ANALYSIS OF THE MAGNITUDE AND FREQUENCY OF PEAK DISCHARGE AND MAXIMUM OBSERVED PEAK DISCHARGE IN NEW MEXICO

By

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CONTENTS

FIGURES

TABLES

CONVERSION FACTORS

Multiply	By	To obtain
inch	25.40	millimeter
foot	0.3048	meter
mile	1.609	kilometer
square mile	2.590	square kilometer
cubic foot per second	0.02832	cubic meter per second

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

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ABSTRACT

Equations for estimating the magnitude of peak discharges for recurrence intervals of 2, 5, 10, 25, 50, 100, and 500 years were updated for New Mexico. The equations represent flood response for eight distinct physiographic regions of New Mexico. Additionally, a regional equation was developed for basins less than 10 square miles and below 7,500 feet in mean basin elevation. Flood-frequency relations were updated for 201 gaging stations on unregulated streams in New Mexico and the bordering areas of adjacent States. The analysis described in this report used data collected through 1993. A low-discharge threshold was applied to frequency analysis of 140 gaging stations. Inclusion of these low peak flows affects the fitting of the lower tail and the upper tail of the distribution.

Peak discharges can be estimated at an ungaged site on a stream that has a gaging station upstream or downstream. These estimates are derived using the drainage-area ratio and the drainage-area exponent from the regional regression equation of the respective region.

Flood-frequency estimates for 201 gaged sites were weighted by estimates from the regional regression equation. The observed, predicted, and weighted flood-frequency data were computed for each gaging station.

A maximum observed peak discharge as related to drainage area was determined for eight physiographic regions in New Mexico. Peak-discharge data collected at 201 gaging stations were used to develop a maximum peak-discharge relation as an alternative method of estimating the peak discharge of an extreme event.

INTRODUCTION

Estimates of the magnitude and frequency of peak discharge at unregulated gaged or ungaged stream locations in New Mexico are necessary for the design of hydraulic structures, such as bridges, culverts, dams, levees, and channels. For example, the magnitude of the peak discharge with a 50-year recurrence interval is statistically expected to recur at least once in a 50-year period. The 50-year peak discharge is frequently used by the New Mexico State Highway and Transportation Department (NMSHTD) in the design of State highway bridges. More frequent flood events, such as the 10- and 25-year peak discharges, are used for design of culverts on small drainages; less frequent flood events, such as the 500-year peak discharge, are used in bridge-scour analysis.

Since about 1948 the U.S. Geological Survey (USGS) has cooperated with the NMSHTD to collect and interpret peak-discharge data for numerous sites in New Mexico to improve estimation techniques for drainage areas ranging from 0.16 to 3,660 square miles. To date (1996) 15 reports on the subject have been published by the USGS, the last in 1986 (Waltemeyer, 1986).

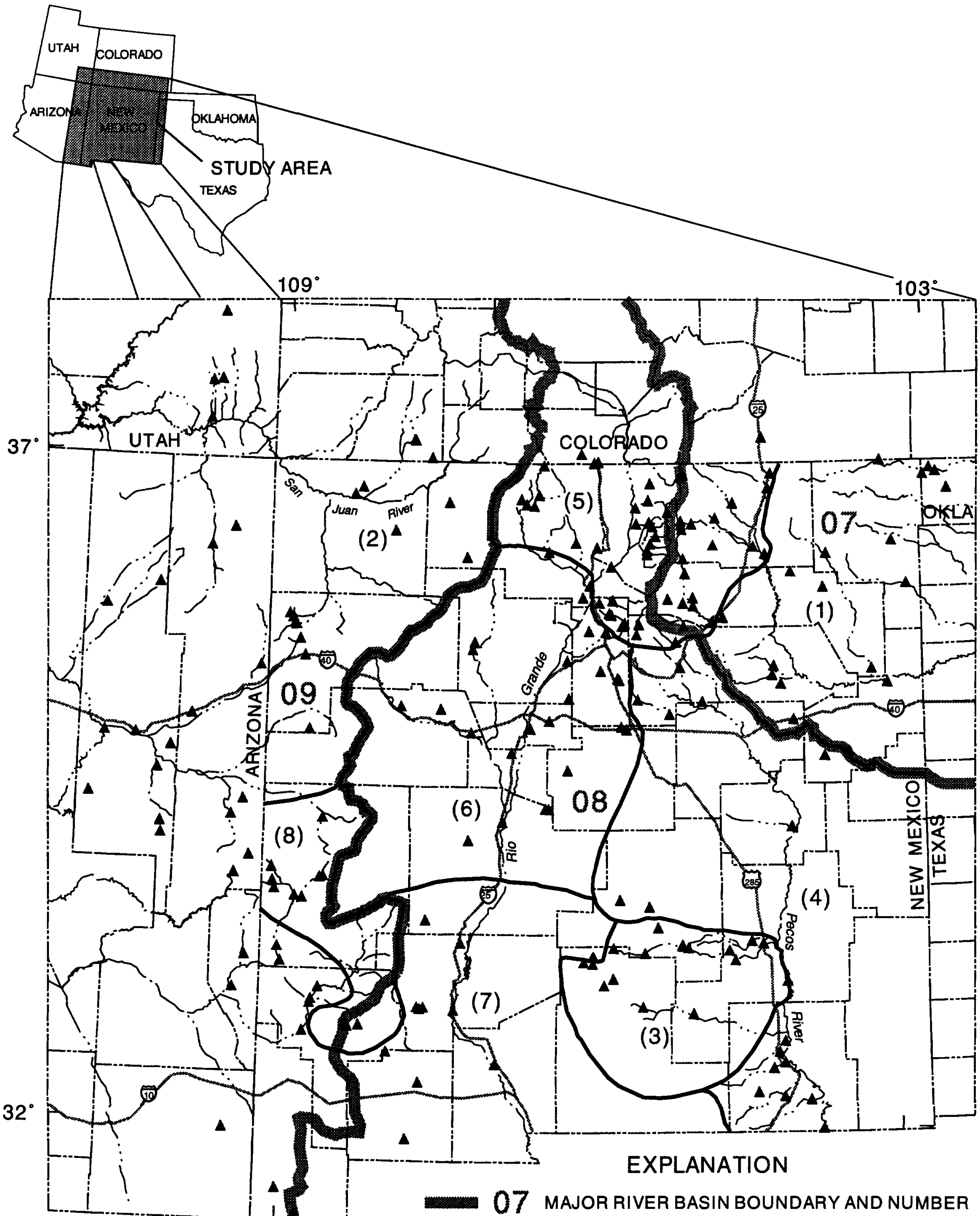
That report included analysis of flood data collected at 219 stations through 1982, and presented statistical equations that relate the magnitude and frequency of peak discharges for eight physiographic regions in New Mexico. The report used a generalized skew coefficient developed for New Mexico (Interagency Advisory Committee on Water Data, 1982) and an ordinary-least-squares approach for regression analysis (SAS Institute, Inc., 1982). Thomas and others (1993) reported that the use of a zero generalized skew coefficient and a low-discharge threshold improved flood-frequency analysis of streams in the southwestern United States. Other statistical approaches to regression analysis, such as generalized least squares (Stedinger and Tasker, 1985), have been found to improve estimation of regional flood-frequency relations. In New Mexico, the peak-discharge data are available from a network of partial-record gaging stations operated by the USGS in cooperation with the NMSHTD and from a network of continuous-record gaging stations operated by the USGS in cooperation with a variety of local, State, and Federal agencies. The partial-record network began about 1948 and consisted of about 150 stations. The network was reduced in the late 1980's to about 110 stations and in 1995 to about 80 stations. The number of continuous-record stations in the network since the early 1950's has varied, ranging from about 117 in 1950 to 184 in 1994.

This report presents updated estimates of the magnitude and frequency of peak discharge based on 11 additional years of gaging-station data and improved analytical techniques as compared to Waltemeyer (1986). Annual peak-discharge data through 1993 were used for 201 stations. Data for adjacent States were used to avoid State line discontinuities in the regionalization of floods. The magnitudes of peak discharges were determined for recurrence intervals of 2, 5, 10, 25, 50, 100, and 500 years for unregulated gaging stations. The frequency analyses were based on data for 201 gaging stations that have 10 or more years of record. The location of the 201 gaging stations is shown in figure 1. Updated regional regression equations also are provided for estimating peak discharges at ungaged sites using updated flood-frequency estimates.

DESCRIPTION OF THE STUDY AREA

The physiography of New Mexico is varied and complex and includes mountains, plains, plateaus, valleys, and deserts. The Rocky Mountains end in northern New Mexico, creating a marked climatological division in the north-central part of the State. Storms that originate in the Pacific Ocean travel over the mountains and progressively intensify in the plains of eastern New Mexico. Isopluvials of annual maximum precipitation indicate a pattern of increasing intensity in an easterly direction in the eastern plains (Miller and others, 1973). Storms that originate in the Gulf of Mexico during the summer period affect the eastern half of New Mexico; isopluvials show a decreasing precipitation intensity in a westerly direction. Intense rainfall during the summer is usually moisture from the Gulf of Mexico. Regional thunderstorms develop over the mountains during early and late summer. Significant floods, such as the early summer flood of 1965 and the early fall flood of 1904, have occurred during these seasons. However, the greatest monthly precipitation, although mostly of irregular regional extent, typically occurs in July and August. Intense, convective midsummer storms commonly are preceded by mild rainfall to produce severe flooding, particular in the northern part of the State.

Floods in the northern, southeastern, and southwestern mountain regions are produced generally by snowmelt, sometimes by rainfall, and rarely by rainfall on snowpack. Floods in the plains, plateaus, valleys, and deserts almost always are produced by rainfall.



U.S. Geological Survey base

0 20 40 60 80 100 MILES

0 20 40 60 80 100 KILOMETERS

EXPLANATION

07 MAJOR RIVER BASIN BOUNDARY AND NUMBER
07 Lower Mississippi River Basin
08 Western Gulf of Mexico Basin
09 Colorado River Basin

(3) PHYSIOGRAPHIC REGION BOUNDARY AND NUMBER
(From Waltemeyer, 1986)

(1)-Northeast plains region
(2)-Northwest plateau region
(3)-Southeast mountain region
(4)-Southeast plains region
(5)-Northern mountain region
(6)-Central mountain valley region
(7)-Southwest desert region
(8)-Southwest mountain region

▲ GAGING STATION

Figure 1.--Boundaries and physiographic regions and location of gaging stations in New Mexico and adjacent areas.

ANALYSIS OF MAGNITUDE AND FREQUENCY OF PEAK DISCHARGE

Peak-discharge data collected at crest-stage and continuous-record gaging stations were used to estimate the magnitude and frequency of peak discharges at the gaging stations using a log-Pearson Type III probability distribution (Interagency Advisory Committee on Water Data, 1982). The peak-discharge characteristics at the gaging stations were related to basin and climatic characteristics using generalized least-squares (GLS) regression.

Station Flood-Frequency Analysis

Peak-discharge data at gaging stations consist of a period of gaged record of annual peak discharges, referred to as the systematic record, and for some stations, one or more historic, extreme discharges outside the systematic record. Relating the magnitudes of annual peak discharges, generally referred to as flood-frequency data or characteristics, to their expected frequency of exceedance is termed a flood-frequency analysis. The frequency of peak discharges is generally expressed in terms of exceedance probability or recurrence intervals. Exceedance probability is the probability that a flood will exceed a given magnitude in any year. Recurrence interval, in years, is the reciprocal of the exceedance probability. For example, a flood with an exceedance probability of 0.01 has a recurrence interval of 100 years. The term "recurrence interval" is used in this report for simplicity.

Peak discharges for selected recurrence intervals were determined for each of 201 gaging stations using the log-Pearson Type III probability distribution as recommended by the Interagency Advisory Committee on Water Data (1982). Various adjustments for low outliers, zero-flow years, historic peak discharges, user-defined low-discharge threshold, and a user-defined generalized coefficient of skewness were applied to station data where applicable.

Floods in the United States have been recognized to be mainly from three different populations: annual peak discharges caused by annual snowmelt runoff from mountainous regions, annual peak discharges caused by annual rainfall runoff from convective thunderstorms, and annual peak discharges caused by annual rainfall runoff from infrequent hurricanes or tropical storms. Composite frequency analysis is required for some sites that have mixed populations. Crippen (1978) described techniques for making a composite analysis primarily from two populations of annual peak discharges, those caused by snowmelt runoff and rainfall runoff. The mechanisms that cause floods in New Mexico were described in the 1988-89 National Water Summary (U.S. Geological Survey, 1991). Only a few gaging stations have recorded extreme peak discharges that plot as high outliers from the main distribution. The maximum peak discharge recorded at seven gaging stations were noted to be high outliers (appendix, in back of report). Other peak discharges at gaging stations are considered marginal high outliers, but are not noted as such. These outliers are commonly from hurricanes or tropical storms and are from a different population. New Mexico gaging stations have recorded some peak discharges from rainfall on snowpack in the southwest mountain region (fig. 1). Gaging-station records for the northern mountain region have some extreme peak discharges as a result of rainfall from hurricanes. Other regions in New Mexico have similar gaging-station records of one or two outliers from hurricanes. Data on the separate sample population for these rare storms are inadequate, thus a composite frequency analysis could not be performed. Mixed population analysis was not required for any of the gaging stations.

Because the following two adjustments were not used in previous studies for New Mexico, the low-discharge threshold and the zero-generalized coefficient of skewness resulted in significant changes in flood-frequency analysis at some stations. The low-discharge threshold was first presented in the research study of flood frequency in the southwestern United States by Thomas and others (1993). The user-defined low-discharge threshold is based on the rationale that, in some instances, discharges less than some threshold value are not from the same population of peak discharges as the larger peak discharges. A probability-density-function plot of annual series data shows that these low discharges have a different slope than the larger peak discharges. As a result, the overall fit of the probability distribution is affected, and peak discharges for large recurrence intervals tend to be underestimated when the low discharges are included. The low-discharge threshold was visually selected from the probability-density-function plots and applied to the frequency analysis of 140 gaging stations. Use of the low-discharge threshold generally eliminated the peak discharges having recurrence intervals less than 1.4 years. An example of the low-discharge adjustment is shown on the probability-density-function plot for Conchas River at Variadero (fig. 2). All low-discharge thresholds applied in the analysis are listed in the appendix.

The skew coefficient used in the log-Pearson Type III analysis was a weighted value determined by weighting the station skew with a generalized skew in inverse proportion to its mean-square errors (Interagency Advisory Committee on Water Data, 1982). The station skews ranged from -0.22 to 0.29 log units for the eight physiographic regions in New Mexico (fig. 1); previous studies have reported the median for most of the regions as very close to zero (Waltemeyer, 1986). Accordingly, the generalized skew for all regions was assumed to be zero for the current study. A recent study of flood frequency for the southwestern United States (Thomas and others, 1993) also used zero for the generalized skew. Results from the study showed that the mean-square error of generalized skew was 0.31; the same mean-square error was assumed to be applicable for this study.

The USGS computer program PEAKFQ (Kirby, 1981) was used to perform the flood-frequency analyses. Peak-discharge data and basin characteristics were obtained from the Water-Data Storage and Retrieval System (WATSTORE) computerized data system (Dempster, 1981, 1983) and placed in the ANNIE data-management program (Lumb and others, 1990) for analysis. Selected basin, climatic, and flood characteristics for each station are listed in the appendix.

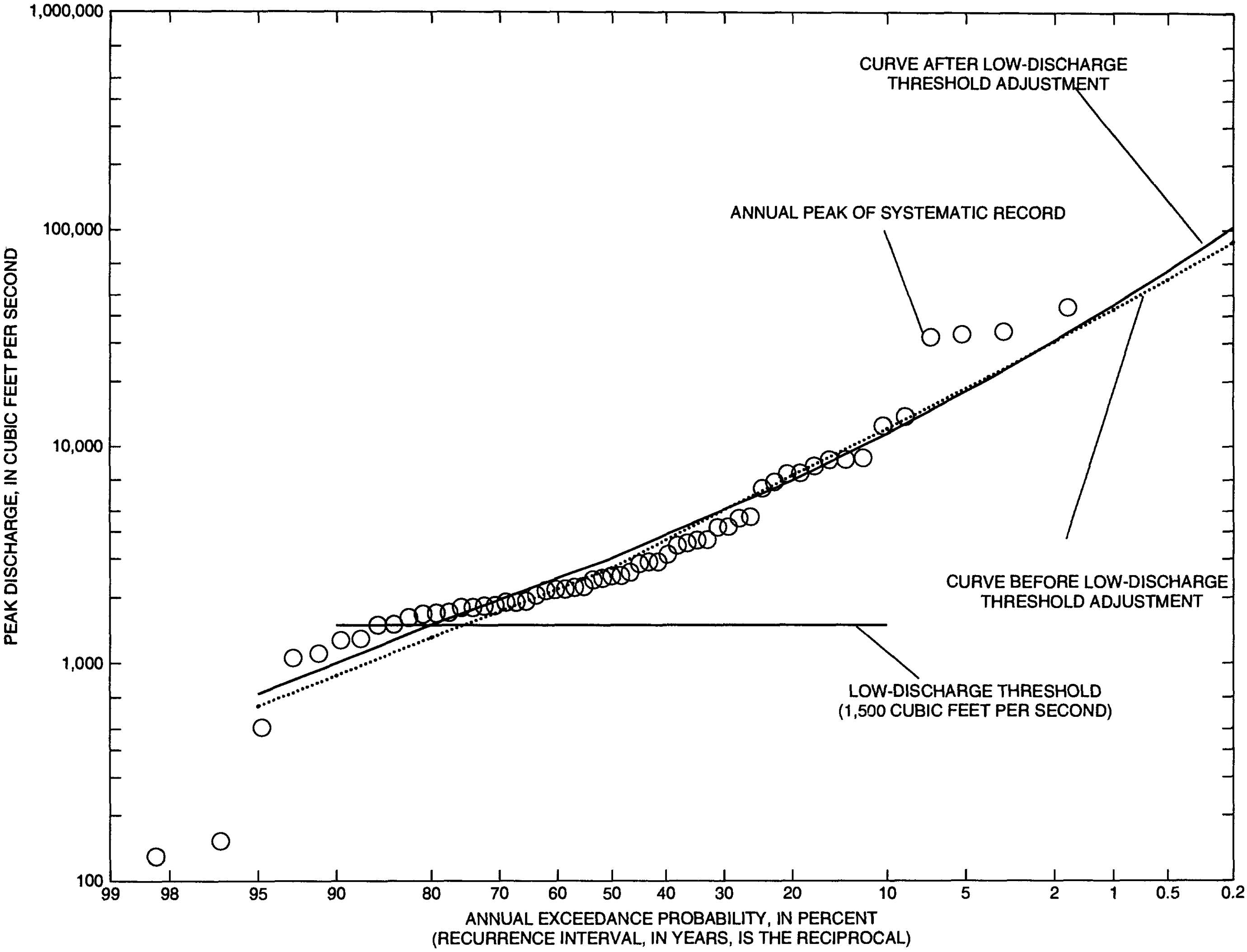


Figure 2.--Flood-frequency relations for Conchas River at Variadero, New Mexico (07222500), showing effect of low-discharge threshold adjustment.

Regional Flood-Frequency Analysis

Regionalization of flood-frequency characteristics with basin and climatic characteristics is used to estimate peak discharge at ungaged sites. The magnitude of peak discharge is influenced by the basin and climatic characteristics of a physiographic region. In New Mexico, previous work (Waltemeyer, 1986) identified three mountainous regions and five other physiographic regions-- plateau, desert, valley, and two plains regions--that have different flood characteristics. These eight regions defined by the previous flood-frequency study for New Mexico (Waltemeyer, 1986) were used for the current study (fig. 1): (1) northeast plains region, (2) northwest plateau region, (3) southeast mountain region, (4) southeast plains region, (5) northern mountain region, (6) central mountain valley region, (7) southwest desert region, and (8) southwest mountain region. These regions generally correspond to the regions defined by the National Weather Service (U.S. Weather Bureau, 1995). Each region is defined by a major river basin having boundaries at transition zones with mountains. The mountain regions were differentiated from plain, plateau, valley, and desert regions by elevation. Peak discharges at gaging stations higher than 7,500 feet above sea level generally are produced by snowmelt runoff; peak discharges measured at sites lower than 7,500 feet generally are produced by rainfall runoff (Jarrett and Costa, 1982). Accordingly, areas above 7,500 feet were considered to be mountain regions. The regional equations developed for these regions attempt to explain flood response by certain basin and climatic characteristics. Each region has unexplained variation, largely from basin and climatic characteristics that are not measured and used in the regional equations.

Residuals of regression analysis from the prior analysis (Waltemeyer, 1986) and the present analysis were examined. When the data are compiled as a whole for the State, negative residuals exist for the mountainous regions. For regions where negative residuals exist, the flood characteristic is overestimated. This overestimation demonstrates the need for regional boundaries and specifically for the distinction between mountainous regions, as has been previously demonstrated. Some of the other regions were examined by multivariate techniques to define a separate basis for this distinction. For example, a discriminant analysis computer program (Statware, Inc., 1990) was used to compare the northeast plains regions (region 1) and the northwest plateau region (region 2). The analysis showed that 78 percent of the 100-year peak-discharge data were correct or belonged to the group for region 1 and that 63 percent of the data were correct or belonged to the group for region 2 (fig. 1).

Regional regression estimates made for small basins are sometimes unreliable; therefore, unit-hydrograph techniques have been used for smaller basins. All previous studies have included small basins in the regional analysis, but the number of small basins included is few. An analysis of small basins is presented in this report for drainage areas 10 square miles or less and having mean basin elevations less than 7,500 feet. Estimates of peak discharge that use these equations should represent runoff from nonmountainous regions that are subject to rainfall-produced floods. A statewide regional equation was developed because of a lack of distinct residual patterns, indicating that no physiographic region below 7,500 feet was different from another. Additionally, the number of sites with small basins in any of the eight regions was few and not representative of regional flood information. The analysis was based on data for 43 sites, where drainage area was the only significant variable (P-value 0.05 or less). Drainage areas of small basins ranged from 0.20 to 10.0 square miles (table 1). The average standard error of prediction is 63 percent for estimates of the 100-year peak discharge in small basins. The equations are presented in table 2.

Table 1.--Range of statistically significant basin and climatic characteristics selected for use in the regression analysis

[--, data not statistically significant]

	Drainage area (square miles)	Average of channel ele-vations (feet)	Mean basin ele-vation (feet)	Maximum 24-hour precipitation intensity for indicated recurrence interval 10 years (inches)	25 years (inches)
Northeast plains region (1)	0.36-2,060	--	--	--	--
Northwest plateau region (2)	0.17-925	--	--	--	--
Southeast mountain region (3)	3.08-947	--	5,440-9,060	--	--
Southeast plains region (4)	0.16-689	--	--	--	--
Northern mountain region (5)	0.63-2,850	--	7,810-11,400	--	2.00-4.45
Central mountain valley region (6)	0.16-3,660	5,310-9,280	--	2.15-3.00	--
Southwest desert region (7)	0.20-2,830	--	--	--	--
Southwest mountain region (8)	2.12-426	6,160-8,980	--	--	--
Small basins statewide	0.20-10.0	--	--	--	--

Table 2.--Regional flood-frequency equations using generalized least-squares regression

[Q, peak discharge, in cubic feet per second, for indicated recurrence interval; A, drainage area, in square miles; E, mean basin elevation, in feet; Ec, average channel elevation upstream from gaging station, in feet; I24,10, maximum precipitation intensity, in inches, of a storm of 24-hour duration with a recurrence interval of 10 years; I24,25, maximum precipitation intensity, in inches, of a storm of 24-hour duration with a recurrence interval of 25 years,]

Equations	Recurrence interval (years)	Average standard error of estimates: Regression, Log units	Regression, Percent	Prediction, Log units	Prediction, Percent
Northeast plains region (1)					
$Q_2 = 1.14 \times 10^2\ A^{0.53}$	2	0.326	88	0.346	96
$Q_5 = 3.07 \times 10^2\ A^{0.50}$	5	0.282	72	0.301	78
$Q_{10} = 5.08 \times 10^2\ A^{0.49}$	10	0.269	69	0.288	75
$Q_{25} = 8.53 \times 10^2\ A^{0.48}$	25	0.264	66	0.284	72
$Q_{50} = 1.18 \times 10^3\ A^{0.48}$	50	0.265	66	0.285	72
$Q_{100} = 1.58 \times 10^3\ A^{0.48}$	100	0.269	69	0.291	75
$Q_{500} = 2.80 \times 10^3\ A^{0.48}$	500	0.286	75	0.312	82
Northwest plateau region (2)					
$Q_2 = 8.47 \times 10^1\ A^{0.47}$	2	0.376	107	0.390	111
$Q_5 = 1.97 \times 10^2\ A^{0.46}$	5	0.299	78	0.311	82
$Q_{10} = 3.06 \times 10^2\ A^{0.46}$	10	0.270	69	0.282	72
$Q_{25} = 4.86 \times 10^2\ A^{0.45}$	25	0.249	63	0.262	66
$Q_{50} = 6.54 \times 10^2\ A^{0.45}$	50	0.242	60	0.255	63
$Q_{100} = 8.53 \times 10^2\ A^{0.45}$	100	0.240	60	0.254	63
$Q_{500} = 1.45 \times 10^3\ A^{0.45}$	500	0.249	63	0.265	66

Table 2.--Regional flood-frequency equations using generalized least-squares regression--Continued

Equations	Recurrence interval (years)	Average standard error of estimates: Regression, Log units	Regression, Percent	Prediction, Log units	Prediction, Percent
Southeast mountain region (3)					
$Q_{2} = 8.54 \times 10^{6}\ A^{0.60}\ (E/1{,}000)^{-5.96}$	2	0.127	31	0.150	36
$Q_{5} = 7.14 \times 10^{7}\ A^{0.67}\ (E/1{,}000)^{-6.69}$	5	0.136	33	0.163	38
$Q_{10} = 1.60 \times 10^{8}\ A^{0.70}\ (E/1{,}000)^{-6.94}$	10	0.140	33	0.169	41
$Q_{25} = 3.04 \times 10^{8}\ A^{0.75}\ (E/1{,}000)^{-7.10}$	25	0.144	33	0.178	43
$Q_{50} = 4.15 \times 10^{8}\ A^{0.78}\ (E/1{,}000)^{-7.16}$	50	0.150	36	0.187	46
$Q_{100} = 5.21 \times 10^{8}\ A^{0.81}\ (E/1{,}000)^{-7.19}$	100	0.158	38	0.199	49
$Q_{500} = 7.11 \times 10^{8}\ A^{0.87}\ (E/1{,}000)^{-7.20}$	500	0.189	46	0.236	60
Southeast plains region (4)					
$Q_{2} = 8.17 \times 10^{1}\ A^{0.51}$	2	0.512	172	0.538	192
$Q_{5} = 2.36 \times 10^{2}\ A^{0.54}$	5	0.402	116	0.424	124
$Q_{10} = 4.07 \times 10^{2}\ A^{0.55}$	10	0.352	96	0.374	103
$Q_{25} = 7.21 \times 10^{2}\ A^{0.57}$	25	0.305	78	0.326	88
$Q_{50} = 1.04 \times 10^{3}\ A^{0.58}$	50	0.278	72	0.300	78
$Q_{100} = 1.43 \times 10^{3}\ A^{0.59}$	100	0.258	66	0.282	72
$Q_{500} = 2.72 \times 10^{3}\ A^{0.62}$	500	0.234	57	0.262	66

Table 2.--Regional flood-frequency equations using generalized least-squares regression--Continued

Equations	Recurrence interval (years)	Regression: Log units	Regression: Percent	Prediction: Log units	Prediction: Percent
Northern mountain region (5)					
$Q_{2} = 8.54 \times 10^{2}\ A^{0.83}\ (E/1{,}000)^{-2.22}\ I24{,}25^{0.31}$	2	0.330	88	0.343	92
$Q_{5} = 7.39 \times 10^{3}\ A^{0.81}\ (E/1{,}000)^{-3.01}\ I24{,}25^{0.63}$	5	0.296	78	0.309	82
$Q_{10} = 2.19 \times 10^{4}\ A^{0.81}\ (E/1{,}000)^{-3.41}\ I24{,}25^{0.81}$	10	0.284	72	0.297	78
$Q_{25} = 6.90 \times 10^{4}\ A^{0.80}\ (E/1{,}000)^{-3.85}\ I24{,}25^{1.03}$	25	0.280	72	0.294	75
$Q_{50} = 1.44 \times 10^{5}\ A^{0.80}\ (E/1{,}000)^{-4.13}\ I24{,}25^{1.18}$	50	0.284	72	0.298	78
$Q_{100} = 2.80 \times 10^{5}\ A^{0.80}\ (E/1{,}000)^{-4.40}\ I24{,}25^{1.33}$	100	0.291	75	0.306	82
$Q_{500} = 1.10 \times 10^{6}\ A^{0.80}\ (E/1{,}000)^{-4.95}\ I24{,}25^{1.64}$	500	0.320	85	0.337	92
Central mountain valley region (6)					
$Q_{2} = 7.47 \times 10^{5}\ A^{0.50}\ (Ec/1{,}000)^{-5.28}\ I24{,}10^{1.18}$	2	0.339	92	0.366	103
$Q_{5} = 2.57 \times 10^{5}\ A^{0.47}\ (Ec/1{,}000)^{-4.49}\ I24{,}10^{1.76}$	5	0.252	63	0.274	69
$Q_{10} = 1.53 \times 10^{5}\ A^{0.46}\ (Ec/1{,}000)^{-4.09}\ I24{,}10^{2.06}$	10	0.210	51	0.231	57
$Q_{25} = 8.89 \times 10^{4}\ A^{0.44}\ (Ec/1{,}000)^{-3.67}\ I24{,}10^{2.37}$	25	0.173	41	0.193	46
$Q_{50} = 6.11 \times 10^{4}\ A^{0.43}\ (Ec/1{,}000)^{-3.38}\ I24{,}10^{2.57}$	50	0.158	38	0.180	43
$Q_{100} = 4.18 \times 10^{4}\ A^{0.42}\ (Ec/1{,}000)^{-3.09}\ I24{,}10^{2.74}$	100	0.150	36	0.173	41
$Q_{500} = 1.78 \times 10^{4}\ A^{0.40}\ (Ec/1{,}000)^{-2.45}\ I24{,}10^{3.03}$	500	0.159	38	0.185	43

Table 2.--Regional flood-frequency equations using generalized least-squares regression--Continued

Equations	Recurrence interval (years)	Average standard error of estimates: Regression, Log units	Regression, Percent	Prediction, Log units	Prediction, Percent
Southwest desert region (7)					
$Q_{2} = 1.28 \times 10^{2}\ A^{0.46}$	2	0.217	54	0.229	57
$Q_{5} = 2.46 \times 10^{2}\ A^{0.48}$	5	0.199	49	0.211	51
$Q_{10} = 3.45 \times 10^{2}\ A^{0.49}$	10	0.198	49	0.212	51
$Q_{25} = 4.91 \times 10^{2}\ A^{0.50}$	25	0.206	51	0.220	54
$Q_{50} = 6.15 \times 10^{2}\ A^{0.51}$	50	0.215	54	0.231	57
$Q_{100} = 7.51 \times 10^{2}\ A^{0.52}$	100	0.227	57	0.244	60
$Q_{500} = 1.12 \times 10^{3}\ A^{0.55}$	500	0.260	66	0.279	72
Southwest mountain region (8)					
$Q_{2} = 2.58 \times 10^{7}\ A^{0.19}\ (Ec/1{,}000)^{-6.10}$	2	0.300	78	0.332	88
$Q_{5} = 1.49 \times 10^{7}\ A^{0.23}\ (Ec/1{,}000)^{-5.53}$	5	0.284	72	0.315	85
$Q_{10} = 1.03 \times 10^{7}\ A^{0.25}\ (Ec/1{,}000)^{-5.19}$	10	0.285	72	0.318	85
$Q_{25} = 6.53 \times 10^{6}\ A^{0.27}\ (Ec/1{,}000)^{-4.80}$	25	0.295	75	0.331	88
$Q_{50} = 4.69 \times 10^{6}\ A^{0.29}\ (Ec/1{,}000)^{-4.52}$	50	0.306	82	0.345	92
$Q_{100} = 3.40 \times 10^{6}\ A^{0.30}\ (Ec/1{,}000)^{-4.25}$	100	0.320	85	0.359	96
$Q_{500} = 1.66 \times 10^{6}\ A^{0.32}\ (Ec/1{,}000)^{-3.68}$	500	0.356	99	0.403	116

Table 2.--Regional flood-frequency equations using generalized least-squares regression--Concluded

Equations	Recurrence interval (years)	Average standard error of estimates: Regression, Log units	Regression, Percent	Prediction, Log units	Prediction, Percent
Statewide small basin, 10 square miles or less and less than 7,500 feet mean basin elevation					
$Q_2 = 1.07 \times 10^2 A^{0.39}$	2	0.402	116	0.413	120
$Q_5 = 2.43 \times 10^2 A^{0.42}$	5	0.317	85	0.326	88
$Q_{10} = 3.74 \times 10^2 A^{0.43}$	10	0.283	72	0.292	75
$Q_{25} = 5.91 \times 10^2 A^{0.44}$	25	0.257	66	0.266	69
$Q_{50} = 7.92 \times 10^2 A^{0.45}$	50	0.245	60	0.255	66
$Q_{100} = 1.03 \times 10^3 A^{0.46}$	100	0.238	60	0.248	63
$Q_{500} = 1.73 \times 10^3 A^{0.47}$	500	0.235	60	0.247	63

Regression Methods and Basin and Climatic Characteristics

Regional equations are commonly used for estimating the magnitude and frequency of peak discharges at various locations that have no streamflow data. Equations have been developed from a regression analysis that relates peak discharges for various recurrence intervals determined at gaging stations to basin and climatic characteristics. Ordinary least-squares (OLS) regression techniques (Statware, Inc., 1990) were used to determine the most appropriate basin and climatic variables. GLS regression (Stedinger and Tasker, 1985) was used to determine the values of the regression constant and regression coefficients and the error terms of the regression equations. One or more of the following basin and climatic characteristics were found to be statistically significant for inclusion as independent variables in the regression equations:

A = drainage area, in square miles;
Ec = average of channel elevations upstream from the gaging station, in feet above sea level;
E = mean basin elevation, in feet above sea level;
I24,10 = maximum precipitation intensity of a storm of 24-hour duration with a recurrence interval of 10 years, in inches; and
I24,25 = maximum precipitation intensity of a storm of 24-hour duration with a recurrence interval of 25 years, in inches.

Drainage area (A) was determined by planimetering the delineated area on the largest scale topographic map available. Average of channel elevations (Ec) was determined from appropriate topographic maps as the average of elevations at points 10 and 85 percent of stream length upstream from the gaging stations. Mean basin elevation (E) was determined by overlaying a transparent grid on a topographic map and averaging the elevations of the points at the grid intersections (generally 20 to 80 points per basin). Maximum 24-hour precipitation intensities for 10- and 25-year (I24,10 and I24,25 respectively) recurrence intervals were determined at each gage location by interpolation between isohyetal lines from precipitation-frequency maps for New Mexico (Miller and others, 1973). Other basin and climatic characteristics also were available and evaluated for statistical significance but were not included in the final models. These characteristics--stream length, mean minimum January temperature, main channel slope, and maximum 24-hour 50-year and 100-year precipitation--are highly cross correlated with other variables; however, the final basin and climatic characteristics used in the mathematical models did not include cross-correlated variables. For example, in all regions drainage area and stream length were cross correlated, but drainage area was used for the explanatory variable. In region 8, mean minimum January temperature was cross correlated with the average of channel elevations, but the average of channel elevations variable was chosen. Mean basin elevation or average of channel elevations was the explanatory variable chosen for three regions. Basin and climatic data used in the final regressions are listed in the appendix, and the range of values for each characteristic is listed in table 1.

A stepwise OLS multiple-regression procedure (Statware, Inc., 1990) was used to determine which independent variables were significant in the equations for peak discharge. In the stepwise procedure, variables were added one at a time until all that were significant at the 5-percent level were included. In some regions, one precipitation-intensity variable was used for all recurrence intervals even though the second precipitation-intensity variable may have been more significant for some recurrence intervals. Because the logarithms of peak discharge are commonly determined to be linearly related to logarithms of basin and climatic variables, all variables were transformed to base 10 logarithms before the regression analysis was begun. The general form of the mathematical model is:

$$\log Q_t = \log k + a \log x_1 + b \log x_2 + \ldots + n \log x_n \tag{1}$$

or

$$Q_t = K\, x_1^{a}\, x_2^{b} \ldots x_n^{n}$$

where Q_t = peak discharge (instantaneous peak discharge), in cubic feet per second, for recurrence interval t;
k = regression constant;
$a, b, \ldots n$ = regression coefficients;
$x_1, x_2, \ldots x_n$ = basin and climatic variables; and
K = the anti-log of the regression constant.

Generalized Least-Squares Regression

Once the appropriate independent variables had been determined using the OLS regression, GLS regression was used to determine the best values of the regression coefficients. Regression coefficients determined from a GLS regression procedure (Stedinger and Tasker, 1985; Tasker and others, 1986) were used rather than those determined from OLS regression because GLS regression considers the time-sampling error of the dependent variable, whereas OLS regression does not. GLS regression also considers spatial sampling errors from the cross correlation among concurrent peak discharges between gaging stations, whereas OLS regression does not. The basic regression model using GLS is written in matrix form (Stedinger and Tasker, 1985) as:

$$Y = X\beta + \varepsilon \tag{2}$$

where Y = logarithm of estimated peak-discharge characteristics (dependent variable);
X = matrix of logarithms of basin and climatic characteristics (independent variables);
β = vector of regression coefficients; and
ε = vector of random errors.

The GLS estimator of β is:

$$(X^{T}\Lambda^{-1}X)^{-1}X^{T}\Lambda^{-1}Y$$

where T = t-year event;
X = matrix of basin and climatic characteristics (independent variables);
Λ = covariance matrix; and
Y = estimated flood characteristic (dependent variable).

The operational difficulty with this equation is that Λ is unknown and must be estimated from available data. Stedinger and Tasker (1985) proposed that Λ be estimated as:

$$\Lambda = \Upsilon^2 I + V \tag{3}$$

where Λ = covariance matrix;
Υ^2 = estimate of the model-error variance due to an imperfect model;
I = identity matrix; and
V = n x n matrix of sample covariances that depend on record length, natural variability of the flow characteristic, cross correlation of sample response variables, and the flow characteristic being estimated.

The GLS procedure uses the Λ matrix to assign different weights to observed flow characteristics on the basis of their record length, cross correlation with flow characteristics at other sites, and the model-error variance, Υ^2. Tasker and Stedinger (1989) provided further details on how the elements of Λ are determined.

The equations determined from the GLS regression analysis are shown in table 2. Included are equations for estimating peak discharges having recurrence intervals of 2, 5, 10, 25, 50, 100, and 500 years for each of the eight regions in New Mexico. Additionally, an equation was developed from data for basins 10 square miles or less and less than 7,500 feet in mean basin elevation; this equation also is shown in table 2.

Limitations and Accuracy of Regression Equations

The intended use of regression equations is to provide reliable estimates of peak discharges for selected recurrence intervals at unregulated, ungaged stream sites in New Mexico. Estimates are commonly required for ungaged sites on ungaged streams and, often, for ungaged sites on streams that have gaging stations located near the ungaged sites. Estimates for ungaged sites in a basin located in two regions are less common and somewhat more difficult than for basins in one region. In parts of some regions, particularly the southeast plains region (4) (fig. 1) and the central mountain valley region (6), gaging stations generally are sparse. For example, few data are available for east of the Pecos River (region 4), and essentially no data are available for the Sandia Mountains (region 6). Region 6 has eight sites representing mountainous basins that generally have floods produced from snowmelt runoff. However, these eight sites were excluded from the regional regression analysis because they are too few in number to be statistically representative of regional flood information for mountainous areas in region 6. Regression equations may not be reliable for areas having sparse data or for ungaged sites that have basin and climatic variables beyond the range of those listed in table 1. The application of regional equations is not intended to preclude the use of sound hydrologic judgment or any other hydrologic or engineering method that may provide a more reliable estimate. Unit-hydrograph techniques that use gaged precipitation in a basin lacking gaging-station data may yield more reliable estimates of peak discharge than regional equations.

Accuracy of the GLS regression equations generally is measured by the average standard error of prediction and the equivalent years of record. The average standard error of prediction is the sum of the average regression or model error and the average sampling error. The average standard error of regression presented in table 2 for a 100-year recurrence interval peak discharge ranged from 36 to 85 percent for the regions. The average standard error of prediction presented in table 2 for a 100-year recurrence interval peak discharge ranged from 41 to 96 percent for the regions. Those errors generally are less than errors previously reported (Waltemeyer, 1986), and those in the previous report were model errors only. Overall, the equations based on GLS regression are more reliable than those in the previous report because of the increased length of record, improved flood-frequency analysis, and use of the GLS regression method. The average standard error of prediction was calculated in log units and converted to percent using methods described by Hardison (1971).

Equivalent years of record is an alternative measure of the accuracy of regression equations that is particularly useful for comparison to gaging-station data. Equivalent years of record is the number of years of actual peak-discharge record that would be required to achieve the same accuracy in the estimate of the t-year peak discharge as that obtained from the regional equation. Equivalent years of record is computed by the GLSNET computer program using the method described by Hardison (1971).

Estimate of Magnitude and Frequency of Peak Discharges at Gaged Sites

Flood-frequency estimates for gaged sites can be weighted by estimates from the regional regression equation (appendix) (Interagency Advisory Committee on Water Data, 1982). The GLSNET computer program computes the weighted estimate using the observed station peak discharge, the regression-equation-predicted peak discharge, the equivalent years of record, and the actual record length. The observed, predicted, and weighted flood-frequency data are listed in the appendix for each gaging station. Weighted estimates were determined by:

$$Q_w = (n_i\, y_i + en_i\, x_i b) \,/\, (n_i + en_i) \tag{4}$$

where Q_w = weighted flood-frequency data at the gaged site, in cubic feet per second;
n_i = actual record length, in years;
y_i = flood-frequency data at the gaging station, in cubic feet per second;
en_i = equivalent record length, in years; and
$x_i b$ = predicted flood-frequency data at the gaging station using the regression equation, in cubic feet per second.

The weighted estimate determined by equation 4 is a function of actual record length and equivalent years from the regression analysis. If actual record length is longer than equivalent years, more weight is given to the observed station data. Conversely, if actual record length is shorter than equivalent years, more weight is given to the regression estimate.

Estimate of Magnitude and Frequency of Peak Discharges at Ungaged Sites

Peak discharges having various recurrence intervals can be estimated for ungaged sites on unregulated, ungaged streams from the regional equations listed in table 2. A weighting technique can be used to estimate peak discharge at an ungaged site on an ungaged stream that is in two regions. Gaging-station data can be extrapolated to estimate peak discharge at an ungaged site on a stream having a nearby gaging station. Additionally, flood-frequency data are available for gaging stations on the main stems of some streams not used in this report for the development of regional regression relations. Data at these gaging stations can be used to make estimates at ungaged sites on the same stream. The independent variables that pertain to the equation for each region need to be measured as previously described for the development of the equations. These methods are described in more detail in the "National Handbook of Recommended Methods for Water-Data Acquisition" (U.S. Geological Survey, 1977) and in the section "Regression Methods and Basin and Climatic Characteristics" in this report. The following sections present examples of the above procedures.

Ungaged Site on an Ungaged Stream

An estimate of peak discharge with a recurrence interval of 500 years is required for an ungaged site in the southeast mountain region (3) that has a drainage area of 600 square miles and a mean basin elevation of 7,610 feet. Using the equation in table 2, the peak discharge for a 500-year recurrence interval is:

$$
\begin{aligned}
Q_{500} &= 7.11 \times 10^{8}\ A^{0.87}\ (E/1{,}000)^{-7.20} \\
&= (7.11 \times 10^{8})\ (600)^{0.87}\ (7{,}610/1{,}000)^{-7.20} \\
&= 83{,}700 \text{ cubic feet per second.}
\end{aligned}
$$

Ungaged Site on an Ungaged Stream in Two Regions

Flood responses in adjacent regions can vary considerably. Flood frequency at an ungaged site on an ungaged stream that drains parts of two regions can be better estimated by weighting the individual peak-discharge estimate of each region proportional to the drainage area in each region. The following example demonstrates the method for a basin that is partly in region 3 and partly in region 4. Peak discharge with a recurrence interval of 50 years is estimated for an ungaged site where 59.9 square miles of the drainage area is in the southeast mountain region and 60.1 square miles is in the southeast plains region. The total drainage area is 120 square miles, and the mean basin elevation of the drainage area is 8,150 feet.

By using the equation for the southeast mountain region (3) (table 2), the peak discharge for a 50-year recurrence interval is:

$$
\begin{aligned}
Q_{50} &= 4.15 \times 10^{8}\quad A^{0.78}\quad (E/1{,}000)^{-7.16} \\
&= (4.15 \times 10^{8})\quad (120)^{0.78}\quad (8{,}150/1{,}000)^{-7.16} \\
&= 5{,}200 \text{ cubic feet per second.}
\end{aligned}
$$

By using the equation for the southeast plains region (4) (table 2), the peak discharge for a 50-year recurrence interval is:

$$\begin{aligned} Q_{50} &= 1.04 \times 10^3 \quad A^{0.58} \\ &= (1.04 \times 10^3) \quad (120)^{0.58} \\ &= 16{,}700 \text{ cubic feet per second.} \end{aligned}$$

The peak discharge weighted on drainage area is:

$$\begin{aligned} Q_{50} &= 5{,}200 \quad (59.9/120) \quad + \quad 16{,}700 \quad (60.1/120) \\ &= 11{,}000 \text{ cubic feet per second.} \end{aligned}$$

Ungaged Site on a Stream Having a Nearby Gaging Station

Flood-frequency estimates can be made for ungaged sites upstream or downstream from gaging stations using a method developed by Thomas and others (1993). This method transfers flood-frequency data at the gaged site to the ungaged site using the following drainage-area ratio adjustment equation:

$$Q_{T(u)} = Q_{T(g)} \, (A_u/A_g)^x, \tag{5}$$

where
- $Q_{T(u)}$ = weighted flood-frequency estimate at the ungaged site, in cubic feet per second;
- $Q_{T(g)}$ = flood-frequency estimate at the gaged site, in cubic feet per second;
- A_u = drainage area at the ungaged site, in square miles;
- A_g = drainage area at the gaged site, in square miles; and
- x = exponent of the drainage area of the applicable regional regression equation listed in table 2.

According to Thomas and others (1993), equation 5 is applicable where the drainage-area ratio is between 0.5 and 1.5. This technique has been simplified from the technique presented by Waltemeyer (1986). For example, to estimate a 50-year peak discharge at an ungaged site in region 4 upstream from gaging station Fourmile Draw near Lakewood, New Mexico (08400000), the weighted value listed in the appendix is 29,500 cubic feet per second. The best estimate at the streamflow-gaging station is the weighted value, and the exponent of the drainage area from the regional equation provides the transfer mechanism of the flood response to the ungaged site. The drainage area at the gage is 265 square miles. The exponent of the drainage area of the regression equation for a 50-year recurrence interval for region 4 is 0.58 (table 2). The drainage area at the ungaged site is 210 square miles, and by using equation 5 the peak discharge at the ungaged site is:

$$\begin{aligned} Q_{50\,u} &= Q_{50\,g} \quad (A_u/A_g)^x \\ &= (29{,}500) \quad (210/265)^{0.58} \\ &= 25{,}800 \text{ cubic feet per second.} \end{aligned}$$

ANALYSIS OF MAXIMUM OBSERVED PEAK DISCHARGE

Maximum observed peak discharges for 201 gaging stations in New Mexico were plotted against drainage area for each of eight physiographic regions in New Mexico (figs. 3-10). Similar relations have been shown for maximum floodflows in the United States (Crippen and Bue, 1977). Parts of four regions from Crippen and Bue (1977) are in New Mexico: region 12 applies to eastern New Mexico, region 13 applies to the upper Rio Grande Basin, region 14 applies to the San Juan Basin, and region 16 applies to the lower Rio Grande Basin. These envelope curves of maximum observed floodflows were plotted in figures 3-10 for the eight physiographic regions to ascertain the relative reliability of peak discharges estimated from regression equations. Envelope curves were determined from the maximum observed peak discharge for each of the eight physiographic regions in New Mexico. These new curves for New Mexico inherently provide better estimates of the maximum peak discharge expected using all available data through 1993. Envelope curves from Crippen and Bue (1977) used a lesser number of gaging stations in the New Mexico physiographic regions and data through September 1974. Because the envelope curves are based on maximum observed discharges without regard to record length, the envelope curves are not related to any specific recurrence interval. On that basis, the curve can be used only as a general guide for judging whether regression estimates appear to be reasonable. Nevertheless, the envelope curve indicates the maximum flood response observed in New Mexico and is useful for extreme-flood comparisons. Figures 3-10 show that for most regions the envelope curves from Crippen and Bue (1977) estimate larger values than the new envelope curves except for region 2 and region 6.

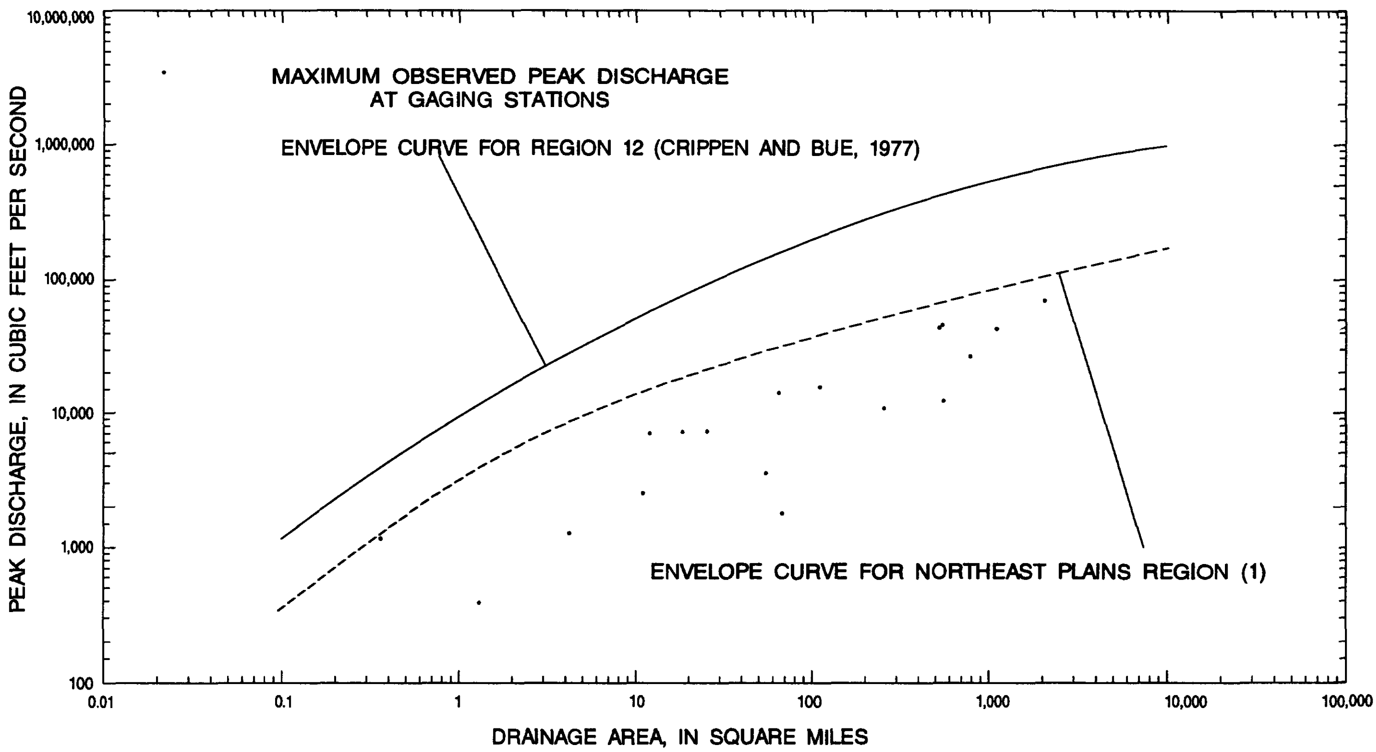


Figure 3.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the northeast plains region (1).

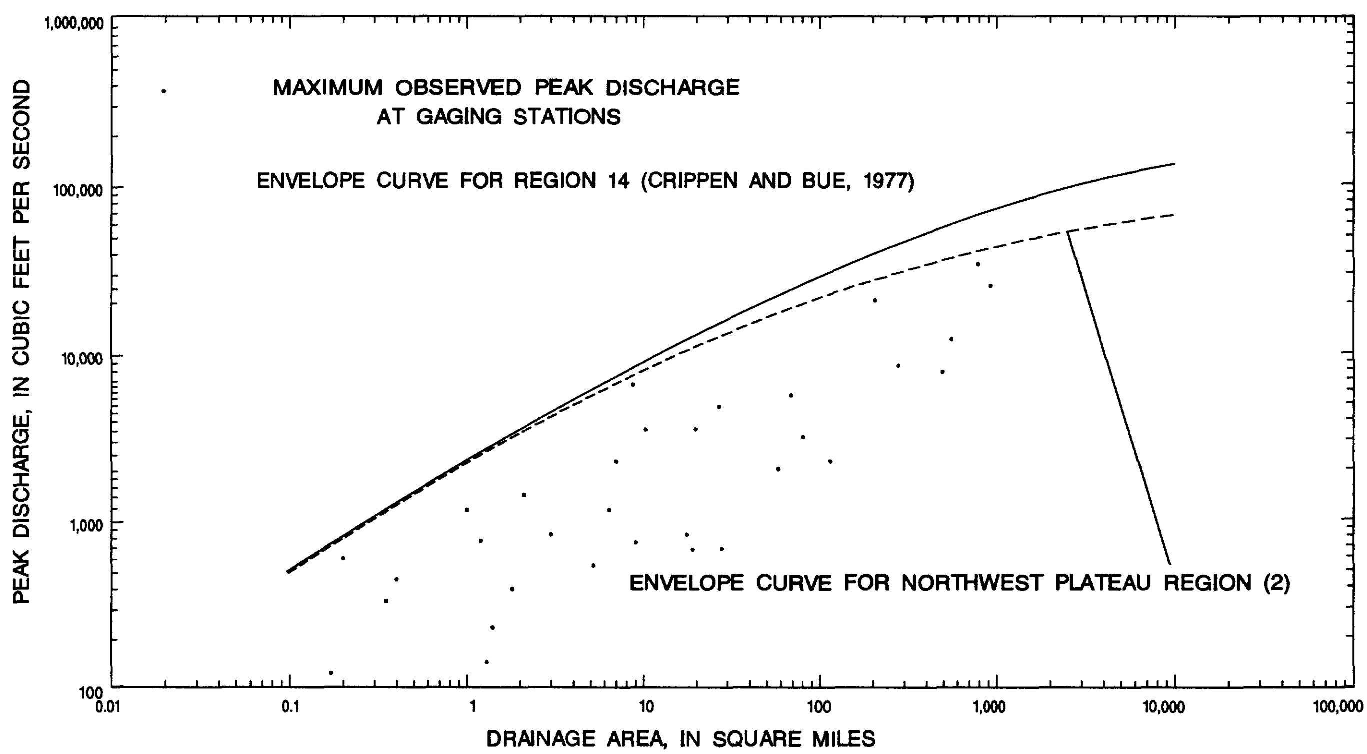


Figure 4.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the northwest plateau region (2).

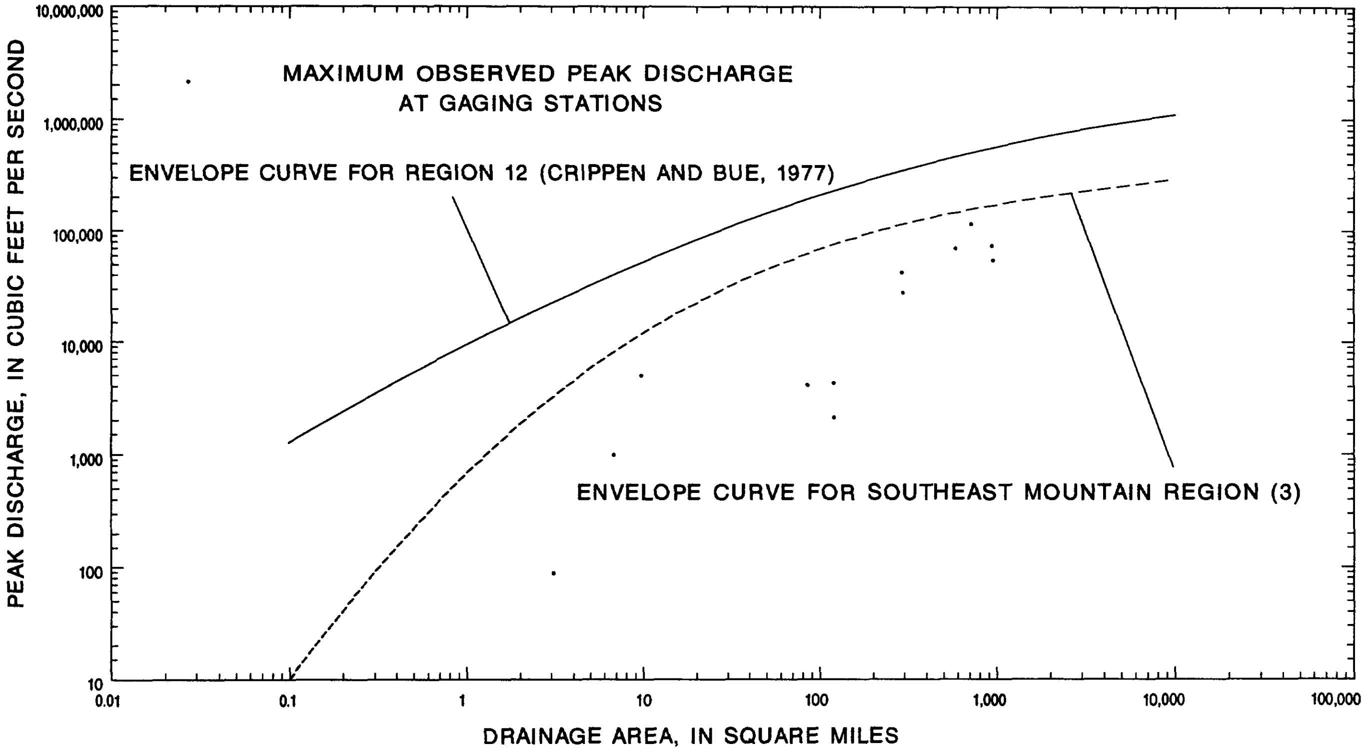


Figure 5.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the southeast mountain region (3).

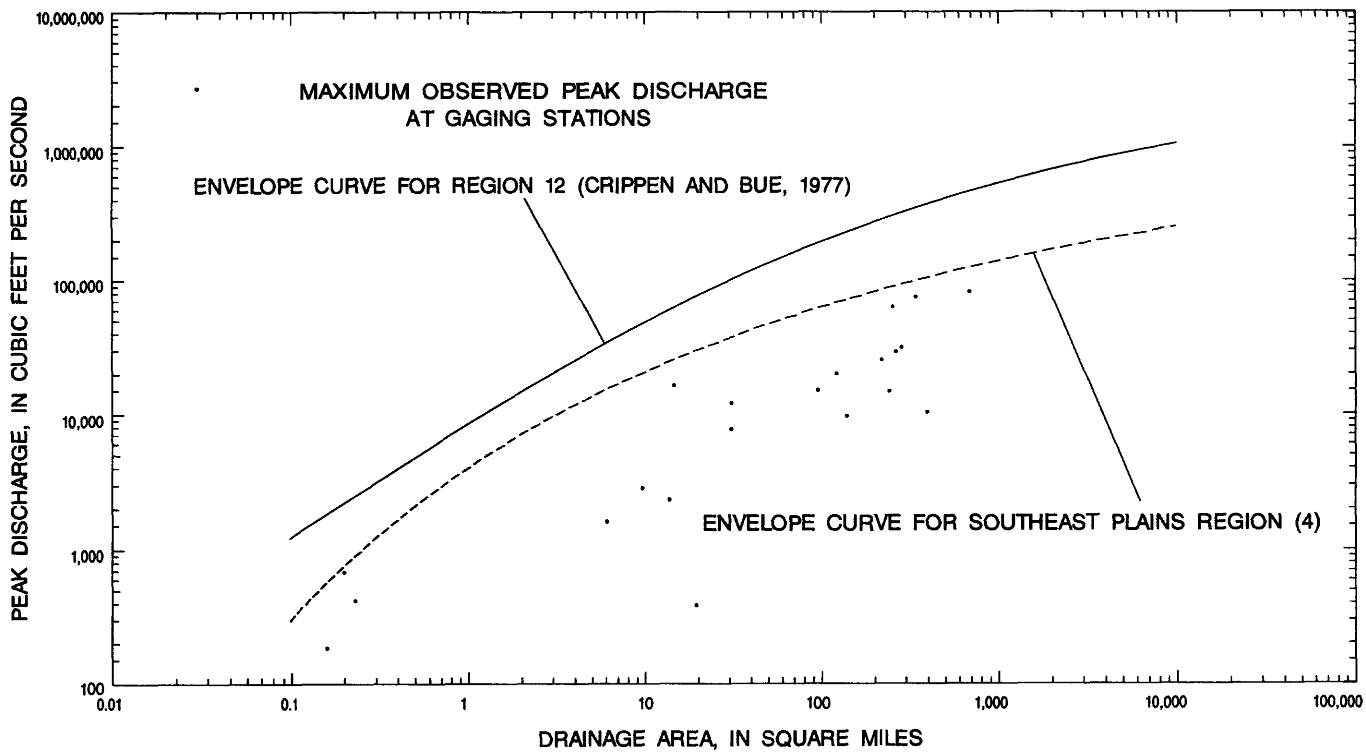


Figure 6.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the southeast plains region (4).

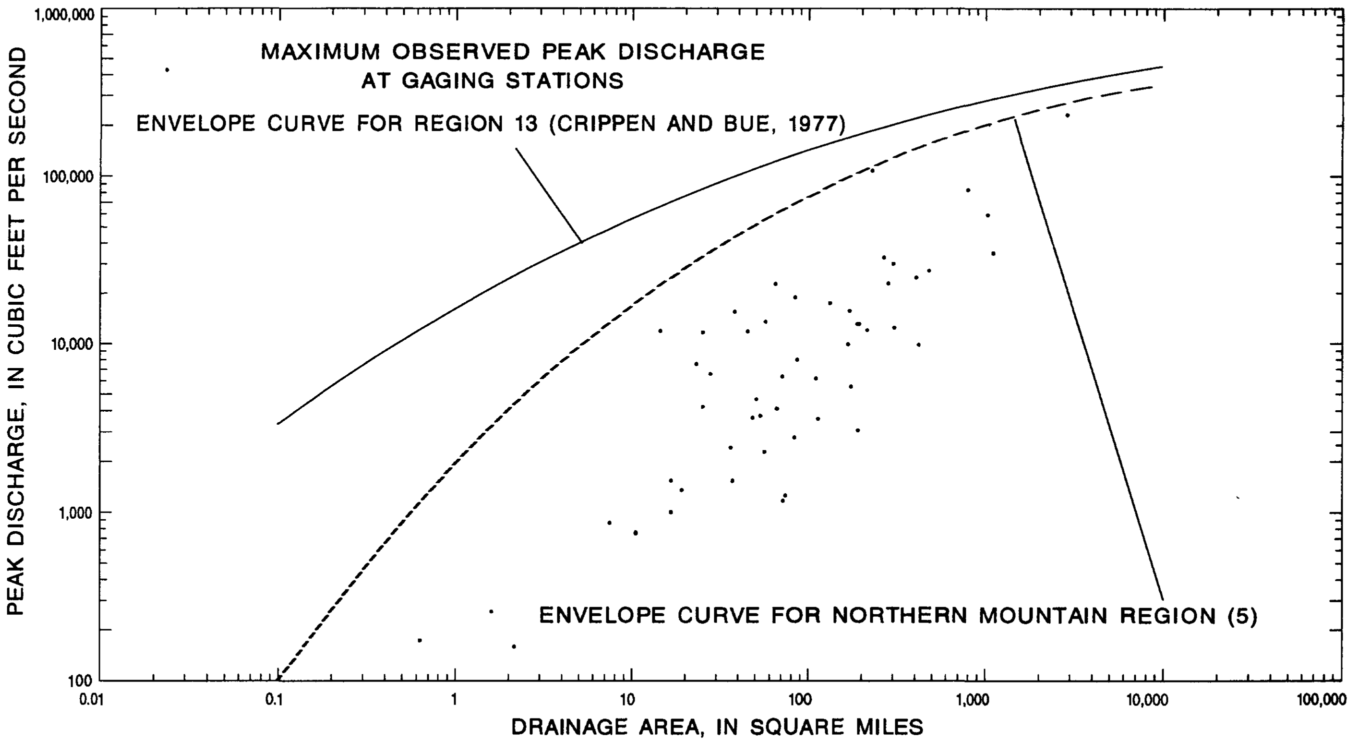


Figure 7.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the northern mountain region (5).

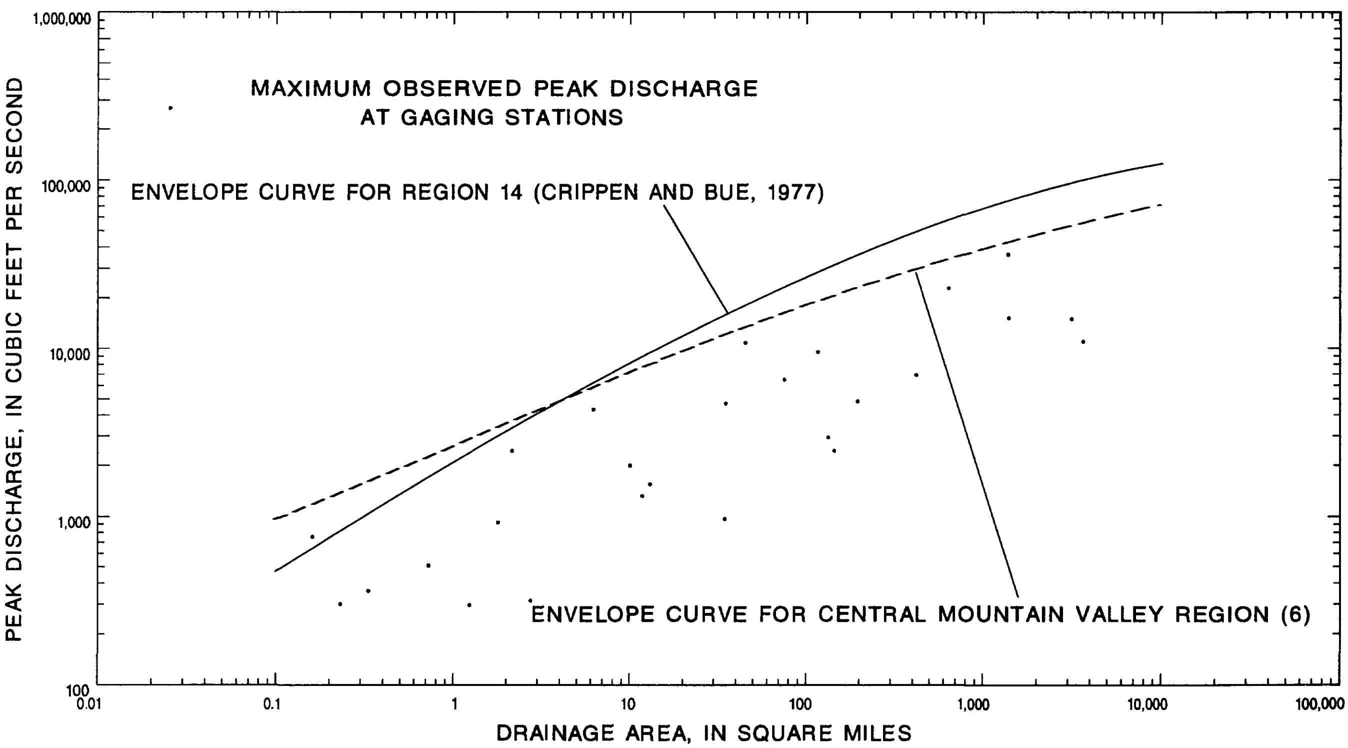


Figure 8.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the central mountain valley region (6).

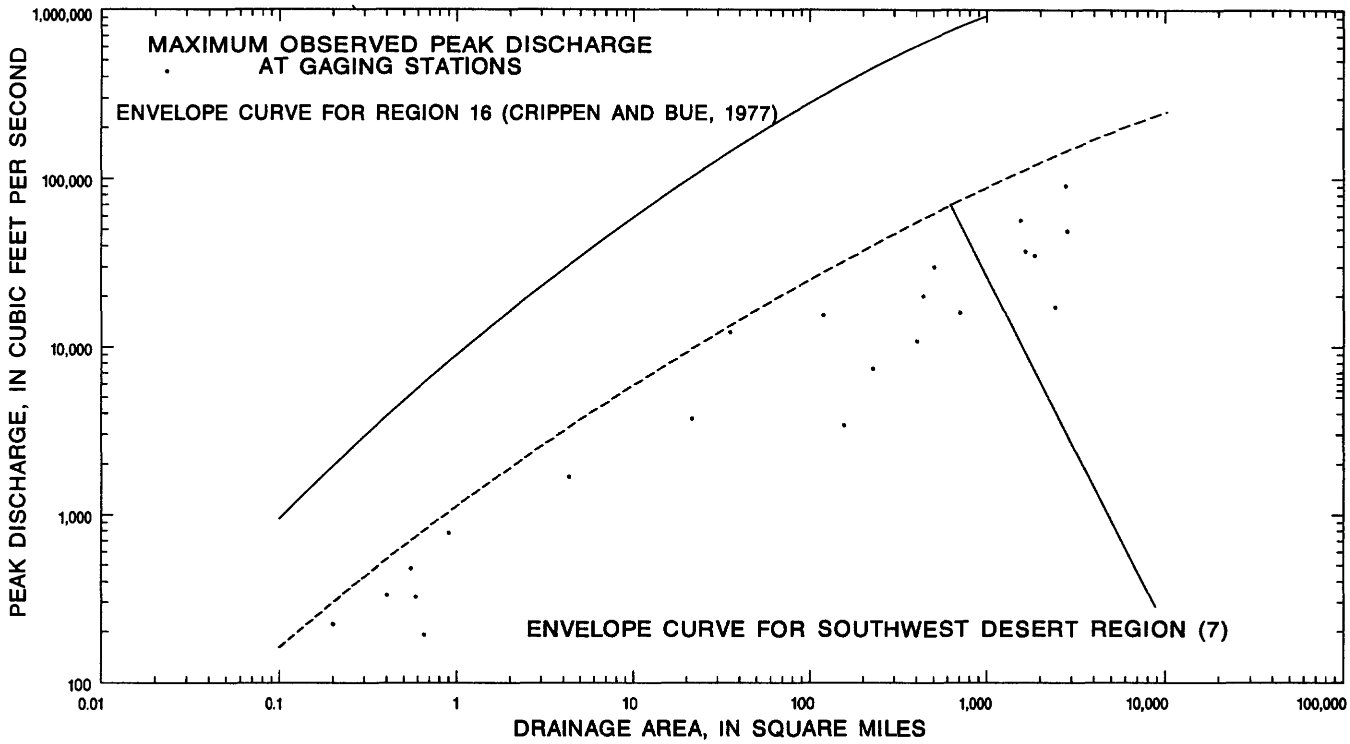


Figure 9.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the southwest desert region (7).

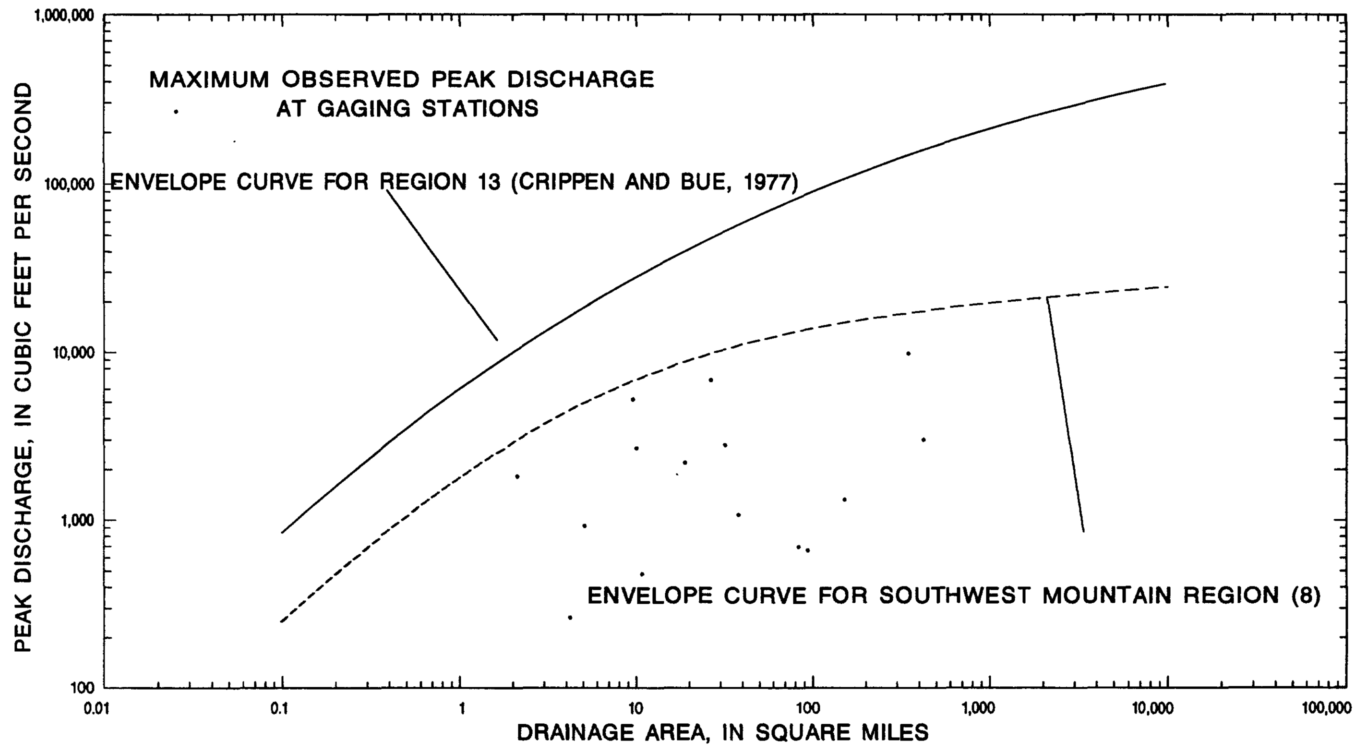


Figure 10.--Relation of maximum observed peak discharge and envelope curves of maximum floodflows to drainage area in the southwest mountain region (8).

SUMMARY

Estimates of the magnitude and frequency of peak discharge are critical for the reliable design of hydraulic structures, such as bridges, culverts, dams, levees, and channels. Equations were developed for estimating the magnitude of peak discharges for recurrence intervals of 2, 5, 10, 25, 50, 100, and 500 years at ungaged sites using data collected through 1993 at 201 gaging stations in New Mexico and bordering areas of adjacent States. Peak discharges for selected recurrence intervals were determined at gaging stations by fitting observed data to a log-Pearson Type III distribution with adjustments for a low-discharge threshold and a zero-skew coefficient. The equations reflect flood response for eight distinct physiographic regions of New Mexico. The eight regions were delineated on the basis of physiography, climate, and regression residuals and are: (1) northeast plains region, (2) northwest plateau region, (3) southeast mountain region, (4) southeast plains region, (5) northern mountain region, (6) central mountain valley region, (7) southwest desert region, and (8) southwest mountain region. Within each region, logarithms of the peak discharges for selected recurrence intervals were related to logarithms of basin and climatic characteristics using OLS techniques for exploratory data analysis. GLS regression, a regression procedure that accounts for time and spatial sampling errors, was then applied to the same data used in the OLS regression analyses. The average standard error of regression for a peak discharge having a recurrence interval of 100 years ranged from 36 to 85 percent. The average standard error of prediction, which includes average sampling error and average standard error of regression, ranged from 41 to 96 percent. A regional regression equation was developed to represent flood information for small basins 10 square miles or less and less than 7,500 feet in mean basin elevation. The equation was based on 43 sites in basins of New Mexico ranging in size from 0.20 to 10.0 square miles. The average standard error of prediction is 63 percent for estimates of the 100-year peak discharge in small basins.

Techniques for transferring flood-frequency relations to ungaged sites on the same stream were simplified from a previous 1986 study. Peak discharges can be estimated at an ungaged site on a stream that has a gaging station upstream or downstream by using the drainage-area ratio and the drainage-area exponent from the regional regression equation of the respective region.

Flood-frequency estimates for 201 gaged sites were weighted by estimates from the regional regression equation according to a procedure described by the Interagency Advisory Committee on Water Data. The estimates were computed with the GLSNET computer program. The observed, predicted, and weighted flood-frequency data were computed for each gaging station.

The maximum observed peak discharge as related to drainage area was presented for New Mexico using the maximum observed peak discharge of record for 201 gaging stations. Envelope curves developed for the maximum floodflows of the United States were compared to the maximum observed peak discharges presented in this report. Peak discharge estimated from regional regression equations or other methods can be compared to this relation.

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APPENDIX

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS

[Peak discharge values: first line, station value used in regression analysis; second line, predicted value using regression equation; third line, weighted value with station and predicted value. See figure 1 for gaging-station and region locations. *crest-stage gage; --, no data]

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northeast plains region (1)					
07153500	Dry Cimarron River near Guy, N. Mex.	545	6,000	6,740	3.82	4.70
07154400*	Carrizozo Creek near Kenton, Okla.	111	4,920	4,900	4.08	5.07
07154500	Cimarron River near Kenton, Okla.	1,110	--	5,480	4.10	5.05
07154650	Tesesquite Creek near Kenton, Okla.	25.4	--	4,560	4.12	5.08
07155100	Cold Springs Creek near Wheeless, Okla.	11.0	--	4,600	4.12	5.10
07213700	Canadian River tributary near Mills, N. Mex.	4.20	6,030	5,910	3.24	3.97
07220900*	Dog Creek near Shoemaker, N. Mex.	18.4	6,750	7,200	3.30	4.02
07222300*	Trementina Creek at Trementina, N. Mex.	65.0	5,050	5,500	3.10	3.80
07222500	Conchas River at Variadero, N. Mex.	523	5,400	5,760	3.05	3.77

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)									
Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northeast plains region (1)									
2,870	6,640	10,700	18,300	26,400	37,000	76,100	46,100	535	34
3,180	7,070	10,900	17,500	23,900	31,900	57,500	--	--	
2,880	6,670	10,700	18,200	26,000	36,000	71,600	--	--	
1,760	4,680	7,680	12,900	17,800	23,800	42,200	15,600	0	41
1,370	3,200	5,020	8,160	11,200	14,900	26,800	--	--	
1,740	4,570	7,380	12,100	16,600	21,900	38,400	--	--	
5,140	11,500	18,000	29,800	41,800	57,200	111,000	43,400	1,200	43
4,620	10,100	15,400	24,600	33,600	44,600	80,700	--	--	
5,130	11,400	17,800	29,200	40,700	55,300	105,000	--	--	
1,730	4,120	6,270	9,550	12,400	15,400	23,600	7,250	1,100	21
631	1,540	2,450	4,030	5,540	7,390	13,200	--	--	
1,610	3,640	5,300	7,750	9,870	12,300	19,200	--	--	
87	406	920	2,230	3,960	6,670	19,300	2,520	0	21
406	1,010	1,630	2,690	3,720	4,960	8,830	--	--	
99	465	1,040	2,350	3,880	6,010	14,200	--	--	
220	732	1,310	2,340	3,340	4,550	8,190	1,280	55	13
244	628	1,020	1,700	2,350	3,130	5,570	--	--	
223	710	1,220	2,090	2,910	3,870	6,800	--	--	
825	2,050	3,280	5,360	7,350	9,730	17,100	7,180	100	40
532	1,310	2,090	3,450	4,750	6,330	11,300	--	--	
810	1,990	3,130	5,030	6,820	8,950	15,500	--	--	
1,600	4,200	6,820	11,300	15,500	20,600	36,000	14,100	0	35
1,040	2,450	3,870	6,320	8,680	11,600	20,700	--	--	
1,570	4,020	6,390	10,300	13,900	18,200	31,300	--	--	
3,010	6,950	11,500	20,500	30,700	45,100	104,000	44,000	1,500	57
3,110	6,920	10,700	17,200	23,500	31,200	56,300	--	--	
3,010	6,950	11,400	20,200	29,900	43,200	95,500	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northeast plains region (1) - Concluded					
07222800*	Garita Creek tributary near Variadero, N. Mex.	12.0	4,510	4,290	3.08	3.78
07225000*	Pajarito Creek at Newkirk, N. Mex.	55.0	4,790	4,860	3.20	3.83
07225500	Ute Creek near Gladstone, N. Mex.	256	6,430	5,800	3.41	4.17
07226300*	Carrizo Creek near Roy, N. Mex.	68.0	5,820	6,000	3.54	4.36
07226500	Ute Creek near Logan, N. Mex.	2,060	5,090	5,770	3.40	4.09
07227050*	Plaza Largo Creek tributary near Ragland, N. Mex.	0.36	--	4,750	3.78	4.55
07227100	Revuelto Creek near Logan, N. Mex.	786	4,090	4,740	3.38	4.00
07227200*	Tramperos Creek near Stead, N. Mex.	556	--	5,100	4.05	5.05
07227295*	Sandy Arroyo tributary near Clayton, N. Mex.	1.25	5,170	5,250	3.84	4.78

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Northeast plains region (1) - Concluded									
573	1,740	3,150	6,020	9,210	13,500	30,000	7,020	0	23
425	1,060	1,700	2,810	3,870	5,170	9,210	--	--	
562	1,640	2,840	5,050	7,310	10,200	20,100	--	--	
958	1,750	2,400	3,390	4,240	5,180	7,840	3,550	0	40
948	2,260	3,570	5,830	8,010	10,700	19,100	--	--	
958	1,780	2,500	3,650	4,700	5,930	9,520	--	--	
6,160	9,280	11,500	14,500	16,900	19,400	25,600	10,900	0	20
2,130	4,850	7,550	12,200	16,700	22,200	40,000	--	--	
5,520	8,260	10,400	13,700	16,800	20,500	31,300	--	--	
408	681	907	1,250	1,550	1,880	2,860	1,800	250	39
1,060	2,510	3,960	6,450	8,870	11,800	21,200	--	--	
424	747	1,050	1,580	2,080	2,680	4,480	--	--	
5,900	13,000	19,800	31,200	42,100	55,200	96,400	70,000	1,500	53
6,410	13,700	20,800	33,100	45,200	60,100	109,000	--	--	
5,910	13,000	19,800	31,400	42,400	55,700	97,900	--	--	
177	333	467	675	859	1,070	1,680	1,170	0	42
67	185	309	523	727	971	1,710	--	--	
170	319	448	651	835	1,050	1,690	--	--	
5,980	11,000	15,400	22,600	29,200	37,100	61,300	26,700	2,000	34
3,860	8,480	13,000	20,900	28,500	37,900	68,500	--	--	
5,890	10,800	15,200	22,400	29,100	37,200	62,700	--	--	
1,050	2,910	4,950	8,730	12,600	17,400	33,800	12,300	250	29
3,210	7,140	11,000	17,700	24,200	32,200	58,000	--	--	
1,110	3,150	5,480	9,870	14,400	20,100	39,100	--	--	
44	111	181	304	425	574	1,060	388	0	42
129	344	566	950	1,320	1,760	3,110	--	--	
46	122	205	361	520	719	1,360	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northwest plateau region (2)					
09187000	Cottonwood Creek near Monticello, Utah	115	--	7,210	--	--
09355000	Spring Creek at La Boca, Colo.	58.0	6,860	7,300	1.89	2.31
09355700*	Gobernador Canyon near Gobernador, N. Mex.	19.8	6,590	6,900	1.82	2.19
09356520*	Burro Canyon near Lindrith, N. Mex.	9.11	7,090	6,970	1.88	2.28
09357200	Gallegos Canyon tributary near Nageezi, N. Mex.	0.20	6,830	6,750	1.75	2.12
09363100	Salt Creek near Oxford, Colo.	17.7	6,730	6,800	2.08	2.50
09367400*	La Plata River tributary near Farmington, N. Mex.	1.03	5,730	5,380	1.70	2.12
09367530	Locke Arroyo near Kirtland, N. Mex.	2.96	5,410	5,500	1.70	2.05
09367840	Yazzie Wash near Mexican Springs, N. Mex.	2.10	7,120	7,400	2.20	2.61

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
				Northwest plateau region (2)					
390	1,270	2,330	4,410	6,650	9,570	19,900	2,200	0	19
788	1,750	2,670	4,180	5,580	7,240	12,300	--	--	
406	1,320	2,390	4,350	6,290	8,660	16,300	--	--	
377	665	915	1,310	1,660	2,080	3,320	1,980	0	43
571	1,280	1,950	3,060	4,100	5,320	9,020	--	--	
381	688	974	1,460	1,920	2,470	4,180	--	--	
401	812	1,190	1,790	2,330	2,980	4,910	3,450	0	38
345	780	1,190	1,880	2,520	3,280	5,570	--	--	
399	810	1,190	1,800	2,370	3,040	5,080	--	--	
76	198	328	564	801	1,100	2,090	725	0	24
239	545	838	1,320	1,770	2,310	3,930	--	--	
81	223	389	706	1,030	1,430	2,720	--	--	
138	252	347	488	609	744	1,120	580	60	35
40	94	147	234	316	413	706	--	--	
133	237	318	437	540	657	996	--	--	
214	392	535	742	913	1,100	1,590	811	0	27
327	741	1,140	1,790	2,400	3,120	5,290	--	--	
218	416	597	898	1,180	1,510	2,450	--	--	
65	194	347	654	991	1,450	3,150	1,130	0	24
86	200	310	493	663	865	1,470	--	--	
66	194	341	617	895	1,250	2,430	--	--	
106	250	394	639	874	1,160	2,050	812	0	36
141	325	502	795	1,070	1,390	2,370	--	--	
107	255	404	662	909	1,210	2,140	--	--	
285	587	855	1,270	1,640	2,060	3,260	1,390	40	49
120	277	429	680	915	1,190	2,030	--	--	
277	560	799	1,160	1,470	1,830	2,880	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northwest plateau region (2) - Continued					
09367860	Chuska Wash near Mexican Springs, N. Mex.	8.70	6,890	6,800	1.90	2.40
09367880	Catron Wash near Mexican Springs, N. Mex.	26.9	6,860	6,600	1.72	2.12
09367900*	Black Springs Wash near Mexican Springs, N. Mex.	7.05	6,620	5,920	1.74	2.09
09378700	Cottonwood Wash near Blanding, Utah	205	--	6,820	--	--
09378950	Comb Wash near Blanding, Utah	10.3	--	5,760	--	--
09379000	Comb Wash near Bluff, Utah	278	--	6,060	--	--
09379030	Black Mountain Wash near Chinle, Ariz.	80.7	--	5,920	--	--
09379060	Lukachukai Creek tributary near Lukachukai, Ariz.	1.37	--	5,820	1.89	2.26
09385800	Little Colorado River tributary near St. Johns, Ariz.	0.35	--	6,350	2.18	2.59

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northwest plateau region (2) - Continued									
1,220	2,390	3,440	5,110	6,620	8,390	13,700	6,400	600	40
234	534	821	1,300	1,740	2,260	3,850	--	--	
1,140	2,120	2,880	3,950	4,870	5,940	9,160	--	--	
1,720	3,020	4,030	5,470	6,660	7,930	11,300	4,750	100	31
398	898	1,370	2,160	2,890	3,760	6,390	--	--	
1,570	2,600	3,290	4,250	5,070	6,020	8,840	--	--	
467	1,040	1,560	2,360	3,060	3,850	6,050	2,200	300	56
212	485	746	1,180	1,580	2,060	3,500	--	--	
456	994	1,450	2,130	2,710	3,370	5,250	--	--	
923	2,460	4,310	8,120	12,500	18,600	43,700	20,500	1,000	29
1,030	2,290	3,470	5,430	7,250	9,400	15,900	--	--	
926	2,450	4,210	7,580	11,100	15,800	32,600	--	--	
746	1,440	2,090	3,150	4,150	5,350	9,160	3,430	100	10
253	577	887	1,400	1,880	2,440	4,150	--	--	
669	1,210	1,640	2,290	2,890	3,610	5,870	--	--	
1,730	3,150	4,420	6,480	8,380	10,600	17,700	8,390	1,200	10
1,190	2,630	3,990	6,230	8,310	10,800	18,300	--	--	
1,670	3,050	4,300	6,380	8,350	10,700	18,000	--	--	
892	1,630	2,220	3,060	3,760	4,510	6,480	3,100	450	15
667	1,490	2,270	3,560	4,750	6,170	10,500	--	--	
874	1,610	2,230	3,200	4,080	5,100	8,050	--	--	
18	46	77	137	202	289	611	227	5	14
98	228	353	561	754	983	1,680	--	--	
21	60	112	223	345	501	1,020	--	--	
51	126	205	352	503	697	1,380	326	0	14
52	122	189	302	407	532	908	--	--	
52	125	202	335	464	622	1,130	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northwest plateau region (2) - Continued					
09387050*	Galestena Canyon tributary near Black Rock, N. Mex.	19.0	7,360	7,100	1.84	2.26
09390500	Show Low Creek near Lakeside, Ariz.	68.6	--	7,320	3.38	--
09392800	Long Lake tributary near Show Low, Ariz.	5.22	--	6,700	--	--
09393500	Silver Creek near Snowflake, Ariz.	925	--	6,400	2.79	--
09395100	Carr Lake Draw tributary near Holbrook, Ariz.	1.28	--	5,420	--	--
09395500*	Puerco River at Gallup, N. Mex.	558	6,970	7,900	1.84	2.23
09395600	Wagon Trail Wash near Gamerco, N. Mex.	0.38	6,660	6,500	1.82	2.18
09395900	Black Creek near Lupton, Ariz.	494	--	7,500	2.08	2.52
09396400	Dead Wash tributary near Holbrook, Ariz.	1.22	--	5,740	--	--

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)									
Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northwest plateau region (2) - Continued									
92	207	319	510	692	912	1,600	660	40	37
338	765	1,170	1,850	2,470	3,220	5,460	--	--	
95	224	362	616	873	1,190	2,200	--	--	
516	1,620	2,930	5,480	8,200	11,800	24,300	5,550	110	40
618	1,380	2,110	3,300	4,420	5,740	9,730	--	--	
519	1,600	2,840	5,120	7,390	10,200	19,600	--	--	
23	194	523	1,380	2,480	4,070	10,300	530	0	12
184	422	650	1,030	1,380	1,800	3,060	--	--	
31	237	566	1,200	1,800	2,520	4,690	--	--	
2,670	5,130	7,100	9,920	12,200	14,700	21,100	[3]25,000	410	74
2,100	4,580	6,910	10,700	14,300	18,500	31,300	--	--	
2,660	5,110	7,090	9,990	12,400	15,100	22,400	--	--	
27	73	120	198	271	356	606	140	0	13
95	221	342	544	731	954	1,630	--	--	
31	91	161	293	423	580	1,050	--	--	
1,890	4,400	6,680	10,200	13,400	16,900	26,700	12,000	500	54
1,650	3,630	5,490	8,540	11,400	14,800	25,000	--	--	
1,880	4,350	6,570	10,000	13,100	16,500	26,300	--	--	
78	170	255	393	520	668	1,110	437	20	24
54	126	197	314	423	552	942	--	--	
77	165	246	376	494	633	1,050	--	--	
2,550	4,420	5,860	7,860	9,480	11,200	15,600	7,680	100	19
1,560	3,430	5,190	8,080	10,800	14,000	23,600	--	--	
2,490	4,310	5,750	7,910	9,830	12,000	18,200	--	--	
197	371	519	746	944	1,170	1,810	743	50	13
93	216	335	532	716	933	1,590	--	--	
186	341	469	668	849	1,060	1,700	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northwest plateau region (2) - Concluded					
09397200	Penzance Wash near Joseph City, Ariz.	0.17	--	5,150	--	--
09397800	Brookbank Canyon near Heber, Ariz.	27.9	--	6,950	--	--
09398000	Chevelon Creek near Winslow, Ariz.	785	--	6,440	3.08	--
09400560	Oraibi Wash tributary near Oraibi, Ariz.	1.78	--	6,020	--	--
09400565	Polacca Wash tributary near Chinle, Ariz.	6.45	--	6,890	--	--

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northwest plateau region (2) - Concluded									
38	84	125	187	240	299	459	120	10	14
37	87	136	218	294	384	656	--	--	
38	84	127	196	259	331	543	--	--	
129	329	516	814	1,080	1,370	2,180	666	30	13
405	913	1,400	2,200	2,940	3,830	6,490	--	--	
141	385	650	1,130	1,590	2,140	3,740	--	--	
2,450	6,290	10,700	19,200	28,600	41,200	88,900	33,600	520	64
1,940	4,250	6,410	9,970	13,300	17,200	29,100	--	--	
2,430	6,190	10,300	18,000	25,900	36,200	72,600	--	--	
124	237	333	481	609	755	1,170	383	25	14
111	257	398	631	849	1,110	1,890	--	--	
123	240	347	523	689	884	1,460	--	--	
363	700	976	1,380	1,720	2,090	3,070	1,130	50	13
203	465	716	1,130	1,520	1,980	3,360	--	--	
347	657	908	1,290	1,640	2,040	3,210	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southeast mountain region (3)					
08387000	Rio Ruidoso at Hollywood, N. Mex.	120	8,020	9,060	2.83	3.50
08388000	Rio Ruidoso at Hondo, N. Mex.	290	6,460	7,760	2.97	3.61
08389000*	Rio Bonito near Fort Stanton, N. Mex.	85.0	7,020	8,650	--	--
08389500*	Rio Bonito at Hondo, N. Mex.	295	6,190	7,900	2.97	3.62
08390100	Rio Hondo at Picacho, N. Mex.	715	6,280	7,740	2.38	2.96
08390500	Rio Hondo at Diamond A Ranch near Roswell, N. Mex.	947	5,480	7,400	3.14	3.83
08394500	Rio Felix at Old Highway Bridge, near Hagerman, N. Mex.	932	5,210	7,070	3.20	3.98
08397400*	Hyatt Canyon near Cloudcroft, N. Mex.	3.08	8,060	8,320	3.14	3.79
08397600*	Rio Peñasco near Dunken, N. Mex.	583	6,900	8,000	3.22	3.95

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southeast mountain region (3)									
263	548	841	1,370	1,920	2,630	5,180	2,120	50	40
307	682	1,070	1,750	2,420	3,240	5,960	--	--	
268	568	882	1,450	2,040	2,790	5,380	--	--	
1,000	2,640	4,690	9,130	14,500	22,300	57,400	42,700	200	40
1,310	3,460	5,820	10,200	14,600	20,200	39,100	--	--	
1,070	2,840	5,020	9,500	14,500	21,400	48,800	--	--	
526	1,220	1,900	3,030	4,100	5,380	9,310	4,100	0	39
328	739	1,150	1,870	2,570	3,430	6,160	--	--	
486	1,110	1,680	2,640	3,550	4,640	8,140	--	--	
2,040	5,230	8,520	14,300	19,900	26,700	48,500	28,200	125	49
1,190	3,110	5,200	9,060	13,000	18,000	34,900	--	--	
1,800	4,530	7,250	12,000	16,700	22,500	42,100	--	--	
2,260	6,980	13,300	27,800	45,800	73,100	198,000	115,000	0	14
2,300	6,420	11,200	20,300	30,000	42,600	87,500	--	--	
2,280	6,680	12,000	22,800	34,600	50,600	114,000	--	--	
2,630	8,050	15,300	31,900	52,500	83,600	226,000	54,800	500	54
3,570	10,500	18,600	34,500	51,500	73,800	154,000	--	--	
2,800	8,580	16,200	32,800	52,100	79,700	195,000	--	--	
5,420	12,300	18,600	28,800	37,900	48,400	78,800	74,000	2,000	56
4,630	14,000	25,200	47,100	70,500	101,000	211,000	--	--	
5,240	12,700	20,400	34,100	47,800	64,400	115,000	--	--	
40	62	78	99	116	133	174	88	10	41
56	105	146	206	256	311	453	--	--	
43	71	94	128	157	186	255	--	--	
1,370	4,150	7,420	13,800	20,600	29,500	61,200	[2]70,000	0	53
1,670	4,500	7,700	13,800	20,200	28,500	57,700	--	--	
1,430	4,240	7,500	13,800	20,400	29,100	59,800	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southeast mountain region (3) - Concluded					
08480650	Minnie Hall Draw near Three Rivers, N. Mex.	9.70	6,060	6,230	2.44	2.98
08480700*	Indian Creek near Three Rivers, N. Mex.	6.80	7,890	7,900	2.80	3.30
08481500	Tularosa Creek near Bent, N. Mex.	120	6,820	7,580	2.55	3.10

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southeast mountain region (3) - Concluded									
672	1,810	2,940	4,830	6,580	8,620	14,500	4,970	700	28
624	1,570	2,440	3,800	4,980	6,290	9,870	--	--	
661	1,740	2,770	4,430	5,900	7,590	12,400	--	--	
136	322	500	791	1,060	1,370	2,300	990	0	37
122	252	365	539	689	856	1,310	--	--	
134	309	467	715	936	1,190	1,940	--	--	
823	2,060	3,320	5,540	7,700	10,400	18,900	4,280	1,000	46
887	2,250	3,680	6,200	8,670	11,700	21,500	--	--	
836	2,100	3,420	5,760	8,060	10,900	19,900	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southeast plains region (4)					
08379300*	Tecolote Creek at Tecolote, N. Mex.	122	7,180	7,390	2.83	3.40
08379550	Cañon Blanco near Leyba, N. Mex.	11.2	6,930	6,660	2.42	2.88
08379600	Pecos River tributary near Dilia, N. Mex.	0.16	5,470	5,450	2.68	3.25
08385530*	Alamosa Creek tributary near Jordan, N. Mex.	9.71	--	4,950	3.76	4.56
08385600*	Yeso Creek near Fort Sumner, N. Mex.	242	--	4,720	3.40	4.16
08385670*	Aragon Creek tributary near Encinoso, N. Mex.	6.07	6,740	6,780	2.83	3.45
08390050	Rio Hondo tributary at Tinnie, N. Mex.	0.23	5,300	5,150	2.98	3.63
08393200	Rocky Arroyo abve. Two Rivers Reservoir near Roswell, N. Mex.	31.0	4,420	4,550	3.19	3.88
08393600	North Spring River at Roswell, N. Mex.	19.5	3,660	3,600	3.19	3.92

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southeast plains region (4)									
1,200	2,910	4,660	7,720	10,700	14,400	26,400	20,000	0	57
959	3,120	5,740	11,000	16,700	24,300	52,500	--	--	
1,190	2,920	4,770	8,230	11,900	16,900	35,000	--	--	
227	681	1,210	2,210	3,260	4,610	9,310	1,440	0	13
282	864	1,540	2,840	4,190	5,950	12,000	--	--	
232	710	1,290	2,440	3,690	5,330	11,100	--	--	
16	57	109	215	331	484	1,030	184	0	33
32	88	148	255	360	486	878	--	--	
16	58	112	221	336	485	974	--	--	
39	145	301	679	1,170	1,930	5,550	2,850	8	32
262	801	1,420	2,610	3,860	5,470	11,000	--	--	
43	168	373	920	1,670	2,830	7,730	--	--	
1,340	3,110	4,990	8,470	12,100	16,800	33,900	14,800	260	57
1,360	4,510	8,370	16,200	24,800	36,400	80,000	--	--	
1,350	3,180	5,250	9,420	14,200	20,900	47,000	--	--	
496	849	1,120	1,500	1,810	2,140	3,000	1,610	350	33
206	622	1,100	2,000	2,940	4,150	8,250	--	--	
482	830	1,120	1,590	2,060	2,650	4,670	--	--	
36	146	298	634	1,030	1,580	3,750	420	0	23
38	107	181	314	444	602	1,100	--	--	
36	141	273	523	765	1,050	1,950	--	--	
789	2,380	4,230	7,830	11,600	16,700	34,400	12,000	300	18
475	1,490	2,700	5,050	7,550	10,800	22,500	--	--	
760	2,220	3,810	6,700	9,610	13,300	26,300	--	--	
14	70	158	366	621	987	2,450	387	5	28
375	1,160	2,090	3,880	5,780	8,250	16,900	--	--	
16	95	247	700	1,370	2,450	7,070	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southeast plains region (4) - Continued					
08393900	Eight Mile Draw near Roswell, N. Mex.	397	4,820	3,740	3.18	3.87
08400000	Fourmile Draw near Lakewood, N. Mex.	265	4,380	4,690	3.20	3.98
08401200	South Seven Rivers near Lakewood, N. Mex.	220	4,660	4,020	3.20	3.98
08401800	Rocky Arroyo near Carlsbad, N. Mex.	254	4,660	4,890	3.20	3.99
08401900	Rocky Arroyo at Highway Bridge near Carlsbad, N. Mex.	285	4,550	4,630	3.20	3.98
08405050	Last Chance Canyon tributary near Carlsbad Caverns, N. Mex.	0.20	4,220	4,180	3.19	4.00
08405100	Mosley Canyon near White City, N. Mex.	14.6	6,180	--	3.20	3.98
08405500	Black River above Malaga, N. Mex.	343	4,180	4,540	3.20	3.98
08408500	Delaware River near Red Bluff, N. Mex.	689	3,920	4,160	3.20	3.98

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)									
Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southeast plains region (4) - Continued									
302	1,630	3,990	10,500	19,600	34,500	110,000	[2]22,200	0	53
1,760	5,880	11,000	21,400	33,000	48,800	109,000	--	--	
322	1,800	4,520	12,100	22,500	38,700	109,000	--	--	
456	2,680	6,600	16,900	30,800	52,400	151,000	29,300	150	42
1,430	4,730	8,800	17,000	26,100	38,400	84,600	--	--	
475	2,790	6,830	17,000	29,500	47,400	117,000	--	--	
1,060	6,290	15,100	37,100	64,800	106,000	272,000	25,500	100	30
1,300	4,280	7,940	15,300	23,500	34,400	75,400	--	--	
1,070	6,090	13,800	30,300	47,700	69,800	146,000	--	--	
5,630	16,500	29,100	53,300	78,800	112,000	230,000	63,300	600	14
1,400	4,620	8,600	16,600	25,500	37,500	82,400	--	--	
5,040	13,600	21,700	34,800	47,200	62,800	119,000	--	--	
2,480	10,800	21,900	44,500	68,600	99,600	203,000	31,600	1,000	30
1,480	4,920	9,160	17,700	27,200	40,100	88,500	--	--	
2,420	10,000	19,200	35,500	51,100	70,100	134,000	--	--	
116	269	406	618	803	1,010	1,570	683	75	35
36	99	168	290	409	555	1,010	--	--	
113	256	378	556	707	875	1,360	--	--	
1,660	3,380	4,950	7,490	9,840	12,600	21,000	16,400	30	35
323	997	1,780	3,290	4,890	6,960	14,200	--	--	
1,580	3,120	4,440	6,460	8,310	10,500	17,800	--	--	
2,040	8,330	17,100	36,000	58,000	88,300	204,000	74,600	0	54
1,630	5,430	10,100	19,700	30,300	44,700	99,200	--	--	
2,030	8,150	16,300	33,000	51,100	74,700	159,000	--	--	
3,220	9,880	18,300	36,100	56,600	85,600	202,000	81,400	125	56
2,330	7,910	14,900	29,300	45,400	67,500	152,000	--	--	
3,190	9,790	18,000	35,100	54,500	81,100	185,000	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southeast plains region (4) - Concluded					
08480150*	White Oaks Canyon near Carrizozo, N. Mex.	31.0	6,030	5,450	2.57	3.22
08481000	Three Rivers at Three Rivers, N. Mex.	96.0	5,740	6,430	2.44	2.99
08481100	Tularosa Basin tributary near Three Rivers, N. Mex.	13.8	5,510	5,590	2.43	2.98
08482000	Rio Tularosa near Tularosa, N. Mex.	140	6,340	7,400	2.48	2.99

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Southeast plains region (4) - Concluded									
1,060	2,010	2,880	4,350	5,760	7,470	13,000	7,690	0	35
475	1,490	2,700	5,050	7,550	10,800	22,500	--	--	
1,040	1,970	2,860	4,470	6,160	8,390	16,400	--	--	
2,100	5,000	7,760	12,300	16,400	21,200	35,200	15,000	182	22
848	2,740	5,030	9,580	14,500	21,100	45,300	--	--	
2,000	4,700	7,220	11,500	15,700	21,100	40,200	--	--	
254	938	1,750	3,260	4,760	6,600	12,200	2,340	200	25
314	967	1,730	3,190	4,730	6,730	13,700	--	--	
257	941	1,750	3,240	4,750	6,650	13,000	--	--	
2,420	4,740	6,820	10,200	13,200	16,800	27,700	9,640	700	11
1,030	3,360	6,190	11,900	18,100	26,400	57,100	--	--	
2,220	4,440	6,640	10,900	15,500	21,900	45,800	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5)					
07124500	Purgatoire River at Trinidad, Colo.	795	6,980	8,000	2.99	3.40
07199000	Canadian River near Hebron, N. Mex.	229	7,360	8,300	3.56	4.34
07201000	Raton Creek at Raton, N. Mex.	14.4	7,120	8,100	3.64	4.45
07203000*	Vermejo River near Dawson, N. Mex.	301	7,730	9,350	3.61	4.41
07204000	Moreno Creek at Eagle Nest, N. Mex.	73.8	8,690	10,200	2.00	2.49
07204500	Cieneguilla Creek near Eagle Nest, N. Mex.	56.0	8,840	9,400	2.00	2.40
07205000	Sixmile Creek near Eagle Nest, N. Mex.	10.5	9,360	9,500	2.00	2.39
07206400*	Clear Creek near Ute Park, N. Mex.	7.44	8,810	9,770	3.45	4.24
07207500	Ponil Creek near Cimarron, N. Mex.	171	7,860	9,350	3.48	4.19

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Northern mountain region (5)									
6,620	12,600	17,600	25,100	31,400	38,500	57,700	45,400	850	86
3,090	6,950	10,800	17,600	24,100	32,200	58,400	--	--	
6,530	12,400	17,200	24,500	30,800	37,800	57,800	--	--	
3,090	6,880	10,800	17,800	24,900	34,000	65,500	62,400	250	40
1,100	2,630	4,260	7,210	10,200	14,000	26,800	--	--	
2,970	6,460	9,860	15,800	21,700	29,100	55,000	--	--	
409	938	1,460	2,340	3,180	4,210	7,440	3,990	100	41
119	303	505	877	1,260	1,750	3,440	--	--	
387	860	1,300	2,020	2,700	3,540	6,270	--	--	
1,580	3,240	4,740	7,160	9,360	11,900	19,600	12,600	250	65
1,060	2,320	3,580	5,770	7,900	10,500	19,000	--	--	
1,570	3,200	4,680	7,050	9,230	11,800	19,600	--	--	
67	115	152	204	246	291	406	240	30	65
229	398	537	738	906	1,090	1,570	--	--	
68	118	158	215	263	313	444	--	--	
108	228	332	489	625	777	1,190	505	10	65
216	398	551	780	974	1,190	1,770	--	--	
109	231	338	501	642	800	1,230	--	--	
26	52	75	111	143	181	291	128	0	63
53	98	137	194	242	295	438	--	--	
26	53	76	114	147	186	300	--	--	
22	45	67	105	142	188	339	151	5	32
45	98	150	238	322	424	741	--	--	
23	47	72	117	162	217	396	--	--	
413	1,080	1,820	3,230	4,730	6,720	13,900	5,630	0	78
656	1,420	2,180	3,470	4,720	6,250	11,100	--	--	
417	1,090	1,840	3,250	4,730	6,660	13,500	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5) - Continued					
07208500	Rayado Creek at Sauble Ranch near Cimarron, N. Mex.	65.0	8,350	10,400	3.36	4.05
07211000	Cimarron River at Springer, N. Mex.	1,030	6,640	9,160	3.20	3.99
07211500	Canadian River near Taylor Springs, N. Mex.	2,850	6,880	8,640	3.20	3.98
07214500	Mora River near Holman, N. Mex.	57.0	8,680	10,000	2.55	2.98
07214800	Rio La Casa near Cleveland, N. Mex.	23.0	9,620	9,000	3.52	3.98
07215500	Mora River at La Cueva, N. Mex.	173	7,860	9,540	3.19	3.96
07216500	Mora River near Golondrinas, N. Mex.	267	7,630	9,400	3.38	3.92
07217000	Coyote Creek below Black Lake, N. Mex.	48.0	8,810	9,300	2.80	3.32
07217100	Coyote Creek above Guadalupita, N. Mex.	71.0	8,200	9,420	3.38	3.84

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northern mountain region (5) - Continued									
155	346	560	984	1,460	2,120	4,800	[3]9,000	36	80
230	459	673	1,020	1,340	1,720	2,860	--	--	
156	348	563	986	1,450	2,090	4,620	--	--	
764	1,930	3,310	6,100	9,270	13,700	31,700	29,500	150	64
2,990	6,320	9,590	15,200	20,500	27,100	47,900	--	--	
781	2,000	3,460	6,450	9,830	14,500	33,000	--	--	
4,740	10,500	16,900	29,600	43,700	63,400	143,000	[3]162,000	1,000	90
7,870	17,200	26,600	42,900	59,000	78,800	144,000	--	--	
4,790	10,700	17,300	30,400	44,800	64,700	143,000	--	--	
561	1,630	2,860	5,220	7,710	11,000	22,400	4,700	0	21
204	383	539	779	989	1,220	1,890	--	--	
541	1,490	2,460	4,100	5,660	7,570	13,900	--	--	
204	433	667	1,090	1,520	2,070	4,020	2,260	35	14
134	302	470	760	1,040	1,380	2,470	--	--	
197	411	621	987	1,350	1,810	3,350	--	--	
541	854	1,090	1,400	1,660	1,930	2,610	1,530	200	63
622	1,300	1,960	3,060	4,100	5,350	9,260	--	--	
542	866	1,120	1,480	1,780	2,110	2,960	--	--	
774	1,550	2,340	3,780	5,260	7,210	14,300	[3]14,000	200	78
917	1,930	2,900	4,550	6,110	7,980	13,900	--	--	
776	1,560	2,360	3,820	5,320	7,270	14,200	--	--	
43	176	386	923	1,650	2,820	8,690	913	6	13
216	444	657	1,000	1,320	1,700	2,820	--	--	
49	199	427	942	1,550	2,400	5,810	--	--	
115	331	600	1,170	1,820	2,760	6,600	1,820	0	17
303	643	971	1,520	2,040	2,660	4,590	--	--	
122	356	645	1,230	1,870	2,730	5,930	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5) - Continued					
07218000	Coyote Creek near Golondrinas, N. Mex.	215	7,730	8,760	3.35	4.10
07220000	Sapello River at Sapello, N. Mex.	132	7,600	7,950	3.30	4.08
07221000	Mora River near Shoemaker, N. Mex.	1,100	7,040	9,020	3.28	4.03
08246500	Conejos River near Mogote, Colo.	282	9,240	10,300	1.92	2.32
08247500	San Antonio River at Ortiz, Colo.	110	8,890	9,500	1.87	2.20
08248000	Los Pinos River near Ortiz, Colo.	167	9,070	9,900	1.93	2.30
08252500	Costilla Creek above Costilla Dam, N. Mex.	25.1	10,400	11,400	3.19	4.00
08253000	Casias Creek near Costilla, N. Mex.	16.6	10,400	11,100	3.20	3.60
08253500	Santistevan Creek near Costilla, N. Mex.	2.15	10,700	10,500	2.92	3.60

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northern mountain region (5) - Continued									
596	1,280	1,940	3,060	4,140	5,440	9,600	4,050	60	65
909	2,050	3,210	5,250	7,240	9,710	17,800	--	--	
601	1,300	2,000	3,190	4,350	5,780	10,300	--	--	
2,470	4,190	5,530	7,450	9,040	10,800	15,300	6,420	300	17
753	1,840	3,010	5,120	7,270	10,000	19,300	--	--	
2,220	3,710	4,880	6,720	8,440	10,500	16,700	--	--	
2,150	5,100	7,880	12,300	16,300	21,000	34,100	15,200	0	79
3,280	7,040	10,800	17,200	23,400	31,000	55,400	--	--	
2,160	5,150	7,970	12,600	16,700	21,600	35,500	--	--	
2,640	3,660	4,400	5,410	6,230	7,100	9,370	[3]9,000	0	91
664	1,100	1,450	1,940	2,350	2,780	3,900	--	--	
2,620	3,610	4,310	5,270	6,050	6,870	9,040	--	--	
497	794	1,010	1,310	1,540	1,780	2,400	[2]1,750	180	74
359	632	854	1,180	1,450	1,740	2,510	--	--	
495	791	1,010	1,300	1,540	1,780	2,400	--	--	
1,350	1,850	2,180	2,590	2,880	3,180	3,870	3,160	850	79
469	806	1,080	1,470	1,800	2,150	3,070	--	--	
1,340	1,830	2,150	2,540	2,830	3,130	3,820	--	--	
63	139	225	393	580	839	1,880	[3]3,870	13	57
85	158	224	326	418	521	820	--	--	
63	140	225	390	569	814	1,770	--	--	
61	96	121	154	180	207	272	181	22	57
62	116	162	235	298	370	573	--	--	
61	96	122	157	185	214	287	--	--	
9	12	15	18	20	23	28	18	5	56
13	26	38	56	73	92	147	--	--	
9	13	15	19	22	25	32	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5) - Continued					
08263000	Latir Creek near Cerro, N. Mex.	10.5	9,880	11,500	2.01	2.43
08264000	Red River near Red River, N. Mex.	19.1	10,600	10,800	2.49	2.85
08265000	Red River near Questa, N. Mex.	113	8,910	9,930	1.80	2.39
08267000	Red River at mouth, near Questa, N. Mex.	190	8,360	9,500	1.79	2.00
08267500	Rio Hondo near Valdez, N. Mex.	36.2	9,320	10,100	2.20	2.60
08268500	Arroyo Hondo at Arroyo Hondo, N. Mex.	65.6	8,450	9,730	1.79	2.00
08269000	Rio Pueblo de Taos near Taos, N. Mex.	66.6	8,740	9,500	2.28	2.84
08271000	Rio Lucero near Arroyo Seco, N. Mex.	16.6	9,610	10,800	2.27	2.68
08275000	Rio Fernando de Taos near Taos, N. Mex.	71.7	8,180	8,870	1.82	2.25

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northern mountain region (5) - Continued									
47	77	100	132	159	188	263	126	0	33
35	56	72	95	112	130	175	--	--	
47	76	99	130	156	183	255	--	--	
107	166	208	263	305	348	453	264	0	24
69	122	166	230	285	344	503	--	--	
105	164	204	260	303	348	460	--	--	
250	430	568	759	914	1,080	1,500	886	0	79
341	595	803	1,110	1,360	1,630	2,360	--	--	
251	433	573	770	931	1,100	1,540	--	--	
311	472	585	731	843	957	1,230	730	0	28
547	928	1,230	1,660	2,000	2,370	3,320	--	--	
315	483	607	776	908	1,050	1,380	--	--	
162	268	346	455	542	633	865	541	0	59
132	236	323	452	561	680	1,000	--	--	
162	267	346	455	543	636	874	--	--	
156	317	465	707	932	1,200	2,020	1,060	38	51
215	364	480	642	773	910	1,260	--	--	
157	318	466	704	924	1,180	1,960	--	--	
176	372	541	797	1,020	1,260	1,920	1,050	0	83
257	493	701	1,020	1,310	1,630	2,550	--	--	
177	375	546	808	1,030	1,290	1,970	--	--	
127	186	226	276	313	351	439	310	100	83
60	105	141	193	237	283	406	--	--	
126	184	223	272	310	347	437	--	--	
59	113	161	238	308	390	636	219	20	67
295	556	778	1,110	1,400	1,720	2,590	--	--	
63	127	189	295	395	511	852	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5) - Continued					
08275500	Rio Grande del Rancho near Talpa, N. Mex.	83.0	8,720	9,400	1.91	2.32
08275600	Rio Chiquito near Talpa, N. Mex.	37.0	8,560	9,350	1.84	2.28
08279000	Embudo Creek at Dixon, N. Mex.	305	7,760	8,980	1.78	2.00
08281200	Wolf Creek near Chama, N. Mex.	27.7	9,500	9,600	2.21	2.80
08283500	Rio Chama at Park View, N. Mex.	405	8,410	9,270	1.80	2.19
08284100	Rio Chama near La Puente, N. Mex.	480	8,180	9,000	1.80	2.19
08284300	Horse Lake Creek above Heron Reservoir near Park View, N. Mex.	45.0	7,740	7,970	2.00	2.42
08284500	Willow Creek near Park View, N. Mex.	193	7,600	8,000	1.85	2.29
08288000	El Rito near El Rito, N. Mex.	50.5	8,760	8,700	1.86	2.30

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)									
Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northern mountain region (5) - Continued									
162	275	363	487	588	697	983	644	100	41
296	536	736	1,030	1,280	1,560	2,300	--	--	
164	281	374	511	624	747	1,070	--	--	
72	152	225	345	455	586	982	309	10	24
152	279	385	541	672	816	1,200	--	--	
74	156	234	361	478	614	1,010	--	--	
1,080	1,650	2,080	2,690	3,200	3,740	5,200	4,200	400	67
917	1,620	2,180	3,010	3,700	4,440	6,410	--	--	
1,080	1,650	2,080	2,710	3,220	3,780	5,270	--	--	
445	893	1,280	1,860	2,370	2,930	4,490	1,900	490	13
121	232	329	478	609	757	1,170	--	--	
412	776	1,040	1,410	1,720	2,060	3,030	--	--	
4,060	5,750	6,920	8,440	9,610	10,800	13,700	10,000	2,000	43
1,110	1,960	2,650	3,680	4,530	5,470	7,980	--	--	
3,960	5,550	6,610	7,970	9,030	10,100	12,900	--	--	
3,950	6,670	8,710	11,500	13,800	16,100	22,100	11,200	0	38
1,370	2,460	3,370	4,720	5,870	7,140	10,600	--	--	
3,880	6,470	8,340	10,900	12,900	15,000	20,600	--	--	
101	256	440	824	1,270	1,910	4,590	3,960	25	29
261	550	816	1,240	1,630	2,080	3,420	--	--	
105	268	465	867	1,320	1,930	4,350	--	--	
1,190	1,820	2,330	3,090	3,760	4,520	6,730	4,500	600	34
847	1,720	2,500	3,740	4,850	6,120	9,830	--	--	
1,180	1,810	2,340	3,150	3,870	4,700	7,120	--	--	
220	405	571	835	1,080	1,360	2,240	1,240	0	39
232	449	637	925	1,170	1,450	2,230	--	--	
220	407	574	842	1,090	1,370	2,240	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Northern mountain region (5) - Concluded					
08289000	Rio Ojo Caliente at La Madera, N. Mex.	419	7,900	8,640	1.83	2.21
08291000	Santa Cruz River at Cundiyo, N. Mex.	86.0	8,650	9,190	1.99	2.44
08294300	Rio Nambe at Nambe Falls near Nambe, N. Mex.	25.1	8,630	9,380	2.00	2.50
08295000	Rio Nambe near Nambe, N. Mex.	38.2	8,280	9,100	1.98	2.40
08295200	Rio en Medio near Santa Fe, N. Mex.	0.63	–	11,300	3.40	3.98
08302200	North Fork Tesuque Creek near Santa Fe, N. Mex.	1.60	10,700	11,000	3.00	3.48
08377900	Rio Mora near Terrero, N. Mex.	53.2	9,450	10,300	2.82	3.41
08378500	Pecos River near Pecos, N. Mex.	189	9,140	9,910	2.49	2.90
08380500	Gallinas Creek near Montezuma, N. Mex.	84.0	8,180	7,810	3.24	3.91

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Northern mountain region (5) - Concluded									
1,050	1,640	2,050	2,590	3,000	3,410	4,380	3,140	300	62
1,340	2,500	3,490	5,000	6,300	7,750	11,800	--	--	
1,050	1,660	2,090	2,670	3,120	3,590	4,710	--	--	
323	638	918	1,360	1,750	2,210	3,560	2,420	180	63
325	610	853	1,220	1,540	1,890	2,880	--	--	
323	637	915	1,350	1,740	2,190	3,500	--	--	
99	226	363	621	894	1,260	2,590	1,090	25	16
113	214	300	430	542	666	1,010	--	--	
99	225	355	585	812	1,100	2,060	--	--	
201	622	1,130	2,170	3,320	4,870	10,700	5,580	0	33
169	321	452	649	820	1,010	1,530	--	--	
200	605	1,070	1,950	2,870	4,050	8,240	--	--	
8	14	18	23	28	32	44	20	3	22
4	8	12	18	23	28	45	--	--	
8	13	17	22	27	32	44	--	--	
9	15	20	29	36	45	70	33	0	11
9	17	25	36	46	56	87	--	--	
9	15	21	30	38	48	75	--	--	
254	411	538	729	893	1,080	1,610	937	150	30
191	365	521	768	987	1,240	1,970	--	--	
252	408	537	732	903	1,100	1,650	--	--	
610	1,090	1,510	2,170	2,760	3,450	5,510	4,500	100	74
557	1,030	1,430	2,060	2,600	3,210	4,940	--	--	
609	1,090	1,510	2,170	2,750	3,440	5,470	--	--	
568	1,490	2,510	4,430	6,440	9,050	18,200	7,120	116	79
531	1,310	2,140	3,650	5,180	7,110	13,700	--	--	
567	1,490	2,490	4,370	6,310	8,820	17,600	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Central mountain valley region (6)					
08286650*	Canjilon Creek above Abiquiu Reservoir, N. Mex.	144	7,350	6,300	1.78	2.10
08290000	Rio Chama near Chamita, N. Mex.	3,140	6,840	7,400	1.60	2.00
08292000	Santa Clara Creek near Española, N. Mex.	34.5	7,680	7,230	2.04	2.37
08293700*	Arroyo Seco tributary near Pojoaque, N. Mex.	0.72	5,920	5,850	1.90	2.30
08313100	Cañada Ancha tributary near Santa Fe, N. Mex.	1.23	6,610	6,600	1.98	2.38
08316600	North Frijoles Arroyo near Santa Fe, N. Mex.	0.33	7,250	7,150	2.00	2.40
08317600*	San Cristobal Arroyo near Galisteo, N. Mex.	116	6,800	7,110	2.39	2.82
08317700	Tarhole Canyon near Galisteo, N. Mex.	2.15	6,520	6,700	2.40	2.83
08317720*	Cañada de la Cueva near Galisteo, N. Mex.	1.79	6,230	6,120	2.20	2.64

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Central mountain valley region (6)									
709	1,210	1,620	2,210	2,710	3,260	4,760	2,450	0	29
472	963	1,410	2,110	2,750	3,500	5,760	--	--	
700	1,190	1,590	2,190	2,720	3,350	5,160	--	--	
5,490	8,180	10,200	12,900	15,000	17,400	23,300	15,000	2,700	79
2,830	4,740	6,230	8,360	10,100	12,000	17,200	--	--	
5,460	8,100	10,000	12,500	14,500	16,600	22,400	--	--	
99	228	360	593	824	1,110	2,080	970	15	58
215	509	804	1,310	1,810	2,420	4,390	--	--	
102	247	413	745	1,100	1,550	2,950	--	--	
96	202	298	451	589	749	1,220	508	20	23
113	232	341	517	678	863	1,400	--	--	
97	205	305	470	622	798	1,310	--	--	
16	69	147	326	543	858	2,150	298	3	34
86	195	302	483	655	862	1,510	--	--	
17	77	169	370	586	860	1,790	--	--	
141	242	320	429	518	612	856	360	20	13
28	70	115	196	278	381	729	--	--	
120	188	229	293	363	454	769	--	--	
1,460	3,070	4,470	6,620	8,490	10,600	16,400	9,500	350	39
901	2,070	3,200	5,110	6,930	9,080	15,600	--	--	
1,430	2,950	4,230	6,150	7,880	9,910	16,000	--	--	
319	736	1,120	1,750	2,310	2,960	4,830	2,440	210	35
154	380	613	1,030	1,430	1,930	3,500	--	--	
308	684	1,000	1,470	1,910	2,420	4,090	--	--	
112	264	417	685	947	1,270	2,340	919	60	24
161	366	567	908	1,230	1,620	2,790	--	--	
115	276	448	763	1,070	1,450	2,590	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Central mountain valley region (6) - Continued					
08318000	Galisteo Creek at Domingo, N. Mex.	640	6,010	6,000	1.99	2.39
08318900*	San Pedro Creek near Golden, N. Mex.	45.2	6,590	6,860	2.17	2.59
08330500*	Tijeras Arroyo at Albuquerque, N. Mex.	75.3	6,380	7,020	2.34	2.81
08330600	Tijeras Arroyo near Albuquerque, N. Mex.	133	5,930	6,800	1.78	2.20
08331100*	Belen Highline Canal tributary near Los Lunas, N. Mex.	0.16	5,310	5,250	1.78	2.18
08331650*	Cañada Montoso near Scholle, N. Mex.	35.0	6,150	6,260	2.32	2.80
08331700	Abo Arroyo tributary near Scholle, N. Mex.	0.23	6,030	6,080	2.24	2.75
08334000	Rio Puerco above Arroyo Chico near Guadalupe, N. Mex.	420	6,540	7,550	2.10	2.48
08340500	Arroyo Chico near Guadalupe, N. Mex.	1,390	6,620	6,900	2.20	2.58

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Central mountain valley region (6) - Continued									
6,440	11,000	14,700	20,100	24,700	29,800	43,900	22,800	1,500	29
3,270	5,850	7,980	11,100	13,800	16,600	24,100	--	--	
6,340	10,700	13,800	18,100	21,400	25,100	35,700	--	--	
886	1,690	2,470	3,800	5,120	6,770	12,400	10,800	200	41
593	1,280	1,930	3,000	3,990	5,150	8,580	--	--	
875	1,660	2,390	3,590	4,730	6,100	10,600	--	--	
617	1,820	3,130	5,510	7,860	10,800	20,000	6,500	400	51
991	2,160	3,260	5,080	6,750	8,690	14,300	--	--	
627	1,840	3,150	5,400	7,480	9,910	17,300	--	--	
777	1,300	1,710	2,330	2,850	3,420	5,020	2,930	200	42
1,410	2,420	3,250	4,460	5,470	6,550	9,410	--	--	
784	1,330	1,790	2,520	3,180	3,920	5,850	--	--	
194	292	365	465	546	632	857	754	150	39
88	165	233	339	432	535	820	--	--	
192	287	355	449	527	613	849	--	--	
345	996	1,770	3,350	5,090	7,470	16,600	4,700	0	33
812	1,740	2,620	4,050	5,360	6,870	11,200	--	--	
355	1,040	1,870	3,510	5,180	7,240	14,000	--	--	
86	142	189	261	324	396	607	301	0	32
70	166	262	431	593	789	1,400	--	--	
85	144	199	298	397	520	875	--	--	
1,750	3,120	4,190	5,690	6,920	8,230	11,600	6,940	400	42
1,810	3,600	5,200	7,690	9,900	12,400	19,400	--	--	
1,750	3,140	4,280	6,030	7,590	9,360	14,000	--	--	
4,030	6,800	9,040	12,400	15,200	18,300	27,200	15,200	600	43
3,260	6,530	9,430	14,000	18,000	22,500	35,200	--	--	
4,010	6,780	9,080	12,600	15,900	19,500	29,800	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Central mountain valley region (6) - Concluded					
08343100	Grants Canyon at Grants, N. Mex.	13.0	6,800	7,000	1.98	2.39
08348500*	Encinal Creek near Casa Blanca, N. Mex.	6.19	7,530	7,780	2.00	2.43
08351500	Rio San Jose at Correo, N. Mex.	3,660	6,580	7,000	1.78	2.18
08353500*	La Jencia Creek near Magdalena, N. Mex.	195	6,880	7,180	2.18	2.75
08354000	Rio Salado near San Acacia, N. Mex.	1,380	5,950	6,500	1.96	2.37
08488170	Chavez Draw tributary near Clines Corners, N. Mex.	2.73	6,670	6,550	2.15	2.78
08488200*	Osita Draw near Clines Corners, N. Mex.	10.0	6,760	6,960	2.23	2.78
08488600*	Arroyo del Cuervo near Torreon, N. Mex.	11.8	7,460	6,680	2.61	3.31

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Central mountain valley region (6) - Concluded									
202	471	742	1,220	1,680	2,260	4,140	1,550	30	32
242	525	794	1,240	1,650	2,140	3,640	--	--	
204	475	749	1,220	1,670	2,210	3,910	--	--	
92	317	630	1,350	2,240	3,570	9,500	4,330	0	35
99	238	380	628	872	1,170	2,170	--	--	
92	308	578	1,080	1,590	2,240	4,790	--	--	
1,440	3,020	4,490	6,900	9,150	11,800	20,000	[2]11,000	200	59
4,250	7,310	9,750	13,300	16,200	19,400	27,800	--	--	
1,460	3,100	4,680	7,380	9,930	12,900	21,500	--	--	
1,980	3,440	4,420	5,630	6,500	7,320	9,110	4,830	1,750	37
985	2,130	3,200	4,960	6,590	8,480	14,100	--	--	
1,940	3,320	4,230	5,460	6,520	7,740	11,000	--	--	
8,660	14,500	18,900	24,900	29,600	34,500	46,700	[2]36,200	5,000	56
4,980	8,580	11,500	15,700	19,100	22,800	32,100	--	--	
8,590	14,300	18,300	23,500	27,400	31,500	42,500	--	--	
38	117	215	416	641	949	2,120	315	10	16
135	316	496	808	1,110	1,470	2,610	--	--	
42	142	281	574	877	1,250	2,440	--	--	
204	510	829	1,400	1,970	2,670	5,010	2,000	0	33
252	588	921	1,490	2,040	2,710	4,760	--	--	
206	520	849	1,430	2,000	2,690	4,870	--	--	
280	621	948	1,490	2,010	2,630	4,560	1,320	0	25
195	538	917	1,630	2,360	3,290	6,450	--	--	
272	605	938	1,550	2,190	3,010	5,680	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southwest desert region (7)					
08359400	Lumber Canyon tributary near Monticello, N. Mex.	0.90	--	5,130	2.16	2.64
08360000*	Alamosa Creek near Monticello, N. Mex.	403	7,020	7,530	2.20	2.78
08361650*	Percha Creek near Kingston, N. Mex.	21.5	6,600	7,070	2.68	3.40
08361660	Percha Creek tributary near Kingston, N. Mex.	0.58	5,940	6,970	2.65	3.35
08361700*	Percha Creek near Hillsboro, N. Mex.	35.4	6,380	6,800	2.62	3.22
08361800	Percha Creek at Caballo Dam, near Arrey, N. Mex.	119	5,300	6,100	2.24	2.78
08363100*	Rio Grande tributary near Radium Springs, N. Mex.	0.40	4,150	4,450	2.15	2.67
08477500	Mimbres River near Faywood, N. Mex.	440	6,170	7,400	2.40	2.79
08478600*	Mimbres Basin tributary near Florida, N. Mex.	0.55	4,510	4,500	2.40	2.82

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Southwest desert region (7)									
155	333	487	718	915	1,130	1,710	778	130	24
122	234	328	466	582	710	1,060	--	--	
152	320	458	662	833	1,020	1,530	--	--	
1,900	3,990	5,870	8,860	11,600	14,700	23,800	10,800	600	63
2,000	4,280	6,430	10,000	13,400	17,400	30,100	--	--	
1,910	4,010	5,930	9,030	11,800	15,100	24,900	--	--	
509	880	1,210	1,750	2,250	2,850	4,740	3,740	0	41
521	1,060	1,540	2,300	2,970	3,750	6,030	--	--	
510	894	1,250	1,820	2,350	2,990	4,960	--	--	
73	174	268	419	554	709	1,140	323	0	10
99	190	264	373	465	564	831	--	--	
77	178	267	400	514	640	986	--	--	
950	2,170	3,450	5,790	8,200	11,300	22,400	12,200	600	37
655	1,340	1,960	2,950	3,840	4,870	7,930	--	--	
927	2,060	3,180	5,140	7,080	9,520	17,900	--	--	
1,240	3,210	5,340	9,250	13,200	18,300	35,800	15,400	700	24
1,140	2,390	3,550	5,430	7,160	9,200	15,400	--	--	
1,230	3,070	4,910	8,100	11,200	15,100	27,800	--	--	
125	191	238	300	349	399	524	332	60	38
84	159	221	310	384	464	678	--	--	
123	188	236	301	353	408	545	--	--	
2,970	6,510	9,860	15,400	20,600	26,800	45,700	20,000	300	38
2,080	4,460	6,710	10,500	14,000	18,300	31,700	--	--	
2,880	6,180	9,210	14,200	18,800	24,300	41,400	--	--	
146	254	335	448	538	632	869	480	0	35
97	185	258	364	452	549	808	--	--	
143	247	325	435	523	617	858	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southwest desert region (7) - Continued					
08478800*	Seventysix Draw tributary near Waterloo, N. Mex.	0.20	–	4,450	2.40	2.98
08479300*	Deer Creek tributary near Antelope Wells, N. Mex.	4.30	5,480	5,200	2.73	3.30
09384000	Little Colorado River above Lyman Lake near St. Johns, Ariz.	706	–	7,760	2.49	3.02
09430500	Gila River near Gila, N. Mex.	1,860	6,100	8,100	2.40	2.80
09430900*	Duck Creek at Cliff, N. Mex.	228	5,270	6,560	2.40	2.80
09431000	Gila River near Cliff, N. Mex.	2,440	–	7,560	2.40	2.85
09431500	Gila River near Redrock, N. Mex.	2,830	5,740	6,280	2.49	3.04
09438200*	Animas Creek near Cloverdale, N. Mex.	157	5,220	6,200	2.78	3.36
09443000	San Francisco River near Alma, N. Mex.	1,550	–	8,120	2.40	2.81

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southwest desert region (7) - Continued									
56	96	127	174	213	256	372	222	0	27
61	114	157	219	269	323	464	--	--	
56	98	131	181	223	268	391	--	--	
234	452	661	1,020	1,370	1,800	3,250	1,680	75	35
249	493	702	1,020	1,300	1,610	2,500	--	--	
235	456	666	1,020	1,350	1,760	3,080	--	--	
776	1,750	2,690	4,270	5,780	7,590	13,200	[2]16,000	0	54
2,580	5,580	8,460	13,300	17,900	23,400	41,000	--	--	
824	1,920	3,050	4,990	6,850	9,100	16,300	--	--	
2,030	5,660	9,980	18,700	28,300	41,600	92,700	35,200	900	66
4,030	8,860	13,600	21,600	29,400	38,900	69,800	--	--	
2,090	5,840	10,300	19,000	28,500	41,200	88,800	--	--	
3,670	5,270	6,330	7,670	8,660	9,640	11,900	7,400	2,000	37
1,540	3,260	4,880	7,520	9,990	12,900	22,000	--	--	
3,460	5,000	6,090	7,640	8,910	10,300	13,700	--	--	
6,050	10,000	12,800	16,400	19,100	21,800	28,200	17,200	4,800	29
4,550	10,100	15,500	24,800	33,800	44,800	80,900	--	--	
5,890	10,000	13,300	18,100	22,100	26,500	38,000	--	--	
6,340	13,200	19,700	30,700	41,300	54,100	95,300	48,800	1,000	88
4,880	10,800	16,600	26,700	36,400	48,500	87,700	--	--	
6,260	13,000	19,400	30,200	40,500	53,200	94,000	--	--	
662	1,180	1,630	2,320	2,930	3,630	5,680	3,400	200	35
1,300	2,730	4,060	6,240	8,250	10,700	18,000	--	--	
695	1,310	1,880	2,800	3,640	4,620	7,450	--	--	
5,130	13,000	21,800	38,900	57,300	82,100	175,000	56,600	300	23
3,700	8,110	12,400	19,700	26,700	35,300	63,000	--	--	
4,940	11,900	19,200	32,300	45,600	63,000	125,000	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southwest desert region (7) - Concluded					
09444000	San Francisco River near Glenwood, N. Mex.	1,650	--	7,780	2.39	2.80
09444200	Blue River near Clifton, Ariz.	506	--	6,910	2.73	3.28
09444500	San Francisco River at Clifton, Ariz.	2,770	--	6,880	2.57	3.00
09536350	Surprise Canyon near Dos Cabezas, Ariz.	0.65	--	6,280	3.20	3.75

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)

Recurrence interval (years) 2	5	10	25	50	100	500	Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
Southwest desert region (7) - Concluded									
2,630	5,750	9,020	15,100	21,300	29,600	59,500	37,100	500	66
3,810	8,370	12,800	20,400	27,600	36,600	65,300	--	--	
2,670	5,900	9,310	15,600	22,100	30,500	60,300	--	--	
3,590	9,320	15,600	27,400	39,600	55,600	112,000	30,000	2,000	28
2,220	4,770	7,190	11,200	15,100	19,700	34,100	--	--	
3,430	8,430	13,400	22,100	30,800	41,800	79,300	--	--	
6,770	17,000	27,800	47,300	66,800	91,500	174,000	[2]90,900	800	103
4,830	10,700	16,500	26,400	36,000	47,900	86,700	--	--	
6,690	16,600	26,800	44,800	62,700	85,200	160,000	--	--	
46	111	171	261	339	424	648	191	20	14
105	200	280	395	493	599	885	--	--	
51	127	195	300	387	482	732	--	--	

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southwest mountain region (8)					
08477560	Little Walnut Creek near Silver Ciy, N. Mex.	5.10	6,290	6,500	2.80	3.39
08477570	Silva Creek tributary at Silver City, N. Mex.	2.12	6,210	6,920	2.70	3.30
08477580*	Silva Creek at Silver City, N. Mex.	10.0	6,180	6,770	2.70	3.28
08477600	San Vicente Arroyo at Silver City, N. Mex.	26.5	6,160	6,740	2.62	3.20
08478000*	Cameron Creek at Central, N. Mex.	18.8	6,540	6,940	2.50	3.00
09383500	Nutrioso Creek above Nelson Reservoir near Springerville, Ariz.	83.3	8,450	8,550	2.60	3.02
09386100	Largo Creek near Quemado, N. Mex.	151	7,630	8,270	1.90	2.32
09442630	Mail Hollow near Luna, N. Mex.	4.20	7,490	7,080	2.38	2.82
09442650	Romero Creek near Arizona State line near Luna, N. Mex.	10.8	8,980	9,000	2.50	3.02

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Peak discharge (cubic feet per second)									
Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southwest mountain region (8)									
479	617	709	827	916	1,010	1,220	920	400	28
473	822	1,100	1,500	1,840	2,210	3,220	--	--	
479	623	725	859	963	1,070	1,330	--	--	
407	861	1,260	1,890	2,440	3,060	4,810	1,830	500	18
432	721	945	1,260	1,520	1,800	2,540	--	--	
407	854	1,240	1,830	2,340	2,900	4,480	--	--	
651	1,360	1,970	2,880	3,640	4,480	6,710	2,670	0	36
600	1,060	1,430	1,970	2,420	2,920	4,260	--	--	
650	1,350	1,950	2,820	3,550	4,350	6,490	--	--	
1,890	2,920	3,680	4,740	5,590	6,500	8,860	[2]6,800	0	28
739	1,350	1,850	2,600	3,240	3,950	5,910	--	--	
1,790	2,730	3,400	4,340	5,110	5,950	8,180	--	--	
576	1,060	1,440	1,970	2,410	2,880	4,090	2,200	600	40
480	895	1,250	1,780	2,240	2,760	4,240	--	--	
574	1,050	1,230	1,960	2,400	2,870	4,100	--	--	
110	259	407	661	905	1,200	2,140	700	30	18
134	306	478	780	893	1,450	2,670	--	--	
112	265	418	684	943	1,260	2,270	--	--	
315	530	704	963	1,180	1,430	2,130	1,320	200	40
280	617	943	1,500	2,030	2,670	4,700	--	--	
313	534	720	1,010	1,260	1,550	2,370	--	--	
57	91	120	164	203	248	381	264	20	25
157	299	423	617	292	994	1,590	--	--	
59	97	132	186	235	291	457	--	--	
55	136	225	392	567	795	1,610	480	0	19
62	136	209	334	457	609	1,100	--	--	
55	136	223	382	546	756	1,490	--	--	

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONTINUED

Station number	Station name	Drainage area (square miles)	Average of channel elevations (feet)	Mean basin elevation (feet)	Maximum 24-hour precipitation for 10-year recurrence interval (inches)	Maximum 24-hour precipitation for 25-year recurrence interval (inches)
	Southwest mountain region (8) - Concluded					
09442660	Trout Creek at Luna, N. Mex.	31.9	7,980	8,950	2.28	2.68
09442680	San Francisco River near Reserve, N. Mex.	350	6,880	8,540	2.08	2.52
09442692	Tularosa River above Aragon, N. Mex.	94.0	7,230	7,720	2.20	2.56
09442695*	Negro Canyon at Aragon, N. Mex.	9.62	7,480	7,900	2.22	2.58
09442740	Tularosa River near Reserve, N. Mex.	426	7,000	8,200	2.20	2.58
09489070	North Fork of East Fork Black River near Alpine, Ariz.	38.1	8,850	9,060	3.40	4.05

[1]Record length used in frequency analysis.
[2]Historic peak not used in frequency analysis.
[3]High outlier.

SELECTED BASIN, CLIMATIC, AND FLOOD CHARACTERISTICS, MAXIMUM PEAK DISCHARGE RECORDED, AND LOW-DISCHARGE THRESHOLD FOR GAGING STATIONS--CONCLUDED

Peak discharge (cubic feet per second)

Recurrence interval (years)							Maximum peak discharge recorded	Low-discharge threshold	Record length[1] (years)
2	5	10	25	50	100	500			
Southwest mountain region (8) - Concluded									
166	484	870	1,660	2,550	3,790	8,620	2,790	0	40
158	336	506	791	1,060	1,390	2,420	--	--	
165	475	838	1,560	2,340	3,400	7,380	--	--	
879	2,080	3,440	6,110	9,070	13,100	29,200	9,830	285	35
620	1,330	1,990	3,090	4,110	5,320	9,010	--	--	
869	2,030	3,300	5,740	8,350	11,900	25,100	--	--	
87	212	339	563	781	1,050	1,920	660	10	27
355	745	1,110	1,700	2,260	2,910	4,920	--	--	
92	232	381	646	906	1,230	2,250	--	--	
271	522	772	1,220	1,670	2,260	4,340	[3]5,200	150	36
186	365	524	778	1,010	1,280	2,090	--	--	
268	513	754	1,180	1,600	2,140	4,010	--	--	
364	813	1,240	1,930	2,580	3,350	5,660	3,020	300	32
580	1,260	1,910	3,000	4,020	5,240	9,010	--	--	
371	835	1,280	2,020	2,720	3,540	6,050	--	--	
305	546	735	1,000	1,220	1,460	2,070	1,070	100	13
87	198	309	505	699	942	1,750	--	--	
269	468	621	857	1,050	1,290	1,960	--	--	

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