46sqmi; slope= 38.3ft/mi; length= 2.4mi									
199	2490700	Union Creek near Tylertown, MS	1953-69	985	2,040	2,880	3,870	4,630	5,270	6,080	6,960
		note: * mean= 2.934; sd= 0.429; skew= 0.083	1900	21	20	21	23	25	28	31	35
		region 1 area= 12.4sqmi; slope= 16.8ft/mi; length= 6.6mi									
200	2490750	McGees Creek at Tylertown, MS	1952-74	4,360	8,500	11,900	16,400	19,900	23,300	27,200	31,800
		note: * mean= 3.617; sd= 0.353; skew= -0.052	1980,83	15	15	16	19	22	24	27	31
		region 1 area= 152 sqmi; slope= 5.3ft/mi; length= 32.8mi	1900,43								
201	2491500	Bogue Chitto at Franklinton, LA	1922-88	23,800	37,500	50,000	65,500	78,200	92,200	99,800	122,000
		note: * mean= 4.307; sd= 0.322; skew= -0.281	1900	9	9	9	10	11	12	13	15
		region 4 area= 985 sqmi; slope= 4.4ft/mi; length= 65.3mi									
202	2492000	Bogue Chitto near Bush, LA	1938-88	19,100	34,000	45,700	60,500	72,900	86,300	92,400	113,000
		note: * mean= 4.267; sd= 0.307; skew= -0.154		10	10	10	11	12	13	14	15
		region 4 area= 1,210 sqmi; slope= 4.0ft/mi; length= 92.4mi									
203	2492350	East Hobolochitto Creek at Picayune, MS	1957-66	4,000	6,160	8,110	11,000	13,500	15,900	18,600	22,000
		note: * mean= 3.618; sd= 0.188; skew= 0.596	1969-71	11	13	15	19	22	25	28	32
		region 1 area= 114 sqmi; slope= 5.7ft/mi; length= 32.7mi	1916,28,74								
204	2492360	West Hobolochitto Creek near McNeill, MS	1966-88	6,010	9,970	13,100	17,300	20,700	24,100	27,900	32,600
		note: * mean= 3.784; sd= 0.253; skew= 0.053		12	13	14	17	20	23	25	29
		region 1 area= 175 sqmi; slope= 5.2ft/mi; length= 33.9mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
205	2492600	Pearl River at Pearl River, LA	1900-88	56,500	87,400	111,000	143,000	169,000	198,000	228,000	272,000
		note: gh mean= 4.757; sd= 0.221; skew= 0.150	1874	5	6	7	10	12	15	18	21
		region 4 area= 8,590 sqmi; slope= -- ; length= --									
206	3592718	Little Yellow Creek near Burnsville, MS	1974-88	1,790	3,370	4,620	6,170	7,370	8,440	9,750	11,200
		note: * mean= 3.217; sd= 0.343; skew= -0.093		18	18	19	21	24	26	29	33
		region 1 area= 24.7sqmi; slope= 13.9ft/mi; length= 7.4mi									
207	3592800	Yellow Creek near Doskie, MS	1938-61	4,930	9,010	12,400	17,100	20,900	24,500	28,700	33,700
		note: * mean= 3.675; sd= 0.301; skew= 0.004	1973-78	12	13	14	17	20	23	25	29
		region 1 area= 143 sqmi; slope= 5.5ft/mi; length= 16.8mi	1902								
208	3593010	Chambers Creek near Kendrick, MS	1940-61	2,140	3,910	5,160	6,570	7,580	8,480	9,590	10,800
		note: * mean= 3.350; sd= 0.368; skew= -0.220		17	16	17	20	22	25	28	32
		region 1 area= 21.1sqmi; slope= 11.8ft/mi; length= 8.8mi									
209	7029252	Pool Branch near Ripley, MS	1965-77	316	453	553	686	796	897	1,020	1,160
		note: * mean= 2.499; sd= 0.175; skew= -0.089		12	12	13	16	19	21	24	28
		region 1 area= 1.24sqmi; slope= 36.0ft/mi; length= 2.0mi									
210	7029270	Hatchie River near Walnut, MS	1947-80	7,230	12,500	16,600	22,300	27,000	31,700	36,900	43,600
		note: * mean= 3.849; sd= 0.271; skew= -0.058		11	11	13	15	18	20	23	27
		region 1 area= 272 sqmi; slope= 4.4ft/mi; length= 32.4mi									
211	7029300	Tuscumbia River Canal near Corinth, MS	1950-80	8,550	14,500	19,200	25,800	31,000	36,300	42,100	49,600
		note: * mean= 3.930; sd= 0.260; skew= 0.046		11	12	13	16	19	21	24	28
		region 1 area= 278 sqmi; slope= 3.9ft/mi; length= 25.1mi									
212	7029400	Hatchie River at Pocahontas, TN	1942-77	15,300	25,900	35,300	49,400	63,200	79,100	88,600	114,000
		note: * mean= 4.175; sd= 0.250; skew= 0.071		10	10	11	12	12	13	14	16
		region 4 area= 837 sqmi; slope= 2.5ft/mi; length= 49.1mi									
213	7029412	Hurricane Creek near Walnut, MS	1953-70	1,440	1,590	1,690	1,780	1,860	1,930	2,000	2,090
		note: c mean= 3.156; sd= 0.051; skew= -0.351		3	3	3	4	5	6	7	9
		region 1 area= 20.2sqmi; slope= 17.1ft/mi; length= 8.0mi									
214	7030365	Wesley Branch near Walnut, MS	1966-77	256	476	680	971	1,210	1,420	1,680	1,950
		note: c mean= 2.322; sd= 0.261; skew= 0.093		17	17	18	21	24	26	29	33
		region 1 area= 2.17sqmi; slope= 63.5ft/mi; length= 2.4mi									
215	7030500	Wolf River at Rossville, TN	1930-71	9,850	16,600	21,400	27,700	32,700	37,600	43,100	49,900
		note: * mean= 3.966; sd= 0.285; skew= -0.480		11	10	10	13	15	18	20	24
		region 1 area= 503 sqmi; slope= 3.0ft/mi; length= 58.9mi									
216	7266000	Cane Creek near New Albany, MS	1939-41	3,020	4,540	5,570	6,920	7,890	8,990	9,920	11,300
		note: * mean= 3.478; sd= 0.213; skew= -0.107	1950-74	10	10	11	14	16	19	21	25
		region 2 area= 22.2sqmi; slope= 12.8ft/mi; length= 9.7mi									

Table 1.--Flood quantities, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) / bottom line-- Standard error of T-year flood estimate (percent)							
217	7267000	Hell Creek near New Albany, MS	1939-42	4,220	5,680	6,630	7,800	8,660	9,510	10,400	11,500
		note: *abg mean= 3.624; sd= 0.155; skew= -0.055	1952-88	9	10	11	15	18	22	26	31
		region 2 area= 26.8sqmi; slope= 8.6ft/mi; length= 12.7mi									
218	7267200	Cracker Ditch near Pontotoc, MS	1955-58	124	169	198	239	270	303	330	372
		note: * mean= 2.076; sd= 0.157; skew= -0.113	1962-75	9	9	10	13	15	18	20	24
		region 2 area= 0.23sqmi; slope= 91.6ft/mi; length= 0.8mi									
219	7268000	Little Tallahatchie River at Etta, MS	1937-88	27,800	43,100	54,000	68,600	79,800	92,200	104,000	120,000
		note: * mean= 4.439; sd= 0.229; skew= -0.152		8	8	9	11	13	16	18	21
		region 2 area= 526 sqmi; slope= 5.3ft/mi; length= 32.0mi									
220	7268200	Fice Creek at Etta, MS	1952-70	1,620	2,910	3,740	4,620	5,070	5,700	6,100	6,780
		note: * mean= 3.228; sd= 0.374; skew= 0.052		18	19	20	24	26	28	31	34
		region 2 area= 8.78sqmi; slope= 15.1ft/mi; length= 6.2mi									
221	7268500	Cypress Creek near Etta, MS	1939-42	4,850	7,790	9,870	12,600	14,600	16,700	18,800	21,700
		note: ag mean= 3.675; sd= 0.254; skew= -0.233	1952-88	11	11	13	16	20	24	28	34
		region 2 area= 28.5sqmi; slope= 9.4ft/mi; length= 8.8mi									
222	7269000	North Tippah Creek near Ripley, MS	1939-42	4,050	5,530	6,460	7,590	8,400	9,190	9,960	11,000
		note: *abg mean= 3.602; sd= 0.165; skew= -0.190	1952-80	9	10	11	14	17	21	25	30
		region 2 area= 19.3sqmi; slope= 16.1ft/mi; length= 7.7mi	1983-88,1948								
223	7269990	Tippah Creek near Potts Camp, MS	1943-83	11,400	16,600	20,300	25,600	29,900	35,000	39,800	46,500
		note: * mean= 4.038; sd= 0.192; skew= -0.239		10	10	11	14	16	19	21	25
		region 2 area= 355 sqmi; slope= 3.4ft/mi; length= 43.4mi									
224	7271000	Clear Creek near Oxford, MS	1939-41	2,910	4,200	5,060	6,110	6,840	7,620	8,280	9,240
		note: * mean= 3.466; sd= 0.195; skew= -0.153	1950-74	9	9	10	13	15	17	20	23
		region 2 area= 10.4sqmi; slope= 25.4ft/mi; length= 4.2mi									
225	7272500	Little Tallahatchie River at Sardis Dam, MS	1940-83	--	--	--	--	--	--	--	--
		note: ak mean= 3.692; sd= -- ; skew= --		--	--	--	--	--	--	--	--
		region 4 area= 1,540 sqmi; slope= 2.9ft/mi; length= 70.3mi									
226	7273000	Tallahatchie River near Sardis, MS	1929-60	--	--	--	--	--	--	--	--
		note: *abk mean= 3.825; sd= -- ; skew= --		--	--	--	--	--	--	--	--
		region 4 area= 1,600 sqmi; slope= 2.7ft/mi; length= 77.9mi									
227	7273550	Little Tallahatchie River(Panola-Quitman Floodway) near Batesville, MS	1942-63	12,200	17,300	21,000	26,100	30,300	34,800	39,600	46,600
		note: ag mean= 4.098; sd= 0.169; skew= 0.400		10	12	15	20	26	32	38	48
		region 4 area= 1,770 sqmi; slope= 2.3ft/mi; length= 94.8mi	1937,40								
228	7274000	Yocona River near Oxford, MS	1947-88	9,800	17,300	23,400	32,000	38,700	46,600	53,500	63,200
		note: * mean= 3.987; sd= 0.289; skew= 0.111		11	11	13	17	19	22	25	28
		region 2 area= 254 sqmi; slope= 4.1ft/mi; length= 34.8mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
229	7274250	Otoucalofa Creek at Water Valley, MS note: * mean= 3.643; sd= 0.239; skew= 0.251 region 2 area= 84.1sqmi; slope= 7.9ft/mi; length= 19.1mi	1952-88	4,470 10	7,340 11	9,740 13	13,400 16	16,300 19	19,700 22	22,700 25	27,100 28
230	7275000	Yocona River at Enid Dam near Enid, MS note: *abk mean= 3.384; sd= -- ; skew= -- region 2 area= 606 sqmi; slope= 3.2ft/mi; length= 63.5mi	1927-83	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
231	7275500	Long Creek at Courtland, MS note: * mean= 3.932; sd= 0.226; skew= 0.075 region 2 area= 62.3sqmi; slope= 13.8ft/mi; length= 11.6mi	1940-43 1952-88 1948	8,410 9	13,000 10	16,400 12	20,900 15	24,000 17	27,700 20	30,700 22	35,200 26
232	7276000	Coldwater River near Lewisburg, MS note: * mean= 3.995; sd= 0.295; skew= -0.570 region 2 area= 213 sqmi; slope= 4.2ft/mi; length= 49.9mi	1940-58	10,400 15	17,300 14	21,900 14	27,200 18	30,700 20	35,300 23	38,900 26	44,100 30
233	7277000	Pigeon Roost Creek near Lewisburg, MS note: ag mean= 3.882; sd= 0.232; skew= 0.360 region 2 area= 229 sqmi; slope= 8.7ft/mi; length= 26.8mi	1940-58	7,380 13	11,800 16	15,400 20	20,700 28	25,300 35	30,400 43	36,200 52	45,000 66
234	7277500	Coldwater River near Coldwater, MS note: * mean= 4.243; sd= 0.355; skew= -0.249 region 2 area= 634 sqmi; slope= 3.2ft/mi; length= 70.0mi	1929-42	19,300 20	35,700 19	48,000 20	63,900 23	74,600 25	88,800 28	99,500 31	115,000 34
235	7277550	James Wolf Creek tributary near Looxahoma, MS note: * mean= 2.345; sd= 0.245; skew= -0.309 region 2 area= 0.29sqmi; slope= 149 ft/mi; length= 0.6mi	1965-77	242 16	372 15	455 16	563 19	630 22	701 25	743 27	823 31
236	7277700	Hickahala Creek near Senatobia, MS note: * mean= 3.977; sd= 0.226; skew= -0.027 region 2 area= 122 sqmi; slope= 9.9ft/mi; length= 19.6mi	1943-58	9,650 13	15,100 14	19,200 15	24,800 18	29,000 21	34,000 24	38,000 27	43,800 30
237	7277730	Senatobia Creek near Senatobia, MS note: * mean= 4.155; sd= 0.096; skew= -0.330 region 2 area= 82.0sqmi; slope= 10.3ft/mi; length= 15.8mi	1943-58	14,100 6	17,000 6	18,600 6	20,500 8	21,700 10	23,000 11	24,300 13	26,000 16
238	7278500	Coldwater River at Arkabutla Dam, MS note: ak mean= 3.659; sd= -- ; skew= -- region 4 area= 1,000 sqmi; slope= 2.9ft/mi; length= 80.6mi	1938-83	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
239	7279300	Coldwater River at Prichard, MS note: afg mean= 3.772; sd= 0.067; skew= -0.450 region 4 area= 1,210 sqmi; slope= -- ; length= --	1946-58	5,980 5	6,750 4	7,140 5	7,550 6	7,810 8	8,040 9	8,240 11	8,480 13
240	7279500	Coldwater River at Savage, MS note: *bi mean= 4.072; sd= 0.377; skew= -0.262 region 4 area= 1,230 sqmi; slope= 2.8ft/mi; length= 94.9mi	1909-12 1936-42	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
241	7279600	Arkabutla Creek near Arkabutla, MS note: * mean= 4.045; sd= 0.115; skew= -0.342 region 2 area= 98.1sqmi; slope= 7.5ft/mi; length= 21.0mi	1947-58	11,000 8	13,800 8	15,400 9	17,300 11	18,700 13	20,400 15	21,900 17	24,100 20
242	7279970	Bobo Bayou at Bobo, MS note: gh mean= 3.228; sd= 0.041; skew= -0.722 region 3 area= 92.0sqmi; slope= 7.1ft/mi; length= 19.6mi	1946-58	1,710 3	1,830 2	1,890 3	1,940 3	1,970 5	2,000 6	2,020 7	2,040 8
243	7280000	Tallahatchie River near Lambert, MS note: ag mean= 4.046; sd= 0.092; skew= -0.300 region 3 area= 1,980 sqmi; slope= 2.0ft/mi; length= 135.2mi	1936-83	11,200 4	13,300 4	14,400 4	15,700 5	16,500 6	17,300 7	18,000 9	18,900 10
244	7280270	Tillatoba Creek below Oakland, MS note: * mean= 3.725; sd= 0.163; skew= -0.190 region 2 area= 37.1sqmi; slope= 11.7ft/mi; length= 12.3mi	1975-84	5,210 12	7,180 12	8,430 13	10,000 16	11,200 19	12,600 21	13,700 24	15,500 28
245	7280340	South Fork Tillatoba Creek near Charleston, MS note: * mean= 3.784; sd= 0.219; skew= -0.208 region 2 area= 53.9sqmi; slope= 9.7ft/mi; length= 15.2mi	1976-88	6,020 14	9,090 14	11,100 15	13,700 18	15,500 21	17,600 23	19,300 26	21,800 30
246	7281000	Tallahatchie River at Swan Lake, MS note: ag mean= 4.258; sd= 0.131; skew= 0.300 region 3 area= 5,130 sqmi; slope= 1.8ft/mi; length= 133.6mi	1930-83	17,900 6	23,300 7	26,900 8	31,700 11	35,300 14	39,100 17	42,900 21	48,300 25
247	7282000	Yalobusha River at Calhoun City, MS note: *abg mean= 4.393; sd= 0.258; skew= -0.273 region 2 area= 305 sqmi; slope= 3.0ft/mi; length= 30.2mi	1949-88	25,400 14	41,000 14	52,000 16	66,100 20	76,800 25	87,500 30	98,300 36	113,000 44
248	7282300	Sabougla Creek tributary at Sabougla, MS note: * mean= 2.240; sd= 0.178; skew= 0.102 region 2 area= 0.50sqmi; slope= 38.2ft/mi; length= 1.0mi	1967-77	180 12	258 13	314 15	395 19	454 21	519 24	568 27	647 30
249	7282500	Yalobusha River at Graysport, MS note: * mean= 4.259; sd= 0.275; skew= -0.066 region 2 area= 607 sqmi; slope= 2.3ft/mi; length= 56.9mi	1940-49	18,300 18	30,900 18	40,400 20	53,100 23	62,300 25	74,400 28	83,900 31	97,300 34
250	7283000	Skuna River at Bruce, MS note: *abg mean= 4.252; sd= 0.255; skew= -0.277 region 2 area= 254 sqmi; slope= 3.6ft/mi; length= 31.2mi	1948-88	18,300 13	29,400 13	37,100 15	47,100 19	54,500 23	62,000 28	69,500 34	79,500 41
251	7283490	Caney Creek near Coffeeville, Ms note: * mean= 2.942; sd= 0.139; skew= -0.246 region 2 area= 1.97sqmi; slope= 33.5ft/mi; length= 2.8mi	1955-84	876 7	1,140 7	1,290 7	1,470 9	1,600 11	1,720 13	1,840 15	1,990 18
252	7283500	Skuna River near Coffeeville, MS note: *bi mean= 4.182; sd= 0.208; skew= 0.218 region 2 area= 435 sqmi; slope= 2.9ft/mi; length= 52.0mi	1940-49	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
253	7285000	Yalobusha River at Grenada Dam near Grenada, MS note: ak mean= 3.620; sd= -- ; skew= -- region 4 area= 1,320 sqmi; slope= 2.2ft/mi; length= 66.1mi	1954-83	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
254	7285100	Tie Plant Branch near Grenada, MS note: * mean= 1.967; sd= 0.153; skew= 0.028 region 2 area= 0.17sqmi; slope= 93.7ft/mi; length= 0.6mi	1966-77 1955	97 10	133 11	158 12	194 15	221 18	251 21	275 23	313 27
255	7285500	Yalobusha River at Grenada, MS note: *abeg mean= 4.036; sd= 0.147; skew= 0.950 region 4 area= 1,550 sqmi; slope= 2.2ft/mi; length= 69.3mi	1909-11 1927-58	10,300 18	14,000 22	-- --	-- --	-- --	-- --	-- --	-- --
256	7285700	Long Creek near Cascilla, MS note: * mean= 2.955; sd= 0.166; skew= 0.007 region 2 area= 1.64sqmi; slope= 45.1ft/mi; length= 1.5mi	1965-88	886 8	1,220 9	1,430 10	1,700 13	1,890 15	2,080 18	2,240 20	2,480 23
257	7286010	Brushy Creek tributary near Oxberry, MS note: c mean= 2.844; sd= 0.169; skew= 0.096 region 2 area= 1.49sqmi; slope= 70.1ft/mi; length= 1.7mi	1965-77	702 11	988 12	1,180 14	1,450 17	1,640 20	1,850 22	2,000 25	2,260 29
258	7286047	Tippo Bayou tributary at Phillip, MS note: gh mean= 1.256; sd= 0.115; skew= 0.273 region 3 area= 0.04sqmi; slope= 31.7ft/mi; length= 0.3mi	1967-77	18 9	22 10	26 12	29 17	32 21	35 26	38 31	42 38
259	7286200	Yalobusha River at Whaley, MS note: aeg mean= 3.938; sd= 0.105; skew= 0.450 region 4 area= 1,960 sqmi; slope= 2.0ft/mi; length= 102.9mi	1938-59	8,510 11	10,500 14	11,900 18	-- --	-- --	-- --	-- --	-- --
260	7286500	Thompson Creek at McCarley, MS note: * mean= 3.399; sd= 0.102; skew= 0.097 region 2 area= 14.4sqmi; slope= 19.5ft/mi; length= 8.4mi	1950-66	2,500 6	3,080 7	3,470 8	3,990 10	4,390 12	4,850 14	5,270 17	5,890 20
261	7286520	Big Sand Creek trib. near North Carrollton, MS note: * mean= 1.674; sd= 0.081; skew= -0.022 region 2 area= 0.06sqmi; slope= 106 ft/mi; length= 0.5mi	1965-84	48 4	56 5	61 5	66 7	71 8	75 10	79 11	85 14
262	7286700	Big Sand Creek at Carrollton, MS note: * mean= 3.960; sd= 0.256; skew= -0.174 region 2 area= 74.1sqmi; slope= 10.6ft/mi; length= 13.6mi	1952-70	8,910 14	14,200 14	17,900 15	22,400 18	25,300 21	28,900 24	31,500 26	35,500 30
263	7286800	Big Sand Creek at Valley Hill, MS note: c mean= 4.254; sd= 0.142; skew= 0.012 region 2 area= 110 sqmi; slope= 6.8ft/mi; length= 23.0mi	1947-58	16,700 10	21,900 10	24,900 12	28,400 15	30,600 17	33,600 20	36,000 23	39,600 26
264	7287000	Yazoo River at Greenwood, MS note: ag mean= 4.361; sd= 0.114; skew= 0.050 region 3 area= 7,450 sqmi; slope= 1.3ft/mi; length= 187.3mi	1908-12 1928-83	22,900 5	28,600 6	32,100 7	36,400 9	39,500 11	42,600 13	45,600 15	49,500 19

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
265	7287050	Palucia Creek tributary near Carrollton, MS note: c mean= 1.861; sd= 0.253; skew= 0.242 region 2 area= 0.43sqmi; slope= 75.2ft/mi; length= 1.7mi	1964-77	89 15	158 16	220 19	319 22	391 25	470 28	525 30	613 34
266	7287165	Mosquito Lake tributary no.1 at Itta Bena, MS note: * mean= 1.754; sd= 0.126; skew= 0.338 region 3 area= 0.11sqmi; slope= 10.6ft/mi; length= 0.5mi	1966-84	56 8	73 9	84 11	101 15	113 18	127 21	141 24	159 28
267	7287170	Mosquito Lake tributary no.2 at Itta Bena, MS note: * mean= 1.845; sd= 0.095; skew= 0.168 region 3 area= 0.13sqmi; slope= 10.6ft/mi; length= 0.6mi	1966-84	70.0 6	84.0 7	94.0 8	106 10	115 13	125 15	135 17	149 21
268	7287350	Fannesgusha Creek near Tchula, MS note: * mean= 3.976; sd= 0.232; skew= 0.124 region 2 area= 100 sqmi; slope= 6.9ft/mi; length= 28.2mi	1951-88 1947	9,180 9	14,400 10	18,000 12	22,700 15	25,900 17	29,800 20	33,100 23	37,800 26
269	7287480	Piney Creek near Yazoo City, MS note: * mean= 3.861; sd= 0.236; skew= -0.355 region 2 area= 70.3sqmi; slope= 9.0ft/mi; length= 20.4mi	1953-70 1951	7,290 13	11,200 12	13,700 13	16,800 16	18,800 18	21,300 21	23,200 24	26,100 28
270	7287505	Broad Lake tributary no.1 near Yazoo City, MS note: gh mean= 1.278; sd= 0.102; skew= -0.171 region 3 area= 0.11sqmi; slope= 10.6ft/mi; length= 0.4mi	1966-77	19 8	23 8	26 9	28 12	30 14	32 17	33 20	36 24
271	7287520	Short Creek tributary near Yazoo City, MS note: * mean= 2.880; sd= 0.155; skew= -0.426 region 2 area= 1.49sqmi; slope= 48.7ft/mi; length= 2.5mi	1964-73	756 12	1,010 11	1,140 12	1,310 14	1,410 17	1,530 20	1,620 22	1,770 26
272	7288500	Big Sunflower River at Sunflower, MS note: * mean= 3.802; sd= 0.164; skew= -0.155 region 3 area= 767 sqmi; slope= 0.5ft/mi; length= 103.5mi	1936-83	6,310 6	8,610 6	10,000 7	11,700 9	12,900 10	14,000 12	14,900 14	16,200 17
273	7288568	Quiver River tributary near Schlater, MS note: c mean= 1.516; sd= 0.065; skew= 0.022 region 3 area= 0.18sqmi; slope= 10.0ft/mi; length= 0.5mi	1967-79	34 5	38 5	42 6	46 8	50 10	54 12	58 13	64 16
274	7288570	Quiver River near Doddsville, MS note: * mean= 3.420; sd= 0.186; skew= 0.128 region 3 area= 292 sqmi; slope= 0.7ft/mi; length= 55.2mi	1938-60	2,620 9	3,760 10	4,550 12	5,560 16	6,310 19	7,020 22	7,650 25	8,510 28
275	7288650	Bogue Phalia near Leland, MS note: * mean= 3.775; sd= 0.131; skew= -0.412 region 3 area= 484 sqmi; slope= 0.8ft/mi; length= 61.8mi	1946-58	5,910 9	7,580 8	8,500 9	9,510 11	10,200 14	10,800 16	11,400 19	12,200 22
276	7288680	Big Sunflower River at Little Callao Landing, MS note: gh mean= 4.176; sd= 0.086; skew= -0.140 region 3 area= 2,290 sqmi; slope= 0.4ft/mi; length= 157.0mi	1948-58	15,100 6	17,700 7	19,300 8	21,000 10	22,200 12	23,300 15	24,400 17	25,700 21

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
277	7288770	Deer Creek near Hollandale, MS note: * mean= 2.757; sd= 0.125; skew= -0.017 region 3 area= 98.0sqmi; slope= 0.4ft/mi; length= 69.8mi	1946-58	585 8	745 9	845 10	970 13	1,070 16	1,160 19	1,250 21	1,360 25
278	7289000	Mississippi River at Vicksburg, MS note: ghi mean= 6.132; sd= 0.104; skew= -0.583 area= 1,140,400sqmi; slope= -- ; length= --	1927-86 1897-99 1900-22 1858,85	1,390 3	1,660 2	1,810 3	1,960 3	2,050 4	2,130 5	2,200 6	2,290 8
279	7289010	Durden Creek at Vicksburg, MS note: * mean= 3.213; sd= 0.217; skew= 0.090 region 2 area= 5.50sqmi; slope= 17.6ft/mi; length= 5.4mi	1941-46 1953-58 1935,49	1,520 13	2,240 14	2,670 16	3,160 20	3,440 22	3,820 25	4,070 28	4,510 31
280	7289100	Big Black River tributary near Eupora, MS note: * mean= 2.861; sd= 0.140; skew= -0.116 region 2 area= 2.29sqmi; slope= 27.8ft/mi; length= 2.8mi	1965-77	726 9	953 10	1,100 11	1,290 14	1,420 16	1,570 18	1,700 21	1,890 24
281	7289180	Big Black River near Kilmichael, MS note: *f mean= 4.183; sd= 0.252; skew= -0.160 region 2 area= 564 sqmi; slope= 3.5ft/mi; length= 41.7mi	1937-58 1962,73 1979,83	16,200 12	26,700 12	34,800 14	46,700 17	56,400 19	67,900 22	78,100 25	92,700 28
282	7289225	Downing Branch near French Camp, MS note: * mean= 2.693; sd= 0.187; skew= -0.236 region 2 area= 1.74sqmi; slope= 24.5ft/mi; length= 2.5mi	1965-77	498 7	612 7	681 8	769 10	836 12	909 14	973 16	1,070 19
283	7289265	Hays Creek tributary no.1 near Valden, MS note: * mean= 3.277; sd= 0.207; skew= -0.205 region 2 area= 14.6sqmi; slope= 15.5ft/mi; length= 6.0mi	1960-88	1,950 9	2,900 9	3,550 11	4,420 13	5,080 15	5,820 18	6,460 20	7,390 24
284	7289268	Hurricane Creek tributary near Vaiden, MS note: * mean= 2.540; sd= 0.150; skew= 0.051 region 2 area= 0.40sqmi; slope= 71.8ft/mi; length= 1.0mi	1966-77	337 10	448 11	514 13	596 16	646 18	704 21	745 24	816 27
285	7289330	Zilpha Creek near Kosciusko, MS note: * mean= 3.633; sd= 0.349; skew= 0.124 region 2 area= 86.6sqmi; slope= 6.8ft/mi; length= 19.1mi	1953-70 1979	4,710 17	9,010 18	12,500 20	17,100 23	20,200 26	24,100 28	26,900 31	31,000 34
286	7289350	Big Black River at West, MS note: * mean= 4.357; sd= 0.230; skew= -0.047 region 4 area= 1,030 sqmi; slope= 2.3ft/mi; length= 76.8mi	1937-88 1927,30	22,100 7	34,500 8	43,400 8	55,000 10	65,400 11	77,500 12	84,800 13	104,000 14
287	7289395	Sharkey Creek tributary near West, MS note: * mean= 2.214; sd= 0.137; skew= -0.007 region 2 area= 0.30sqmi; slope= 50.6ft/mi; length= 1.0mi	1967-79 1982-84	164 8	215 9	247 10	290 13	320 15	354 18	382 20	425 23
288	7289470	Tacketts Creek tributary near Pickens, MS note: * mean= 2.146; sd= 0.164; skew= -0.417 region 2 area= 0.15sqmi; slope= 110 ft/mi; length= 0.5mi	1965-84	144 9	193 9	223 10	258 12	282 14	306 17	325 19	354 22

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
289	7289500	Big Black River at Pickens, MS note: *f mean= 4.256; sd= 0.323; skew= -0.257 region 4 area= 1,490 sqmi; slope= 1.7ft/mi; length= 120.0mi	1937-73 1979,83 1892,1927,30	18,600 11	33,000 11	43,800 11	56,800 12	68,100 12	80,800 13	86,600 14	107,000 16
290	7289505	Big Cypress Creek near Vaughn, MS note: * mean= 3.843; sd= 0.161; skew= 0.229 region 2 area= 86.6sqmi; slope= 3.4ft/mi; length= 28.7mi	1960-70 1979	6,520 11	8,940 13	10,500 15	12,600 18	14,000 21	16,000 24	17,700 27	20,100 30
291	7289530	Doaks Creek near Canton, MS note: * mean= 3.795; sd= 0.254; skew= 0.283 region 2 area= 164 sqmi; slope= 4.4ft/mi; length= 31.4mi	1948-70 1973 1979	6,350 12	10,700 13	14,500 16	19,900 20	24,100 22	29,200 25	33,400 28	39,500 32
292	7289560	Bear Creek near Madison, MS note: * mean= 3.238; sd= 0.218; skew= 0.237 region 2 area= 24.4sqmi; slope= 7.5ft/mi; length= 9.1mi	1948-58 1979	1,820 15	2,890 16	3,770 18	5,070 22	6,050 25	7,210 27	8,120 30	9,460 33
293	7289600	Tilda Bogue near Canton, MS note: * mean= 3.417; sd= 0.271; skew= -0.280 region 2 area= 24.8sqmi; slope= 10.9ft/mi; length= 9.4mi	1948-88	2,710 10	4,460 10	5,680 11	7,270 14	8,400 16	9,650 19	10,700 21	12,200 25
294	7289610	Bachelor Creek at Canton, MS note: dg mean= 2.874; sd= 0.139; skew= 0.350 region 2 area= 3.85sqmi; slope= 14.7ft/mi; length= 3.0mi	1953-70 1979 1973,75	734 7	972 8	1,140 10	1,360 14	1,530 18	1,710 22	1,890 26	2,150 32
295	7289640	Panther Creek near Flora, MS note: * mean= 2.267; sd= 0.091; skew= -0.261 region 2 area= 0.26sqmi; slope= 67.9ft/mi; length= 0.7mi	1965-77 1979	186 6	222 6	242 7	266 8	284 10	303 12	319 14	343 16
296	7289641	Panther Creek tributary near Flora, MS note: * mean= 1.984; sd= 0.129; skew= -0.570 region 2 area= 0.07sqmi; slope= 192 ft/mi; length= 0.3mi	1964-85	99 7	125 6	139 6	154 8	166 10	176 12	185 15	198 17
297	7289730	Big Black River near Bentonia, MS note: *f mean= 4.439; sd= 0.232; skew= -0.076 region 4 area= 2,340 sqmi; slope= 1.3ft/mi; length= 172.0mi	1929-58 1962 1973,79,83	26,800 9	41,500 9	52,100 10	65,000 11	76,900 12	90,400 13	96,300 14	118,000 15
298	7289850	Bogue Chitto near Flora, MS note: * mean= 3.690; sd= 0.356; skew= -0.411 region 2 area= 126 sqmi; slope= 4.2ft/mi; length= 22.0mi	1953-70 1979,80	5,590 17	10,200 16	13,700 17	18,300 20	21,500 23	25,400 26	28,400 28	32,700 32
299	7290000	Big Black River near Bovina, MS note: * mean= 4.391; sd= 0.244; skew= -0.017 region 4 area= 2,770 sqmi; slope= 1.3ft/mi; length= 216.0mi	1936-88	24,600 8	39,400 8	50,500 9	64,500 10	76,800 11	90,200 12	96,400 13	117,000 15
300	7290005	Clear Creek near Bovina, MS note: * mean= 3.763; sd= 0.269; skew= 0.172 region 2 area= 32.0sqmi; slope= 16.6ft/mi; length= 9.3mi	1953-88	5,560 11	9,240 12	11,900 14	15,200 17	17,300 20	19,800 23	21,700 26	24,400 29

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
301	7290110	Fleetwood Creek near Bolton, MS	1960-69	2,110	3,370	4,210	5,230	5,870	6,660	7,200	8,080
		note: * mean= 3.312; sd= 0.273; skew= -0.349		18	17	18	21	23	26	29	32
		region 2 area= 13.0sqmi; slope= 15.1ft/mi; length= 6.5mi	1979								
302	7290115	Unnamed Creek near Bolton, MS	1960-70	773	1,180	1,440	1,790	2,020	2,280	2,480	2,790
		note: * mean= 2.863; sd= 0.236; skew= -0.368		15	15	16	19	21	24	27	30
		region 2 area= 3.10sqmi; slope= 26.0ft/mi; length= 2.7mi	1979								
303	7290220	Dry Draw near Brookhaven, MS	1966-77	166	240	291	356	396	440	467	519
		note: * mean= 2.225; sd= 0.190; skew= 0.340		12	14	16	20	23	26	29	32
		region 2 area= 0.20sqmi; slope= 100 ft/mi; length= 0.6mi	1955								
304	7290500	Bayou Pierre near Carpenter, MS	1945-71	17,500	25,600	30,600	36,600	41,000	46,200	50,700	57,000
		note: * mean= 4.223; sd= 0.214; skew= -0.598	1940,75	9	8	9	11	14	16	19	22
		region 2 area= 375 sqmi; slope= 4.3ft/mi; length= 54.7mi	1910,28,32								
305	7290525	Whiteoak Creek tributary near Utica, MS	1965-84	575	761	877	1,020	1,110	1,220	1,310	1,440
		note: * mean= 2.771; sd= 0.145; skew= 0.069		8	9	10	13	15	18	20	23
		region 2 area= 1.36sqmi; slope= 25.0ft/mi; length= 2.5mi									
306	7290650	Bayou Pierre near Willows, MS	1959-88	25,500	39,400	50,000	64,900	76,300	90,300	103,000	120,000
		note: * mean= 4.413; sd= 0.216; skew= 0.174		9	10	12	16	18	21	24	27
		region 2 area= 654 sqmi; slope= 3.9ft/mi; length= 70.7mi									
307	7290690	Clarks Creek near Pattison, MS	1962-88	8,500	13,200	16,700	20,900	23,700	27,200	29,900	34,000
		note: * mean= 3.951; sd= 0.231; skew= 0.264		11	12	14	18	20	23	26	30
		region 2 area= 75.0sqmi; slope= 9.5ft/mi; length= 21.0mi									
308	7290830	Little Creek near Fayette, MS	1967-88	792	1,120	1,330	1,600	1,790	1,990	2,160	2,400
		note: * mean= 2.897; sd= 0.179; skew= -0.099		9	10	11	13	16	18	21	24
		region 2 area= 1.71sqmi; slope= 54.8ft/mi; length= 1.8mi									
309	7290870	Coles Creek near Fayette, MS	1961-88	31,000	43,300	51,300	61,000	67,600	75,400	82,100	91,700
		note: * mean= 4.508; sd= 0.175; skew= 0.027		8	9	10	13	15	18	20	23
		region 2 area= 260 sqmi; slope= 7.3ft/mi; length= 32.6mi									
310	7290900	St. Catherine Creek near Natchez, MS	1950-60	8,890	14,400	17,400	20,400	21,900	24,500	25,900	28,700
		note: c mean= 4.056; sd= 0.324; skew= -0.074		21	21	22	25	27	30	32	35
		region 2 area= 54.3sqmi; slope= 12.4ft/mi; length= 15.7mi									
311	7290910	Spanish Bayou at Natchez, MS	1966-77	1,150	1,520	1,750	2,030	2,240	2,430	2,630	2,880
		note: dg mean= 3.060; sd= 0.144; skew= -0.087		10	11	13	17	20	24	29	35
		region 2 area= 2.46sqmi; slope= 27.9ft/mi; length= 3.7mi									
312	7291000	Homochitto River at Eddiceton, MS	1939-88	16,500	25,400	31,400	38,500	43,300	48,500	53,100	59,300
		note: * mean= 4.215; sd= 0.237; skew= -0.309		8	8	9	11	13	15	18	21
		region 2 area= 181 sqmi; slope= 6.2ft/mi; length= 32.6mi									

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
313	7291250	McCall Creek near Lucien, MS note: * mean= 3.897; sd= 0.252; skew= -0.019 region 2 area= 60.8sqmi; slope= 10.9ft/mi; length= 14.8mi	1955-88 1953	7,720 10	12,400 11	15,700 13	19,800 16	22,700 18	25,900 21	28,500 23	32,300 27
314	7291260	Beaver Run near McCall Creek, MS note: * mean= 2.607; sd= 0.298; skew= -0.193 region 2 area= 2.65sqmi; slope= 37.0ft/mi; length= 4.0mi	1955-77	471 14	813 14	1,070 16	1,430 19	1,680 21	1,970 24	2,180 27	2,500 30
315	7291500	Homochitto River near Bude, MS note: * mean= 4.506; sd= 0.183; skew= 0.263 region 2 area= 407 sqmi; slope= 5.8ft/mi; length= 39.7mi	1942-50 1972-74 1961,65	30,100 12	43,500 13	52,900 15	65,400 19	74,300 22	85,900 24	95,100 27	109,000 31
316	7292500	Homochitto River at Rosetta, MS note: ag mean= 4.698; sd= 0.326; skew= -0.447 region 2 area= 787 sqmi; slope= 5.0ft/mi; length= 64.4mi	1952-88	52,700 14	94,800 13	125,000 14	164,000 18	194,000 22	223,000 27	252,000 32	290,000 40
317	7294000	Second Creek at Sibley, MS note: aeg mean= 3.991; sd= 0.264; skew= -0.176 region 2 area= 55.3sqmi; slope= 9.2ft/mi; length= 23.3mi	1952-59	9,980 24	16,400 24	21,100 28	27,400 36	-- --	-- --	-- --	-- --
318	7294400	Observer's Draw near Doloroso, MS note: * mean= 2.290; sd= 0.185; skew= 0.232 region 2 area= 0.22sqmi; slope= 153 ft/mi; length= 1.1mi	1954-77	194 9	280 11	338 13	412 16	460 19	514 22	550 24	613 28
319	7294500	Homochitto River near Doloroso, MS note: afg mean= 4.710; sd= 0.266; skew= -0.255 region 4 area= 1,140 sqmi; slope= 4.0ft/mi; length= 85.3mi	1940-58 1972-78 1938,61,65 1969,83	52,600 12	86,500 12	110,000 13	142,000 17	166,000 21	190,000 26	215,000 30	248,000 37
320	7295000	Buffalo River near Woodville, MS note: * mean= 4.382; sd= 0.258; skew= -0.572 region 2 area= 180 sqmi; slope= 7.5ft/mi; length= 27.1mi	1942-88	24,200 9	38,200 8	46,700 9	55,600 11	60,500 13	65,900 16	70,000 19	75,800 22
321	7373500	West Fork Thompson Creek near Wakefield, LA note: * mean= 3.792; sd= 0.293; skew= -0.276 region 2 area= 35.3sqmi; slope= 11.8ft/mi; length= 15.1mi	1950-70	5,860 15	9,660 14	12,100 15	14,600 18	15,900 21	17,600 24	18,800 26	20,600 30
322	7373550	Moores Branch near Woodville, MS note: * mean= 2.323; sd= 0.203; skew= -0.371 region 2 area= 0.21sqmi; slope= 49.0ft/mi; length= 0.7mi	1955-88	210 9	300 8	353 9	411 11	443 13	475 16	498 18	534 21
323	7375235	Tangipahoa River tributary near McComb, MS note: * mean= 2.735; sd= 0.225; skew= -0.244 region 2 area= 2.82sqmi; slope= 26.3ft/mi; length= 3.0mi	1966-84	579 12	881 12	1,090 13	1,370 16	1,580 18	1,810 21	2,000 24	2,280 27
324	7375250	Little Tangipahoa River at Magnolia, MS note: * mean= 3.437; sd= 0.405; skew= -0.347 region 2 area= 39.8sqmi; slope= 9.7ft/mi; length= 14.6mi	1960-73	3,330 22	6,130 21	8,130 22	10,600 24	12,000 27	13,900 29	15,200 32	17,200 35

Table 1.--Flood quantiles, standard error of estimate, and other information for gaging stations--Continued

Map no.	Station no.	Station name and description	Period of record	2-year	5-year	10-year	25-year	50-year	100-year	200-year	500-year
				top line-- Peak T-year flood magnitude (cubic feet per second) bottom line-- Standard error of T-year flood estimate (percent)							
325	7375500	Tangipahoa River at Robert, LA	1939-88	15,300	29,100	40,600	58,200	72,600	89,500	105,000	127,000
		note: * mean= 4.138; sd= 0.334; skew= -0.139		11	11	13	16	18	21	23	27
		region 2 area= 646 sqmi; slope= 6.0ft/mi; length= 66.0mi									
326	7375800	Tickfaw River at Liverpool, LA	1956-88	4,210	9,080	13,400	19,600	23,900	28,900	32,700	38,100
		note: * mean= 3.556; sd= 0.413; skew= 0.077		16	17	19	22	24	27	30	33
		region 2 area= 89.7sqmi; slope= 8.7ft/mi; length= 16.9mi									
327	7376665	Stock Pond Draw near Liberty, MS	1965-77	217	323	390	470	517	574	609	674
		note: * mean= 2.336; sd= 0.223; skew= -0.018		15	15	17	20	23	25	28	32
		region 2 area= 0.38sqmi; slope= 56.3ft/mi; length= 1.2mi	1955								
328	7376720	Tanyard Creek at Liberty, MS	1953-70	1,330	2,710	3,600	4,530	4,980	5,640	6,010	6,690
		note: c mean= 2.980; sd= 0.678; skew= -0.228		27	25	26	28	29	31	34	37
		region 2 area= 9.92sqmi; slope= 14.7ft/mi; length= 7.0mi	1973								
329	7376760	CRS Draw near Liberty, MS	1965-84	492	626	709	809	879	952	1,020	1,110
		note: * mean= 2.694; sd= 0.127; skew= -0.105		7	7	8	10	12	14	16	19
		region 2 area= 0.80sqmi; slope= 48.5ft/mi; length= 1.3mi	1955								
330	7377000	Amite River near Darlington, LA	1949-88	21,500	41,900	58,000	80,600	97,200	116,000	132,000	154,000
		note: * mean= 4.281; sd= 0.375; skew= -0.346		14	13	14	17	20	22	25	29
		region 2 area= 580 sqmi; slope= 6.4ft/mi; length= 41.6mi									

* The station was used in the computation of regional flood-frequency equations.

a The station is affected by regulation or channelization. The estimates may have more uncertainty than is indicated by the standard error of estimate. If station is affected by channelization, the slope and length may not be fully representative of existing conditions.

b The station is affected by regulation, channelization, or urbanization. Record collected prior to basin changes was used to contribute to the regional analysis. The flood magnitudes, if shown, are estimates for current conditions.

c The station was not used in regional analyses because of regionally uncharacteristic flood frequency or other sample problems. Flood magnitudes are weighted estimates.

d The drainage basin is significantly urbanized. The flood magnitudes are unweighted stations estimates.

e The period of record is insufficient for station estimates of large recurrence interval floods.

f The logarithmic mean and standard deviation of the station record were adjusted by correlation with long-term records on the same stream using procedures described in Bulletin 17B (Interagency Advisory Committee on Water Data, 1982).

g The flood magnitudes are unweighted station estimates.

h The drainage basin characteristics are outside the limitations of the regional equations.

i The post-regulation or post-channelization period of record is insufficient for flood-frequency analysis. The statistics of logarithms of annual peak flow are for natural conditions.

j The unweighted flood-flow estimates are for existing project conditions and represent combined flow in the natural and regulated channels. The flood-flow values were obtained from the U.S. Army Corps of Engineers, Mobile District (written commun., April 1990). The statistics of logarithms of annual peak flow are for natural conditions.

k The logarithmic mean of annual peak flow is for regulated conditions. The flood magnitudes and the logarithmic standard deviation and skew of annual peak flow are not presented in this report. For additional information, contact the U.S. Army Corps of Engineers, Vicksburg District.

l Peak T-year flood magnitude is in thousands of cubic feet per second.

APPENDIX

REGIONAL SKEW COEFFICIENTS