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COMPILATION OF
FLOOD DATA IN ARIZONA
1862—1953

By Winchell Smith and Wilbur L. Heckler

Prepared in cooperation with the

ARIZONA STATE LAND DEPARTMENT

Roger Ernst, Commissioner

Open-file report

Tucson, Arizona

August 1955

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INTRODUCTION

The use of flood magnitude and frequency data is necessary for the economical design of structures such as bridges, levees, buildings on a flood plain, and dams, or for other planning or construction activities that might be affected by floods. When loss of life or extensive damage would result from failure or overtopping of the planned structure, it is necessary that the design flood be of such magnitude that it will probably never be exceeded. However, for most structures, economy usually will be achieved by designing for floods with an average frequency about the same as the expected life of the structure. This is particularly true when the loss caused by a flood greater than the design flood would be less than the additional cost of providing for safe passage of the larger floods.

Satisfactory solution of the problems related to floods depends upon reliable records of flood occurrences. The purpose of this report is to present in convenient and usable form all reliable flood data currently available for streams within the State of Arizona.

The scope of this report has purposely been limited to the presentation of flood records. A comprehensive study of flood-frequency data on an areal basis is planned for the entire Colorado River basin. That study will include analysis of all usable flood records from gaging stations operated within the basin. The records presented herein constitute an interim report on flood data.

Administration and acknowledgments

This report was prepared in cooperation with the State of Arizona, Roger Ernst, Land Commissioner, under the direction of John H. Gardiner, District Engineer, Surface Water Branch, Water Resources Division, U. S. Geological Survey. Review of gaging-station records was made by J. S. Gatewood, hydraulic engineer.

Physiography

For this report the State of Arizona may be divided into three general physiographic regions: (1) The plateau region, (2) the mountain region, and (3) the desert region.

The northern plateau and the southern desert regions are separated by the mountain region which originates in New Mexico and enters Arizona just below the center of the eastern boundary. This region is a broad band of rugged mountains curving north in the west-central area, and extending to the northwest corner. The sharp escarpment of the Mogollon rim divided the steep-sloped canyons to the south from the gentler sloping plateau region to the north. Drainage is thus predominantly to the south and southwest through the narrow valleys of the San Francisco, Black, White, Salt, Verde, Agua Fria and Hassayampa Rivers. These rivers are all tributary to the Gila River, which heads at the continental divide in western New Mexico in the extension of this same mountain region and flows across the southern part of Arizona, from east to west, entering the Colorado River at Yuma. This river drains nearly half of the State, forming the southern boundary of the mountain region in the eastern half, and bisecting the desert region in the southwest.

The plateau region is a tableland ranging in altitude from about 4,000 to 7,000 feet occupying the north and northeastern third of the State. This is a portion of the Colorado plateau province extending into Arizona from the north. It is bounded by the Mogollon rim to the south and terminated on the west by the portion of the mountain region that projects to the northern border. In contrast to the general topography are deeply incised canyons and occasional projecting mountains which rise as high as 12,700 feet. The region is drained chiefly by the Little Colorado River, which cuts across diagonally on a northwesterly course. Tributaries enter from both the north and the south.

The southern and western parts of the State, covering about one half of the total area, compose the desert region. In this region isolated northwest trending mountain ranges are separated by broad, gently sloping alluvial valleys. Drainage is predominantly from the south to the Gila River. Principal tributaries are the San Simon, San Pedro, and Santa Cruz Rivers, which flow in a northwesterly direction before joining the Gila. In the southwestern part of the desert area tributary washes enter the Gila from both the north and the south. In the west-central portion a separate drainage system, the Bill Williams River basin, drains directly to the Colorado River.

Storm precipitation

Mean annual precipitation in Arizona ranges from 4 inches at Yuma, in the desert region, to more than 30 inches in the higher parts of the mountain region. Altitude is the chief factor controlling the amount of precipitation at any given point in the State. Directional aspect of the mountain barriers to the storm movement is also an important factor.

Storms may occur at any time during the year, but most of them occur in two distinct periods: during the summer, July to early October, or during the winter, December to February. Flood-producing storms are

of three distinct types: summer thunderstorms of the cloudburst type, which are generally local in extent; general winter storms of the cyclonic type, one of which may cover a large part of the State; and occasional tropical hurricanes, which may cover about a quarter of the State.

The water vapor carried by the summer storms generally originates in the Atlantic or Carribbean areas, moves into the State from the southeast, and is precipitated in numerous local thunderstorms. Nearly all the floods in the southern and southwest desert area result from this type of storm. Summer storms are less frequent in the mountain and plateau regions. In the upper reaches of the Little Colorado and its tributaries entering from the north and northwest about three-quarters of the floods result from summer storms.

The rare tropical hurricanes coming from the south and southwest concentrate in the western part of the desert region, extending into the Bill Williams River basin, which is not subject to frequent summer storms. Storms of the hurricane type occur less than once a year on the average, during the period August to early October. They are of larger extent than the usual summer storms, are short and intense, and result in serious floods.

Winter storms, originating over the Pacific Ocean, usually cover large areas. These storms move into the State from the west or northwest, are intercepted in the mountain region, and provide the bulk of the annual precipitation in this region in the form of both rain and snow. The spring snow melt often produces annual maxima in the mountain region, but maxima for the period of record are in almost all cases the result of winter rain upon accumulated snow.

FLOOD CHARACTERISTICS

Arizona has been deservedly noted for its flash floods. Newspaper accounts frequently tell of persons trapped in "dry washes" by floods arriving without warning. Floods of this type are the dominant feature of runoff in the desert region, and to a lesser extent in the mountain and plateau regions. A typical flood on a small drainage area will come down a dry channel without warning, reach its peak within a few minutes, and rapidly recede. Within a period of a few hours the channel will be dry. This same pattern is repeated on a modified scale on the major streams of the desert areas. Peaks occur within a very short time after the start of a rise, and total runoff from a given storm will be completed within a period of 24 to 48 hours. Floods in the mountain region are less flashy. Some annual maxima result entirely from snow melt in which case peak flow may not exceed the mean daily flow by a great amount. Other floods may result from general winter storms, and are characterized by broad flood crests of several hours duration. Many streams are affected by both summer and winter storms. The Gila River above Blue Creek, near Virden, N. Mex., is typical in this respect; flood hydrographs are presented (figure 1) to indicate the striking differences between typical summer and winter floods. Note that for the summer flood of September 6, 1940, peak discharge was 11,000 cfs and total three-day runoff was 1,390 cfs-days, while for the winter flood of February 16-18, 1937, peak discharge was 9,070 cfs and total three-day runoff was 11,430 cfs-days.

FLOOD RECORDS

Streamflow records collected by the Geological Survey and cooperating parties provided the bulk of the data tabulated in this report. Data from sources other than Geological Survey files have been credited to the party or agency furnishing the information. Data are presented in a following section of this report entitled "Gaging-Station records", beginning on page 3.

All records included were reviewed and in some instances changes or revisions were made. Revisions are not designated in this report because the review was made prior to publication of Water-Supply Paper 1313 (Compilation of records of surface waters of the United States through September 1950, Part 9, Colorado River basin) and all revisions of annual maxima made were published therein. Lists of supplementary peaks given herein include many that have not been previously published. Rules and procedures pertaining to selection and publication of supplementary peaks were revised in 1946; consequently it has been necessary to re-analyze earlier records on the same basis that is currently in use. Supplementary peaks have been included for nonrecording gages where sufficient data were available to permit graphing of accurate gage-height records.

For each gaging station a description and table of annual maxima and peaks above a selected base discharge are given. Stations are listed in the same downstream order used in current water-supply papers. Stations are numbered and their location is shown by index number on the map presented as figure 2. The period of record at each station is indicated on the bar graph, figure 3.

Miscellaneous flood data

Where other data are not available, information about isolated flood events is a help in evaluating the flood potential of an ungaged area. A listing of miscellaneous flood observations is therfore included, even though nothing is known regarding the frequency of such events. This list is presented as table 1.

Many of the floods listed come from short-term gaging-station records which, because of their brevity, are not included elsewhere within the body of the report. Floods listed for these points are merely the maxima observed during the period of record, which is indicated, and may not be significant flood events. Observations of floods at points other than short-term gaging stations were made in most cases because of the outstanding magnitude of the particular event. Unless otherwise indicated, data in the listing have been published previously in various Geological Survey publications. Reference to information from other sources has been placed in footnotes. Senate Document 436 (65th Congress) includes listings of several hundred estimates of peak flow on the Gila River and its tributaries upstream from San Carlos, Ariz. The bulk of these estimates were for floods in January and October 1916, which were record events in that area. This group of estimates and many others to be found in reports of other agencies have not been included in this report because bases for the estimates are not known.

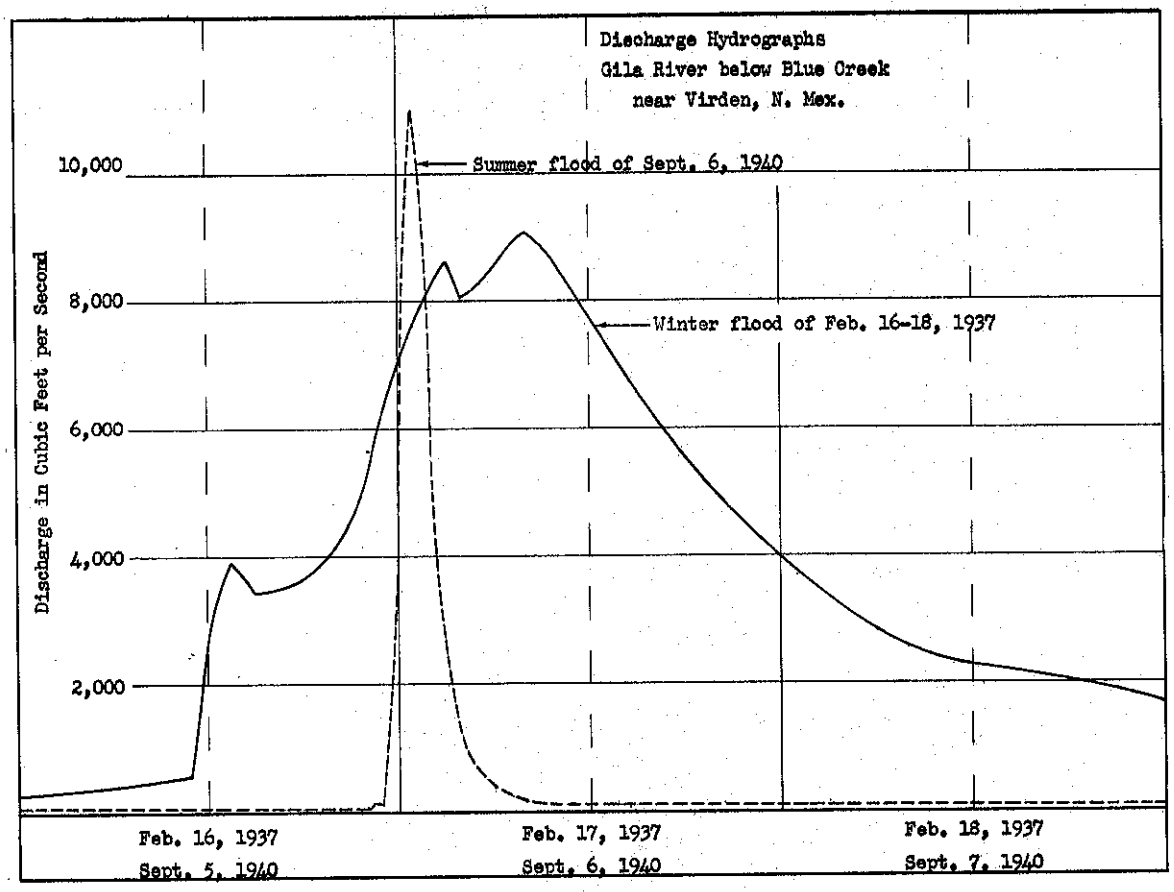


Figure 1.--Discharge hydrographs for Gila River below Blue Creek near Virden, N. Mex.

Maximum floods known

Maximum known flood stages and discharges of Arizona streams are shown in the tables accompanying the gaging station records presented in a following section of this report. Known peak discharges at other than gaging stations are listed in table 1.

Maximum flood discharges at both gaging stations and miscellaneous sites are portrayed graphically in figure 4. This figure shows the tabulated discharges per square mile arrayed against drainage area. Figure 4 is useful for a general comparison of individual peak discharges with the peak floods experienced, and may be used as a guide to the possible maximum discharge of a stream in any area of the State.

FLOOD-FREQUENCY METHODS

Methods of computing flood frequency are discussed in the references listed in the bibliography (see page 109). Reports by Bodhaine, Carter, Cragwall, and Dalrymple discuss in detail the methods recommended by engineers of the Water Resources Division of the Geological Survey.

Illustrative frequency diagrams have been plotted from several of the long-term records in this report (see figures 5-10). Recurrence intervals in these plottings were computed as recommended in the references above, from the formula $T = (N + 1)/M$, where T equals the recurrence interval in years, N equals the number of years of record, and M equals relative magnitude of the event, beginning with the highest as 1 down to the lowest as a number equal to N. The annual floods are plotted on a special probability chart. On this form the frequency curve will tend to be a straight line. Discharges are plotted to an arithmetic scale as the ordinate; the abscissa (scale of recurrence intervals) is specially graduated according to the theory of extreme values.

It is emphasized that analysis of flood data on a regional basis is preferable to use of single records as illustrated herein. However, regional analysis of this type should include additional data from areas adjacent to Arizona, which are not yet available. Such studies will be carried forward by the Geological Survey as soon as possible.

GAGING-STATION RECORDS

This section contains a brief description of the gaging station and a tabulation of flood peaks for each gaging station furnishing data for this report. Terms used in presenting these data are explained below.

The description of each gaging station includes paragraphs on: Location; drainage area; gage; stage-

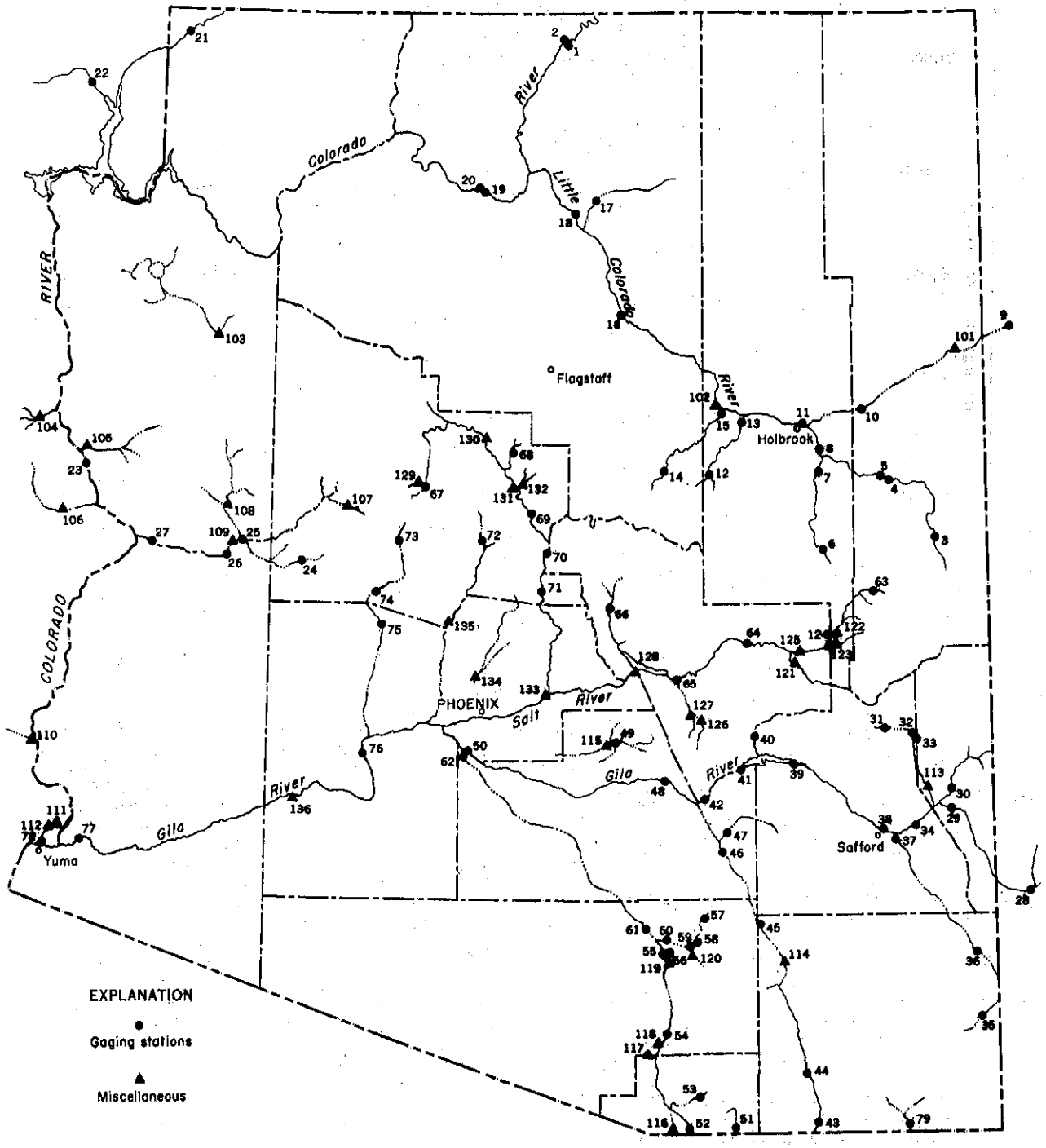


Figure 2. --Map of Arizona showing location of gaging stations and miscellaneous flood records.

Table 1.--Miscellaneous flood data

Index no.	Stream and place of determination	Tributary to	Drainage area (sq mi)	Period of record	Date	Maximum discharge	
						Cfs	Cfs per sq mi
101	Black Creek near Houck, Ariz.	Puerco River	648	Oct. 1943 to Jan. 1945	Sept. 26, 1944	1,380	2.13
102	Salt Creek near Winslow, Ariz.	Little Colorado River	287	Oct. 1940 to June 1941	Aug. 14 or 15, 1940	2,900	10.1
103	Truxton Canyon near Kingman, Ariz.	Red Lake Basin	417	----------	July or Aug. 1904	49,000	118
104	Piute Wash at box canyon 8.5 mi northwest of Needles, Calif.	Colorado River	770	----------	Sept. 12, 1939	30,000	39.0
105	Sacramento Wash at mouth near Topock, Ariz.	Colorado River	1,430	----------	Sept. 6, 1939	15,000	10.5
106	Chemehuevi Wash at Needles-Vidal highway near Needles, Calif.	Colorado River	270	----------	Sept. 25, 1939	12,000	44.4
107	Kirkland Creek at Yava, Ariz.	Santa Maria River	335	Nov. 1940 to July 1942	Mar. 14, 1941	4,300	12.8
108	Big Sandy River below Burro Creek, at Signal, Ariz.	Bill Williams River	2,670	----------	Sept. 6, 1939	about 100,000	37.5
109	Bill Williams River at confluence of Big Sandy and Santa Maria Rivers, near Alamo, Ariz.	Colorado River	4,330	----------	Sept. 6, 1939	77,000	17.8
110	Arroyo Seco at mouth, 21 miles upstream from Picacho, Calif.	Colorado River	450	----------	Sept. 5, 1939	40,000	88.9
111	Wash at All-American Canal, near Yuma, Ariz.	Colorado River	35.3	----------	Sept. 5, 1939	5,000	142
112	Picacho Wash at All American Canal, near Yuma, Ariz.	Colorado River	41.5	----------	Sept. 5, 1939	37,000	892
113	Eagle Creek above Pumping Plant near Morenci, Ariz.	Gila River	613	1944-53	Feb. 10, 1932	13,000	21.2
114	Wash above Gunters Ranch 12½ miles north of Pomerene, Ariz.	San Pedro River	3.8	----------	Sept. 26, 1948	6,700	[c] 1,760
115	Queen Creek near Florence Junction, Ariz.	Gila River	191	1939-41	Aug. 7, 1939	13,200	69.1
116	Nogales Wash at Nogales, Ariz.	Santa Cruz River	37	Apr. 1932 to Feb. 1934	July 29 or Aug. 15, 1931	4,400	119
117	Sopori Wash 3 miles above mouth and 2 miles northwest of Amado, Ariz.	Santa Cruz River	161	----------	Aug. 15, 1948	16,000	99.4
118	Wash ¼ mile above mouth and 5 miles northeast of Amado, Ariz.	Santa Cruz River	10.3	----------	Sept. 26, 1948	2,000	194
119	Julian Wash at Highway 80 near Tucson, Ariz.	Santa Cruz River	26.1	----------	Aug. 1945	[a] 3,000	115

Table 1.--Miscellaneous flood data--Continued

Index no	Stream and place of determination	Tributary to	Drainage area (sq mi)	Period of record	Date	Maximum discharge	
						Cfs	Cfs per sq mi
120	Pantano Wash near Tucson, Ariz.	Rillito Creek	602	June 1940 to Mar. 1941	Aug. 13, 1940	9,200	15.3
121	Black River near Fort Apache, Ariz.	Salt River	1,230	1912-18	Dec. 20, 1914 Jan. 28, 1915	18,000 over 18,000	-
122	White River at White River, Ariz.	Salt River	357	1917-22	Nov. 1919 or Feb. 1920 Aug. 4, 5, 1921	over 2,700 2,700	-
123	East Fork White River at Fort Apache, Ariz.	White River	135	1912-20	About Jan. 17, 18, 1916 Mar. 13, 1918	over 1,000 640	-
124	White River at Fort Apache, Ariz.	Salt River	499	1913 to June 1922	Probably Jan. 19, 1916	over 3,830	-
125	White River at Wanslee's Ranch, near Fort Apache, Ariz.	Salt River	632	1918	Mar. 13, 1918	3,110	4.92
126	Cooper Hill Wash (Copper Gulch) at Globe, Ariz.	Pinal Creek	1.6	----------	Aug. 17, 1904	3,200	[c] 2,000
127	Pinal Creek below Copper Hill Wash at Glove, Ariz.	Salt River	33.4	----------	Aug. 17, 1904	13,200	395
128	Salt River at Roosevelt (below Tonto Creek), Ariz.	Gila River	5,830	1888-1907 1912, 13	About Feb. 23, 1891	150,000	25.7
129	Willow Creek near Prescott, Ariz.	Granite Creek	22	1932-37	Sept. 7, 1933 July 19, 1934 Aug. 25, 1935	450 900 1,300	- 59.1
130	Verde River near Clarkdale, Ariz.	Salt River	3,530	1915-21	Feb. 21, 1920	50,600	14.3
131	Verde River at Camp Verde, Ariz.	Salt River	4,220	1913-20	Feb. 21, 1920	over 60,000	-
132	Beaver Creek at Camp Verde, Ariz.	Verde River	413	1912-20	Feb. 22, 1920	17,000	41.2
133	Salt River at Arizona Dam, Ariz.	Gila River	12,900	1888-91, 95	Feb. 24, 1891	300,000	23.3
134	Cave Creek near Phoenix, Ariz.	Salt River	200	----------	Aug. 1921	[b] 25,000	125
135	Agua Fria River at Lake Pleasant Dam, Ariz.	Gila River	1,460	1910-24 1933-53	Jan. 28, 1916 Nov. 27, 1919	105,000 over 100,000	71.9
136	Gila River near Sentinel, Ariz.	Colorado River	51,600	1913-17	Probably Feb. 1891	About 250,000	4.84

Note.--Senate Document No. 436, published in 1919 under title "Gila River Flood Control", lists several hundred estimates of peak flow on Gila River tributaries above San Carlos, Ariz.

a From House Document No. 274 (80th Congress)

b From "Low Dams" prepared by the Subcommittee on Small Storage Projects of the Water Resources Committee of the National Resources Committe, Washington, D. C., 1938.

c Not plotted on figure 4.

discharge relation; historical data, where available; and remarks, including pertinent general information.

Location and drainage areas are obtained from the most accurate maps available, and the areas have been computed in accordance with procedures recommended by the Federal Inter-Agency River Basin Committee.

The gage paragraph is given to indicate type of gage and periods of use. Flood records from recording gages are generally more reliable than those from non-recording gages where local observers must be depended upon.

The stage-discharge relation is the tool by which records of stage, or water-surface elevation, are converted into discharge. Definition of this relationship is based primarily upon current-meter measurements. In many cases peaks of record lie beyond the defined range, and extensions of the stage-discharge relationship are made on the basis of indirect determinations such as slope-area measurements. Where such data are unavailable, extensions are based upon studies of the hydraulic characteristics of the channel. These relationships of stage and discharge are seldom stable; however, changes at high stage are generally less pronounced than at low stage and consequently definition obtained in years subsequent to a given flood period can be used in checking validity of previous flood computations.

Information as to historical floods is of great value in extending the period of known records, even though only approximate estimates of peak discharges are known. For example, if a flood is known to have been the highest within a specified period prior to the beginning of actual record at a gaging station, the recurrence interval for this peak can be safely extended to cover the entire period. Unfortunately the span of known history is short in Arizona, dating no farther back in most places than the advent of the white man. As settlement of the State has been relatively recent, and as the population was confined to relatively few areas, little is known regarding historical floods on most of the streams.

In the tables of flood data, gage height and discharge are given for the water-year maxima, and for all floods above a selected base discharge. For each station this base discharge was chosen so as to yield an average of about three floods a year. Supplementary peaks are included even for incomplete years of record, but unless otherwise indicated, listings for each water year may be considered complete. The period of flood records in some cases does not correspond exactly with the period of record of daily discharge. For example, it may be known that a gaging-station record starting after October of a given year includes all peaks above the base occurring within the entire water year October 1 to September 30. Such a record is considered a complete flood record for that water year.

To indicate breaks in the continuity of the record, change in datum, or significant changes in location a standardized system of horizontal lines across the tables has been adopted. A line across the date columns indicates a break in the continuity of the record. A change in datum is indicated by a line across the gage-height column, and a change in site which involves a change in drainage area is represented by a line across the discharge column. Various combinations of these symbols result where more than one change is involved. For example, reestablishment of a gaging station at a new site is indicated by a continuous line across date, gage height, and discharge columns. Footnotes have been appended to the tables regarding items needing explanatory information.

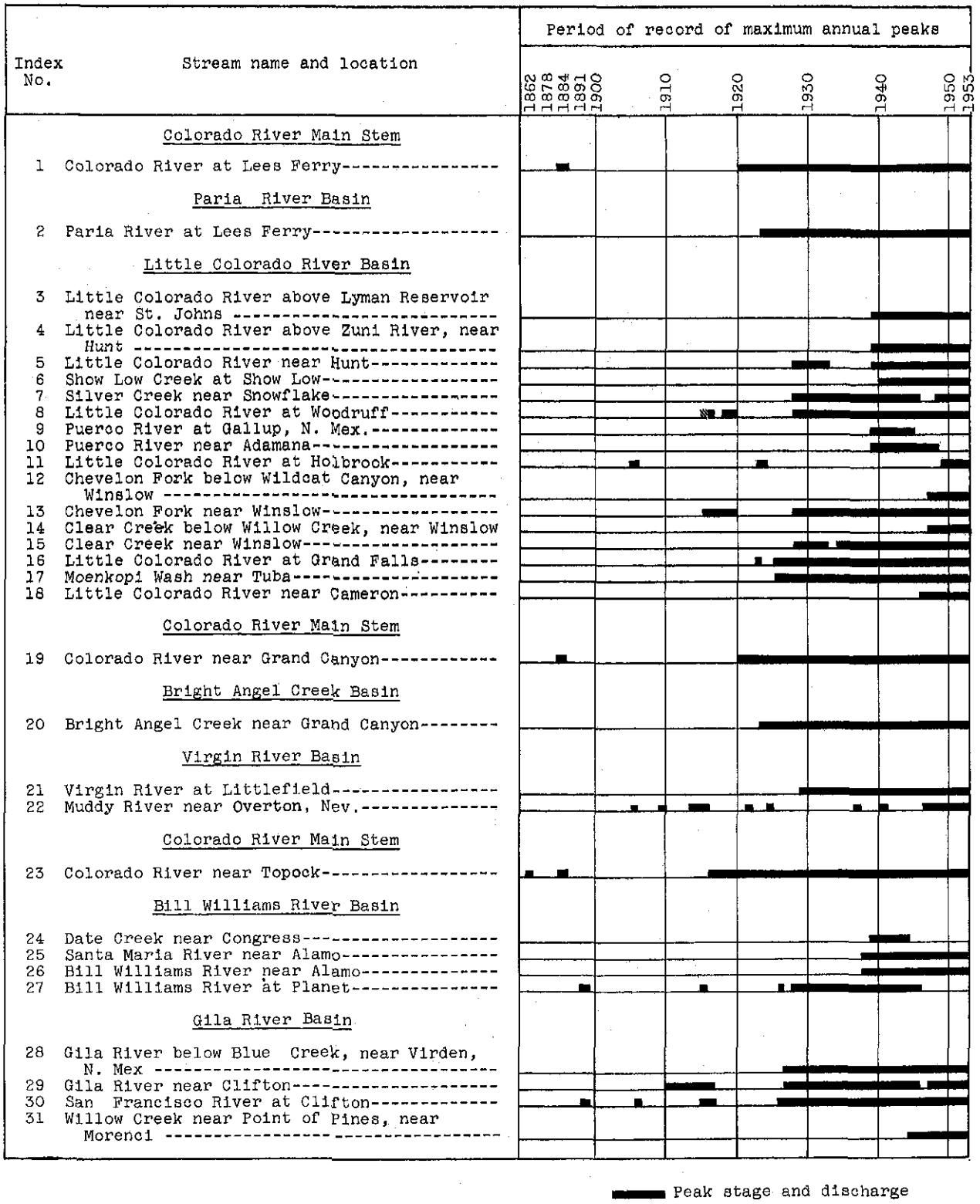
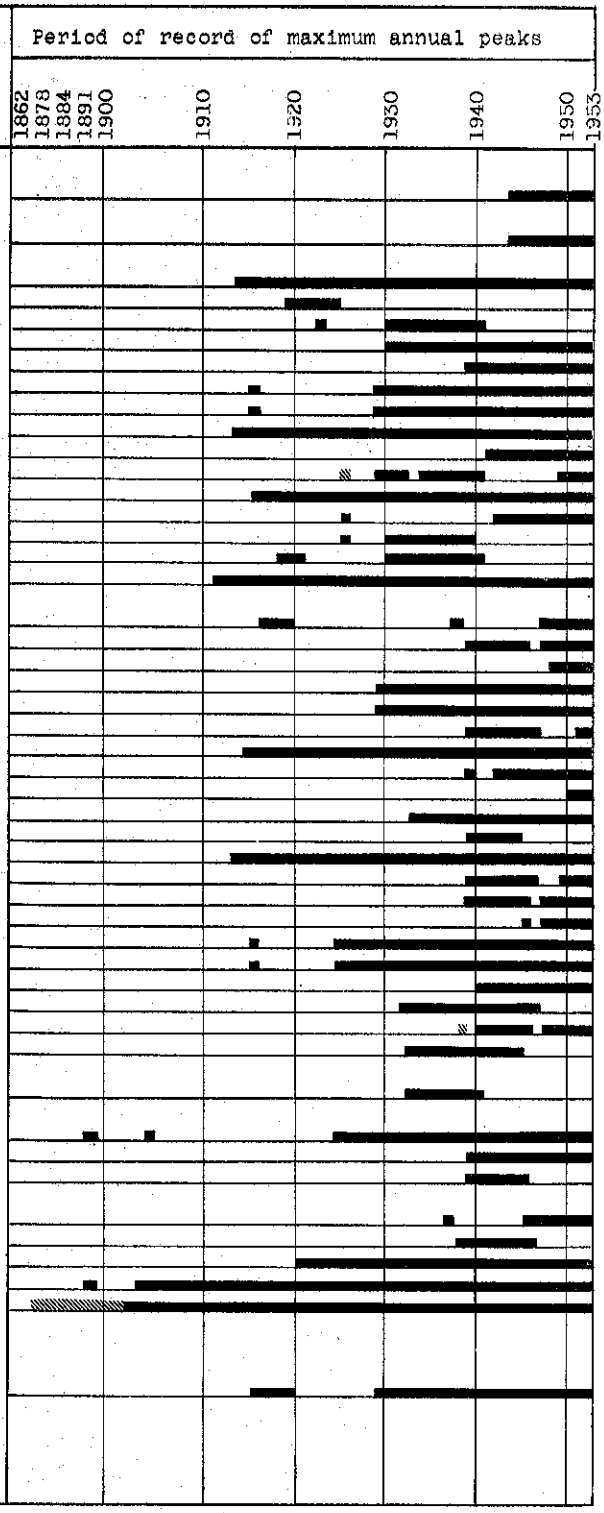


Figure 3.--Bar graph showing period of record

Index No.	Stream name and location
32	Willow Creek near Double Circle Ranch, near Morenci
33	Eagle Creek near Double Circle Ranch, near Morenci
34	Gila River at head of Safford Valley, near Solomon
35	Cave Creek near Paradise
36	San Simon Creek near San Simon
37	San Simon Creek near Solomon
38	Gila River at Safford
39	Gila River at Calva
40	San Carlos River near Peridot
41	Gila River below Coolidge Dam
42	Gila River at Winkelman
43	San Pedro River at Palominas
44	San Pedro River at Charleston
45	San Pedro River near Redington
46	San Pedro River near Mammoth
47	Aravaipa Creek near Feldman
48	Gila River at Kelvin
49	Queen Creek at Whitlow dam site, near Superior
50	Gila River near Laveen
51	Santa Cruz River near Lochiel
52	Santa Cruz River near Nogales
53	Sonoita Creek near Patagonia
54	Santa Cruz River at Continental
55	Santa Cruz River at Tucson
56	Tucson Arroyo at Vine Ave Tucson
57	Sabino Creek near Mount Lemmon
58	Sabino Creek near Tucson
59	Rillito Creek near Wrightstown
60	Rillito Creek near Tucson
61	Santa Cruz River at Cortaro
62	Santa Cruz River near Laveen
63	White River near McNary
64	Salt River near Chrysotile
65	Salt River near Roosevelt
66	Tonto Creek above Gun Creek, near Roosevelt
67	Granite Creek near Prescott
68	Oak Creek near Cornville
69	Verde River near Camp Verde
70	Verde River below East Verde River, near Pine
71	Verde River below Tangle Creek above Horseshoe Dam
72	Agua Fria River near Mayer
73	Hassayampa River near Wagoner
74	Hassayampa River at Box dam site, near Wickenburg
75	Hassayampa River near Morristown
76	Gila River below Gillespie Dam
77	Gila River near Dome
78	Colorado River at Yuma
	Whitewater Draw Basin
79	Whitewater Draw near Douglas



Peak stage only

of maximum annual peaks at gaging stations.

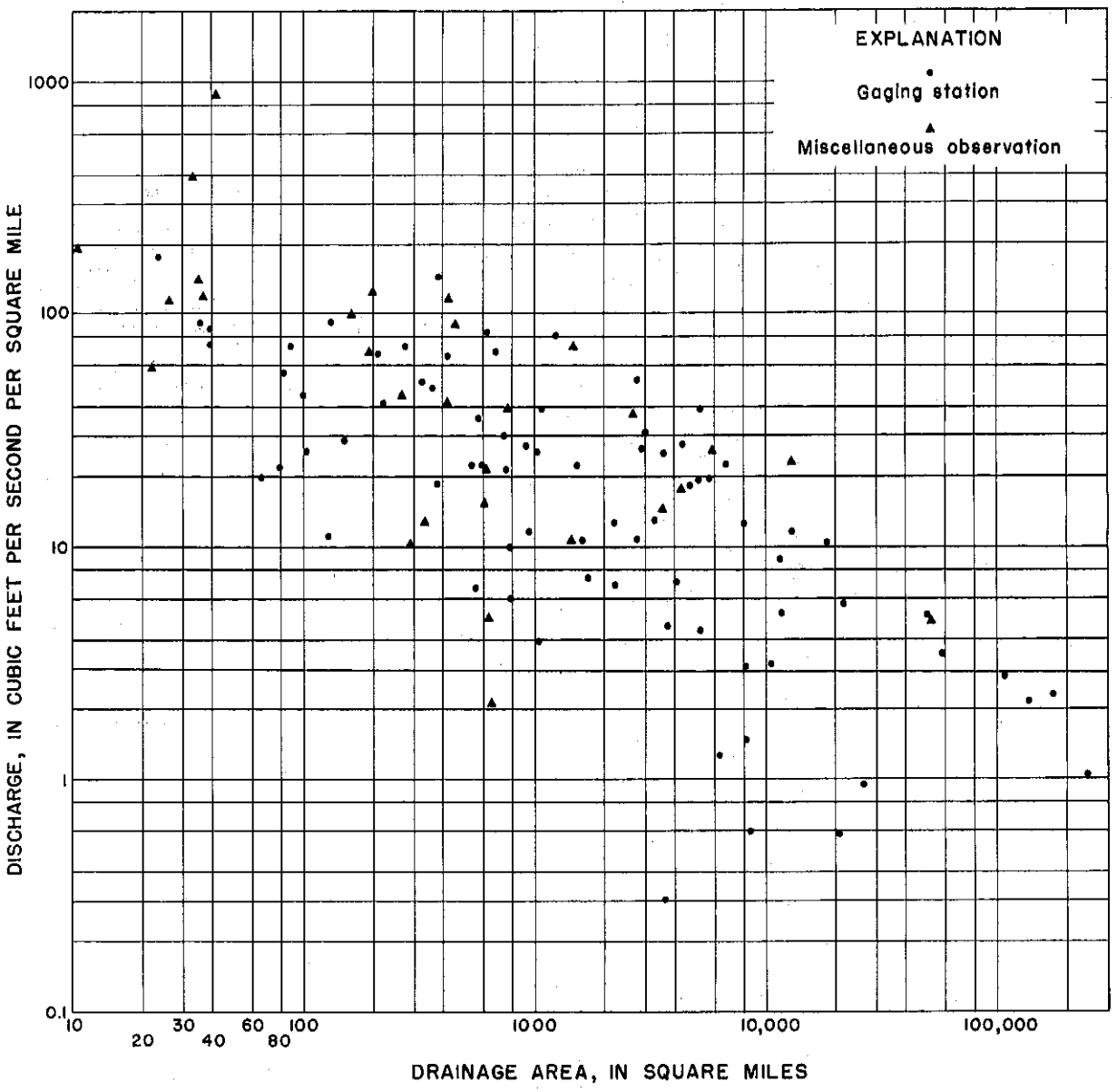


Figure 4.--Unit discharge versus drainage area for maximum discharges in Arizona.

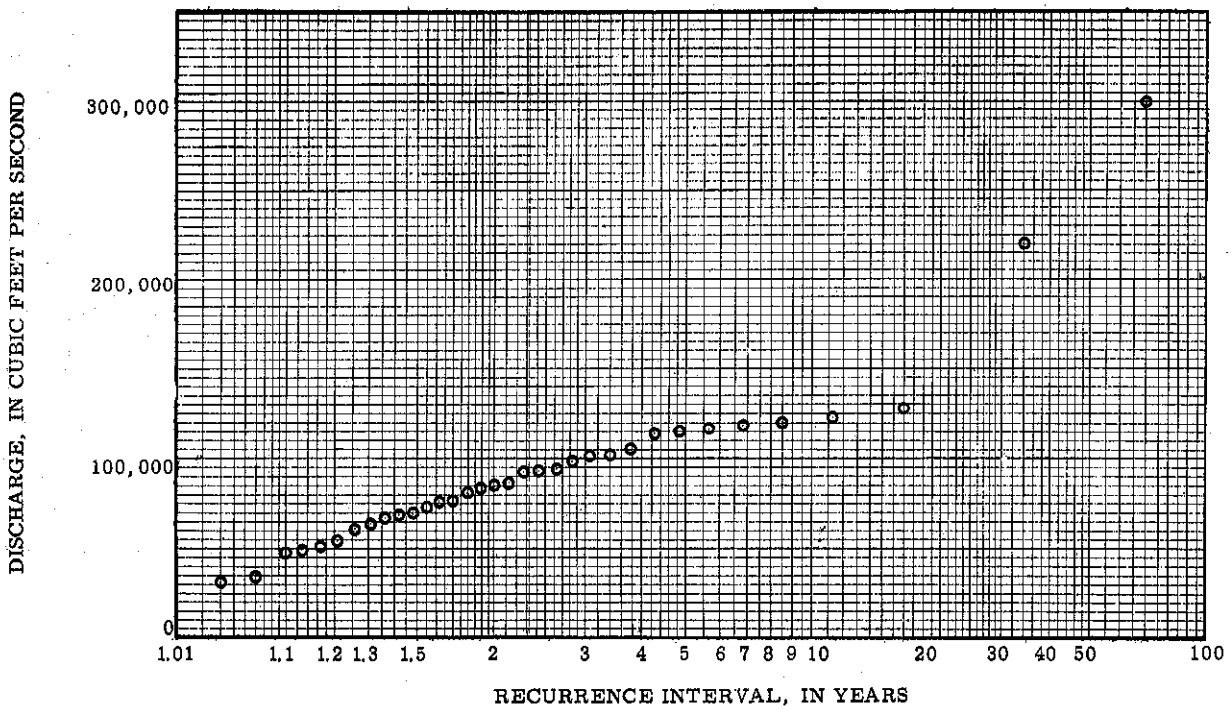


Figure 5. --Annual flood plot, Colorado River at Lees Ferry, Ariz.

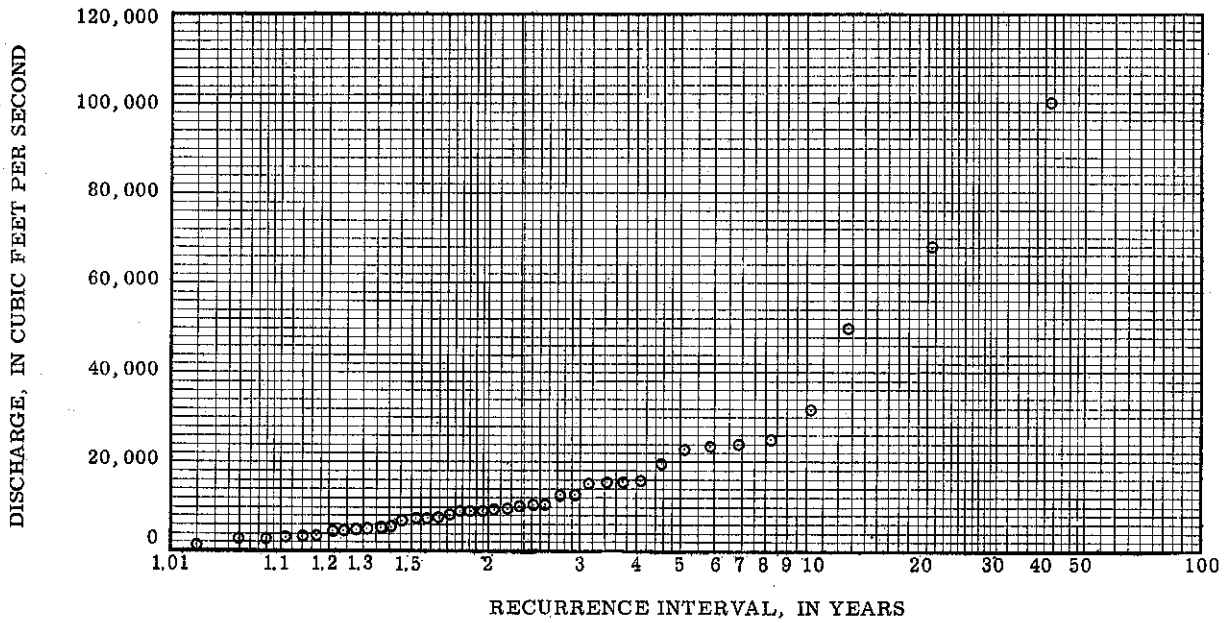


Figure 6. --Annual flood plot, Gila River at head of Safford Valley, near Solomon, Ariz.

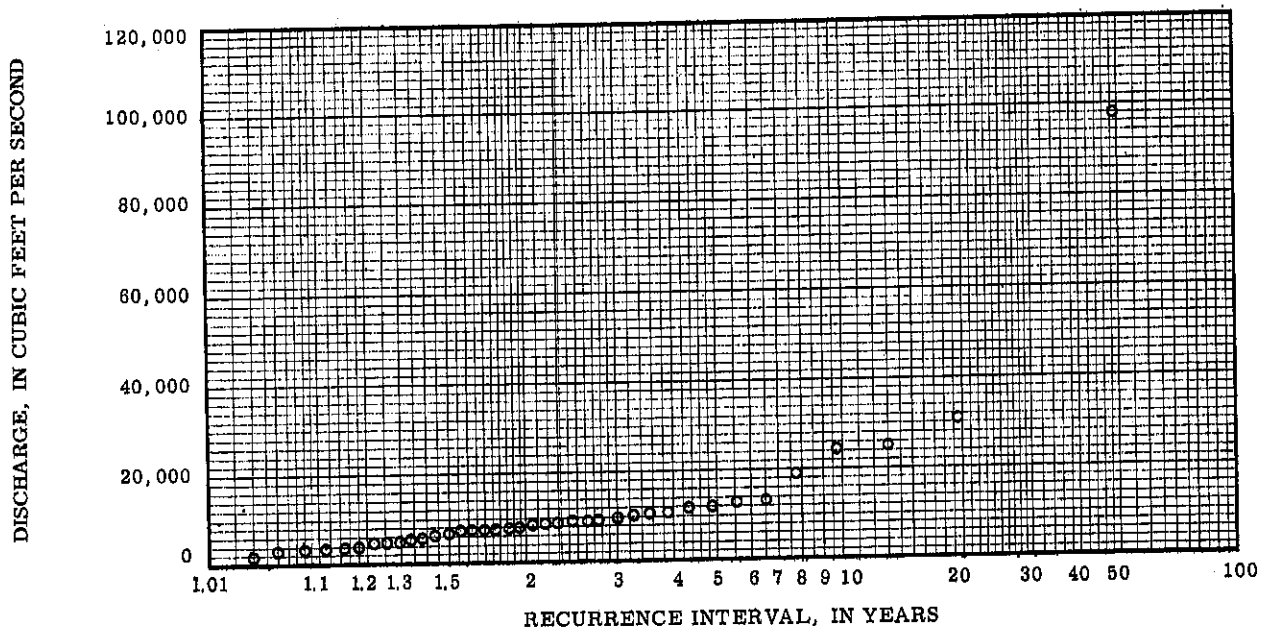


Figure 7. --Annual flood plot, San Pedro River at Charleston, Ariz.

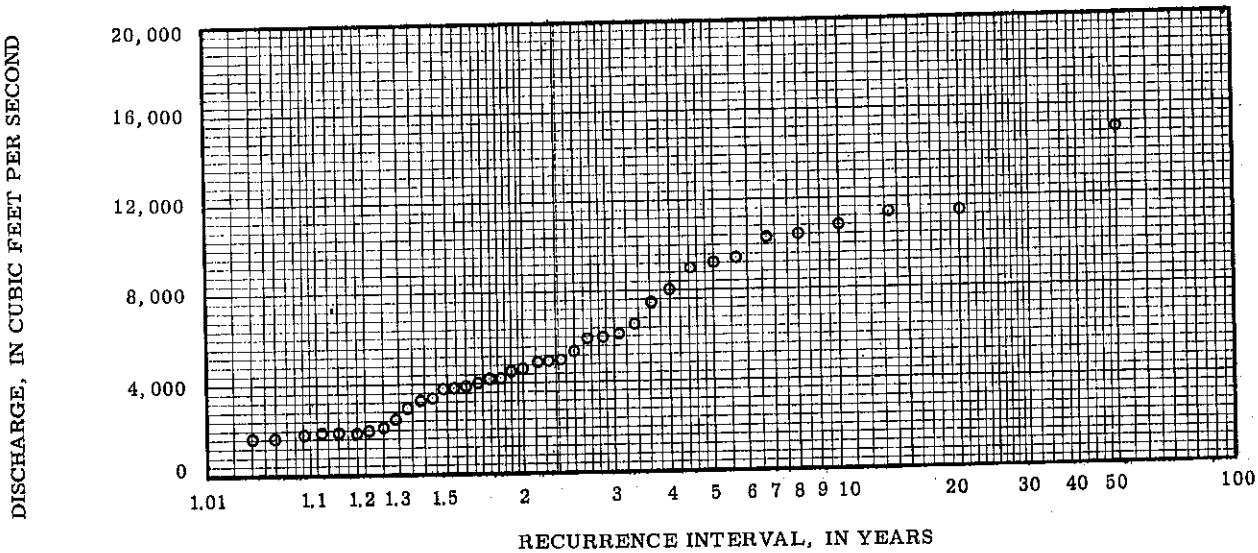


Figure 8. --Annual flood plot, Santa Cruz River at Tucson, Ariz.

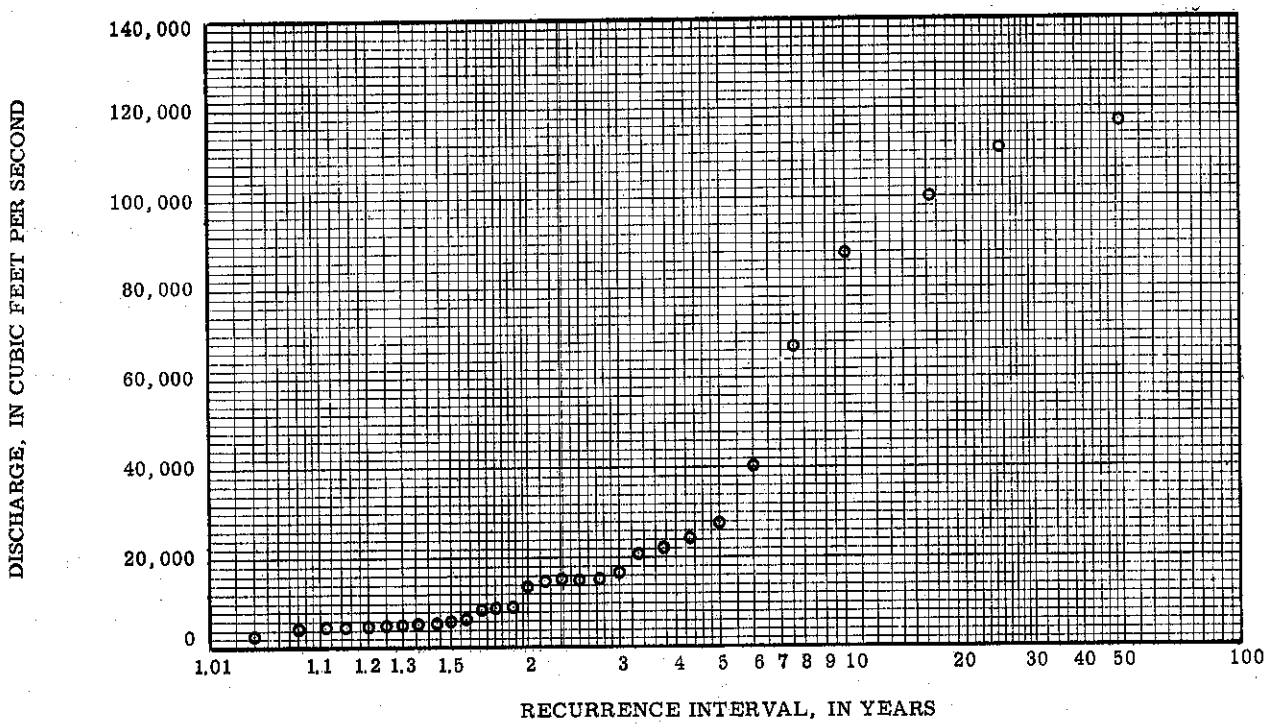


Figure 9. --Annual flood plot, Salt River near Roosevelt, Ariz.

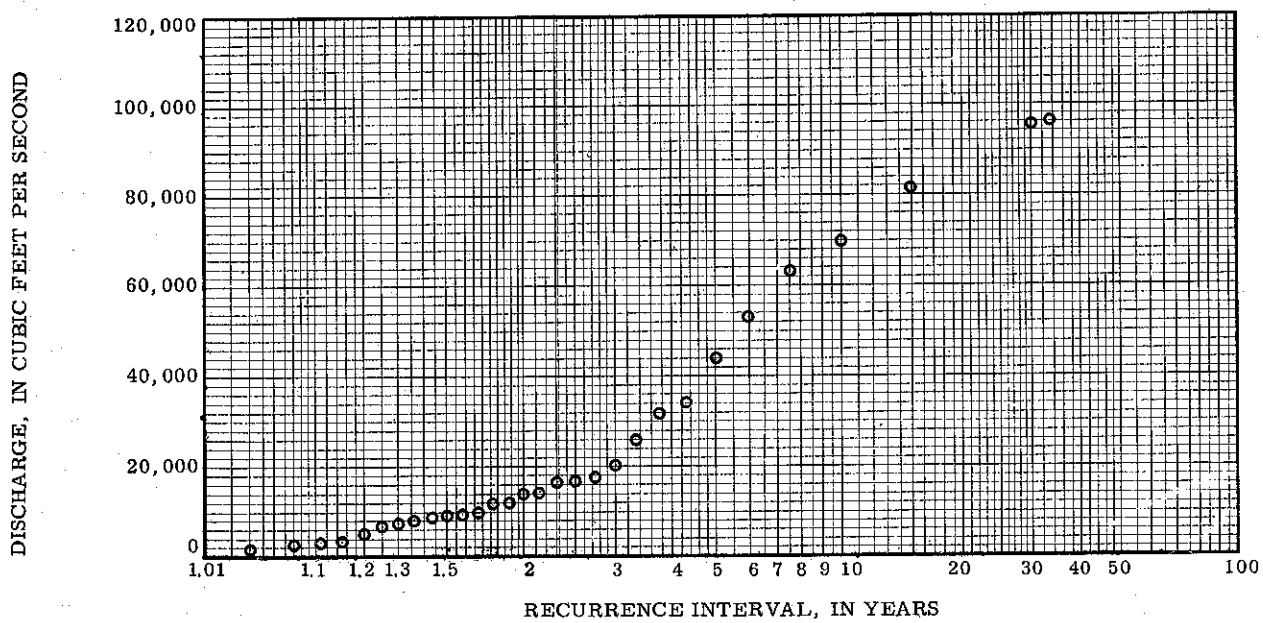


Figure 10. --Annual flood plot, Verde River below Tangle Creek, above Horseshoe Dam, Ariz.

Colorado River Main Stem

(1) Colorado River at Lees Ferry, Ariz.

Location. --Lat 36°51'45", long. 111°36'15', in NE¼SE¼ sec. 13, T. 40 N., R. 7 E., at head of Marble Gorge, at Lees Ferry, just upstream from Paria River, 28 miles downstream from Utah-Arizona State line, 61.5 miles upstream from Little Colorado River, and 79 miles downstream from San Juan River.

Drainage area. --107,900 sq mi, approximately.

Gage. --Recording gage since Jan. 19, 1923. Datum of gage is 3,106.16 ft above mean sea level, datum of 1929. June 13, 1921, to Jan. 18, 1923, non-recording gages within 400 ft of present gage, all referenced to present datum.

Stage-discharge relation. --Defined by current-meter measurements below 120,000 cfs and extended above on basis of discharge computed for flood of June 18, 1921, at station near Grand Canyon. Relation subject to shifting.

Historical data. --Flood of about July 7, 1884, reached a stage of 31.5 ft, from floodmarks at mouth of Paria River, discharge about 300,000 cfs.

Remarks. --Flood record slightly affected by storage and diversions above station. Combined capacity of all reservoirs above station was about 1,700,000 acre-feet in 1950.

Base for partial-duration series, 35,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1884	July 7, 1884	[a] 31.5	[b] 300,000
1921	June 18, 1921	[a] 26.5	[c] 220,000
1922	May 10, 1922	16.90	86,800
	31,	19.8	116,000
	June 12	19.0	110,000
1923	May 14, 1923	14.84	74,000
	31	17.5	98,300
	June 19	16.64	90,600
	Sept. 20	13.81	57,800
1924	Apr. 18, 1924	12.98	47,300
	27	12.20	38,500
	May 23	14.56	67,600
	June 17	15.2	76,200
1925	Apr. 21, 1925	11.88	35,500
	June 3	13.60	54,900
	25	13.4	52,500
1926	Oct. 6, 1925	12.37	36,500
	May 9, 1926	15.09	73,000
	29	16.7	86,500
	July 14	12.40	37,600
1927	May 8, 1927	14.51	66,000
	22	16.71	91,200
	June 22	15.07	72,800
	July 1	20.35	127,000
	Sept. 11	14.43	63,500
	13	20.23	126,000
1928	May 14, 1928	16.68	90,500
	June 3	19.55	115,000
1929	Mar. 14, 1929	12.00	36,300
	Apr. 7	12.66	42,000
	23	12.94	43,900
	May 29	18.89	114,000
	June 12	17.55	101,000
	Aug. 3	14.36	62,500
	7	15.27	73,300
	13	15.07	71,000
	Sept. 9	13.06	46,500
	24	13.51	50,400
1930	Apr. 16, 1930	12.67	42,100
	28	13.21	46,700
	June 3	15.15	73,300
	16	14.64	65,600
	Aug. 12	13.43	48,100
1931	May 21, 1931	12.05	34,600
1932	Apr. 23, 1932	12.89	40,900
	May 26	18.30	102,000
	June 28	15.38	72,300
	July 14	12.97	42,000
	Aug. 30	14.01	54,800
1933	June 5, 1933	16.45	82,700
	July 9	12.13	35,300
1934	May 16, 1934	11.05	25,300
1935	June 19, 1935	18.90	105,000
1936	May 9, 1936	15.37	69,000
	23	16.14	76,300
	July 13	12.22	35,300

Colorado River Main Stem

(1) Colorado River at Lees Ferry, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1937	Apr. 19, 1937	13.14	47,000	1945	May 17, 1945	14.90	64,400
	May 20	16.88	84,800		31	13.90	52,400
	June 2	15.13	68,000		June 11	14.18	55,800
					18	14.14	55,100
1938	May 4, 1938	15.75	72,500				
	22	15.80	73,500	1946	May 2, 1946	12.72	39,400
	June 8	18.45	101,000		June 14	13.66	50,400
	26	16.13	77,300				
				1947	May 13, 1947	16.26	80,400
1939	May 9, 1939	13.70	49,700		June 14	15.22	67,300
	26	13.86	49,700		24	15.55	71,600
	June 8,	13.19	43,600		Aug. 5	12.54	38,500
					24	13.50	47,100
1940	May 18, 1940	13.54	47,200				
	June 5	12.96	42,400	1948	Oct. 16, 1947	12.88	41,200
					Apr. 25, 1948	14.30	54,000
1941	May 17, 1941	20.51	120,000		May 11	13.95	50,500
	June 22	16.10	77,200		25	17.76	92,400
1942	Oct. 15, 1941	16.47	89,200	1949	May 2, 1949	13.94	52,700
	27	12.97	42,700		June 22	20.0	119,000
	Apr. 8, 1942	14.06	56,000				
	17	15.45	70,300	1950	Apr. 27, 1950	12.45	37,400
	26	15.42	71,500		June 6	14.81	60,600
	May 15	14.90	64,500		July 10	12.81	40,700
	30	17.30	92,800				
				1951	June 1, 1951	15.27	67,300
1943	May 7, 1943	14.45	59,600		25	14.78	62,800
	June 5	15.14	68,600				
				1952	May 9, 1952	19.9	113,000
1944	May 19, 1944	17.20	94,400		June 12	21.15	123,000
	June 4	16.71	84,200				
				1953	June 17, 1953	15.60	69,600

[a] From floodmarks.
[b] Estimated.
[c] Annual peak.

Paria River Basin

(2) Paria River at Lees Ferry, Ariz.

Location. —Lat 36°52'15", long. 111°36'30", in NW¼NE¼ sec. 13, T. 40 N., R. 7 E., half a mile upstream from mouth and 1 mile northwest of Lees Ferry.

Drainage area. –1,570 sq mi, approximately.

Gage. --Recording gage at present site since Sept. 11, 1929. Datum of gage is 3,123.40 ft above mean sea level, datum of 1929.

Nov. 22, 1923, to Oct. 5, 1925, staff gage 2,000 ft upstream at different datum.
Oct. 13, 1925, to Sept. 11, 1929, staff gage at present site and datum.

Stage-discharge relation. --Defined by current-meter measurements to 2,000 cfs; extended above by float-area determination at gage height 16.3 ft, and several determinations of increase in flow of Colorado River below mouth of Paria River. Relation subject to shifting.

Remarks. --Flood records unaffected by small irrigation diversions above station.
Base for partial-duration series, 1,400 cfs.

Bank-full stage. --20 ft.

Paria River Basin

(2) Paria River at Lees Ferry, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1924	Sept. 10, 1924	6.0	[c] 4,330
1925	Sept. 19, 1925	6.5	[c] 4,800
1926	Oct. 5, 1925	[a] 16.3	[c] 16,100
1927	Sept. 13, 1927	[a] 16.0	[c] 14,300
1928	July 16, 1928	7.50	[c] 2,960
1929	July 11, 1929	7.1	2,240
	28	8.2	3,440
	31	8.6	3,920
	Aug. 2	13.8	12,000
	4	8.0	3,210
	Sept. 3	7.9	3,100
	8	10.2	6,000
1930	July 30, 1930	7.80	2,540
	Aug. 8	7.17	1,730
	11	11.0	7,150
	Sept. 8	7.48	2,110
	30	7.21	1,780
1931	Nov. 18, 1930	7.53	2,190
1932	Feb. 9, 1932	9.53	4,880
	July 13	9.87	5,260
	Aug. 9	7.22	1,530
	22	7.49	1,880
	28	13.0	10,500
1933	July 18, 1933	7.82	2,300
	Aug. 7	7.35	1,690
	22	8.81	3,660
	Sept. 9	8.35	3,020
1934	May 29, 1934	8.54	3,290
	Aug. 29	11.8	8,400
1935	Sept. 1, 1935	8.12	2,700
1936	July 11, 1936	11.95	8,700
	26	7.30	1,630
	28	8.18	2,780
	Aug. 4	7.80	2,270
	6	9.44	4,610
	17	8.09	2,660
	31	9.62	4,880
	Sept. 2	11.45	7,840
	12	8.73	3,550
1937	Oct. 20, 1936	7.24	1,560
	Feb. 7, 1937	8.12	2,700
	July 9	7.99	2,520
	Aug. 29	8.85	3,720
1938	Mar. 3, 1938	11.22	7,440
	June 29	7.56	1,960
	Sept. 1	7.72	2,170
1939	Sept. 7, 1939	11.31	7,040
	11	7.92	1,990
	13	12.9	9,800
1940	Jan. 12, 1940	7.4	1,480
	Aug. 24	10.1	5,130
	Sept. 6	16.0	14,000
	14	11.2	5,800
	18	12.4	7,800
1941	Oct. 26, 1940	7.95	2,060
	July 24, 1941	12.3	7,500
1942	Oct. 28, 1941	7.50	1,680
1943	Aug. 17, 1943	8.50	2,830
	22	9.8	4,680
	Sept. 28	7.7	1,890
1944	Oct. 19, 1943	12.1	8,400
1945	Aug. 1, 1945	7.55	1,740
	13	8.10	2,340
	Sept. 3	8.83	3,290
1946	Oct. 16, 1945	9.30	3,930
	July 25, 1946	10.0	4,980
	Aug. 11	7.55	1,740
	15	8.94	3,430
	17	9.94	4,830
	24	8.90	3,360
1947	Oct. 29, 1946	7.64	1,590
	Aug. 22, 1947	11.77	7,650
	28	7.90	1,620
1948	Aug. 5, 1948	11.6	6,150
1949	Sept. 29, 1949	10.0	3,410
1950	July 19, 1950	8.17	1,340
1951	Aug. 4, 1951	11.5	4,480
	29	11.5	4,180
1952	Sept. 22, 1952	9.0	1,830
1953	July 18, 1953	9.7	2,100
	Aug. 27	12.8	6,400

[a] From floodmark.
[c] Annual peak; peaks other than annual not known.

Little Colorado River Basin

(3) Little Colorado River above Lyman Reservoir, near St. Johns, Ariz.

Location. --Lat 34°20', long. 109°22', in NE¼SE¼ sec. 27, T. 11 N., R. 28 E., 1 mile downstream from Coyote Creek, 4½ miles upstream from Lyman Dam, and 13 miles south of St. Johns.

Drainage area. --747 sq mi.

Gage. --Recording gage at present site since Oct. 27, 1940. Staff gages at various sites and datums within 1 mile upstream Apr. 10-26, Aug. 2 to Oct. 27, 1940. Apr. 27 to July 25, 1940, recording gage 600 ft upstream at datum 1.70 ft higher.

Altitude of gage is about 6,050 ft (from topographic map).

All gage heights listed referenced to present site and datum.

Stage-discharge relation. --Defined by current-meter measurements below 500 cfs and extended above by slope-area determination at gage height 17.1 ft. Relation subject to shifting.

Historical data. --Flood of July 25, 1940, (gage height, 17.1 ft, present datum, from flood marks) was considered highest in previous 40 years by local residents.

Remarks. --Flood records not materially affected by diversions for irrigation and many small reservoirs totaling about 15,000 acre-ft above station.

Base for partial-duration series, 400 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	July 25, 1940	17.1	[c]16,000	1947	July 22, 1947	9.8	1,460
					Aug. 10	9.05	900
1941	May 7, 1941	7.12	1,510		18	8.5	634
	July 23	8.56	2,520		22	9.98	1,620
	Aug. 12	5.3	642		26	8.78	830
					29	7.82	402
1942	Aug. 10, 1942	4.54	379				
				1948	Apr. 17, 1948	8.22	[c]732
1943	Aug. 7, 1943	5.62	768				
	22	8.37	2,360	1949	Apr. 24, 1949	6.80	524
					July 12	6.41	426
1944	Aug. 15, 1944	9.57	3,400		Aug. 2	8.35	1,000
	23	6.65	1,250		8	7.60	638
1945	July 30, 1945	6.12	661	1950	July 18, 1950	4.84	181
	Aug. 6	5.54	441				
	11	6.29	740	1951	July 21, 1951	9.7	1,550
					Aug. 2	12.4	3,200
1946	July 18, 1946	8.5	1,400		4	7.95	484
	21	6.70	520				
	Aug. 4	13.1	6,000	1952	Apr. 17, 1952	7.05	489
	7	11.4	3,820		Aug. 16	8.2	972
	12	7.88	880		28	9.6	1,570
	28	7.33	495				
	Sept. 20	8.42	1,000	1953	Aug. 10, 1953	5.75	229

[c] Annual peak.

Little Colorado River Basin

(4) Little Colorado River above Zuni River, near Hunt, Ariz.

Location. --Lat 34°38', long. 109°40', in SW¼NW¼ sec. 2, T. 14 N., R. 25 E., 500 ft upstream from Zuni River, and 3 miles northwest of Hunt.

Drainage area. --3,680 sq mi, approximately (including 830 sq mi in closed basin surrouding Quemado, N. Mex.).

Gage. --Recording gage since March 1940. Altitude of gage is 5,400 ft (from river-profile map).

Stage-discharge relation. --Defined by current-meter measurements below 500 cfs and extended above. Relation subject to minor shifting.

Remarks. --Flood records are affected by irrigation diversions and many reservoirs (combined capacity, about 44,000 acre-ft in 1940 and 54,000 acre-ft in 1950) above station.

Base for partial-duration series, 70 cfs.

Bank-full stage. --10 ft.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1940	July 26, 1940	3.46	577
	Aug. 21	2.69	186
	27	2.97	298
	Sept. 8	2.48	126
	18	2.37	101
	24	2.40	107
1941	Mar. 15, 1941	2.56	150
	May 11	3.37	516
	July 26	2.96	289
1942	Oct. 7, 1941	1.98	37
1943	Sept. 26, 1943	1.61	11
1944	Sept. 26, 1944	2.36	101
1945	Aug. 11, 1945	2.79	226
	13	4.13	1,100
	21	2.41	115
	23	2.22	88
1946	July 18, 1946	2.38	122
	23	2.37	119
	Aug. 4	3.60	745
	8	2.80	274
	12	2.76	257
	14	2.56	180
	21	2.55	177
	Sept. 19	2.42	136
	21	2.37	122
1947	Aug. 4, 1947	2.86	301
	9	2.43	139
	14	2.25	92
	22	2.35	122
	26	2.55	187
1948	Sept. 17, 1948	2.17	75
1949	Aug. 3, 1949	2.28	99
	7	2.68	244
	10	3.11	478
1950	July 7, 1950	2.41	140
1951	Aug. 28, 1951	2.19	70
1952	July 27, 1952	2.12	67
1953	July 27, 1953	2.02	62

Little Colorado River Basin

(5) Little Colorado River near Hunt, Ariz.

Location. --Lat 34°39', long. 109°42', in NE¼NW¼ sec. 4, T. 14 N., R. 25 E., at bridge on U. S. Highway 260, 2 miles downstream from Zuni River and 5 miles northwest of Hunt.

Drainage area. --6,280 sq mi, approximately (including 830 sq mi in closed basin surrounding Quemado, N. Mex.).

Gage. --Recording gage at present site since Apr. 11, 1940. Datum of gage is 5,371.59 ft above mean sea level, datum of 1929.

May 1929 to October 1933, recording gage at site of former bridge 40 ft downstream. Datum was 0.16 ft lower prior to Sept. 1, 1931, and 2.16 ft lower Sept. 1, 1931, to October 1933.

Stage-discharge relation. --Defined by current-meter measurements below 3,500 cfs and extended above by logarithmic plotting. Shifts in relation occur.

Remarks. --Flood record not materially affected by diversions and reservoirs (combined capacity, about 54,000 acre-ft in 1938 and 63,000 acre-ft in 1950) above station.

Base for partial-duration series, 600 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1929	July 28, 1929	17.0	8,000
	Aug. 1	9.9	2,950
	8	6.90	1,400
	13	7.78	1,800
	22	6.15	1,080
	Sept. 3	5.50	850
	6	6.44	1,220
	23	11.6	3,960
1930	Oct. 16, 1929	4.74	716
	July 18, 1930	3.96	729
	21	3.75	663
	Aug. 7	4.66	965
	10	3.60	624
1931	July 19, 1931	3.99	764
	28	10.05	3,310
	31	4.9	1,070
	Aug. 5	10.5	3,600
	9	3.66	718
	31	3.43	653
	Sept. 16	5.44	653
	28	5.40	643
1932	Oct. 2, 1931	6.98	1,070
	Mar. 27, 1932	5.53	604
	Apr. 14	6.20	617
	July 30	7.13	905
	Aug. 22	7.31	980
	29	7.83	1,200
1933	July 24, 1933	12.4	3,600
	30	6.50	662
	Aug. 10	6.70	735
	Sept. 10	7.39	1,010
1940	July 26, 1940	10.34	2,110
	29	7.11	629
	Aug. 15	7.55	838
	26	8.30	1,120
	Sept. 6	7.52	918
1941	Mar. 15, 1941	7.41	816
	Apr. 3	7.22	767
	May 10	6.71	636
	July 25	8.96	1,560
	Sept. 30	7.34	854
1942	Oct. 4, 1941	6.99	725
1943	Aug. 11, 1943	6.40	508
1944	Sept. 30, 1944	7.51	451
1945	Aug. 13, 1945	10.87	1,590
1946	Aug. 5, 1946	13.90	2,390
	8	12.78	1,840
	12	11.34	1,400
	Sept. 19	9.09	710
1947	Aug. 4, 1947	8.94	662
	23	10.50	1,290
1948	Oct. 14, 1947	9.49	925
1949	Aug. 7, 1949	13.8	2,360
	9	16.87	4,050
1950	July 24, 1950	6.42	119
1951	Aug. 28, 1951	9.74	531
1952	Sept. 22, 1952	9.07	395
1953	July 18, 1953	7.02	42

Little Colorado River Basin

(6) Show Low Creek at Show Low, Ariz.

Location. --Lat 34°15'10", long. 110°01'40", in NE¼ sec. 20, T. 10 N., R. 22 E., at bridge on U. S. Highway 60 at Show Low.

Drainage area. --87.0 sq mi.

Gage. --Recording gage since January 1940 except July 26, 1951, to Apr. 5, 1952, when staff gages at or near present site were used. Datum of gage is 6,309.22 ft above mean sea level, datum of 1929. All gage heights reduced to present datum.

Stage-discharge relation. --Defined by current-meter measurements below 510 cfs and extended above on basis of slope-area determination at 9.9 ft.

Remarks. --Records prior to March 1945 compiled by Bureau of Reclamation.

Flood record prior to spring of 1953 slightly affected by irrigation diversions and several reservoirs (combined capacity 2,400 acre-ft) above station. Flood record greatly affected after completion of Jaques Dam in spring of 1953 increasing total capacity of reservoirs above station to 8,800 acre-ft.

Base for partial-duration series, 150 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1941	Mar. 14, 1941	9.30	[b] 3,200	1949	Dec. 23, 1948	3.74	290
					Jan. 13, 1949	5.38	840
1942	Oct. 13, 1941	3.12	[c] 211		Feb. 23	5.04	740
					Mar. 7	5.22	800
1943	Mar. 5, 1943	5.22	[c] 768		Aug. 6	3.73	330
1944	Mar. 16, 1944	4.00	[c] 472	1950	Mar. 3, 1950	3.34	238
1945	Mar. 10, 1945	3.57	302	1951	Aug. 28, 1951	3.10	170
	27	3.18	211				
				1952	Dec. 31, 1951	-	[b] 2,500
1946	July 14, 1946	7.8	750		Jan. 13, 1952	8.0	3,000
	Sept. 19	6.71	1,200		18	9.9	6,250
					Mar. 17	-	[b] 1,000
1947	Nov. 25, 1946	3.96	166		31	4.34	238
					Apr. 27	6.39	1,190
1948	Oct. 14, 1947	5.18	618				
	Dec. 2	3.61	151	1953	Mar. 8, 1953	5.06	[d] 444
	Feb. 18, 1948	3.37	153				
	Mar. 18	3.56	202				
	24	3.77	248				
	July 27	5.03	640				

[b] Estimated.
[c] Annual Peak.
[d] May be affected by storage in Lake Show Low.

Little Colorado River Basin

(7) Silver Creek near Snowflake, Ariz.*

Location. --Lat 34°40'00", long. 110°02'30", in SW¼NW¼ sec. 29, T. 15 N., R. 22 E., on left bank 6 miles upstream from mouth and 14 miles north of Snowflake.

Drainage area. --886 sq mi at present site. 942 sq mi at site used prior to October 1950.

Gage. --Recording gage since April 1929. Prior to October 1950, at site 5½ miles downstream. Altitude of present gage is 5,245 ft (from river-profile map). Altitude of gage at former site was 5,196 ft (from river-profile map).

Stage-discharge relation. --For site in use prior to October 1950, defined by current-meter measurements below 3,700 cfs and extended above on basis of slope-area determination at 11,000 cfs. At present site, defined by current-meter measurements below 4,000 cfs and extended above on basis of relation at former site. Relations at both sites stable.

Remarks. --Flood record prior to 1953 not significantly affected by irrigation and storage above station. Completion of Jaques Dam in spring of 1953 increased total capacity of reservoirs above station from 7,500 acre-ft to 13,700 acre-ft not including Lone Pine Reservoir. This flood record is a combination of records published for station near Woodruff through water year 1952 (listed here through 1950) and present gage established in 1950. Records for 1951 and 1952 indicate that flood flows at these two points are almost identical.

Base for partial-duration series, 1,000 cfs.

*Published as "near Woodruff", prior to 1952.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1929	July 21, 1929	11.67	10,500
	25	6.45	3,050
	31	3.66	1,020
	Aug. 3	3.98	1,100
	7	4.47	1,440
	Sept. 23	6.47	3,070
1930	July 12, 1930	4.57	1,520
	Aug. 11	6.40	3,000
1931	July 16, 1931	4.25	1,290
	24	4.28	1,310
	Aug. 7	5.49	2,200
	Sept. 6	6.24	2,850
1932	Feb. 9, 1932	11.35	9,900
	Mar. 1	4.01	1,120
	July 9	4.60	1,530
1933	Aug. 20, 1933	5.07	1,780
	Sept. 10	7.83	4,600
1934	-	-	[b] [c] 2,000
1935	Sept. 27, 1935	6.22	[c] 2,820
1936	July 25, 1936	7.60	4,300
	30	4.12	1,060
	Aug. 4	4.28	1,180
	6	5.18	1,890
1937	Feb. 7, 1937	7.57	4,300
	Mar. 15	4.59	1,400
	17	4.69	1,480
1938	Mar. 4, 1938	6.28	2,900
	Aug. 7	5.51	2,140
	8	6.52	3,100
	Sept. 1	4.13	1,090
1939	Aug. 6, 1939	4.44	1,310
	29	4.64	1,460
1940	July 16, 1940	6.74	2,680
	26	12.37	11,000
	Aug. 19	5.33	1,510
	25	5.48	1,610
	Sept. 12	5.98	2,000
	27	4.86	1,210
1941	Jan. 12, 1941	5.30	1,480
	Mar. 15	7.61	3,700
	Sept. 28	5.55	1,640
1942	Oct. 3, 1941	4.33	932
1943	July 24, 1943	5.24	1,360
	Aug. 2	5.32	1,400
	31	7.08	3,120
1944	Aug. 25, 1944	3.49	416
1945	July 29, 1945	5.68	1,730
	Aug. 5	5.25	1,400
	11	7.06	3,230
1946	July 21, 1946	4.94	1,140
	Aug. 5	4.81	1,040
	Sept. 19	5.67	1,680
1949	Jan. 13, 1949	6.88	[c] 2,900
1950	July 7, 1950	4.93	[c] 1,160
1951	Aug. 28, 1951	10.5	3,780
1952	Dec. 31, 1951	10.3	3,620
	Jan. 13, 1952	12.4	5,220
	19	18.0	10,100
	July 6	6.6	1,260
	Aug. 20	9.9	3,330
	Sept. 22	8.8	2,530
1953	July 16, 1953	5.9	1,060

[b] Estimated.
[c] Annual peak.

Little Colorado River Basin

(8) Little Colorado River at Woodruff, Ariz.*

Location.--Lat 34°47', long. 110°03', in NE¼SW¼ sec. 17, T. 16 N., R. 22 E., at county bridge in Woodruff, and 3 3/4 miles downstream from Silver Creek.

Drainage area.--8,100 sq mi. approximately.

Gage.--Recording gage at present site and datum since Sept. 22, 1949. Datum of gage is 5,129.0 ft above mean sea level (from river-profile survey, based on datum of 1929).

1915-19, recording gage 1½ miles downstream, at different datum.

April 1929 to Sept. 21, 1949, recording gage 800 ft downstream from preceding gage and 5½ miles downstream from Silver Creek at datum 5.5 ft lower than present gage.

Stage-discharge relation.--Defined by current meter measurements at present site. At site in use prior to 1929 relation was defined by current meter measurements below 2,000 cfs and extended above. That for site 1929-49 was defined by current meter measurements below 6,800 cfs and extended above on basis of slope-area determination at 13.45 ft. Relations stable.

Historical data.--Flood of Jan. 19, 1916, discharge undetermined (gage height, 12.7 ft, from floodmark, datum then in use), is believed to be greater than flood of Dec. 5, 1919.

Remarks.--Flood record partially affected by diversions and storage above station. Combined capacity of all reservoirs above station, about 73,000 acre-ft, not including Lone Pine Reservoir.

Base for partial-duration series, 1,900 cfs.

*Published as "near Woodruff", 1916-20, 1928-48.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 19, 1916	[a]12.7	-
1917	Apr. 18, 1917	5.0	[c]2,800
1919	July 19, 1919	5.4	[c]4,600
1920	Dec. 5, 1919	12.0	[c]25,000
1929	July 21, 1929	12.45	10,700
	26	8.05	3,320
	29	11.6	9,050
	31	7.0	2,180
	Aug. 2	8.25	3,600
	8	7.45	2,590
	13	7.65	2,810
	Sept. 23	12.4	10,600
1930	Aug. 2, 1930	7.9	3,120
	11	11.05	8,000
1931	July 24, 1931	8.3	3,680
	29	9.2	5,000
	Aug. 7	10.90	7,750
	10	6.5	1,920
	22	7.45	2,660
	Sept. 7	7.4	2,610
1932	Feb. 10, 1932	12.1	10,200
	July 9	8.6	4,350
	Aug. 20	6.3	1,980
1933	July 7, 1933	7.1	2,640
	24	8.2	3,810
	Aug. 6	6.6	2,280
	Sept. 11	11.0	8,300
1934	-	-	[b c]2,500
1935	Sept. 28, 1935	9.3	[c]5,400
1936	July 10, 1936	6.32	2,170
	25	11.0	8,300
	Sept. 21	6.70	2,410
1937	Feb. 7, 1937	9.3	5,640
	July 28	6.3	2,300
1938	Mar. 4, 1938	7.10	2,880
	Aug. 7	5.92	2,070
	8	7.20	2,960
1939	Aug. 6, 1939	3.95	1,180
1940	July 16, 1940	6.50	2,670
	26	13.45	13,000
	Aug. 15	8.5	4,540
	19	6.1	2,400
	25	5.6	2,120
	Sept. 12	8.2	4,210
	18	5.35	2,020
1941	Jan. 12, 1941	7.0	3,090
	Mar. 15	9.45	6,050
	Sept. 28	8.4	4,690
1942	Oct. 3, 1941	4.70	1,670
1943	Aug. 2, 1943	5.2	1,920
	31	7.46	3,590
1944	Sept. 28, 1944	3.70	1,140

Little Colorado River Basin

(8) Little Colorado River at Woodruff, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1945	July 23, 1945	8.42	4,690	1949	Jan. 14, 1949	10.1	2,600
	29	5.71	2,170		July 20	9.9	2,400
	Aug. 11	7.67	3,810		Aug. 8	13.1	7,540
	20	5.52	2,070				
1946	July 22, 1946	5.60	1,990	1950	July 19, 1950	9.85	2,050
	Aug. 5	6.52	2,580	1951	Aug. 28, 1951	19.75	8,290
	Sept. 19	7.8	3,880				
1947	Aug. 5, 1947	6.90	3,000	1952	Dec. 31, 1951	11.24	2,580
	10	5.63	2,160		Jan. 14, 1952	13.84	4,180
	13	6.10	2,440		19	21.9	10,200
	23	7.56	3,700		July 6	10.42	2,250
	29	8.26	4,560		Aug. 20	11.45	2,950
					Sept. 22	13.93	4,440
1948	Oct. 14, 1947	8.30	4,560	1953	July 29, 1953	11.32	2,770
	Sept. 27	9.76	1,920				

[a] From floodmarks.
[b] Estimated.
[c] Annual Peak.

(9) Puerco River at Gallup, N. Mex.

Location. --Lat 35°32', long. 108°44', in SW¼NW¼ sec. 15, T. 15 N., R. 18 W., 1,500 ft upstream from Second Street Bridge in Gallup and half a mile upstream from Little Puerco Wash.

Drainage area. -558 sq mi.

Gage. --Recording gage, May 1940 to July 12, 1946. Datum of gage is 6,490.36 ft above mean sea level, datum of 1929.

Stage-discharge relation. --Defined by current-meter measurements below 340 cfs; extended above on basis of slope-area determinations. Relation subject to small shifts.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 1,200 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	July 27, 1940	5.0	1,450	1944	Sept. 27, 1944	4.30	1,040
	Sept. 11	4.92	1,380				
	21	7.35	3,500	1945	July 23, 1945	5.90	2,270
					30	6.43	2,760
1941	July 24, 1941	5.48	1,830		Aug. 5	5.14	1,640
	Aug. 10	4.8	1,230		7	5.46	1,880
	Sept. 17	5.2	1,620		9	4.7	1,310
	28	7.65	3,700		11	5.50	1,920
					31	4.73	1,340
1942	Oct. 3, 1941	5.0	1,480				
1943	July 21, 1943	4.66	1,260				
	31	5.75	2,280				
	Aug. 10	4.47	1,270				
	25	5.08	1,720				

Little Colorado River Basin

(10) Puerco River near Adamana, Ariz.

Location.--Lat 34°58'45", long. 109°47'40", in NE¼ sec. 9, T. 18 N., R. 24 E., at bridge on State Highway 63 in Petrified Forest National Monument, a quarter of a mile downstream from Dead Wash, and 1½ miles east of Adamana.

Drainage area.--2,760 sq mi, approximately.

Gage.--Recording gage, March 1940 to September 1949. Datum of gage is 5,312.92 ft above mean sea level, datum of 1929.

Stage-discharge relation.--Defined by current-meter measurements below 17,000 cfs; extended above by logrithmic plotting. Relation affected by very large shifts.

Remarks.--Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 3,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 14, 1940	5.85	7,000	1945	Feb. 3, 1945	7.40	5,740
	21	5.37	5,200		July 30	6.98	4,150
	23	5.9	7,500				
				1946	Aug. 10, 1946	7.40	7,970
1941	Jan. 11, 1941	5.27	5,960		12	10.4	30,000
	Mar. 15	7.1	7,400				
	May 24	7.9	11,400	1947	Aug. 10, 1947	8.6	22,000
	Aug. 8	6.48	4,650		13	5.6	7,500
	10	6.5	4,650		22	5.7	8,440
	14	6.08	3,090		30	7.7	15,800
	17	6.18	3,250		Sept. 9	5.95	6,420
	Sept. 29	9.5	22,600				
				1948	Oct. 14, 1947	7.3	17,100
1942	Oct. 4, 1941	9.1	19,400		July 28, 1948	7.3	7,060
	14	7.4	8,780		Sept. 26	5.6	4,020
1943	Aug. 28, 1943	6.53	4,530	1949	Feb. 24, 1949	5.11	3,010
	Sept. 26	6.8	4,800		July 24	5.95	3,710
					Aug. 3	5.75	3,120
1944	Sept. 26, 1944	7.2	4,700		8	6.9	8,040
					Sept. 13	6.25	4,700

Little Colorado River Basin

(11) Little Colorado River at Holbrook, Ariz.

Location. --Lat 34°53'50", long. 110°09'40", in SW¼SW¼ sec. 6, T. 17 N., R. 21 E., at bridge on U. S. Highway 260 at Holbrook and 2½ miles downstream from Puerco River.

Drainage area. --11,300 sq mi, approximately.

Gage. --Recording gage at present site and datum since Sept. 14, 1949. Datum of gage is 5,062.87 ft above mean sea level, datum of 1929. 1905-9, staff gage at former highway bridge just upstream from present bridge at different datum.

Stage-discharge relation. --Defined by current meter measurements since 1950. Relation in use during 1906 water year was apparently defined below about 3,500 cfs and extended above.

Historical data. --Flood peak of 60,000 cfs, Sept. 19, 1923, was computed from cross section and slope of water surface by Corps of Engineers, whose studies indicate that this was probably the greatest flood since 1870.

Remarks. --Flood records partially affected by diversions and storage above station. Base for partial duration series, 3,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1906	Nov. 27, 1905	-	[c,e]20,200	1952	Dec. 31, 1951	6.80	3,190
					Jan. 14, 1952	7.55	4,700
1923	Sept. 19, 1923	-	[c,f]60,000		19	8.70	8,400
					July 6	6.98	3,120
1950	July 19, 1950	7.68	2,960		Aug. 20	6.95	3,040
					28	8.00	6,000
1951	Aug. 28, 1951	8.80	8,700		Sept. 22	7.45	4,400
				1953	July 29, 1953	7.53	6,030

[c] Annual peak.
[e] Maximum daily discharge.
[f] Computed by Corps of Engineers.

(12) Chevelon Fork below Wildcat Canyon, near Winslow, Ariz.

Location. --Lat 34°38', long. 110°43', in SW¼ sec. 36, T. 15 N., R. 15 E., three-eighths of a mile downstream from Wildcat Canyon and 25 miles south of Winslow.

Drainage area. --275 sq mi.

Gage. --Recording gage since May 1947. Datum of gage is 5,905.16 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark).

Stage-discharge relation. --Defined by current meter measurements below 6,300 cfs and extended above on basis of slope-area determinations at gage heights 13.7 and 18.2 ft. Relation subject to shifting at high stage.

Remarks. --No regulation or diversion above station. Base for partial-duration series, 400 cfs.

Little Colorado River Basin

(12) Chevelon Fork below Wildcat Canyon, near Winslow, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1948	Mar. 31, 1948	5.08	689	1951	May 4, 1951	4.97	618
	Apr. 5	5.43	877		Aug. 29	13.7	8,940
	12	5.51	931				
				1952	Dec. 31, 1951	10.3	4,710
1949	Dec. 23, 1948	5.34	808		Jan. 18, 1952	18.2	19,800
	28	5.02	614		Apr. 8	7.34	2,290
	Mar. 8, 1949	4.72	493		15	6.24	1,400
	20	6.08	1,210		20	6.18	1,370
	Apr. 14	6.23	1,290				
				1953	Mar. 11, 1953	4.97	653
1950	Feb. 8, 1950	4.73	524				
	28	5.08	726				

(13) Chevelon Fork near Winslow, Ariz.

Location.--Lat 34°56', long. 110°31', in SE¼SW¼ sec. 27, T. 18 N., R. 17 E., 3 miles upstream from mouth and 12 miles southeast of Winslow.

Drainage area.--1,010 sq mi, approximately, including some area which is probably noncontributing.

Gage.--Recording gage at present site and datum since June 3, 1929. Altitude of gage is 4,905 ft (from river-profile map). Dec. 18, 1915, to Dec. 5, 1919, recording gage 500 ft downstream at datum 1.02 ft higher. Mar. 30 to July 2, 1929, staff gage 500 ft downstream at different datum.

Stage-discharge relation.--Defined by current-meter measurements below 4,000 cfs; extended above on basis of slope-area determination at 19.8 ft. Relation subject to shifts.

Remarks.--Base for partial-duration series, 500 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 19, 1916	13.0	[a]9,500	1933	May 2, 1933	4.44	565
					July 24	4.82	643
1917	Apr. 24, 1917	5.30	[c]1,300		Sept. 20	5.41	1,060
1918	Mar. 13, 1918	[b]11	[c]6,200	[d]1934-35	-	[a]8.05	2,700
1919	Apr. 1, 1919	5.37	[c]1,110	1936	Apr. 12, 1936	5.88	1,350
					July 10	4.83	753
1920	Dec. 5, 1919	12.9	[c]9,000		28	4.30	516
					Aug. 3	4.53	611
1929	Apr. 4, 1929	17.8	[c]16,100		Sept. 10	5.04	864
1930	Mar. 27, 1930	4.87	519	1937	Feb. 8, 1937	6.66	1,820
	Apr. 7	4.70	502		15	5.86	1,340
					Mar. 17	5.90	1,360
1931	Mar. 19, 1931	4.86	548		Apr. 3	4.80	738
					12	5.75	1,320
1932	Feb. 10, 1932	8.58	3,100		Aug. 31	4.72	699
	Mar. 2	4.71	748				
	10	4.28	587	1938	Mar. 1, 1938	5.84	1,330
	20	5.58	1,340		4	14.15	9,400
	26	5.58	1,370		13	8.17	2,090

Little Colorado River Basin

(13) Chevelon Fork near Winslow, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1939	Mar. 23, 1939	7.00	1,120	1946	Sept. 18, 1946	5.30	509
	Apr. 5	7.29	1,360		20	6.24	892
	Aug. 3	8.74	2,410				
				1947	Nov. 16, 1946	5.34	526
1940	July 25, 1940	7.01	1,180		25	7.49	1,550
	Aug. 23	6.38	845		Aug. 4, 1947	8.84	2,460
1941	Jan. 11, 1941	6.35	795	1948	Apr. 1, 1948	5.86	616
	Feb. 17	6.83	1,090		6	6.23	780
	22	6.80	1,090		13	6.30	825
	Mar. 3	5.60	582		Aug. 4	6.17	758
	15	7.52	1,630				
	Apr. 2	6.05	820	1949	Mar. 9, 1949	5.58	540
	18	5.54	582		21	6.88	1,120
	27	6.36	1,030		Apr. 14	6.95	1,150
	May 4	7.15	1,530				
				1950	Mar. 1, 1950	5.59	616
1942	Apr. 6, 1942	6.52	985				
				1951	Aug. 30, 1951	13.4	7,200
1943	Mar. 7, 1943	6.11	932				
	11	6.82	1,330	1952	Dec. 31, 1951	10.9	3,770
					Jan. 19, 1952	19.8	25,300
1944	Apr. 6, 1944	6.87	1,180		Apr. 7	9.59	2,180
	13	5.90	713		15	8.30	1,130
	Sept. 26	6.14	822		21	8.36	1,320
1945	Apr. 10, 1945	6.50	1,060	1953	Mar. 12, 1953	6.97	650
	19	7.30	1,460				
	Aug. 4	9.03	2,620				

[a] From floodmark.
[b] Estimated.
[c] Annual peak.
[d] Annual peak for 1934 or 1935 water year occurred between Feb. 6, 1934, and Sept. 23, 1935.

(14) Clear Creek below Willow Creek, near Winslow, Ariz.

Location.--Lat 34°40', long. 111°00', in NW¼NE¼ sec. 30, T. 15 N., R. 13 E., 2 miles downstream from Willow Creek and 30 miles southwest of Winslow.

Drainage area.--321 sq mi.

Gage.--Recording gage since June 1947. Altitude of gage is about 6,000 ft (from Forest Service map).

Stage-discharge relation.--Defined by current-meter measurements below 1,900 cfs, and extended above on basis of area-velocity studies and logarithmic plotting. Relation is stable.

Remarks.--No regulation or diversion above station. Base for partial-duration series, 500 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1948	Apr. 12, 1948	9.54	1,810	1951	May 5, 1951	7.21	708
					Aug. 29	16.3	8,090
1949	Dec. 23, 1948	8.14	1,090				
	28	7.55	842	1952	Dec. 31, 1951	15.2	6,730
	Mar. 8, 1949	7.34	766		Jan. 18, 1952	21.5	16,400
	20	9.0	1,520		Apr. 7	10.27	2,180
	Apr. 15	9.75	1,990		20	10.83	2,580
					Aug. 15	6.73	574
1950	Feb. 8, 1950	6.80	594				
	28	8.17	1,090	1953	Mar. 11, 1953	6.54	497

Little Colorado River Basin

(15) Clear Creek near Winslow, Ariz.

Location. --Lat 34°58', long. 110°38', in SE¼ sec. 9, T. 18 N., R. 16 E., at county highway bridge, 1½ miles upstream from mouth, and 5 miles southeast of Winslow. Control for station is crest of diversion dam 1,200 ft downstream.

Drainage area. --607 sq mi.

Gage. --Recording gage at present site since July 3, 1929. Datum of gage is 4,861.32 ft above mean sea level, datum of 1929. Datum was 4.03 ft higher prior to July 10, 1931. Mar. 25 to July 2, 1929, staff gage at same site at datum 4.03 ft higher.

Stage-discharge relation. --Defined by current-meter measurements below 13,500 cfs; extended above on basis of velocity-area studies and slope-area determination at gage height 13.4 ft. Rating stabilized by diversion dam 1,200 ft downstream.

Historical data. --Floodmarks 3 ft higher than the stage of the flood of Apr. 4, 1929, were observed 1,850 ft downstream from gage in 1928.

Remarks. --Flood records not affected by small diversions above station. Base for partial-duration series, 500 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1929	Apr. 4, 1929	14.1	[a] 50,000
1930	Mar. 27, 1930	1.83	507
	Apr. 10	2.28	1,080
1931	Mar. 24, 1931	2.13	850
	Apr. 4	1.85	532
	30	2.04	740
	Aug. 30	5.93	581
1932	Feb. 10, 1932	9.08	6,100
	Mar. 3	6.15	826
	10	6.07	718
	20	6.96	2,080
	Apr. 2	6.98	2,120
	16	6.50	1,360
1933	Mar. 30, 1933	5.86	577
	Apr. 5	6.06	780
	May 4	5.92	635
	July 31	5.83	548
	1934 or 1935	[a] 9.15	[a] 6,300
1936	Apr. 14, 1936	6.71	1,680
1937	Feb. 8, 1937	7.39	2,580
	16	7.14	2,290
	Mar. 14	7.03	2,100
	17	7.43	2,790
	Apr. 4	6.26	1,000
	16	7.00	2,050
1938	Mar. 4, 1938	14.3	26,200
	13	7.14	2,300
1939	Mar. 23, 1939	6.45	1,260
	Apr. 4	6.62	1,500
1940	Aug. 15, 1940	6.85	1,840
1941	Oct. 7, 1940	6.12	852
	Dec. 13	5.83	558
	19	5.82	549
	Feb. 13, 1941	5.81	540
	17	6.57	1,380
	22	6.87	1,800
	Mar. 3	6.33	1,090
	15	7.73	3,300
	Apr. 2	6.30	1,050
	13	6.31	1,060
	18	6.34	1,100
	27	6.95	1,920
	May 5	6.96	1,930
1942	Apr. 6, 1942	6.97	1,940
1943	Mar. 7, 1943	6.35	1,130
	11	6.64	1,500
	30	5.88	606
1944	Mar. 27, 1944	5.84	506
	Apr. 8	6.71	1,500
	17	6.42	1,120
	28	6.28	948
	May 4	6.44	1,140
	12	6.21	871
1945	Apr. 3, 1945	5.80	530
	10	6.42	1,180
	22	7.14	2,230
1946	Apr. 9, 1946	6.03	756
	July 22	5.81	540
	Sept. 20	6.34	1,100
1947	Nov. 16, 1946	6.01	736
	25	6.83	1,740
	Dec. 29	5.87	596
	Aug. 13, 1947	6.34	1,100
	Sept. 19	5.99	715

Little Colorado River Basin

(15) Clear Creek near Winslow, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1948	Apr. 1, 1948	5.94	645	1951	May 6, 1951	5.96	647
	13	6.90	1,810		Aug. 30	9.95	8,530
1949	Dec. 29, 1948	6.02	705	1952	Dec. 31, 1951	9.57	7,940
	Mar. 9, 1949	–	[b] 710		Jan. 19, 1952	13.4	22,500
	21	6.52	1,270		Apr. 8	7.14	2,580
	30	–	[b] 550		21	7.38	3,030
	Apr. 16	7.00	1,970		May 5	6.05	980
1950	Mar. 1, 1950	6.30	1,000	1953	Mar. 27, 1953	5.80	524
	July 7	5.95	638		Aug. 27	6.03	695

[a] From floodmark.
[b] Estimated.
[c] Annual peak.
[g] Annual peak for 1934 or 1935 water year occurred between Feb. 6, 1934, and Sept. 24, 1935.

(16) Little Colorado River at Grand Falls, Ariz.

Location.--Lat 35°26', long. 111°12', in T. 24 N., R. 11 E., unsurveyed, 1,000 ft downstream from Grand Falls on Navajo Indian Reservation, 4½ miles upstream from Dinnebito Wash, 30 miles northeast of Flagstaff, and 96 miles upstream from mouth.

Drainage area.--21,200 sq mi approximately.

Gage.--Recording gage since Jan. 5, 1926. Altitude of gage is 4,440 ft (from river-profile map). October 1925 to Jan. 5, 1926, staff gage at same site and datum.

Stage-discharge relation.--Defined by current-meter measurements.

Historical data.--The flood of Sept. 19, 1923, discharge about 120,000 cfs (gage height, 47.0 ft, from floodmarks), was believed to be the largest since 1870 by the Corps of Engineers.

Remarks.--Flood records slightly affected by diversions and storage above station. Combined capacity of all reservoirs above station about 73,000 acre-ft in 1953, not including Lone Pine Reservoir and Lake Mary. Base for partial-duration series, 4,000 cfs.

Little Colorado River Basin

(16) Little Colorado River at Grand Falls, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1923	Sept. 19, 1923	[a] 47.0	[b] 120,000
1926	Apr. 8, 1926	14.0	8,040
	Sept. 12	14.88	9,630
	27	22.5	27,800
1927	Feb. 18, 1927	14.83	9,540
	June 28	22.9	28,800
	Sept. 6	13.36	6,950
	12	16.67	13,200
	18	14.6	9,120
1928	Feb. 7, 1928	9.50	2,140
1929	Nov. 2, 1928	11.6	4,640
	Apr. 5, 1929	30.0	50,500
	July 23	14.9	9,920
	27	21.5	25,200
	29	21.1	24,100
	31	14.95	10,000
	Aug. 5	11.65	4,760
	9	11.95	5,180
	13	16.05	12,200
	Sept. 6	12.84	6,490
	24	18.0	16,500
1930	July 13, 1930	14.35	8,670
	19	16.9	13,700
	Aug. 8	12.85	6,110
	11	14.24	8,470
1931	Aug. 1, 1931	13.0	6,530
	7	12.71	6,070
1932	Oct. 4, 1931	11.78	4,510
	Nov. 12	13.35	6,920
	Feb. 10, 1932	23.8	31,000
	Mar. 3	12.22	5,160
	21	11.60	4,340
	Aug. 30	12.22	5,160
1933	July 26, 1933	12.63	5,760
	Sept. 12	13.69	7,500
1934	Oct. 7, 1933	12.05	4,920
	Aug. 29, 1934	11.9	4,720
1935	Apr. 10, 1935	13.6	7,350
	Aug. 5	12.70	5,870
	25	12.45	5,500
1936	Aug. 6, 1936	12.37	5,430
1937	Feb. 9, 1937	20.25	21,800
	16	14.17	8,580
	Mar. 18	14.24	8,400
1938	Mar. 5, 1938	26.1	38,000
	14	11.94	4,780
	Aug. 9	11.61	4,390
1939	Apr. 5, 1939	13.21	6,680
1940	July 27, 1940	19.57	20,100
	Aug. 15	13.59	7,350
	24	11.77	4,650
	26	11.96	4,910
	Sept. 14	11.60	4,390
	19	11.65	4,390
	22	13.42	7,010
1941	Oct. 1, 1940	11.59	4,390
	Dec. 26	12.58	5,750
	31	12.66	5,900
	Jan. 12, 1941	17.07	14,200
	Feb. 22	12.40	5,460
	Mar. 15	18.30	17,000
	Apr. 27	12.69	5,900
	May 6	11.28	4,020
	25	11.95	4,910
	Aug. 11	11.72	4,520
	16	12.67	5,650
	Sept. 30	18.0	16,000
1942	Oct. 4, 1941	14.55	8,760
	14	14.2	8,050
1943	Sept. 28, 1943	11.23	3,900
1944	Sept. 29, 1944	12.32	5,320
1945	Aug. 12, 1945	11.80	4,650
1946	July 22, 1946	11.3	4,020
	Aug. 13	11.61	4,390
	Sept. 19	16.5	12,900
1947	Aug. 11, 1947	11.32	4,020
	14	11.5	4,260
	24	15.45	10,600
	27	11.68	4,520
	31	13.24	6,680
1948	Oct. 16, 1947	16.27	12,400
	Aug. 6, 1948	12.42	5,460
1949	Aug. 9, 1949	15.3	10,400
1950	July 18, 1950		[b] 3,500
1951	Aug. 30, 1951	15.2	10,200
1952	Jan. 1, 1952	14.71	9,300
	20	21.9	26,100
	Apr. 9	11.35	4,140
1953	July 31, 1953	11.45	4,140

[a] From floodmarks.
[b] Estimated.

Little Colorado River Basin

(17) Moenkopi Wash near Tuba, Ariz.*

Location. --Lat 36°02', long. 111°24', in T. 31 N., R. 9 E., unsurveyed, on Navajo Indian Reservation, at bridge on U. S. Highway 89, 9 miles upstream from mouth, 11 miles north of Cameron, and 11 miles southwest of Tuba.

Drainage area. --2,440 sq mi, approximately, at present site; 2,220 sq mi, approximately, at site used prior to June 23, 1941.

Gage. --Recording gage at present site and datum since June 23, 1941. Datum of gage is 4,310.96 ft above mean sea level (from Arizona Highway Department benchmark). July 13, 1926, to Aug. 17, 1929, staff gages at site 8 miles upstream at different datum. Aug. 18, 1929, to June 22, 1941, recording gage at site of staff gages at datum 0.96 ft higher.

Stage-discharge relation. --Defined by current-meter measurements below 5,000 cfs; extended above by several slope-area determinations. Relation subject to large shifts.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 1,400 cfs.

*Published as "near Tuba City" prior to 1933.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1926	Sept. 26, 1926	19.0	[c] 5,260
1927	Sept. 17, 1927	24.0	[d] 12,900
1928	Aug. 26, 1928	9.0	[e] 3,800
1929	July 18, 1929	7.0	2,800
	26	8.6	4,520
	30	6.1	2,040
	Aug. 4	15.4	15,100
	Sept. 4	12.7	10,300
	21	9.3	5,390
1930	July 11, 1930	7.74	3,540
	12	10.0	6,300
	13	13.6	11,800
	19	8.4	4,280
	Aug. 1	7.9	3,700
	4	12.2	9,520
	8	14.9	14,100
	10	14.5	13,400
	Sept. 8	5.95	1,920
1931	Sept. 15, 1931	6.95	2,760
1932	Aug. 28, 1932	9.22	5,300
1933	July 7, 1933	8.48	4,380
	9	8.10	3,920
	Aug. 20	6.06	2,010
1934	Oct. 3, 1933	8.5	4,400
	5	5.26	1,410
	9	5.28	1,430
	11	7.18	2,980
	Aug. 8, 1934	5.7	1,740
	28	12.85	14,500
1935	Aug. 25, 1935	4.96	2,160
	Sept. 1	5.08	2,320
1936	Aug. 1, 1936	4.49	1,690
	4	8.5	7,230
	6		[b] 2,500
	30	8.9	7,940
	Sept. 2	10.5	11,000
	13	4.72	1,890
	22	6.42	3,960
1937	July 9, 1937	6.5	4,100
	12	5.42	2,660
	28	5.8	3,150
	Sept. 2	9.0	8,120
	30	8.4	7,060
1938	Aug. 9, 1938	4.47	1,640
	31	6.0	3,410
	Sept. 4	7.3	5,270
1939	Sept. 11, 1939	8.30	6,890
1940	Aug. 22, 1940	4.68	1,890
	24	5.62	2,900
	Sept. 14	6.74	4,380
	17	5.34	2,600
	23	7.74	5,740
	28	6.27	3,820
	30	8.7	7,580
1941	Oct. 5, 1940	7.05	4,820
	Aug. 16, 1941	6.79	5,240
	Sept. 13	4.38	2,220
	18	6.22	4,420
1942	Oct. 3, 1941	7.26	5,800
	13	8.0	7,000
1943	Dec. 25, 1942	4.44	2,370
	July 31, 1943	4.67	2,500
	Aug. 10	3.84	1,700
	17	8.1	7,150

Little Colorado River Basin

(17) Moenkopi Wash near Tuba, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1944	Sept. 27, 1944	3.11	964	1949	Aug. 9, 1949	4.78	2,210
1945	July 23, 1945	7.18	5,640	1950	Oct. 19, 1949	5.55	2,480
	31	7.20	5,640		July 25, 1950	6.0	2,890
	Aug. 1	7.60	6,290		Aug. 5	4.6	1,500
	8	3.99	1,700		Sept. 20	5.0	1,500
	12	4.70	2,370				
	18	4.40	2,070	1951	Sept. 30, 1951	8.5	5,000
1946	Dec. 23, 1945	4.10	1,790	1952	Oct. 1, 1951	4.79	1,430
	July 20, 1946	4.10	1,790		Aug. 28, 1952	7.4	3,530
	Aug. 12	6.03	3,910		Sept. 21	12.3	10,000
	28	4.53	2,220				
				1953	July 18, 1953	8.30	3,550
1947	Aug. 14, 1947	4.11	1,790		30	9.35	5,700
	17	5.15	2,860		Aug. 28	6.15	2,250
	21	4.55	2,220				
1948	Oct. 13, 1947	8.0	6,980				
	June 2, 1948	3.82	1,520				
	July 25	3.68	1,440				
	Aug. 5	4.45	2,120				

[b] Estimated.
[c] Annual peak.

(18) Little Colorado River near Cameron, Ariz.

Location. --Lat 35°56', long. 111°34', unsurveyed, on Navajo Indian Reservation, 3 miles downstream from Coconino dam site, 9½ miles downstream from Moenkopi Wash, 9½ miles northwest of Cameron, and 45.5 miles upstream from mouth.

Drainage area. --26,500 sq mi, approximately.

Gage. --Recording gage since June 1947. Altitude of gage is 3,990 ft (from river-profile map).

Stage-discharge relation. --Defined by current-meter measurements below 17,000 cfs and extended above. Relation stable.

Remarks. --Flood records unaffected by diversions and storage above station. Base for partial-duration series, 4,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1947	Aug. 9, 1947	19.60	21,900	1951	July 29, 1951	8.7	4,100
					Aug. 30	14.0	11,700
1948	Oct. 14, 1947	17.9	18,600		Sept. 30	8.96	4,460
	16	14.5	12,600				
	Aug. 6, 1948	9.93	5,580	1952	Jan. 2, 1952	12.45	9,140
					21	20.7	24,900
1949	Aug. 9, 1949	14.35	12,400		Apr. 9	8.62	4,100
					Sept. 21	18.7	20,100
1950	July 18, 1950	8.93	4,340				
				1953	July 30, 1953	10.3	6,230

Colorado River Main Stem

(19) Colorado River near Grand Canyon, Ariz.*

Location. --Lat 36°05'55", long.112°05'30", a quarter of a mile upstream from Bright Angel Creek, 11 miles by trail northeast of Grand Canyon, Coconino County, 26 miles downstream from Little Colorado River, and 267 miles upstream from Hoover Dam.

Drainage area. --137,800 sq mi, approximately.

Gage. --Recording gage since Dec. 9, 1922; supplemented by recording gage 400 ft upstream used for records at lower stages, since Oct. 1, 1934. Datum of both gages is 2,418.7 ft above mean sea level, preliminary datum of 1929. Staff gage at same site and datum Nov. 12 to Dec. 9, 1922. Relation subject to minor shifting.

Stage-discharge relation. --Defined by current-meter measurements below 120,000 cfs; extended above by logarithmic plotting.

Historical data. --Flood of about July 8, 1884, gage height unknown, was estimated as 300,000 cfs on basis of flood studies at Lees Ferry.

Remarks. --Flood record slightly affected by transmountain diversions, irrigation diversions, storage reservoirs, and return flow from irrigated areas. Base for partial-duration series, 35,000 cfs.

* Published as "at Bright Angel Creek, near Grand Canyon", prior to 1944.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1884	July 8, 1884	-	[b] 300,000
1921	June 19, 1921	[a] 37.5	[c] 220,000
1922	June 1, 1922	-	[b e] 115,000
1923	May 15, 1923	22.47	73,600
	31	26.45	98,600
	Aug. 15	15.5	36,800
	Sept. 19	28.5	112,000
1924	Nov. 12, 1923	16.3	41,400
	Dec. 28	19.37	57,000
	Apr. 18, 1924	17.42	46,900
	27	15.65	38,400
	May 23	21.0	66,200
	June 18	22.4	74,000
1925	June 3, 1925	18.75	53,700
	25	18.42	52,000
	Sept. 5	15.44	38,600
1926	Oct. 7, 1925	15.20	37,800
	May 9, 1926	22.17	74,000
	29	24.27	85,600
	July 14	15.80	38,800
	Sept. 27	16.07	40,100
1927	May 8, 1927	20.8	65,200
	23	24.5	92,900
	June 22	22.23	73,400
	July 2	29.25	127,000
	Sept. 11	21.20	67,200
	15	28.9	124,000
1928	May 14, 1928	24.4	88,900
	June 3	27.85	115,000
1929	Mar. 14, 1929	15.65	37,600
	Apr. 6	21.1	64,900
	23	16.92	43,700
	May 29	27.5	111,000
	June 13,	25.9	98,800
	July 30	21.0	64,300
	Aug. 7	21.8	69,100
	13	21.9	69,800
	Sept. 10	17.15	45,400
	24	19.7	57,300
1930	Apr. 18, 1930	16.08	41,700
	29	16.94	45,800
	June 4	21.6	71,000
	16	20.35	63,200
	Aug. 12	19.9	60,500
1931	May 22, 1931	14.36	34,600
1932	Feb. 11, 1932	18.30	53,800
	Apr. 23	15.82	41,200
	May 26	26.1	102,000
	June 29	22.1	72,900
	July 14	16.70	42,400
	Aug. 30	19.07	54,900
1933	June 5, 1933	23.41	81,500
	July 9	15.26	35,400
1934	May 17, 1934	12.32	25,500
1935	June 19, 1935	26.82	105,000
1936	May 9, 1936	21.55	68,300
	24	22.64	76,300
	Aug. 7	16.03	36,400

Colorado River Main Stem

(19) Colorado River near Grand Canyon, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1937	Apr. 20, 1937	17.46	46,200
	May 21	23.90	85,300
	June 3	21.08	66,300
1938	Mar. 5, 1938	19.85	54,500
	May 4	22.20	70,900
	22	22.12	72,100
	June 8	26.38	100,000
1939	May 10, 1939	17.75	46,200
	26	18.07	49,000
	June 9	16.78	41,900
1940	May 18, 1940	17.66	46,800
	June 6	16.60	42,200
1941	May 17, 1941	28.86	120,000
	June 23	22.98	76,600
1942	Oct. 16, 1941	24.75	88,700
	28	16.55	42,000
	Apr. 9, 1942	19.25	53,800
	18	21.65	67,600
	26	21.9	69,800
	May 15	20.90	63,700
	31	25.18	91,800
1943	May 8, 1943	20.70	58,500
	June 6	21.39	66,800
1944	May 20, 1944	25.1	93,400
1945	May 17, 1945	21.40	63,300
	31	19.25	52,900
	June 11	19.65	54,900
	18	19.5	54,100
1946	May 3, 1946	16.30	39,400
	June 14	18.65	50,100
1947	May 14, 1947	23.10	80,100
	June 13	21.50	65,700
	25	22.1	69,400
	Aug. 19	15.7	36,600
	25	20.22	58,600
1948	Oct. 15, 1947	18.7	49,300
	Apr. 25, 1948	19.00	54,500
	May 11	18.00	48,600
	26	24.90	89,800
1949	May 3, 1949	18.55	50,800
	June 22	27.95	112,000
1950	Apr. 28, 1950	15.92	37,000
	June 6	20.55	58,400
	July 10	16.40	40,500
1951	June 1, 1951	21.00	63,700
	25	20.05	59,000
1952	Jan. 21, 1952	16.75	40,100
	May 9	27.7	110,000
	June 12	29.05	122,000
1953	June 17, 1953	21.80	68,500

[a] From floodmarks.
[b] Estimated on basis of flood record for station at Lees Ferry.
[c] Annual peak.

Bright Angel Creek Basin

(20) Bright Angel Creek near Grand Canyon, Ariz.

Location. --Lat 36°05'55", long. 112°05'40", 1,000 ft upstream from mouth, and 11 miles by trail from Grand Canyon, Coconino County.

Drainage area. --98.4 sq mi.

Gage. --Recording gage at present site and datum since Apr. 22, 1943. Datum of gage is 2,452.1 ft above mean sea level, preliminary datum of 1929. October 20, 1923, to Jan. 29, 1933, staff gages 200 ft upstream at several different datums. January 30, 1933, to Aug. 19, 1936, recording gage 200 ft upstream at datum 4.5 ft higher. August 25, 1936, to Apr. 21, 1943, staff gages at several sites from 300 ft downstream to 2,200 ft upstream at different datums.

Stage-discharge relation. --Defined by current-meter measurements below 250 cfs; extended above on basis of slope-area determination. Relation subject to shifting.

Remarks. --Flood record not affected by small irrigation diversions above gage. Base for partial-duration series, 130 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1924	July 3, 1924	2.6	220
	Sept. 10	4.7	530
1925	Sept. 17, 1925	1.85	122
1926	Apr. 8, 1926	2.50	228
	29	2.75	266
	May 5	2.9	290
	July 27	6.5	1,000
1927	Feb. 16, 1927	3.6	450
	27	2.5	217
	Apr. 29	2.84	421
	May 16	2.20	175
	Aug. 4	2.4	208
	Sept. 16	6.0	1,000
1928	Mar. 28, 1928	1.50	150
	May 3	1.75	187
1929	May 6, 1929	1.5	135
	July 10	1.7	173
	Sept. 8	1.65	154
1930	Feb. 23, 1930	1.25	113
1931	June 25, 1931	.70	45
1932	Feb. 9, 1932	3.5	500
	Apr. 19	3.15	352
	May 13	3.30	386
1933	Aug. 7, 1933	4.26	186
	17	4.25	184
1934	Oct. 9, 1933	4.95	250
1935	Apr. 23, 1935	4.81	241
	May 11	4.80	241
	26	4.39	175
	July 13	4.20	148
	20	4.95	270
1936	Apr. 25, 1936	4.49	241
	July 19	6.00	633
	26	5.85	574
	Aug. 19	15.0	4,400
	Sept. 9	4.95	320
	21	5.3	391
1937	Feb. 6, 1937	2.95	179
	14	4.3	915
	Apr. 27	3.35	366
	May 4	3.5	442
	July 8	2.95	473
	29	4.4	2,000
	Sept. 30	3.6	1,000
1938	Dec. 12, 1937	2.0	206
	Feb. 28, 1938	2.05	211
	Mar. 3	3.00	491
	12	1.95	160
	Apr. 21	3.20	575
	May 16	2.4	273
	July 25	1.90	140
	Sept. 3	1.90	140
1939	Apr. 14, 1939	1.82	133
	Sept. 6	2.4	270
	13	1.90	150
1940	Feb. 26, 1940	2.0	168
	Apr. 15	2.20	228
	22	2.25	233
	Aug. 21	1.86	137
	24	3.30	602
	Sept. 12	2.90	416
	17	2.60	314
1941	Oct. 5, 1940	2.8	397
	Dec. 24	2.65	352
	Feb. 21, 1941	2.57	400
	May 13	4.10	848
	25	3.80	496

Bright Angel Creek Basin

(20) Bright Angel Creek near Grand Canyon, Ariz--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1942	Apr. 16, 1942	2.90	178	1948	Aug. 5, 1948	6.8	1,900
	23	3.20	264		Sept. 16	3.05	242
1943	Apr. 23, 1943	1.99	426	1949	Apr. 28, 1949	2.71	206
	Aug. 4	1.44	141		June 11	3.00	152
	15	1.90	340				
				1950	Oct. 18, 1949	3.20	197
1944	May 15, 1944	2.00	199		Apr. 23, 1950	2.90	146
					July 18	3.1	188
1945	May 3, 1945	2.27	259				
	July 30	2.27	297	1951	Aug. 29, 1951	3.30	193
	Aug. 11	1.60	133				
				1952	Oct. 31, 1951	3.20	173
1946	Apr. 7, 1946	1.70	133		Dec. 30	3.60	349
	24	1.81	159		May 5, 1952	3.57	672
	July 19	1.82	172		July 29	2.51	257
	22	4.50	840		Sept. 21	2.35	194
	Aug. 14	2.22	207				
	Sept. 30	2.55	178	1953	Aug. 27, 1953	4.14	930
1947	Aug. 8, 1947	3.06	290				
	11	2.70	200				
	27	3.10	310				

Note.--Peaks for period prior to Jan. 29, 1933, and Aug. 19, 1936, to Apr. 23, 1943, were obtained from a staff-gage record and were either from floodmarks or were maximum peaks observed.

Virgin River Basin

(21) Virgin River at Littlefield, Ariz.

Location. --Lat 36°53', long. 113°56', in SW¼SW¼ sec. 4, T. 40 N., R. 15 W., three-eighths of a mile downstream from Beaverdam Wash, three-eighths of a mile upstream from Littlefield, and 36 miles upstream from water line of Lake Mead at elevation 1,221 ft above mean sea level.

Drainage area. --5,090 sq mi, approximately.

Gage. --Recording gage at present site and datum since Apr. 1, 1942. Datum of gage is 1,763.68 ft above mean sea level, datum of 1929. October 8, 1929, to May 27, 1933, staff gage 300 ft upstream at datum 2.53 ft higher. May 28, 1933, to Mar. 31, 1942, staff gage at present site at datum 2.53 ft higher prior to Nov. 8, 1939, and 2.00 ft higher Nov. 8, 1939, to Mar. 31, 1942.

Stage-discharge relation. --Defined by current-meter measurements below 2,500 cfs; extended above on basis of slope-area determination at 22,000 cfs. Relation subject to shifting.

Remarks. --Flood record not materially affected by irrigation diversions above station. Base for partial-duration series, 1,600 cfs.

Bank-full stage. --18 ft.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1930	Aug. 9, 1930	8.65	[c] 6,500
1931	Nov. 18, 1931	6.50	[c] 3,000
1932	Aug. 27, 1932	[a] 11	[c] 18,000
1933	May 1, 1933	-	[b c] 1,500
1934	Dec. 14, 1933	4.20	[c] 1,220
1935	Aug. 16, 1935	5.00	[c] 1,900
1936	July 10, 1936	7.0	[c] 2,710
1937	Feb. 7, 1937	5.00	[c] 1,440
1938	Mar. 3, 1938	[a] 10.3	[c] 22,000
1939	Sept. 12, 1939	7.5	[c] 13,000
1940	Sept. 18, 1940	7.4	[c] 11,000
1941	Mar. 2, 1941	5.00	[c] 6,000
	July 25	5.00	[c] 6,000
1942	Oct. 13, 1941	6.30	3,740
	Apr. 14, 1942	4.84	1,630
	23	5.7	2,800
	Aug. 10	5.3	2,200
1943	Jan. 23, 1943	5.13	2,080
	Feb. 23	4.67	1,630
	Mar. 11	5.62	2,660
	Aug. 2	4.89	1,790
	17	4.77	1,650
1944	May 9, 1944	4.99	1,900
1945	Feb. 3, 1945	6.57	4,170
	Mar. 16	5.15	1,790
	Aug. 4	5.51	2,520
	12	6.08	3,410
	18	5.01	1,900
	Sept. 3	5.75	2,880
1946	Oct. 12, 1945	5.77	2,880
	Aug. 5, 1946	5.83	3,020
	12	6.95	5,010
1947	Oct. 2, 1946	7.25	4,300
	29	9.35	9,400
	Nov. 14	7.81	5,140
	24	8.33	6,640
	Dec. 28	6.69	2,790
	Aug. 10, 1947	7.28	3,950
	13	6.05	1,660
1948	Sept. 16, 1948	5.19	1,090
1949	Sept. 8, 1949	5.77	1,690
	10	6.35	2,290
1950	July 8, 1950	6.38	2,470
	18	7.34	3,450
	Sept. 8	5.99	1,700
1951	Aug. 4, 1951	10.53	12,000
	30	8.05	4,260
1952	Dec. 30, 1951	8.70	7,170
	Apr. 8, 1952	6.14	2,400
	28	7.40	3,840
	May 4	7.26	3,060
	June 4	6.00	2,280
1953	July 26, 1953	5.46	1,700
	31	5.71	1,950
	Aug. 2	7.74	4,500
	27	8.66	5,490

[a] From floodmarks.
[b] Estimated.
[c] Annual peak.

Virgin River Basin

(22) Muddy River near Overton, Nev.*

Location. --Lat 36°38', long. 114°30', in NW¼NE¼ sec. 21, T. 15 S., R. 67 E., at Wells Siding diversion dam, 2 miles northwest of Logandale, 5 miles downstream from Meadow Valley Wash, 6½ miles northwest of Overton, and 7½ miles southeast of Moapa.

Drainage area. --About 8,180 sq mi, of which about 4,230 sq mi contribute directly to surface runoff, for site near Overton, 1948-50. About 200 sq mi greater for sites near St. Thomas, 1913-16 (now submerged by Lake Mead).

Gage. --Recording gage at present site since Dec. 13, 1947. Datum of gage is 1,432.16 ft above mean sea level, datum of 1929 (Bureau of Reclamation bench mark). June 1913 to September 1916, staff gages at two separate sites 14½ and 15 miles downstream at different datums. Altitude of gage is 1,100 ft (from river profile map).

Stage-discharge relation. --Crest of diversion dam forms control at present site. Relation defined by current-meter measurements below 400 cfs and extended above. Water may also be bypassed downstream through a 4-ft pipe below crest elevation. Relation subject to shifting resulting from operational changes of crest conditions. Relation at former site defined by current-meter measurements below 300 cfs and extended above on basis of slope-area determination at 6,500 cfs. Relation subject to shifting.

Historical data. --Studies by the Corps of Engineers indicate the flood of Aug. 11, 1941, to be the highest since 1906.

Remarks. --Flood records in medium and low range affected to an unknown degree by diversions above station. Records at present site show discharge below Wells Siding dam and do not include diversions at this point which may total about 200 cfs. Large floods are probably not significantly affected. Gage heights are not listed because of complex stage-discharge relation. Only annual peaks are shown. Discharges 1906, 1910, 1922, 1925, 1938, 1941, 1947, and 1948 estimated by Corps of Engineers, U. S. Army, Nevada State Engineers office, U. S. Soil Conservation Service, U. S. Bureau of Reclamation, and/or U. S. Office of Indian Affairs.

* Published as "near St. Thomas", 1913-16.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1906	Mar. 25, 1906	-	8,850	1941	Aug. 11, 1941	-	12,000
1910	Jan. 1, 1910	-	7,000	1947	Oct. 28-30, 1946	-	7,800
1914	Feb. 22, 1914	-	6,500	1948	Feb. 29, 1948	-	h111
1915	Feb. 11, 1915	-	820	1949	Feb. 5, 9-11, 1949	-	36
1916	Jan. 20, 1916	-	1,700	1950	Dec. 26, 27, 1949	-	30
1922	Jan. 2, 1922	-	8,110	1951	Apr. 19, 1951	-	360
1925	Sept. 18, 1925	-	10,200	1952	Mar. 28, 1952	-	562
1938	Mar. 3, 1938	-	10,000	1953	Jan. 19, 1953	-	37

h Probably annual maximum, peaks October to Dec. 12, 1947 not known.

Colorado River Main Stem

(23) Colorado River near Topock, Ariz.

Location. --Lat 34°41'15", long. 114°27'45", in SW¼NW¼ sec. 13, T. 15 N., R. 21 W., Gila and Salt River meridian, 2.7 miles downstream from Topock, 39.5 miles upstream from Parker Dam, and 49 miles downstream from Davis Dam.

Drainage area. --172,300 sq mi, approximately.

Gage. --Recording gage at present site since Dec. 3, 1922. Datum of gage is 423.02 ft above mean sea level, datum of 1929. Prior to Dec. 3, 1922, at site about 1 mile upstream at different datum. Since May 1, 1939, auxiliary recording gage at bridge at Topock 2.7 miles upstream at datum 13.33 ft higher.

Stage-discharge relation. --Defined by current-meter measurements. Relation subject to large shifts.

Historical data. --A discharge of about 300,000 cfs (based on determination for station at Lees Ferry) occurred about July 10, 1884. Discharge in excess of 400,000 cfs (estimated) probably occurred within the period 1857-68 and most likely in 1862. Gage heights listed for these floods are elevations above sea level, Atlantic and Pacific Railroad datum.

Remarks. --Flood records prior to Feb. 1, 1935, not appreciably affected by storage and diversions above station. Discharge controlled by Hoover Dam since Feb. 1, 1935, and by Davis Dam since Jan. 17, 1950. Base for partial-duration series, 40,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1862	-	500.5	[b]400,000
1884	July 10, 1884	492.0	[b]300,000
1917	June 1917	27	156,000
1918	Mar. 14, 1918	11.9	45,500
	May 16	13.1	53,500
	30	13.65	57,000
	June 30	15.55	94,000
	July 17	8.8	56,000
1919	May 12, 1919	11.75	45,000
	June 5	14.65	78,500
	July 21	10.8	42,100
1920	Feb. 26, 1920	16.3	61,000
	June 1	26.1	156,000
	July 6	-	[b]57,000
1921	May 12, 1921	15.5	80,800
	June 22	28.4	[b]200,000
	Aug. 5	10.75	62,300
	27	14.2	68,000
1922	Mar. 22, 1922	11.36	41,700
	May 13	18.0	87,800
	June 3	20.95	125,000
1923	May 17, 1923	16.9	74,200
	June 3	18.6	103,000
	22	16.45	97,400
	Sept. 22	18.3	85,300
1924	Dec. 31, 1923	13.7	51,100
	Apr. 16, 1924	13.98	50,700
	30	11.91	40,300
	May 25	15.35	66,000
	June 20	15.85	71,000
1925	June 6, 1925	14.70	51,200
	28	13.86	48,500
1926	May 12, 1926	18.15	68,600
	June 1	19.80	84,800
1927	May 13, 1927	16.88	64,300
	25	19.54	87,900
	June 24	16.20	70,800
	July 5	22.2	107,000
	Sept. 17	21.63	107,000
1928	May 17, 1928	19.90	86,300
	June 7	22.73	112,000
1929	Apr. 8, 1929	17.62	48,100
	25	16.15	44,300
	June 1	21.9	101,000
	Aug. 10	15.98	60,600
	16	15.82	59,200
	Sept. 12	14.47	42,500
	27	16.00	48,600
1930	May 1, 1930	16.60	44,200
	June 6	19.74	65,100
	19	17.90	60,700
	Aug. 14	18.35	57,100
1931	May 24, 1931	15.82	32,000
1932	Feb. 13, 1932	19.40	49,200
	Apr. 26	16.95	41,200
	May 30	23.75	97,100
	July 2	18.22	66,300
	Sept. 2	15.26	45,500
1933	June 18, 1933	20.22	78,000
1934	May 20, 1934	14.76	25,600

Colorado River Main Stem

(23) Colorado River near Topock, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1935	June 24, 1935	14.83	18,600	1945	Mar. 24, 1945	27.56	[e] 22,300
1936	Aug. 2, 1936	13.90	11,500	1946	Feb. 2, 1946	27.38	[e] 20,700
1937	Aug. 24, 1937	14.28	11,300	1947	Feb. 1, 1947	27.56	[e] 18,700
1938	July 3, 1938	16.55	18,800	1948	Apr. 16, 1948	29.05	[e] 23,100
1939	Feb. 2, 1939	24.18	34,900	1949	Apr. 16, 1949	29.65	[e] 23,400
1940	Apr. 5, 1940	24.68	17,500	1950	Dec. 11, 1949	30.13	[e] 22,800
1941	June 16, 1941	24.31	[e] 34,500	1951	June 26, 1951	30.72	[e] 22,200
1942	Jan. 29, 1942	25.76	35,700	1952	June 5, 1952	21.70	26,900
1943	Oct. 10, 1942	22.14	[e] 22,200	1953	Oct. 1, 2, 1953	31.74	[e] 22,900
1944	Feb. 27, 1944	27.85	[e] 24,000				

[b] Estimated.
[e] Maximum daily discharge.
Note.--Annual peaks only listed for years 1862, 1884, 1917, and 1935-53.

Bill Williams River Basin

(24) Date Creek near Congress, Ariz.

Location.--Lat 34°12', long.113°08', in NW¼SE¼ sec. 13, T. 10 N., R. 9 W., 0.6 mile upstream from Sawyer dam site, 17 miles west of Congress, and 25 miles upstream from mouth.

Drainage area.--127 sq mi.

Gage.--Recording gage after Jan. 18, 1940. Staff gage at same site and datum October 1939 to Jan. 18, 1940.

Stage-discharge relation.--Defined by current-meter measurements below 182 cfs; extended above on basis of slope-area determination at gage height 5.75 ft. Relation subject to large shifts.

Remarks.--Flood record unaffected by small minor irrigation diversions above station. Base for partial-duration series, 50 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Sept. 3, 1940	3.50	25	1942	Dec. 11, 1941	3.75	13
1941	Feb. 25, 1941	4.48	427	1943	Jan. 24, 1943	3.98	51
	Mar. 2	4.42	388		Aug. 3	5.3	300
	5	4.06	148				
	14	5.75	1,400	1944	Feb. 24, 1944	5.26	280
	Apr. 13	5.11	878		Mar. 3	4.3	56
	July 18	4.69	568				

Bill Williams River Basin

(25) Santa Maria River near Alamo, Ariz.

Location. --Lat 34°18', long. 113°31', in NE¼SW¼ sec. 9, T. 11 N., R. 12 W., half a mile upstream from confluence with Big Sandy River and 5¼ miles upstream from Alamo.

Drainage area. --1,520 sq mi, approximately.

Gage. --Recording gage since December 1939. Datum of gage is 1,124.1 ft above mean sea level (from river-profile survey). Prior to Apr. 1, 1951, at site 800 ft upstream at datum 2.50 ft higher.

Stage-discharge relation. --Defined by current-meter measurements below 29,000 cfs; extended above. Relation subject to shifting.

Remarks. --Flood record unaffected by small diversions above gage. Base for partial-duration series, 200 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1939	Sept. 6, 1939	10.0	[c] 22,300	1945	Mar. 5, 1945	5.70	515
					16	6.14	1,220
1940	Feb. 3, 1940	3.31	256		26	6.30	1,530
	Sept. 17	3.20	262		Aug. 1	6.28	1,040
					23	6.10	680
1941	Oct. 5, 1940	4.25	2,500				
	Dec. 24	6.9	8,280	1946	Dec. 24, 1945	5.86	255
	31	4.25	3,120		July 24, 1946	6.52	1,170
	Jan. 12, 1941	3.62	262				
	25	4.65	1,890	1947	Dec. 28, 1946	5.86	234
	Feb. 8	3.91	304		Sept. 19, 1947	6.70	1,610
	21	4.40	1,730				
	24	5.70	4,440	1948	Aug. 5, 1948	6.67	1,520
	Mar. 1	7.75	11,700				
	6	4.98	2,400	1949	Jan. 14, 1949	5.80	610
	14	9.85	20,600		25	5.80	720
	Apr. 2	4.83	840		Feb. 25	6.36	1,100
	13	8.3	13,900				
	Sept. 13	7.73	11,600	1950	Oct. 18, 1949	7.09	1,570
					Sept. 6, 1950	5.65	388
1942	Jan. 14, 1942	4.86	91				
				1951	Aug. 2, 1951	7.85	1,180
1943	Jan. 24, 1943	5.15	319		29	12.95	33,600
	Mar. 5	5.38	497				
	Aug. 4	5.49	544	1952	Oct. 31, 1951	6.62	6,000
					Dec. 31	7.45	8,020
1944	Oct. 19, 1943	5.26	278		Jan. 18, 1952	7.03	6,710
	Feb. 24, 1944	7.05	6,000		Mar. 11	7.35	7,680
	Mar. 3	5.82	2,040		Apr. 29	4.88	522
	14	6.33	2,980		June 3	7.1	2,800
	17	6.06	1,880				
				1953	July 16, 1953	4.60	200
					Aug. 28	5.61	560

[c] Annual peak.

Bill Williams River Basin

(26) Bill Williams River near Alamo, Ariz.*

Location.--Lat 34°14', long. 113°35', in SW¼NW¼ sec. 2, T. 10 N., R. 13 W., 1.5 miles downstream from Alamo, 2.0 miles downstream from Bullard Wash, and 6 miles downstream from confluence of Santa Maria and Big Sandy Rivers.

Drainage area.--4,730 sq mi, approximately, of which about 400 sq mi is below confluence of Santa Maria and Big Sandy Rivers.

Gage.--Recording gage since December 1939. Datum of gage is 1,002.95 ft above mean sea level, datum of 1929.

Stage-discharge relation.--Defined by current-meter measurements. Subject to shifting.

Historical data.--Flood of Sept. 6, 1939, reached a stage of 39.6 ft, from floodmarks (discharge, 86,000 cfs, from rating curve extended above 50,000 cfs on basis of slope-area determination made just below confluence of Santa Maria and Big Sandy Rivers). Floodmarks indicate a previous stage of about 46 ft which probably occurred in February 1937.

Remarks.--Flood record unaffected by small irrigation diversions above station. Base for partial-duration series, 900 cfs.

*Published as Williams River prior to 1944.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
	Prior to 1939	[a,j] 46	-	1945	Mar. 5, 1945	7.01	1,080
					13	7.29	2,250
1939	Sept. 6, 1939	[a] 39.6	[c] 86,000		16	9.25	7,380
					26	7.98	4,340
1940	Feb. 3, 1940	6.75	2,700				
				1946	Dec. 24, 1945	6.75	930
1941	Oct. 5, 1940	6.1	1,340		July 25, 1946	6.28	972
	Dec. 18	5.86	1,010				
	25	17.85	32,900	1947	Dec. 28, 1946	9.22	7,290
	31	9.6	9,110		Aug. 8, 1947	7.02	2,110
	Jan. 12, 1941	6.95	1,000		Sept. 19	8.12	4,650
	25	8.35	5,330				
	Feb. 8	6.31	1,550	1948	Aug. 5, 1948	7.00	2,070
	21	9.5	8,790				
	25	11.2	14,100	1949	Jan. 14, 1949	6.40	1,190
	Mar. 2	22.5	44,800		26	6.45	1,280
	14	23.0	46,000		Feb. 25	7.35	2,900
	Apr. 13	17.8	32,800				
	July 18	7.98	4,290	1950	July 23, 1950	6.08	958
	Aug. 10	7.50	3,150		Sept. 6	6.80	1,850
	Sept. 13	11.46	13,500				
				1951	Aug. 3, 1951	6.48	1,340
1942	Jan. 14, 1942	6.28	407		29	30.8	65,100
1943	Mar. 5, 1943	7.20	2,480	1952	Oct. 30, 1951	7.00	4,510
					Dec. 31	19.65	37,600
1944	Feb. 24, 1944	10.65	11,000		Jan. 18, 1952	15.77	27,300
	Mar. 6	9.18	5,470		Mar. 11	11.20	14,300
	14	8.65	4,390		June 3	7.00	2,340
	17	9.10	6,780				
				1953	Aug. 28, 1953	5.35	193

[a] From floodmarks.
[c] Annual peak.
[j] Probably occurred February 1937.

Bill Williams River Basin

(27) Bill Williams River at Planet, Ariz.*

Location. --Lat 34°16', long. 113°59', in NE¼ sec. 36, T. 11 N., R. 17 W., 1 mile west of Planet and 6 miles upstream from water line of Havasu Lake at elevation 450 ft above mean sea level.

Drainage area. --5,140 sq mi, approximately.

Gage. --Recording gage since Nov. 13, 1928. Datum of gage is 556.33 ft above mean sea level, datum of 1929. Sept. 26, 1910 to Dec. 31, 1915, staff gages at same site and approximately same datum. October 1 to Nov. 12, 1928, staff gages at same site and datum.

Stage-discharge relation. --Defined by current-meter measurements below 51,000 cfs; extended above on basis of velocity-area study. Relation subject to large shifts.

Historical data. --Floods in 1891, 1916, and 1927 were estimated on basis of floodmarks at Striped Canyon, about 23 miles upstream.

Remarks. --Flood record not affected by small irrigation diversions above station. Base for partial-duration series, 1,500 cfs.

*Published as Bill Williams River near Swansea, 1910-12, as Williams River near Swansea, 1913-15, and as Williams River at Planet, 1928-43.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1891	*Feb. 21, 1891	-	b200,000	1938	Mar. 2, 1938	4.77	3,150
					4	10.7	61,000
1916	*Jan. 19, 1916	-	b175,000				
				1939	Sept. 7, 1939	11.7	73,000
1927	*Feb. 16, 1927	-	b125,000		13	8.10	23,200
					25	5.97	8,310
1929	Sept. 2, 1929	6.00	6,270				
	4	8.2	25,000	1940	Feb. 3, 1940	5.13	2,600
1930	Mar. 18, 1930	4.36	1,860	1941	Dec. 25, 1940	8.56	37,800
	Aug. 9	4.73	1,640		Jan. 1, 1941	5.67	6,840
	Sept. 8	11.15	64,000		25	5.70	4,560
					Feb. 8	5.19	2,100
1931	Feb. 14, 1931	4.9	5,620		21	6.75	10,100
	Aug. 5	12.3	80,000		25	7.43	21,800
	14	6.02	13,800		Mar. 2	9.15	42,600
	Sept. 3	4.25	2,520		6	5.69	5,340
					14	8.57	35,400
1932	Dec. 29, 1931	4.66	3,150		Apr. 14	7.97	26,400
	Feb. 9, 1932	9.2	51,000		Aug. 11	5.63	2,280
	18	6.87	15,100		Sept. 13	6.49	8,120
1933	Mar. 4, 1933	4.91	107	1942	Jan. 15, 1942	5.30	300
1934	Aug. 29, 1934	6.51	1,470	1943	Mar. 5, 1943	5.67	1,580
1935	Jan. 7, 1935	6.54	1,530	1944	Feb. 24, 1944	7.19	10,800
	13	6.75	1,950		Mar. 5	6.16	4,520
	16	7.50	4,030		17	6.23	4,780
	Feb. 7	8.92	15,900		Sept. 15	5.64	2,260
	13	7.11	6,930				
	Mar. 5	6.48	4,490	1945	Mar. 11, 1945	5.24	2,590
					16	6.08	4,520
1936	July 28, 1936	5.60	1,540		26	5.78	3,050
	30	6.11	2,270				
	Aug. 9	6.61	2,900	1946	July 22, 1946	4.75	328
1937	Feb. 7, 1937	13.1	92,500				
	15	8.2	27,500				
	Mar. 17	5.34	6,420				
	Sept. 21	4.91	2,150				

b Estimated.
* Date approximate.

Gila River Basin

(28) Gila River below Blue Creek, near Virden, N. Mex.*

Location. --Lat 32°38'55", long. 108°50'45", in SE¼SW¼ sec. 18, T. 19 S., R. 19 W., at head of canyon, 1¼ miles downstream from Blue Creek, 10 miles east of Virden, and 16 miles upstream from state line.

Drainage area. --3,203 sq mi, excluding Animas River basin. 3,272 sq mi at site 9 miles downstream.

Gage. --Recording gage at present site since July 8, 1931. Staff gages within a few feet and readings adjusted to same datum June 1 to July 7, 1931. Altitude of gage is 3,875 ft (from river-profile map). July 1927 to May 1931, *recording gage at Virden Bridge, 9 miles downstream from present site, altitude, 3,770 ft (from topographic map).*

Stage-discharge relation. --Defined by current-meter measurements below 38,000 cfs. Relation for site 9 miles downstream subject to considerable shifting but was defined by current-meter measurements below 4,400 cfs and extended above.

Remarks. --Flood records unaffected by diversions above station. *Base for partial-duration series, 1,900 cfs.*

*Published as "at Virden Bridge, near Duncan, Ariz.", prior to Aug. 1, 1931, and as "at Fuller's Ranch, near Duncan, Ariz.", 1931-38.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1927	July 4, 1927	5.9	1,800
1928	July 26, 1928	5.54	1,630
1929	July 30, 1929	8.85	5,700
	Aug. 10	7.14	3,480
	Sept. 23	5.73	1,970
1930	Oct. 12, 1929	6.37	2,490
	July 24, 1930	5.89	2,170
	27	6.52	2,780
	Aug. 6	6.6	3,090
	8	8.8	5,920
	11	9.43	7,400
1931	July 3, 1931	6.29	3,050
	Aug. 3	13.6	8,000
	10	8.91	3,320
	Sept. 6	9.16	3,570
1932	Feb. 11, 1932	8.46	2,880
	July 30	12.35	6,800
	Aug. 10	8.3	2,750
1933	Oct. 12, 1932	10.82	5,320
	Feb. 26, 1933	9.16	3,570
	June 21	7.45	1,950
	Aug. 29	9.4	3,810
	Sept. 8	11.1	5,650
1934	Apr. 15, 1934	11.0	5,540
	Aug. 21	8.60	3,020
	26	13.50	8,920
1935	Sept. 2, 1935	7.94	2,300
	27	13.3	8,600
1936	June 11, 1936	9.25	3,600
	Sept. 11	7.91	2,240
	21	8.15	2,500
1937	Feb. 8, 1937	9.55	3,820
	17	14.65	9,070
	Mar. 18	10.83	5,030
	Aug. 24	8.36	2,290
1938	July 20, 1938	8.5	2,530
	28	8.44	2,180
	Aug. 6	8.86	2,630
	31	12.28	6,400
1939	Sept. 16, 1939	7.71	1,630
1940	Oct. 7, 1939	15.75	10,000
	Feb. 2, 1940	10.55	4,580
	Sept. 6	15.88	11,000
1941	Dec. 25, 1940	8.18	2,140
	31	11.05	4,410
	Feb. 8, 1941	9.22	2,780
	Mar. 16	9.53	3,510
	Apr. 28	8.00	2,150
	July 20	9.33	3,260
	Aug. 21	8.66	2,780
	Sept. 1	8.58	2,620
	Sept. 29	25.78	41,700
1942	Oct. 4, 1941	7.30	2,260
	Aug. 22, 1942	7.60	2,530
	Sept. 13	8.18	3,140
1943	Sept. 27, 1943	6.87	1,600
1944	Aug. 8, 1944	7.52	2,140
	19	9.03	4,010
	Sept. 5	7.6	2,440
1945	Aug. 11, 1945	10.0	5,370
1946	Oct. 8, 1945	13.07	10,600
	Aug. 14, 1946	9.47	4,670
	Sept. 5	8.0	2,850

Gila River Basin

(28) Gila River below Blue Creek, near Virden, N. Mex. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1947	Aug. 22, 1947	8.46	3,400	1950	Sept. 24, 1950	8.05	2,190
1948	Aug. 12, 1948	8.10	2,240	1951	Aug. 28, 1951	4.40	440
1949	Dec. 28, 1948	13.09	6,040	1952	Jan. 15, 1952	9.54	3,490
	Jan. 14, 1949	17.43	15,600		19	12.06	6,100
	25	8.06	2,260		Sept. 23	10.73	4,260
	Mar. 8	12.55	6,230				
	July 11	8.4	2,460	1953	Aug. 21, 1953	9.55	3,330
	24	14.3	8,970				
	31	8.05	2,190				
	Sept. 15	9.48	3,260				

(29) Gila River near Clifton, Ariz.*

Location. --Lat 32°57'50", long. 109°18'15", in SW¼SW¼ sec. 30, T. 5 S., R. 30 E., 1,100 ft upstream from bridge on former U. S. Highway 666, 6 miles upstream from San Francisco River, and 7 miles south of Clifton.

Drainage area. --4,010 sq mi (revised). For site at Guthrie, 1910-18, drainage area was 3,967 sq mi (revised).

Gage. --Recording gage since Mar. 29, 1928. Datum of gage is 3,339.3 ft above mean sea level, datum of 1929, unadjusted. Staff gage, Nov. 6, 1910, to May 15, 1914, and recording gage, May 16, 1914, to July 11, 1918, at sites about 5½ miles upstream at Guthrie at different datums. March 1928 to June 1948, at site 1,100 ft downstream at datum 4.03 ft lower.

Stage-discharge relation. --Defined by current-meter measurements. Relation for site at Guthrie revised on basis of studies in 1941. Ratings at all sites subject to considerable shifting.

Historical data. --Studies by Corps of Engineers, U. S. Army, indicate that the flood of Sept. 29, 1941, was the greatest since 1891.

Remarks. --Flood records not materially affected by irrigation diversions above station. Base for partial-duration series, 2,500 cfs.

*Published as "at Guthrie", 1910-18.

Gila River Basin

(29) Gila River near Clifton, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1911	July 25, 1911	15.0	[c] 16,000
1912	Mar. 11, 1912	16.5	[c] 21,000
1913	Sept. 22, 1913	8.2	[c] 1,200
1914	Aug. 6, 1914	9.4	[c] 5,700
1915	Dec. 20, 1914	11.4	[c] 12,000
1916	Jan. 18, 1916	10.2	[c] 7,600
1917	Oct. 15, 1916	14.7	[c] 19,500
1928	July 31, 1928	9.40	2,870
1929	July 24, 1929	8.96	2,530
	27	11.08	5,600
	30	14.5	13,200
	Aug. 11	10.04	3,530
	13	9.43	3,030
	Sept. 23	11.5	6,500
1930	Oct. 13, 1929	9.12	2,670
	July 17, 1930	10.8	5,240
	19	10.27	4,510
	26	10.47	4,780
	Aug. 9	10.18	4,380
	11	11.5	6,300
1931	Aug. 3, 1931	9.74	4,080
	5	10.55	5,880
	10	10.33	5,760
	Sept. 4	10.95	6,900
	7	8.98	2,630
1932	July 9, 1932	11.15	4,500
	30	11.10	4,470
	Aug. 9	9.70	3,030
1933	Sept. 9, 1933	10.67	4,000
	11	9.17	2,550
	14	9.98	3,290
1934	[k] Aug. 26, 1934	[a] 16.0	[c] 17,000
1935	Aug. 31, 1935	10.22	[c] 3,100
1936	Aug. 28, 1936	10.95	4,300
1937	Feb. 18, 1937	12.72	7,450
	Mar. 18	9.81	3,550
	Aug. 6	9.28	2,850
	23	8.96	2,550
	Sept. 10	10.0	3,600
	22	10.16	3,820
1938	July 21, 1938	9.18	2,770
	Aug. 6	11.80	5,930
	Sept. 2	9.52	3,270
1939	July 22, 1939	9.52	3,100
	Aug. 5	13.45	8,670
	Sept. 16	11.16	4,680
1940	Oct. 8, 1939	12.05	6,300
	Feb. 3, 1940	9.55	3,300
	Sept. 6	9.32	2,920
1941	Jan. 1, 1941	10.05	3,750
	Mar. 17	9.21	3,000
	July 21	9.61	3,200
	Sept. 1	9.57	3,200
	29	20.12	28,200
1942	Aug. 6, 1942	8.82	3,280
	Sept. 12	8.68	3,130
1943	June 30, 1943	9.40	4,260
	July 25	8.41	2,830
	Aug. 10	10.52	6,230
	Sept. 27	10.82	6,770
1944	Aug. 19, 1944	8.38	2,610
1945	July 31, 1945	8.58	2,780
	Aug. 8	9.59	4,540
	11	9.48	4,360
1946	Oct. 9, 1945	10.26	5,800
	Aug. 9, 1946	8.87	3,200
	16	10.45	4,270
1948	Aug. 3, 1948	5.08	1,090
1949	Dec. 29, 1948	9.17	3,980
	Jan. 15, 1949	15.3	13,900
	Mar. 9	9.2	5,940
	July 24	6.2	2,990
	Sept. 14	9.6	6,660
1950	July 30, 1950	4.80	1,680
1951	Aug. 3, 1951	7.75	4,600
1952	Jan. 20, 1952	7.98	4,280
	Sept. 24	6.06	2,900
1953	July 30, 1953	7.38	3,700

[a] *From floodmark.*
[c] Annual peak.
[k] *Date approximate.*

Gila River Basin

(30) San Francisco River at Clifton, Ariz.

Location. --Lat 33°03'00", long. 109°17'45", in SW¼SE¼ sec. 30, T. 4 S., R. 30 E., at Railroad Boulevard Bridge at Clifton, 8½ miles upstream from mouth.

Drainage area. --2,766 sq mi.

Gage. --Recording gage. Since July 20, 1927, at datum 3,431.67 ft above mean sea level, datum of 1929. May 15, 1914, to Jan. 19, 1916, at site 60 ft upstream, and June 11, 1916, to July 12, 1918, 2,000 ft upstream, at different datums.

Stage-discharge relation. --Defined by current-meter measurements. Discharge for peak of Jan. 19, 1916, derived from slope-area determination computed in 1940 on basis of data compiled from 1916 records. Relation subject to moderate shifting.

Historical data. --Report by Frank H. Olmstead (Senate Document 436, dated 1919) lists flood of 1891 as second highest known (discharge not determined), that of Dec. 3, 1906 as greatest (discharge, 143,450 cfs), and that of Oct. 14, 1916, as third highest (discharge 107,870 cfs). Methods used in computation of these discharge figures are not known.

Remarks. --No significant regulation or diversion above station. Base for partial-duration series, 2,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1891	- 1891	-	[m]
1907	Dec. 3, 1906	-	[m] 143,450
1916	Jan. 19, 1916	[n] 16.8	[b] 90,000
1917	Oct. 14, 1916	19.7	[m] 107,870
1927	Aug. 9, 1927	7.1	2,090
	Sept. 12	9.4	4,060
1928	July 15, 1928	8.7	3,380
	26	7.74	2,600
	31	7.97	2,790
	Aug. 14	7.69	2,560
	28	7.67	2,930
1929	Aug. 2, 1929	7.55	2,450
	8	8.78	3,450
	11	7.80	2,650
	13	9.09	3,740
	Sept. 23	10.1	5,200
1930	Oct. 16, 1929	7.44	2,360
	July 18, 1930	8.05	2,860
	Aug. 8	7.61	2,500
	11	8.75	3,420
1931	Feb. 15, 1931	8.53	3,270
	July 4	7.97	2,830
	Aug. 9	8.24	3,030
	30	7.77	2,680
	Sept. 17	7.53	2,520
	19	8.09	2,910
	29	8.6	3,330
	30	8.58	3,310
1932	Feb. 10, 1932	12.0	10,000
	Mar. 1	8.47	3,220
	July 30	7.24	2,260
	Aug. 9	11.5	8,640
1933	Feb. 26, 1933	8.10	2,920
	July 23	9.1	3,800
	Sept. 9	7.92	2,550
	14	7.67	2,360
1934	Aug. 26, 1934	12.5	[c] 11,700
1935	Sept. 1, 1935	8.37	[c] 2,450
1936	Feb. 17, 1936	8.98	3,700
	July 25	6.95	2,050
	Sept. 11	8.30	3,080
1937	Feb. 8, 1937	12.7	12,400
	16	11.46	8,600
	Mar. 18	7.20	2,190
	Sept. 22	7.81	2,740
1938	Mar. 4, 1938	9.80	4,540
	June 29	8.70	3,480
1939	Apr. 6, 1939	5.81	1,230
1940	Oct. 8, 1939	8.66	3,480
	Feb. 2, 1940	8.23	2,920
	July 26	7.24	2,260
	Aug. 14	9.23	3,850
	Sept. 1	7.32	2,250
	6	11.6	8,700
1941	Dec. 13, 1940	7.28	2,250
	25	10.70	6,070
	31	11.55	8,700
	Jan. 28, 1941	9.75	4,670
	Feb. 8	8.25	2,970
	Mar. 15	11.17	7,600
	Apr. 27	8.49	3,210
	May 2	8.40	3,130
	Aug. 17	8.48	3,210
	Sept. 29	11.16	7,300

Gila River Basin

(30) San Francisco River at Clifton, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1942	Dec. 11, 1941	11.37	7,930	1950	July 27, 1950	5.55	825
1943	Mar. 5, 1943	6.40	1,580	1951	Aug. 29, 1951	5.31	735
1944	Sept. 26, 1944	9.15	3,800	1952	Jan. 14, 1952	12.00	11,300
					19	12.65	15,800
1945	Aug. 17, 1945	7.73	2,500				
	22	8.07	2,820	1953	July 15, 1953	7.50	2,510
					Aug. 1	7.27	2,290
1946	Sept. 5, 1946	6.15	1,380		18	9.85	6,090
1947	Aug. 23, 1947	10.56	5,860				
1948	June 1, 1948	10.3	5,850				
1949	Dec. 28, 1948	7.8	2,890				
	Jan. 13, 1949	15.4	24,100				
	24	9.6	3,940				
	Mar. 8	9.7	4,520				
	July 1	10.5	6,010				
	Aug. 8	10.1	4,680				

[b] Estimated.
[c] Annual peak.
[m] Senate Document No. 436 classes flood of 1891 as second highest known and is source of discharge figures shown for *Dec. 3, 1906, and Oct. 14, 1918, floods.*
[n] Gage height 17.0 feet, present datum.

(31) Willow Creek near Point of Pines, near Morenci, Ariz.

Location.--Lat 33°22'45", long 109°39'00", in NW¼ sec. 2, T. 1 S., R. 26 E., unsurveyed, in San Carlos Indian Reservation, at head of box canyon, 4 miles east of Point of Pines, 10 miles west of Double Circle Ranch, and 23 miles northwest of Morenci.

Drainage area.--102 sq mi.

Gage.--Recording gage and concrete control since Aug. 18, 1944. Altitude of gage is 5,804 ft (by barometer).

Stage-discharge relation.--Defined by current-meter measurements below 60 cfs; extended on basis of slope-area determinations at gage heights 7.96, 8.72, and 10.1 ft. Relation is stable.

Remarks.--Peak discharges have been reduced to natural flow by adjustment for flow (not greater than 20 cfs) pumped from Black River, consequently these figures may differ from those previously published. Base for partial-duration series, 60 cfs.

Gila River Basin

(31) Willow Creek near Point of Pines, near Morenci, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1945	Mar. 26, 1945	3.95	168	1950	July 1, 1950	2.86	23
	July 28	3.99	157				
	Aug. 3	3.45	84	1951	Aug. 1, 1951	3.72	119
					5	6.75	861
1946	July 10, 1946	7.96	1,370		27	3.46	91
	Sept. 11	3.67	110				
				1952	Oct. 25, 1951	5.18	395
1947	July 22, 1947	6.25	687		Dec. 31	6.86	919
	Aug. 12	6.90	917		Jan. 13, 1952	10.1	2,590
	22	4.92	333		18	8.72	1,770
	28	4.27	204		Mar. 6	3.46	102
	30	4.56	258		18	3.64	124
	Sept. 8	3.36	72				
				1953	July 8, 1953	5.04	365
1948	July 24, 1948	3.38	75				
	Aug. 20	5.25	410				
1949	Jan. 11, 1949	3.67	128				
	13	6.37	744				
	23	4.51	266				
	Feb. 24	3.12	64				
	July 24	4.53	270				

Gila River Basin

(32) Willow Creek near Double Circle Ranch, near Morenci, Ariz.

Location.--Lat 33°21'15", long. 109°31'30", in NE¼ sec. 13, T. 1 S., R. 27 E., unsurveyed, in San Carlos Indian Reservation 2¼ miles northwest of Double Circle Ranch, 2½ miles upstream from mouth, and 19 miles northwest of Morenci.

Drainage area.--149 sq mi.

Gage.--Recording gage since Aug. 26, 1944. Altitude of gage is 4,969 ft (by barometer).

Stage-discharge relation.--Defined by current-meter measurements below 70 cfs and extended by logarithmic plotting and slope-area measurements. Relation subject to large shifts.

Remarks.--Peak discharges have been reduced to natural flow by adjustment for flow (not greater than 20 cfs) pumped from Black River; consequently these figures differ in some instances from those previously published. Base for partial-duration series, 60 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1944	Sept. 11, 1944	[b] 4.4	209	1950	Dec. 11, 1949	3.56	24
	24	4.10	145				
	26	5.32	594	1951	Aug. 1, 1951	5.72	359
	28	5.90	[c] 1,100		5	7.1	1,350
					28	4.95	302
1945	Mar. 27, 1945	4.20	134				
	July 29	3.92	70	1952	Oct. 26, 1951	4.87	278
					Dec. 31	6.33	900
1946	July 10, 1946	6.03	1,220		Jan. 13, 1952	7.82	4,230
	Sept. 12	3.92	69		18	7.61	2,620
					Mar. 7	4.34	95
1947	July 22, 1947	5.37	612		19	4.74	159
	Aug. 8	5.09	438		31	4.12	61
	12	4.91	348		Aug. 15	6.12	674
	22	4.92	354		23	5.72	442
	30	4.42	171				
				1953	July 8, 1953	4.95	191
1948	Aug. 20, 1948	4.33	147				
1949	Jan. 13, 1949	6.49	2,010				
	23	4.94	315				
	July 10	4.87	178				
	13	4.87	176				
	19	6.60	563				
	24	5.95	425				

[b] Estimated.
[c] Annual peak; peaks prior to Aug. 26, 1944 not known.

Gila River Basin

(33) Eagle Creek near Double Circle Ranch, near Morenci, Ariz.

Location. --Lat 33°18'00", long. 109°29'30", in SE¼ sec 32, T. 1 S., R. 28 E., unsurveyed, 2 3/4 miles downstream from Willow Creek, 3¼ miles downstream from Double Circle Ranch, and 17 miles northwest of Morenci.

Drainage area. -377 sq mi.

Gage. --Recording gage since Aug. 26, 1944. Altitude of gage is 4,722 ft (from barometer). Prior to Jan. 13, 1952, at datum 2.01 ft higher.

Stage-discharge relation. --Defined by current-meter measurements below 270 cfs and extended above on basis of slope-area determinations at gage heights 6.81 and 8.51 ft, present datum. Relation subject to considerable shifting.

Remarks. --Peak discharges have been reduced to natural flow by adjustment for flow (not greater than 20 cfs) pumped from Black River; consequently these figures differ in some instances from those previously published. Base for partial-duration series, 150 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1944	Sept. 11, 1944	4.80	[c] 2,400	1950	July 28, 1950	3.68	863
	25	4.35	1,880		30	2.81	339
	26	3.07	741		Aug. 4	2.40	176
	28	3.70	1,240		Sept. 17	3.19	328
1945	Aug. 3, 1945	3.10	746	1951	July 22, 1951	3.00	227
	6	3.25	782		29	3.60	587
	31	3.15	717		Aug. 1	3.98	979
					5	3.94	1,070
1946	July 10, 1946	3.78	1,140		25	3.06	440
	31	2.53	315		28	4.15	1,460
	Sept. 19	2.61	222				
				1952	Oct. 26, 1951	2.84	457
1947	July 22, 1947	3.24	616		Dec. 31,	3.97	1,310
	Aug. 8	3.25	664		Jan. 13, 1952	8.51	7,000
	13	2.77	384		19	6.78	3,780
	15	3.51	1,070		Mar. 19	2.81	193
	22	3.82	985		Aug. 15	4.42	468
	25	4.76	2,060		12	3.76	210
	31	2.29	184		18	3.54	160
	Sept. 17	2.45	226		19	4.25	386
					23	3.84	232
1948	Aug. 21, 1948	2.26	118				
				1953	July 25, 1953	4.30	304
1949	Jan. 13, 1949	4.80	2,400		28	4.50	387
	23	2.77	478		29	4.08	201
	Mar. 8	2.16	190		Aug. 1	4.68	446
	July 10	2.19	209				
	19	3.78	983				
	24	2.82	488				
	Aug. 8	3.24	735				

[c] Annual peak; peaks prior to Aug. 26, 1944 not known.

Gila River Basin

(34) Gila River at Head of Safford Valley, near Solomon, Ariz.*

Location. --Lat 32°52'10", long. 109°30'40", on SE¼NE¼ sec. 31, T. 6 S., R. 28 E., 0.6 mile downstream from intake of Brown Canal, 8 miles northeast of Solomon, and 13 miles downstream from San Francisco River.

Drainage area. -7,896 sq mi. At site in use October 1932 to December 1940, 7,856 sq mi.

Gage. --Recording gage. Datum of gage is 3,065.09 ft above mean sea level, datum of 1929 since Jan. 1, 1941. April 31, 1914, to Sept. 13, 1917, datum 1.89 ft higher, and Sept. 13, 1917, to Sept. 30, 1932, at datum 0.89 ft higher. October 1, 1932, to Dec. 31, 1940, at site 3 miles upstream and three-eights of a mile below Bonita Creek at different datum.

Stage-discharge relation. --Defined by current-meter measurements below 26,000 cfs and extended on basis of slope-area determinations. Relation subject to considerable shifting.

Remarks. --Flood record not materially affected by irrigation diversions above station. Base for partial-duration series, 4,000 cfs.

Bank-full stage. --13 ft.

*Published as "near Solomonsville" 1914 to September 1932, 1941-49, and as "below Bonita Creek near Solomonsville" October 1932 to September 1940.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1914	Aug. 21, 1914	4.15	[c] 9,000
1915	Oct. 4, 1914	6.0	24,000
	Nov. 12	3.7	8,000
	Dec. 20	8.75	50,000
	Jan. 30, 1915	8.6	48,000
	Feb. 12	2.86	4,060
	21	4.1	10,500
	Mar. 28	3.9	9,000
	Apr. 7	3.76	7,600
	July 26	5.5	20,000
1916	Jan. 19, 1916	*14.0	100,000
	29	6.0	28,000
	Feb. 13	2.40	4,910
	Mar. 1	2.5	4,900
	25	2.46	4,400
1917	Oct. 14, 1916	10.7	[c] 67,900
1918	July 1, 1918	3.1	2,700
1919	July 14, 1919	5.75	10,600
	Aug. 3	6.60	15,000
1920	Dec. 5, 1919	5.2	7,620
	Feb. 10, 1920	5.0	7,020
	23	4.6	5,820
1921	July 26, 1921	4.6	5,820
	31	-	[b] 9,000
	Aug. 4	-	[b] 9,500
	19	6.1	10,500
	21	7.55	15,700
1922	Aug. 15, 1922	3.6	3,780
1923	July 22, 1923	5.22	7,050
	26	4.32	4,700
	31	3.95	4,080
	Aug. 4	4.08	4,360
	9	6.00	9,720
	12	6.8	12,600
	15	5.35	7,630
	20	4.27	5,280
	26	5.0	6,210
	Sept. 6	4.46	4,930
1924	Nov. 11, 1923	4.22	4,260
	Dec. 28	6.5	10,600
1925	June 24, 1925	4.4	5,140
	July 31	5.50	7,630
	Sept. 3	8.1	15,900
1926	Mar. 30, 1926	4.07	4,300
	Apr. 7	4.58	5,660
1927	Feb. 17, 1927	4.25	4,630
	July 6	4.15	4,500
	Sept. 13	6.08	9,320
1928	Aug. 1, 1928	3.64	3,230
1929	July 27, 1929	5.04	6,350
	30	7.15	12,700
	Aug. 8	4.90	5,940
	10	5.53	7,630
	14	5.42	7,340
	Sept. 23	5.65	7,920
1930	July 26, 1930	5.2	6,770
	Aug. 4	4.75	5,540
	8	6.30	10,000
	11	6.32	10,100

Gila River Basin

(34) Gila River at Head of Safford Valley, near Solomon, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1931	Feb. 15, 1931	6.45	10,500
	Aug. 3	5.76	8,010
	10	5.05	6,420
	Sept. 4	4.47	4,910
	19	4.36	5,220
	29	4.45	5,120
1932	Feb. 10, 1932	11.05	24,000
	Mar. 1	4.59	4,420
	July 30	5.25	6,570
	Aug. 10	5.5	6,450
1933	Feb. 27, 1933	12.15	4,780
	Aug. 31	13.1	6,200
	Sept. 9	15.4	9,600
	14	14.1	6,670
1934	Aug. 27, 1934	[a] 19.4	[a] 23,000
1935	Sept. 1, 1935	13.5	[a] 5,550
1936	Feb. 17, 1936	13.94	8,000
1937	Feb. 8, 1937	19.1	23,700
	17	15.6	12,700
	Mar. 18	13.19	6,430
1938	Mar. 4, 1938	12.85	4,690
1939	Aug. 6, 1939	14.20	7,370
1940	Oct. 8, 1939	14.75	8,070
	Feb. 3, 1940	13.07	4,930
	Sept. 6	15.24	9,840
1941	Dec. 25, 1940	16.35	12,000
	31	18.4	17,600
	Jan. 28, 1941	7.05	8,140
	Feb. 8	5.82	5,490
	Mar. 15	8.64	12,300
	Apr. 27	5.24	4,180
	May 2	5.22	4,610
	Sept. 30	13.43	31,900
1942	Dec. 12, 1941	6.33	7,730
	Sept. 13, 1942	5.55	5,520
1943	Mar. 6, 1943	5.38	4,260
	Aug. 10	5.72	6,100
	Sept. 27	5.87	6,680
1944	Sept. 25, 1944	9.00	15,800
1945	Aug. 11, 1945	5.7	4,820
1946	Oct. 9, 1945	5.83	5,100
1947	Aug. 23, 1947	6.86	6,100
	30	7.30	9,250
1948	June 1, 1948	5.56	2,540
1949	Dec. 29, 1948	6.69	4,170
	Jan. 14, 1949	11.5	25,200
	24	6.71	5,210
	Mar. 9	7.81	8,050
1950	July 30, 1950	5.30	1,240
1951	Aug. 3, 1951	6.98	4,240
1952	Jan. 14, 1952	10.30	18,600
	19	10.50	19,700
1953	July 30, 1953	6.42	3,040

[a] From floodmarks.
[b] Estimated.
[c] Annual peak.

Gila River Basin

(35) Cave Creek near Paradise, Ariz.

Location. --Lat 31°54', long. 109°10', in SW¼SE¼ sec. 34, T. 17 S., R. 31 E., at Portal ranger station 4¼ miles southeast of Paradise.

Drainage area. --39 sq mi.

Gage. --Staff gage Aug. 5, 1919 to September 1925. Altitude of gage is 4,950 ft (from topographic map).

Stage-discharge relation. --Defined by current-meter measurements below 350 cfs and extended above. Relation probably subject to shifts.

Remarks. --Flood record not affected by small diversions above station. Records furnished by University of Arizona, Agricultural Engineering Department. Only annual peaks are available, and these are in most years maximum observed values which may possibly have been exceeded.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1920	Nov. 21, 1919	5	3,000	1923	Aug. 31, 1923	4.00	1,780
1921	Aug. 7, 1921	5.30	3,360	1924	Dec. 27, 1923	2.70	395
1922	Aug. 16, 1922	1.80	110	1925	July 31, 1925	1.95	[e]60

[e] Maximum daily discharge.

Gila River Basin

(36) San Simon Creek near San Simon, Ariz.

Location. --Lat 32°13'30", long. 109°10'30", in SW¼ sec. 10, T. 14 S., R. 31 E., at bridge on San Simon-Paradise highway, 4½ miles southeast of San Simon.

Drainage area. --814 sq mi at site 1931-41; 893 sq mi at site 1919-25.

Gage. --Recording gage since June 1931. Altitude of gage is 3,630 ft (from topographic map). August 1, 1919, to Sept. 30, 1925, staff gage 3½ miles downstream. Altitude of gage is 3,580 ft (from topographic map).

Stage-discharge relation. --Defined by current-meter measurements to 2,300 cfs and extended above on basis of slope-area determination at gage height 10.9 ft at site 1931-41. Defined by current-meter measurements at site 1919-25. Relation subject to shifting.

Remarks. --Flood record unaffected by small diversions for irrigation above station. Records after 1931 are not closely comparable with earlier records because of probable large inflow during summer floods between the two stations. Records for 1919-25 furnished by University of Arizona, Agricultural Engineering Department. Base for partial-duration series, 650 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1923	July 21, 1923	14.0	[c] 5,350	1937	Aug. 9, 1937	5.80	548
1931	Aug. 1, 1931	7.50	1,400	1938	June 29, 1938	8.50	2,280
	4	8.78	2,400		Aug. 4	6.15	699
	10	11.15	4,500				
				1939	July 24, 1939	6.70	1,000
1932	July 25, 1932	7.3	1,250		27	6.28	773
					31	8.58	2,360
1933	Aug. 4, 1933	7.71	1,550		Aug. 5	7.90	1,840
					11	6.61	940
1934	Oct. 9, 1933	6.67	822		13	9.25	2,840
	[o] Aug. - 1934	[a] 11.2	[p] 4,550				
				1940	June 29, 1940	10.9	4,280
1935	Aug. 5, 1935	8.5	2,280		July 24	8.10	2,170
	7	7.09	1,250		Aug. 3	6.54	1,060
	12	6.87	1,090		7	6.89	1,300
	25	7.7	1,680				
	28	11.7	[q] 5,020	1940	Aug. 14, 1940	6.23	868
	Sept. 23	7.17	1,280		Sept. 21	8.47	2,480
1936	July 25, 1936	6.50	880	1941	July 15, 1941	6.13	808
	Aug. 18	10.85	4,190		18	5.94	689
	28	6.45	852		Aug. 15	7.7	1,870
	Sept. 20	6.82	1,060		21	6.40	961
	26	7.00	1,180		Sept. 29	6.57	1,060

[a] From floodmarks
[c] Annual peak.
[o] Date not known; probably in August 1934
[p] Annual peak; other peaks November 1933 to September 1934 not known.
[q] Annual peak; peaks October 1934 to June 1935 not known.

Gila River Basin

(37) San Simon Creek near Solomon, Ariz.*

Location. --Lat 32°48'06", long. 109°38'19", in NW¼NE¼ sec. 25, T. 7 S., R. 26 E., 1 mile southwest of Solomon and 2½ miles upstream from mouth.

Drainage area. --2,192 sq mi.

Gage. --Recording gage since June 1931, and concrete control since 1948. Datum of gage is 2,960.15 ft above mean sea level, datum of 1929.

Stage-discharge relation. --Defined by current-meter measurements below 7,000 cfs; extended above by slope-area determination at gage height 19.0 ft. Relation subject to minor shifting.

Remarks. --Flood record unaffected by small irrigation diversions above station prior to May 27, 1953. Some regulation of flood flow after this date by flood control detention reservoir having 1,400 sq mi of drainage area, located 35 miles upstream. Storage capacity is 3,370 acre-ft at emergency spillway level. Base for partial-duration series, 2,500 cfs.

Bank-full stage. --16 ft.

*Published as "near Solomonsville" prior to 1950.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1931	Aug. 4, 1931	10.7	4,830
	9	19.0	27,500
	24	7.8	2,640
	30	15.4	9,680
	Sept. 18	11.35	5,840
	28	9.13	4,080
1932	Oct. 1, 1931	14.47	8,780
	July 9, 1932	8.34	3,120
	25	8.26	3,060
	28	8.81	3,520
	30	14.5	8,800
	Aug. 8	12.6	7,000
1933	July 16, 1933	[a]9.45	[c]4,000
1934	[b]Aug. - 1934	[a]15.7	[c]11,500
1935	Aug. 1, 1935	16.35	12,000
	6	7.56	2,700
	19	8.8	3,790
	29	8.5	3,500
1936	July 25, 1936	12.05	7,450
	Aug. 8	7.85	3,400
	19	8.8	4,400
	28	6.8	2,530
	Sept. 10	15.0	10,600
	21	6.88	2,610
1937	Aug. 21, 1937	7.20	2,370
1938	July 12, 1938	8.90	4,500
	Aug. 5	9.0	4,000
1939	Aug. 14, 1939	6.90	2,140
1940	Aug. 4, 1940	7.52	2,610
	22	7.28	2,450
	Sept. 5	11.0	6,080
1941	Apr. 25, 1941	7.75	2,860
	Aug. 17	17.55	13,000
	Sept. 28	9.59	4,370
1942	Aug. 6, 1942	7.45	2,780
	8	7.40	2,660
	Sept. 11	10.05	5,000
	20	7.51	2,750
1943	July 25, 1943	7.92	3,110
	Aug. 2	10.75	5,750
	5	7.58	2,940
	10	10.85	5,850
	15	11.43	6,430
	24	9.94	4,960
1944	Aug. 16, 1944	8.54	3,740
	18	10.36	5,400
	Sept. 5	7.30	2,590
	25	10.88	5,900
1945	July 31, 1945	8.86	4,010
	Aug. 3	9.6	4,640
	10	12.35	7,350
1946	Oct. 9, 1945	8.09	3,180
	Aug. 30, 1946	9.91	4,820
1947	June 18, 1947	7.34	2,700
	Aug. 8	7.1	2,540
	23	7.17	2,620
1948	Aug. 6, 1948	10.95	5,880
	21	7.70	2,880
1949	July 9, 1949	13.3	6,310
	23	8.05	2,860
	Aug. 8	15.55	8,100
1950	Sept. 18, 1950	7.42	2,060

Gila River Basin

(37) San Simon Creek near Solomon, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1951	July 27, 1951	9.2	3,260	1953	July 7, 1953	10.70	3,970
	Aug. 2	14.15	7,390		31	8.42	2,630
	3	8.54	2,800				
1952	Aug. 15, 1952	10.8	4,030				
	17	12.4	5,100				
	Sept. 22	9.30	3,130				

[a] From floodmarks.
[c] Annual peak.
[o] Date not known; probably in August 1934.

(38) Gila River at Safford, Ariz.

Location. --Lat 32°50'50", long. 109° 42'55", in SW¼SW¼ sec. 5, T. 7 S., R. 26 E., at highway bridge 1 mile north of Safford and 4¼ miles downstream from San Simon Creek.

Drainage area. --10,459 sq mi (revised).

Gage. --Recording gage at present site since July 1, 1942. Datum of gage is 2,880.07 ft above mean sea level, datum of 1929. June 1940 to June 1942 recording gage at site 1,400 ft upstream at datum 6.91 ft higher.

Stage-discharge relation. --Defined by current-meter measurements. Subject to shifting.

Remarks. --Flood record unaffected by irrigation diversions above gage, but affected to some extent after May 27, 1953 by flood control reservoir on San Simon Creek (capacity 3,370 acre-feet at emergency spillway level). Base for partial-duration series, 4,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Sept. 6, 1940	5.06	[c] 8,600	1945	Aug. 3, 1945	7.9	5,320
1941	Dec. 25, 1940	5.44	9,920	1946	Oct. 9, 1945	8.00	6,340
	31	6.9	15,200		Aug. 30, 1946	7.2	4,390
	Jan. 28, 1941	5.05	8,560				
	Feb. 8	4.05	4,980	1947	Aug. 23, 1947	7.18	4,350
	Mar. 16	6.28	12,400		31	7.3	4,600
	Apr. 28	3.59	4,030				
	May 2	3.65	4,140	1948	Aug. 7, 1948	9.34	6,090
	Aug. 17	5.4	9,180				
	Sept. 28	5.15	8,320	1949	Dec. 30, 1948	7.65	4,320
	30	13.0	33,000		Jan. 14, 1949	13.1	23,900
					24	7.35	5,000
1942	Dec. 12, 1941	5.00	7,800		Mar. 9	8.45	7,790
	Sept. 14, 1942	7.45	6,620		July 9	7.5	5,300
					Aug. 9	8.85	8,400
1943	Mar. 6, 1943	6.58	4,270				
	Aug. 2	6.8	4,870	1950	July 30, 1950	5.50	1,860
	10	6.60	4,140				
	15	6.65	4,260	1951	Aug. 3, 1951	8.75	6,390
	24	7.35	5,380				
	Sept. 27	7.15	5,780	1952	Jan. 14, 1952	11.24	14,900
					19	11.42	15,700
1944	Aug. 18, 1944	7.5	6,730		Aug. 17	7.83	4,630
	Sept. 5	7.45	6,590				
	26	10.4	13,600	1953	July 7, 1953	6.56	2,670

[c] Annual peak; peaks October to June not known.

Gila River Basin

(39) Gila River at Calva, Ariz.

Location. --Lat 33°11'10", long. 110°13'10", in SW¼ sec. 8, T. 3 S., R. 21 E., unsurveyed, at railroad bridge, on San Carlos Indian Reservation, at head of San Carlos Reservoir, 1½ miles northwest of Calva.

Drainage area. --11,470 sq mi.

Gage. --Recording gage at present site since Nov. 6, 1929. Datum of gage is 2,514.77 ft above mean sea level, datum of 1929. October 4 to Nov. 1, 1929, staff gage at same site and datum.

Stage-discharge relation. --Defined by current-meter measurements.

Historical data. --The greatest known flood, that of Jan. 20, 1916, was estimated as 100,000 cfs or greater on basis of records at Solomon and at Kelvin.

Remarks. --Flood record not materially affected by irrigation diversions above station. Base for partial-duration series, 3,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 20, 1916	-	[b] 100,000
1930	Oct. 14, 1929	5.45	3,390
	July 10, 1930	5.43	3,810
	29	7.40	9,600
	Aug. 8	6.43	6,860
	13	6.37	7,120
	Sept. 8	5.63	3,420
1931	Feb. 16, 1931	6.80	8,850
	Aug. 6	6.55	7,940
	11	7.12	9,900
	24	5.23	3,130
	30	6.35	6,770
	Sept. 19	6.14	5,920
	29	6.17	5,470
1932	Oct. 1, 1931	6.65	6,520
	Feb. 12, 1932	9.7	21,500
	Mar. 2	6.20	5,580
	July 30	6.82	7,900
1933	Feb. 27, 1933	5.84	5,250
	Sept. 9	6.23	6,560
	14	5.46	4,050
1934	July 20, 1934	6.40	6,100
	Aug. 22	5.76	4,150
	28	9.35	18,000
	Sept. 23	5.87	4,540
1935	Jan. 6, 1935	5.54	3,560
	July 31	6.24	4,470
	Aug. 2	6.00	3,750
	31	6.01	4,320
	Sept. 2	5.68	3,450
1936	Feb. 18, 1936	6.56	5,640
	July 26	5.60	3,200
	Aug. 20	5.61	3,780
	Sept. 11	6.22	6,000
	26	6.04	4,880
1937	Feb. 9, 1937	9.37	12,800
	18	8.06	8,960
	Mar. 19	7.25	7,260
1938	Mar. 5, 1938	6.08	4,310
1939	Aug. 7, 1939	6.49	4,260
	Sept. 17	6.60	4,130
1940	Oct. 9, 1939	7.15	5,620
	Feb. 4, 1940	6.67	4,820
	Aug. 14	6.69	5,180
	Sept. 7	6.69	4,600
1941	Dec. 27, 1940	7.67	6,200
	Jan. 2, 1941	9.44	14,300
	29	7.52	7,260
	Feb. 8	6.61	5,180
	26	5.60	3,420
	Mar. 17	9.06	13,000
	Apr. 28	6.15	3,990
	May 3	6.16	3,990
	Aug. 17	6.17	4,700
	Sept. 28	6.80	5,180
1942	Oct. 1, 1941	11.82	27,900
	Dec. 12	6.81	5,760
	Sept. 14, 1942	5.58	3,320
1943	Mar. 6, 1943	5.60	3,590
	Aug. 24	5.39	3,090
	Sept. 28	5.76	3,710
1944	Aug. 18, 1944	5.82	3,260
	Sept. 27	9.48	12,800
1945	Aug. 3, 1945	6.00	3,390
	12	6.02	3,050
1946	Oct. 10, 1945	6.40	4,680
1947	Aug. 24, 1947	6.20	3,200

(39) Gila River at Calva, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1948	Aug. 7, 1948	6.06	2,570	1951	Aug. 4, 1951	5.97	2,970
1949	Dec. 30, 1948	6.38	3,030	1952	Jan. 16, 1952	9.00	7,880
	Jan. 15, 1949	11.47	19,400		20	11.45	13,200
	25	6.98	5,230		Aug. 17	6.08	3,350
	Mar. 10	7.91	6,290				
	Aug. 9	6.24	4,400	1953	July 30, 1953	4.93	2,040
1950	July 30, 1950	5.30	3,210				

b Estimated.

(40) San Carlos River near Peridot, Ariz.*

Location. --Lat 33°19'20", long. 110°26'50", in NW¼ sec. 30, T. 1 S., R. 19 E., unsurveyed, in San Carlos Indian Reservation, at highway bridge 2 miles downstream from San Carlos and 2 miles upstream from Peridot.

Drainage area. --1,058 sq mi 1929 to January 1942, and 1,027 sq mi thereafter.

Gage. --Recording gage at present site since February 1942. Datum of gage is 2,582.71 ft above mean sea level, datum of 1929. Staff gage Oct. 4 to Nov. 8, 1929, and recording gage Nov. 14, 1929, to Jan. 31, 1942, at railroad bridge 2 miles downstream from Peridot at datum 2,506.6 ft above mean sea level (Southern Pacific Railway benchmark).

Stage-discharge relation. --Defined by current-meter measurements below 23,000 cfs; extended above on basis of rate of change of storage in San Carlos Reservoir. Relation subject to shifting.

Historical data. --Flood of January 1916 was estimated on the ground by W. E. Dickinson, then working for the Interstate Commerce Commission.

Remarks. --Flood record unaffected by small irrigation diversions above station. Base for partial-duration series, 2,200 cfs.

Bank-full stage. --11 ft.

*Published as "at San Carlos" prior to 1929. (Former village of San Carlos, which was located at mouth of San Carlos River 10 miles south of present village, was abandoned in 1929 when San Carlos Reservoir formed.) Drainage area at this location was 1,068 sq mi.

Gila River Basin

(40) San Carlos River near Peridot, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 18 or 19, 1916	-	[b] 25,000
1930	Mar. 17, 1930	6.85	5,700
	July 12	6.45	4,870
	Aug. 8	6.66	5,270
	11	6.60	5,590
1931	Feb. 15, 1931	6.69	5,800
	July 11	6.68	5,750
	16	6.10	3,630
	29	6.50	5,100
	Aug. 7	7.02	7,000
	30	7.01	6,950
	Sept. 28	6.38	4,680
1932	Nov. 21, 1931	5.93	3,080
	Dec. 10	6.20	4,000
	Feb. 10, 1932	8.3	12,000
	20	6.04	3,460
	July 7	5.88	2,910
	Aug. 6	6.34	4,480
1933	Sept. 3, 1933	7.08	7,150
	8	8.04	11,000
1934	Aug. 18, 1934	7.35	8,200
	22	6.80	6,110
	30	5.70	2,320
	Sept. 7	6.84	6,260
1935	Jan. 6, 1935	7.46	8,630
	Feb. 7	8.45	13,800
	11	6.21	4,920
	Apr. 9	7.11	7,230
	July 17	7.94	10,600
	Aug. 1	8.05	11,100
	8	6.02	3,120
	12	7.12	7,270
	24	8.27	12,000
	29	5.80	2,340
	Sept. 4	6.14	2,760
1936	Feb. 13, 1936	6.89	6,370
	17	8.8	14,400
	20	5.89	2,580
	July 25	5.98	2,520
1937	Feb. 7, 1937	10.7	29,400
1938	Mar. 4, 1938	7.35	8,640
1939	Apr. 5, 1939	5.72	3,160
	July 3	5.50	2,520
	Aug. 3	7.96	10,200
	5	6.28	4,640
	7	6.26	4,060
1940	Feb. 2, 1940	5.79	2,840
	July 16	5.74	2,720
	Aug. 3	6.70	6,000
	23	6.39	4,780
	Sept. 29	5.55	2,480
1941	Dec. 25, 1940	9.05	14,600
	30	9.1	18,100
	Jan. 12, 1941	5.92	3,910
	25	5.83	3,770
	28	6.40	5,380
	Feb. 7	6.6	5,990
	25	6.43	5,530
	Mar. 14	11.4	40,600
	Sept. 28	7.12	7,670
1942	Dec. 12, 1941	5.35	2,520
1943	Jan. 24, 1943	4.45	3,580
	28	4.20	2,940
	Mar. 5	4.62	3,450
	Aug. 15	4.08	2,320
	Sept. 26	5.16	5,060
1944	Sept. 27, 1944	3.88	795
1945	Aug. 9, 1945	5.50	3,200
1946	July 27, 1946	7.00	4,530
	Sept. 18	6.20	2,900
1947	Aug. 8, 1947	11.1	15,000
	Sept. 6	6.28	2,330
1948	Aug. 2, 1948	6.65	2,850
1949	Jan. 9, 1949	6.88	3,260
	Aug. 9	6.26	2,260
1950	July 21, 1950	6.68	2,150
1951	July 27, 1951	6.81	2,420
	Aug. 27	6.70	2,280
	29	7.13	2,940
1952	Dec. 31, 1951	9.82	9,390
	Jan. 13, 1952	12.54	39,200
	18	10.2	23,900
	Aug. 5	6.41	3,040
	11	7.70	6,400
	15	6.54	3,300
	19	6.24	2,720
1953	Aug. 27, 1953	5.48	860

[b] Estimated.

Gila River Basin

(41) Gila River below Coolidge Dam, Ariz.*

Location. --Lat 33°10'15", long. 110°31'45", in SW¼ sec. 17, T. 3 S., R. 18 E., unsurveyed, 2,200 ft downstream from Coolidge Dam.

Drainage. --12,886 sq mi.

Gage. --Recording gage and 30-ft concrete Parshall flume since Mar. 9, 1937. Datum of gage is 2,309.33 ft above mean sea level, datum of 1929. April 29, 1914, to Mar. 8, 1937, recording gage at various sites and datums, within 1 mile upstream.

Stage-discharge relation. --For sites in use prior to Mar. 9, 1937, relation defined by current-meter measurements below 7,000 cfs and extended above by logarithmic plotting and comparison with flood records for stations near Solomon and at Kelvin. Relations subject to shifting. Stage-discharge relation for Parshall flume defined by current-meter measurements and conforms closely to theoretical rating.

Historical data. --Notable floods occurred in 1891 and 1905. Flood of 1891 was considered highest in preceding 25-30 years at site near Florence (80 miles downstream). Flood of Nov. 28, 1905 exceeded the 1891 flood at this point. On this basis flood of Nov. 28, 1905 (estimated discharge 150,000 cfs) can be considered greatest since about 1861. Discussion and estimates on these floods is found in WSP 33 and House Doc. No. 791.

Remarks. --Flood record not significantly affected by irrigation diversions above station. Completely regulated at Coolidge Dam after Nov. 15, 1928. Base for partial-duration series, 3,500 cfs (for period prior to Nov. 15, 1928).

*Published as "near San Carlos", 1914-26, and as "at Coolidge Dam", 1927-38.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1906	Nov. 28, 1905	-	[b]150,000	1922	Aug. 21, 1922	5.65	2,800
1914	Aug. 24, 1914	8.25	[c]7,400	1923	July 22, 1923	-	[b]9,000
					Aug. 10	10.3	13,500
1915	Dec. 20, 1914	16.4	[c]42,000		12	-	[b]9,000
					20	7.15	5,200
1916	Jan. 20, 1916	25.5	130,000				
	29	-	[b]30,000	1924	Dec. 28, 1923	11.0	15,100
	Mar. 2	-	[b]5,500				
	25	[b]7.7	6,400	1925	Aug. 1, 1925	10.3	5,550
	Aug. 26	6.46	4,000		Sept. 4	14.1	14,400
	Sept. 10	7.3	5,600		17	9.68	4,380
					19	10.57	5,960
1917	Oct. 14, 1916	20.4	74,000				
	Jan. 22, 1917	[b]13	23,000	1926	Mar. 30, 1926	9.5	4,650
					Apr. 6	11.9	9,960
1918	Aug. 6, 1918	8.84	8,630				
				1927	Feb. 15, 1927	11.22	7,080
1919	July 2, 1919	7.7	6,400		17	11.9	9,100
	6	8.55	8,400		Sept. 12	8.65	4,300
	15	9.85	11,800				
	19	7.65	6,300	1928	Aug. 25, 1928	9.4	6,500
	Aug. 3	11.3	16,000		28	9.75	7,200
	Sept. 27	6.48	4,100				
				1929	Sept. 26, 1929	4.57	241
1920	Dec. 5, 1919	11.8	18,000				
	Feb. 11, 1920	9.2	9,700	1930	Sept. 6, 1930	5.70	954
	21	13.0	23,000				
	23	8.42	7,600	1931	July 20, 1931	5.95	1,020
1921	July 10, 1921	7.2	5,200	1932	July 24, 1932	5.94	980
	21	6.46	3,950				
	27	7.57	6,200	1933	July 11, 1933	5.98	1,040
	31	9.9	12,800				
	Aug. 4	8.28	7,500	1934	Apr. 28, 1934	5.30	535
	22	-	[b]14,000				

Gila River Basin

(41) Gila River below Coolidge Dam, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1935	June 16, 1935	5.54	767	1945	July 16, 1945	2.88	616
1936	Apr. 24, 1936	5.80	980	1946	Aug. 29, 1946	1.98	345
1937	July 31, 1937	4.35	1,240	1947	Mar. 7, 1947	2.65	551
1938	June 19, 1938	2.92	620	1948	Apr. 12, 1948	2.09	362
1939	Apr. 16, 1939	2.94	620	1949	July 18, 1949	4.07	1,090
1940	Aug. 17, 1940	2.94	634	1950	Apr. 30, 1950	3.15	726
1941	July 22, 1941	4.17	1,110	1951	Sept. 13, 1951	1.90	321
1942	Aug. 26, 1942	4.07	1,130	1952	July 28, 1952	4.64	1,350
1943	July 17, 1943	3.92	1,040	1953	Dec. 16, 1952	2.13	373
1944	Aug. 7, 1944	3.52	861				

[b] Estimated
[c] Annual peak.
Note.--Annual peaks only listed after 1928.

Gila River Basin

(42) Gila River at Winkelman, Ariz.

Location. --Lat 30°00'10", long. 110°45'55", in NW¼NE¼ sec. 13, T. 5 S., R. 15 E., 1¼ miles north of Winkelman, 2 miles upstream from San Pedro River, and 29 miles downstream from Coolidge Dam.

Drainage area. --13,268 sq mi (includes 382 sq mi below Coolidge Dam).

Gage. --Recording gage since Sept. 11, 1941. Datum of gage is 1,920.95 ft above mean sea level, datum of 1929, supplementary adjustment of 1949.

Stage-discharge relation. --Defined by current-meter measurements below 2,900 cfs; extended above on basis of slope-area determination at gage height 18.40 ft. Relation subject to minor shifting.

Remarks. --Runoff from area above Coolidge Dam is completely regulated. Peak discharges are adjusted by amount of released water to show natural flow from 382 sq mi drainage area below Coolidge Dam, and differ in some instances from previously published figures. Base for partial duration series, 1,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1942	Aug. 8, 1942	7.95	3,950	1947	Aug. 8, 1947	13.68	24,300
					12	5.54	1,920
1943	Mar. 5, 1943	5.37	1,550		Sept. 19	6.10	2,420
	July 30	5.45	1,010				
	Aug. 3	6.28	2,120	1948	July 26, 1948	4.89	1,220
	Sept. 26	8.70	5,470				
				1949	June 18, 1949	5.85	1,630
1944	Oct. 19, 1943	5.60	1,570		July 30	5.38	1,100
	Aug. 7, 1944	6.15	1,830		Sept. 13	6.70	2,880
	9	18.40	54,500				
				1950	July 7, 1950	5.13	1,330
1945	Aug. 1, 1945	4.70	1,040		21	6.97	3,550
	9	5.37	1,650		30	7.90	4,960
	21	5.59	1,640				
				1951	Aug. 2, 1951	15.15	26,100
1946	Oct. 7, 1945	5.03	1,100		27	6.90	2,810
	Jan. 5, 1946	4.85	1,210				
	Aug. 15	5.05	1,400	1952	Dec. 31, 1951	5.63	1,670
	20	10.70	12,500		Jan. 13, 1952	6.25	2,239
	30	6.10	2,320				
	Sept. 10	4.85	1,160	1953	Aug. 25, 1953	4.38	640
	19	7.72	5,010				
	27	6.5	3,100				

Gila River Basin

(43) San Pedro River at Palominas, Ariz.

Location. --Lat 31°22'50", long. 110°06'45", in SE¼ sec. 33, T. 23 S., R. 22 E., at highway bridge 0.7 mile east of Palominas, 2 3/4 miles upstream from Greenbush Creek, 4½ miles downstream from international boundary, and 13 miles southwest of Bisbee.

Drainage area. --741 sq mi, of which 649 sq mi is in Mexico.

Gage. --Recording gage since June 1930. Altitude of gage is 4,200 ft (from topographic map). Prior to Oct. 18, 1936, at datum 3.71 ft higher; Oct. 18, 1936, to Oct. 10, 1939, at datum 3.91 ft higher; Oct. 11, 1939, to July 16, 1941, at datum 0.29 ft lower.

Stage-discharge relation. --Defined by current-meter measurements below 5,600 cfs; extended above on basis of slope-area determination at gage height 16.16 ft, present datum.

Historical data. --Flood of Sept. 28, 1926, reached a stage of about 23.9 ft, present datum, from floodmarks (discharge not determined).

Remarks. --Flood record unaffected by small irrigation diversions above station. Base for partial-duration series, 2,400 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1926	Sept. 28, 1926	[a] 23.9	-	1938	July 28, 1938	5.77	3,040
					Aug. 7	7.55	6,300
1930	July 22, 1930	7.96	4,040				
	28	7.69	3,500	1939	July 17, 1939	5.18	3,140
	Aug. 7	9.75	9,400		22	6.30	4,230
					Aug. 3	6.77	4,960
1931	Aug. 1, 1931	7.72	3,380		6	8.05	7,500
	6	7.50	3,460				
	8	9.6	8,900	1940	July 25	10.12	3,820
	30	7.61	3,780		Aug. 4	9.54	3,150
	Sept. 1	7.71	3,940		14	16.45	22,000
1932	Oct. 1, 1931	7.46	3,490	1941	Jan. 28, 1941	11.50	[r] 5,900
	July 29, 1932	8.3	5,180				
	Aug. 9	8.0	6,000	1950	July 5, 1950	[a] 8.5	6,270
					21	7.67	5,150
1933	July 13, 1933	7.75	4,020		30	6.51	3,610
	Sept. 19	8.1	4,700				
				1951	July 2, 1951	8.10	5,710
1935	Aug. 14, 1935	6.74	3,000		Aug. 26	5.80	2,760
1936	July 1, 1936	6.40	2,420	1952	Aug. 5, 1952	6.05	3,000
	Aug. 19	6.83	3,200		8	7.54	4,890
	Sept. 10	10.15	13,500		16	9.15	7,400
1937	July 18, 1937	5.75	2,650	1953	July 6, 1953	6.85	3,990
	Aug. 17	6.55	4,060		7	11.68	11,900
	20	8.31	8,090		13	7.20	4,500
	23	6.90	4,860		17	7.10	4,380
	26	6.78	4,730		18	6.60	3,740
	Sept. 7	5.64	2,860				

[a] From floodmarks.
[r] Flood record complete to July 16, 1941; annual peak not determined, probably occurred Aug. 16.

Gila River Basin

(44) San Pedro River at Charleston, Ariz.*

Location. --Lat 31°37'40", long. 110°10'30", in NE¼NE¼ sec. 11, T. 21 S., R. 21 E., in Spanish land grant of San Juan de las Boquillas & Nogales, at highway bridge a quarter of a mile south of Charleston, 1½ miles upstream from Charleston dam site, 8½ miles upstream from Babocomari River, and 29 miles upstream from Benson.

Drainage area. --1,219 sq mi for site used since December 1942; 1,253 sq mi for sites used 1904 to November 1911 and 1928 to November 1942; 1,300 sq mi, approximately, for sites used November 1911 to September 1926. All areas include about 696 sq mi in Mexico.

Gage. --Recording gage and concrete control at present site since Dec. 1, 1942. Datum of gage is 3,954.26 ft above mean sea level, datum of 1929. November 15, 1911, to Oct. 28, 1924, staff gages at various sites and datums from 5½ to 6½ miles downstream. October 29, 1924, to Sept. 27, 1926, recording gage about 6 miles downstream. September 28, 1926, to May 11, 1928, no gage; estimates of discharge based on record for station at Fairbank, below Babocomari River. June 17, 1928, to Dec. 21, 1933, and May 1, 1935, to Nov. 30, 1942, recording gage 1½ miles downstream at datum 24.01 ft lower. Staff gage nearby May 12 to June 16, 1928, at same datum. December 22, 1933, to Apr. 30, 1935, no gage; estimates of discharge based on record for station near Mammoth.

Stage-discharge relations. --Defined by current-meter measurements below 4,400 cfs; extended above on basis of slope-area determination of 1926 flood. Relation prior to Nov. 30, 1942, subject to considerable shifting.

Historical data. --Flood of Sept. 28, 1926, is the greatest known since 1906 or earlier.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 3,000 cfs.

*Published as "near Fairbank", 1911-26.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Aug. 11, 1916	3.9	3,100
	16	5.7	7,700
	Sept. 7	4.0	3,300
1917	Oct. 13, 1916	4.5	[b] 4,400
	July 14, 1917	-	4,000
	18	6.0	8,600
	24	4.8	5,150
	Aug. 2	5.0	5,700
	9	4.0	3,300
	12	7.3	13,000
	Sept. 8	4.0	3,300
1918	June 20, 1918	4.15	3,610
	July 1	-	[b] 4,000
1919	July 3, 1919	6.0	8,600
	5	7.6	14,100
	7	8.4	17,200
	14	6.8	11,300
	28	4.5	4,400
	31	4.6	4,640
	Aug. 2	4.0	3,300
	16	10.3	25,100
1920	Aug. 1, 1920	3.30	3,300
	Sept. 5	3.9	4,500
1921	July 3, 1921	16.5	10,200
	19	20.2	19,000
	27	14.0	5,000
	31	16.9	11,200
	Aug. 4	14.6	6,200
	6	14.3	5,400
	8	14.5	5,800
	19	13.6	4,100
1922	Aug. 10, 1922	13.35	3,630
	Sept. 9	13.4	3,720
1923	July 14, 1923	14.0	4,820
	Aug. 12	14.2	5,200
1924	July 24, 1924	12.2	1,900
1925	June 24, 1925	10.3	7,340
	July 27	7.95	3,940
	Aug. 6	12.1	11,900
	9	7.5	3,450
	Sept. 3	8.2	4,260
1926	Sept. 26, 1926	11.85	10,500
	28	21.9	98,000
1927	Oct. 9, 1926	8.5	[b] 5,100
	July 8, 1927	8.0	[b] 3,600
	Aug. 7	8.5	[b] 4,260
1928	July 15, 1928	6.02	3,800
1929	Oct. 11, 1928	6.95	5,720
	July 17, 1929	6.58	4,910
	27	6.56	4,870
	29	8.74	10,400
	Aug. 2	6.15	4,030
	8	5.85	3,460
1930	July 19, 1930	6.0	3,740
	22	6.50	4,740
	28	6.05	3,840
	Aug. 7	8.5	9,740
	10	5.95	3,640

Gila River Basin

(44) San Pedro River at Charleston, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1931	Aug. 2, 1931	5.95	3,640
	6	6.20	4,090
	9	12.0	24,500
	27	6.5	4,740
	30	6.3	4,330
	Sept. 18	6.0	3,740
1932	Oct. 1, 1931	6.2	4,130
	July 30, 1932	6.4	4,530
	Aug. 9	7.5	7,000
1933	July 13, 1933	6.2	4,130
	22	8.45	9,600
	Sept. 17	7.3	6,550
	20	6.85	5,500
1934	-	-	[b,c]5,000
1935	Aug. 2, 1935	5.9	3,780
	14	5.95	3,870
	28	8.1	8,600
	31	5.96	3,890
1936	July 25, 1936	7.55	7,210
	Aug. 19	6.0	3,250
	Sept. 11	9.5	13,000
1937	Aug. 9, 1937	6.4	4,720
	18	6.02	4,000
	20	8.5	9,430
	23	6.7	4,920
	26	6.85	5,030
	Sept. 8	5.80	3,150
1938	July 28, 1938	7.06	5,700
	Aug. 2	7.25	6,180
	7	7.74	7,450
1939	July 22, 1939	6.50	4,360
	Aug. 3	7.40	6,480
	7	8.45	9,370
	Sept. 7	6.85	5,370
1940	July 16, 1940	8.8	10,700
	Aug. 13	13.1	31,000
1941	Jan. 28, 1941	7.00	6,700
	Aug. 9	7.0	6,700
	16	8.53	10,800
1942	July 24, 1942	4.95	2,870
1943	June 29, 1943	8.22	8,380
	Aug. 6	8.22	8,380
	9	8.20	8,650
	18	8.07	7,860
1944	Aug. 18, 1944	6.87	3,430
1945	Aug. 7, 1945	7.65	6,600
	9	7.95	7,670
	21	6.90	4,180
1946	July 17, 1946	7.90	7,490
	29	6.78	3,900
	Aug. 4	9.10	12,000
1947	Aug. 9, 1947	8.60	10,100
	12	6.64	3,760
	15	7.05	4,620
	22	7.20	5,080
	28	6.57	3,120
1948	July 24, 1948	7.25	5,400
	Aug. 3	8.0	7,850
	12	7.85	7,310
	Sept. 18	6.80	3,900
	26	7.6	5,080
1949	July 19, 1949	7.15	5,160
	22	7.10	5,010
	24	7.65	6,720
	Aug. 8	6.9	4,460
1950	July 6, 1950	7.48	6,070
	21	7.15	4,920
	30	6.72	3,630
1951	July 2, 1951	7.4	5,730
	Aug. 26	6.9	4,180
1952	Aug. 9, 1952	6.45	3,120
	10	7.7	6,770
	17	8.0	7,850
	19	7.05	4,680
1953	July 7, 1953	8.2	8,590
	13	6.43	3,120
	17	6.70	3,720
	25	6.50	3,230

[b] Estimated
[c] Annual peak.

Gila River Basin

(45) San Pedro River near Redington, Ariz.

Location. --Lat 32°22'50", long. 110°26'40", in NE¼NW¼ sec. 19, T. 12 S., R. 19 E., half a mile upstream from Cochise-Pima County line, 4½ miles upstream from Redington, and 30 miles downstream from Benson.

Drainage area. --2,939 sq mi (includes 696 sq mi in Mexico).

Gage. --Recording gage at present site and datum since July 1950. Datum of gage is 2,940.51 ft above mean sea level, datum of 1929. Prior to July 1950, at site 400 ft downstream at datum 2.98 ft lower.

Stage-discharge relation. --Defined by current-meter measurements below 8,400 cfs; extended above on basis of slope-area determination of 1951 peak flow and records for adjacent stations. Relation subject to shifting.

Historical data. --The greatest known flood was that of Sept. 28, 1926, (gage height, 21.5 ft, former datum, from floodmark), discharge estimated as 90,000 cfs on basis of records for stations at Charleston and Gila River at Kelvin.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 3,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1926	Sept. 28, 1926	[a] 21.5	90,000	1948	Sept. 26, 1948	[a] 9.1	[c] 11,500
1943	June 29, 1943	6.03	4,590	1949	[b]	[a] 8.4	[c] 10,000
	Aug. 6	5.92	3,910				
	9	7.40	7,090	1950	July 7, 1950	8.48	3,720
					20	11.4	7,830
1944	Aug. 9, 1944	8.2	9,240		23	9.1	4,470
	18	5.10	3,090		30	12.0	8,800
	Sept. 24	11.05	19,000				
				1951	Aug. 2, 1951	18.0	28,600
1945	Aug. 7, 1945	5.45	3,900				
	10	9.90	14,600	1952	July 28, 1952	9.2	3,910
	21	6.52	5,720		29	9.4	4,330
					Aug. 16	9.5	4,470
1946	Oct. 5, 1945	5.11	3,080				
	Aug. 4, 1946	8.25	9,000	1953	July 7, 1953	11.0	7,290
1947	Aug. 8, 1947	12.0	23,000				
	9	8.12	9,280				
	15	4.90	3,000				

[a] From floodmark.
[c] Annual peak.
[b] Date not known, probably occurred in summer of 1949.

Gila River Basin

(46) San Pedro River near Mammoth, Ariz.

Location. --Lat 32°44'35", long. 110°38'50", in NE¼NW¼ sec. 18, T. 8 S., R. 17 E., at bridge on Mammoth-Winkelman highway 1½ miles north of Mammoth.

Drainage area. --3,599 sq mi.

Gage. --Recording gage May 1931 to June 1941. Datum of gage is 2,306.98 ft above mean sea level, datum of 1929, supplementary adjustment of 1949.

Stage-discharge relation. --Defined by current-meter measurements below 5,300 cfs; extended above on basis of 4 float-area measurements between 20,000 and 41,000 cfs. Relation is subject to large shifts.

Historical data. --Greatest known flood was that of Sept. 28, 1926, (gage height unknown), discharge about 90,000 cfs, estimated on basis of records for stations at Charleston and Gila River at Kelvin.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 4,500 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1926	Sept. 28, 1926	-	[b] 90,000	1937	Aug. 20, 1937	9.40	12,800
					22	9.5	14,000
1931	Aug. 5, 1931	8.4	5,210		27	8.55	7,960
	7	8.58	5,550		30	9.6	14,100
	10	10.9	18,000		Sept. 5	8.47	7,530
	14	8.4	4,740		7	8.22	6,760
	24	9.3	8,270				
	30	9.2	8,270	1938	June 28, 1938	9.15	4,580
	Sept. 19	8.9	4,970		July 29	9.74	6,000
					Aug. 3	9.3	5,090
1932	Oct. 2, 1931	11.1	19,400		5	10.5	7,800
	Aug. 10, 1932	8.8	7,250		8	10.00	6,600
1933	July 23, 1933	9.8	13,500	1939	July 19, 1939	9.35	8,660
	Sept. 10	8.6	5,440		Aug. 2	9.65	9,920
					6	9.85	9,710
1934	Aug. 4, 1934	8.40	7,400		Sept. 11	9.52	9,290
					17	8.7	6,010
1935	Aug. 14, 1935	9.13	5,300				
	24	10.65	16,300	1940	Aug. 14, 1940	12.7	50,000
	28	10.3	14,000		24	8.4	6,570
	Sept. 1	8.55	4,600				
				1941	Dec. 31, 1940	9.4	8,870
1936	July 26, 1936	8.40	7,960		Jan. 29, 1941	9.7	[a] 10,100
	Aug. 9	8.2	8,220				
	Sept. 11	8.9	10,400				

[b] Estimated
[a] Maximum observed; peaks July to September 1941 not known.

Gila River Basin

(47) Aravaipa Creek near Feldman, Ariz.*

Location. --Lat 32°50', long. 110°38', in NW¼ sec. 9, T. 7 S., R. 17 E., 6 miles upstream from mouth and 6 miles east of Feldman (now PZ Ranch), and 8½ miles north of Mammoth.

Drainage area. --542 sq mi; 562 sq mi at site used 1919-21.

Gage. --Staff gage after Jan. 8, 1941. Altitude of gage is 2,345 ft (from topographic map). April 21, 1919, to Sept. 30, 1921, staff gage painted on depth markers at ford 5 3/4 miles downstream and a quarter of a mile upstream from mouth, at different datum. May 23, 1931, to Jan. 1, 1941, recording gage 100 ft downstream at datum 0.32 ft lower, staff gage at same site and datum May 1-22, 1931.

Stage-discharge relation. --Defined by current-meter measurements 1919-21 below 5,100 cfs; 1931-41 below 3,000 cfs, and extended above on basis of velocity-area studies.

Remarks. --Flood record unaffected by upstream irrigation diversions. Base for partial-duration series, 2,500 cfs.

*Former town of Feldman now known as PZ Ranch.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1919	Aug. 2, 1919	[a]6.3	[c]20,000	1936	Feb. 15, 1936	7.57	3,800
					July 22	7.2	3,220
1920	Jan. 5, 1920	[a]4.03	[c]7,400		25	9.1	6,500
					Aug. 9	7.55	3,770
1921	July 31, 1921	[a]5.0	[c]12,600		Sept. 7	7.1	3,070
1931	Aug. 20, 1931	8.11	4,700	1937	Feb. 7, 1937	7.30	3,380
1932	Oct. 1, 1931	9.0	6,300	1938	Mar. 4, 1938	7.56	3,600
	Dec. 10	6.92	2,800				
	Feb. 10, 1932	7.75	4,090	1939	Aug. 5, 1939	9.1	6,450
	Aug. 9	6.79	2,610		7	7.4	3,340
					Sept. 8	7.3	3,170
1933	July 16, 1933	7.1	3,070		11	8.25	4,830
	23	10.5	9,340				
				1940	Oct. 7, 1939	8.35	4,920
1934	July 20, 1934	7.12	3,100		Feb. 23, 1940	7.20	3,080
	Aug. 30	6.85	2,700		June 23	6.97	2,600
					26	7.22	2,950
1935	Jan. 6, 1935	7.75	4,090		Aug. 4	7.15	2,840
	Feb. 7	8.0	4,500		Sept. 21	8.6	5,480
	Aug. 2	7.35	3,460				
	13	6.79	2,610	1941	Nov. 19, 1940	8.4	4,450
	15	10.9	10,200		Dec. 31	10.88	[e]9,600
	24	10.3	8,900		Feb. 7, 1941	7.7	5,400
	29	10.2	8,690		Mar. 16	7.7	5,400

[a] From floodmarks.
[c] Annual peak.
[e] Probably annual peak; peaks July to September 1941 not known.

Gila River Basin

(48) Gila River at Kelvin, Ariz.

Location. --Lat 33°10", long. 110°58'45", in NW¼NW¼ sec. 12, T. 4 S., R. 13 E., at Kelvin, 1,000 ft downstream from Mineral Creek, 17 miles downstream from San Pedro River, and 19½ miles upstream from Ashurst-Hayden Dam.

Drainage area. -18,011 sq mi of which 5,125 sq mi is below Coolidge Dam.

Gage. --Recording gage at present site June 15 to Nov. 30, 1914, and since Sept. 1, 1915. Datum of gage is 1,743.22 ft above mean sea level, datum of 1929, supplementary adjustment of 1949. January 26, 1911, to June 14, 1914, staff gages at several sites within three-quarters of a mile downstream at different datums. December 1, 1914, to Aug. 31, 1915, staff gages and tape gage at several sites from 1 3/4 miles upstream to half a mile downstream except for March 1915 at Florence; all gage-height readings reduced to present datum.

Stage-discharge relation. --Defined by current-meter measurements below 38,000 cfs; extended above on basis of slope-area measurement at 82,000 cfs. Relation subject to minor shifts.

Historical data. --A peak discharge of 102,000 cfs, Feb. 22, 1891, by slope-area determination, was observed at station at the Buttes (15½ miles downstream). This flood was considered highest in at least the preceding 25-30 years. Flood of Nov. 28, 1905, was estimated as 190,000 cfs. Discussion of these floods and basis for estimates can be found in WSP 33 and House Document No. 791.

Remarks. --Early flood records unaffected by irrigation diversions above station. Since Nov. 15, 1928, flow from area above Coolidge Dam has been completely regulated, and flood records represent natural runoff from drainage area below the dam which is affected only to a minor extent by releases at the dam. Base for partial-duration series, 6,000 cfs prior to Nov. 15, 1928, 4,000 cfs thereafter.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1891	Feb. 22, 1891	-	[t]102,000
1906	Nov. 28, 1905	-	[b]190,000
1912	Mar. 12, 1912	16.0	35,000
	July 25	[b]10	12,500
	30	8.4	7,300
	Aug. 31	8.5	7,600
1913	Feb. 25, 1913	6.5	4,400
1914	Aug. 19, 1914	7.55	16,700
	Sept. 15	4.68	6,700
	21	8.26	18,000
1915	Oct. 6, 1914	5.6	8,500
	Dec. 21	14.0	55,000
	24	15.1	67,300
	Jan. 1, 1915	7.1	12,800
	30	15.0	66,000
	Feb. 21	8.6	18,600
	Mar. 27	[b]4.9	6,000
	Apr. 1	[b]5.0	6,400
	8	[b]5.4	7,800
	July 26	[b]7.3	13,200
1916	Jan. 20, 1916	19.5	132,000
	29	10.35	27,000
	Mar. 24	5.50	6,400
	Sept. 9	7.0	11,600
1917	Oct. 15, 1916	14.0	55,000
	Jan. 23, 1917	-	[b]20,000
1918	Aug. 6, 1918	7.9	15,100
1919	July 3, 1919	5.1	6,420
	6	5.54	7,800
	16	7.55	14,200
	28	5.63	7,100
	Aug. 3	9.2	20,800
	27	5.65	7,000
1920	Dec. 5, 1919	10.25	25,800
	Feb. 11, 1920	6.4	9,200
	21	7.3	13,000
1921	July 11, 1921	5.5	6,000
	28	6.25	8,500
	31	9.8	24,000
	Aug. 9	-	[b]7,000
	22	[b]8.1	16,000
1922	Aug. 22, 1922	4.25	2,800
1923	July 14, 1923	6.9	11,700
	23	6.2	8,500
	Aug. 11	[b]6.4	9,700
	13	6.6	10,500
	16	6.35	9,500
	Sept. 12	5.5	6,450
1924	Dec. 29, 1923	6.9	11,700
1925	Aug. 6, 1925	5.50	6,420
	30	5.4	6,100
	Sept. 4	6.9	11,200
	18	5.77	7,250

Gila River Basin

(48) Gila River at Kelvin, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1926	Apr. 7, 1926	5.95	8,000
	Sept. 28	16.2	82,000
1927	Feb. 18, 1927	6.15	8,570
	Sept. 12	5.76	6,870
1928	Aug. 2, 1928	7.05	12,000
	28	6.25	8,640
1929	July 30, 1929	5.68	6,500
	Aug. 1	6.00	7,330
	8	5.32	5,120
	Sept. 24	7.22	11,600
1930	Mar. 18, 1930	4.90	4,020
	July 8	5.69	5,690
	10	5.76	6,310
	20	6.02	7,500
	Aug. 8	12.6	42,800
	Sept. 7	5.05	4,360
1931	Feb. 16, 1931	5.97	6,030
	Aug. 3	5.02	4,020
	10	7.65	11,800
	30	10.6	28,600
	Sept. 19	5.18	4,020
1932	Oct. 2, 1931	7.5	12,800
	Dec. 10	5.50	4,850
	Feb. 10, 1932	6.0	6,060
	July 1	5.31	4,850
	Aug. 10	5.34	4,950
1933	July 24, 1933	6.45	8,800
	Aug. 20	5.27	4,390
1934	July 20, 1934	5.26	4,590
	Aug. 23	5.82	6,750
	Sept. 23	5.47	5,140
1935	Jan. 6, 1935	5.25	4,390
	Feb. 7	5.90	6,670
	Aug. 2	6.10	7,400
	10	5.02	4,060
	15	6.44	9,030
	24	8.4	12,200
	29	9.30	21,000
	Sept. 1	5.50	7,400
1936	July 26, 1936	5.30	4,780
	Aug. 9	6.38	8,310
	Sept. 11	7.45	12,600
1937	Feb. 7, 1937	6.60	8,740
	Aug. 21	6.94	10,200
1938	Aug. 5, 1938	6.55	5,660
	8	6.45	5,360
1939	Aug. 3, 1939	6.55	5,470
	7	7.63	9,320
1940	Aug. 14, 1940	12.06	38,200
	Sept. 12	6.0	4,040
1941	Dec. 24, 1940	7.10	7,170
	31	10.06	23,300
	Feb. 7, 1941	6.07	4,160
	Mar. 15	8.85	11,600
	July 23	7.77	6,270
	Aug. 9	6.82	4,450
	17	6.70	4,170
	Sept. 28	7.09	5,410
1942	Aug. 9, 1942	6.35	3,300
1943	Jan. 23, 1943	7.26	5,960
	Mar. 5	6.64	4,040
	Aug. 10	7.0	5,300
	Sept. 26	7.30	6,290
1944	Aug. 9, 1944	10.95	28,000
	Sept. 25	6.8	4,710
1945	Aug. 10, 1945	9.10	9,200
1946	Aug. 5, 1946	7.92	6,440
	21	6.87	4,320
	Sept. 19	7.35	5,300
1947	Aug. 8, 1947	8.67	10,000
	Sept. 8	6.98	4,730
	20	7.05	4,860
1948	Aug. 3, 1948	7.70	5,850
1949	July 31, 1949	6.91	4,740
	Aug. 8	7.07	5,230
	Sept. 13	6.68	4,500
	15	7.12	5,610
1950	July 21, 1950	6.88	4,330
	30	7.91	6,920
1951	Aug. 3, 1951	9.99	13,200
1952	Jan. 14, 1952	7.57	5,430
1953	July 7, 1953	7.1	4,210
	30	6.7	4,140

[b] Estimated

[t] Maximum peak discharge during period Aug. 26, 1889, to September 1899.

Note. --Contributing drainage area reduced to 5,125 sq mi. since Nov. 15, 1928.

Gila River Basin

(49) Queen Creek at Whitlow dam site, near Superior, Ariz.*

Location.--Lat 33°17'55", long. 111°16'25", in NW¼SE¼ sec. 36, T. 1 S., R. 10 E., at Whitlow dam site, 2½ miles upstream from Whitlow Canyon, 4 miles northeast of Florence Junction, and 10 miles west of Superior.

Drainage area.--144 sq mi.

Gage.--Recording gage and concrete control since May 1, 1948. Datum of gage is 2,048.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1949. January 25, 1896, to Sept. 30, 1920, staff gages at various sites and datums within 1 mile downstream.

Stage-discharge relation.--At present site, defined by current-meter measurements below 1,600 cfs and extended above on basis of slope-area measurement at gage height 8.40 ft. Relation at former site poorly defined, extended above 90 cfs on basis of slope-area measurement at 600 cfs.

Remarks.--Flood records not affected by small diversions above gage. No flood records available prior to 1917. Base for partial-duration series, 500 cfs.

*Published as "near Superior", 1915-20.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1917	May 20, 1917	[a] 6.0	[c] 2,800	1950	July 18, 1950	8.40	5,100
					22	6.65	2,690
1918	Aug. 5, 1918	[a] 8.0	[c] 5,000		Aug. 5	5.80	1,790
1919	Aug. 1, 1919	[a] 11.0	[c] 10,000	1951	Jan. 30, 1951	4.70	840
					July 27	4.59	664
1920	Feb. 20, 1920	[a] 4.5	[c] 750		Aug. 3	5.51	1,510
					3	4.41	646
1939	Aug. 6, 1939	-	[c,u] 13,200		Aug. 26	5.30	1,320
1948	July 21, 1948	4.46	676	1952	Dec. 31, 1951	4.85	1,130
					Jan. 13, 1952	4.20	640
1949	Dec. 27, 1948	4.28	568		18	5.12	1,170
	July 20, 1949	4.75	670		Mar. 17	4.65	624
	22	6.60	2,630				
	23	4.70	805	1953	Feb. 28, 1953	4.64	632
	Aug. 6	4.65	805		Mar. 2	5.10	1,020
	8	5.72	1,710		July 29	5.86	1,780

[a] From floodmarks.
[c] Annual peak.
[u] By slope-area determination. Floodmarks indicate a previous stage 1½ ft higher.

Gila River Basin

(50) Gila River near Laveen, Ariz.

Location. --Lat 33°15', long, 112°10', in SW¼NW¼ sec. 16, T. 2 S., R. 2E., on Gila River Indian Reservation, at highway bridge 1½ miles south of Komatke, 8 miles south of Laveen, and 8 miles upstream from Santa Cruz River.

Drainage area. --20,615 sq mi of which 7,729 sq mi is below Coolidge Dam.

Gage. --Recording gage above concrete diversion dam on main channel since Jan. 1, 1940, and auxiliary recorder on overflow channel at highway bridge a quarter of a mile south since Mar. 18, 1942. Datum of principal gage is 1,018.90 ft above mean sea level, datum of 1929, supplementary adjustment of 1949, and datum of auxiliary gage is 0.23 ft lower. Staff gage at site of auxiliary gage Oct. 16, 1940, to Mar. 17, 1942.

Stage-discharge relation. --Defined by current-meter measurements. Relation is complex owing to operational procedures at the dam and is subject to large shifts during flood periods.

Remarks. --Flood records represent runoff from drainage area below Coolidge Dam and may be slightly affected by irrigation diversions above station. Base for partial-duration series, 700 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 17, 1940	9.21	8,740	1946	Oct. 6, 1945	5.63	1,250
					Aug. 6, 1946	5.76	1,180
1941	Nov. 20, 1940	5.75	1,610		Sept. 20	6.26	1,260
	Dec. 26	5.49	1,440				
	Jan. 2, 1941	9.33	11,900	1948	July 26, 1948	5.70	1,280
	13	5.08	1,040		Aug. 5	6.09	1,430
	30	5.72	1,720				
	Feb. 9	6.19	1,830	1949	July 25, 1949	6.22	880
	26	5.21	1,600		Aug. 1	5.90	755
	Mar. 17	7.80	4,710		10	6.64	1,250
	July 24	5.00	1,420		Sept. 14	5.96	776
	Aug. 11	5.42	1,730		17	6.68	1,210
	18	5.43	1,750				
	Sept. 19	5.14	1,560	1950	July 9, 1950	5.72	706
	29	5.62	1,800		19	6.08	777
					23	6.80	1,040
1942	Dec. 12, 1941	4.90	1,170		Aug. 2	7.22	1,500
					6	7.02	1,160
1943	Jan. 25, 1943	4.68	714				
	Mar. 6	5.13	1,550	1951	Aug. 5, 1951	6.93	1,100
	Aug. 4	4.70	702		29	7.29	1,210
	11	5.41	1,470				
	15	4.70	730	1952	Jan. 15, 1952	6.70	871
	Sept. 27	5.78	1,570		20	7.03	1,070
1944	Aug. 11, 1944	5.83	1,330	1953	July 31, 1953	6.76	565
1945	Aug. 13, 1945	7.42	2,800				

Gila River Basin

(51) Santa Cruz River near Lochiel, Ariz.

Location. --Lat 31°21'20", long. 110°35'25", in SW¼ sec. 11, T. 24 S., R. 17 E., unsurveyed, at bridge on county road on southern border of Spanish land grant of San Rafael, 1½ miles upstream from international boundary, and 2½ miles northeast of Lochiel.

Drainage area. --82.2 sq mi.

Gage. --Recording gage since January 1949. Altitude of gage is 4,620 ft (from topographic map).

Stage-discharge relation. --Defined by current-meter measurements below 1,400 cfs; extended above on basis of slope-area determination at gage height 6.75 ft. Relation subject to minor shifts.

Remarks. --Flood record unaffected by small irrigation diversions above station. Base for partial-duration series, 1,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1949	Aug. 8, 1949	5.70	1,600	1951	Aug. 2, 1951	5.65	2,560
	Sept. 13	5.75	1,650				
				1952	Aug. 16, 1952	3.71	550
1950	July 8, 1950	6.65	4,300				
	20	5.43	2,240	1953	July 7, 1953	4.80	1,730
	22	6.38	3,790		13	5.20	2,180
	30	6.75	4,520		14	6.05	3,320
	Aug. 5	6.74	4,490		15	4.57	1,500
					30	4.55	1,480

(52) Santa Cruz River near Nogales, Ariz.

Location. --Lat 31°20'40", long. 110°51'05", in NW¼ sec. 18, T. 24 S., R. 15 E., unsurveyed, in Spanish land grant of Buena Vista, three-quarters of a mile downstream from international boundary, 5¼ miles upstream from Yerba Buena dam site, and 5½ miles east of Nogales.

Drainage area. --532 sq mi, (includes about 348 sq mi in Mexico).

Gage. --Staff gage May 5 to June 2, 1930, and recording gage thereafter. Datum of gage is 3,702.54 ft above mean sea level, datum of 1929 (levels by International Boundary and Water Commission).

Stage-discharge relation. --Defined by current-meter measurements below 2,300 cfs; extended above on basis of slope-area determinations at gage height 9.5 ft, 10.9 ft, and 12.03 ft. Relation subject to extreme shifting.

Remarks. --Flood records unaffected by irrigation diversions above station. Records were obtained for period 1913-22 at Yerba Buena dam site, 5¼ miles downstream, but did not adequately define peak flow periods and are not included here. Base for partial-duration series, 2,000 cfs.

Gila River Basin

(52) Santa Cruz River near Nogales, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1930	July 22, 1930	6.20	2,400
	26	6.45	2,700
	Aug. 7	8.55	v5,400
1931	July 30, 1931	6.75	2,900
	Aug. 4	7.45	4,150
	6	6.8	3,000
	9	6.52	2,600
	Sept. 14	6.1	2,050
1932	Jan. 14, 1932	7.0	3,500
	July 8	9.5	6,400
	29	6.7	3,100
	Aug. 9	7.9	4,500
	26	5.82	2,270
1933	Sept. 19, 1933	5.5	1,900
1934	Aug. - 1934	9.0	w5,900
1935	July 31, 1935	6.0	2,740
	Aug. 12	6.2	3,000
	14	6.05	2,800
	23	8.25	5,000
	28	5.65	2,310
	31	12.3	12,000
1936	June 26, 1936	6.51	3,200
	July 25	6.70	3,400
	Aug. 4	5.95	2,600
	9	7.34	4,050
1937	Aug. 16, 1937	6.80	2,400
	22	7.10	2,300
	28	6.90	2,100
1938	July 28, 1938	7.45	2,200
1939	July 18, 1939	7.05	2,020
	21	7.95	3,020
	Aug. 2	7.5	2,490
	6	8.67	4,030
	13	10.3	7,010
	28	7.5	2,490
1940	Aug. 4, 1940	6.80	1,800
1941	July 21, 1941	7.0	1,980
1942	July 8, 1942	10.9	8,200
	14	7.4	2,400
	24	7.7	2,900
	Aug. 7	9.26	5,100
	9	10.0	6,410
1943	July 19, 1943	7.15	2,120
	30	9.45	5,300
	Aug. 2	7.3	2,270
	13	7.7	2,720
1944	Aug. 15, 1944	9.15	4,700
1945	July 30, 1945	8.35	3,290
1946	July 26, 1946	12.03	7,200
	29	7.55	3,110
	Aug. 3	9.75	5,440
	11	7.75	3,300
	19	9.65	5,320
	Sept. 9	9.30	4,910
1947	Aug. 8, 1947	6.90	2,460
	29	7.05	2,550
1948	Aug. 1, 1948	7.9	3,410
	6	7.5	3,010
	11	7.35	2,730
	15	7.95	2,930
1949	July 3, 1949	7.6	2,750
	17	7.1	2,300
	20	9.9	5,350
	29	7.8	3,310
	Aug. 8	7.7	2,840
	Sept. 14	10.5	6,350
1950	July 7, 1950	6.95	2,210
	17	10.32	5,890
	20	11.16	7,210
	22	9.36	4,670
	31	8.90	4,060
1951	July 28, 1951	7.85	2,840
	Aug. 3	7.95	3,040
1952	July 29, 1952	7.02	2,330
	Aug. 16	7.00	2,000
1953	July 14, 1953	8.25	3,500

v Annual peak; peaks October 1929 to April 1930 not known.
w Annual peak; other peaks January to September 1934 not known.

Gila River Basin

(53) *Sonoita Creek near Patagonia, Ariz.*

Location.--Lat 31°30'00", long. 110°49'00", in SE¼SW¼ sec. 21, T. 22 S., R. 15 E., at site of former railroad bridge at Circle Z Ranch, 5 miles downstream from Patagonia.

Drainage area.--209 sq mi.

Gage.--Recording gage at present site since Apr. 1, 1940. Datum of gage is 3,818.61 ft above mean sea level, datum of 1929. June 21, 1930, to Mar. 5, 1940, recording gage 2,700 ft downstream at datum 18.00 ft lower. June 11-21, 1930, and Mar. 6-31, 1940, staff gages at same site and datum.

Stage-discharge relation.--Defined by current-meter measurements below 3,400 cfs; extended above on basis of slope-area determination at gage height 13.0 ft.

Remarks.--Flood record not affected by small diversions for irrigation and mining above station. Base for partial-duration series, 1,200 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1930	June 22, 1930	6.25	1,540
	July 8	6.75	2,030
	20	6.3	1,590
	26	5.9	1,220
	Aug. 7	7.3	[v] 2,600
1931	Feb. 12, 1931	6.29	1,270
	15	6.5	1,450
	July 28	6.95	1,900
1932	July 26, 1932	6.75	1,700
1933	July 15, 1933	6.0	1,050
1934	Aug. - 1934	[a] 15.2	[c] 11,000
1935	July 18, 1935	9.1	3,900
	Aug. 1	7.25	2,160
	23	9.8	4,700
	28	7.25	2,160
	31	9.55	4,400
	Sept. 23	8.10	3,000
1936	July 7, 1936	7.45	2,540
	9	6.07	1,210
	20	6.06	1,210
	Aug. 7	7.1	2,170
	9	8.36	3,600
1937	July 27, 1937	6.94	2,020
	Aug. 20	6.70	1,770
	Sept. 6	8.70	3,600
1938	Sept. 9, 1938	8.2	3,400
1939	July 30, 1939	7.80	2,700
	Aug. 2	7.90	2,800
	4	6.60	1,550
	8	8.45	3,300
	11	7.4	2,300
	24	6.2	1,200
	Sept. 3	7.10	2,000
1940	July 17, 1940	7.28	1,480
	24	7.12	1,340
	Aug. 13	8.42	2,580
1941	Aug. 9, 1941	8.02	2,150
1942	Sept. 12, 1942	6.7	1,000
1943	July 6, 1943	7.0	1,260
	14	7.67	1,820
	19	7.12	1,340
	Aug. 2	7.80	2,050
	5	7.65	1,900
	28	9.95	4,530
1944	Aug. 9, 1944	6.22	669
1945	July 18, 1945	7.05	1,580
	31	7.85	2,260
	Aug. 1	7.5	1,990
	4	6.91	1,450
	6	8.70	3,140
	10	7.25	1,810
	Sept. 8	6.70	1,270
1946	Oct. 8, 1945	7.08	1,470
	July 3, 1946	7.65	2,100
	Aug. 20	7.65	2,100
	Sept. 10	8.25	2,900
	30	13.0	14,000
1947	July 20, 1947	7.45	1,860
	Aug. 12	7.60	2,360
1948	Aug. 1, 1948	7.25	2,020
	5	7.92	2,880
	9	6.57	1,300
	11	7.70	2,580
	15	9.1	4,750

Gila River Basin

(53) Sonoita Creek near Patagonia, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1949	July 6, 1949	6.7	1,330	1951	Aug. 2, 1951	8.65	5,030
	23	7.7	2,450		14	6.40	1,290
	Aug. 8	9.4	5,790		Sept. 6	6.97	2,200
	Sept. 9	7.20	1,580				
	13	8.20	3,130	1952	Aug. 14, 1952	7.78	3,630
					26	7.00	2,280
1950	July 17, 1950	7.22	1,800				
	20	7.10	1,740	1953	July 6, 1953	7.35	2,780
	22	7.13	2,520		14	7.4	2,870
	30	9.80	7,300		30	7.20	2,510
	Aug. 10	6.46	1,400				

[a] From floodmark.
[c] Annual peak.
[v] Annual peak; peaks prior to June 21 not known.

(54) Santa Cruz River at Continental, Ariz.

Location. --Lat 31°51'10", long. 110°58'40", in NE¼NE¼ sec. 23, T. 18 S., R. 13 E., unsurveyed, in Spanish land grant of San Ignacio de la Canoa, on bridge on U. S. Highway 89 at Continental.

Drainage area. --1,662 sq mi (includes about 395 sq mi in Mexico.)

Gage. --Recording gage May 1940 to December 1946, and since October 1951. Datum of gage is 2,836.74 ft above mean sea level, datum of 1929, adjustment of 1952.

Stage-discharge relation. --Defined by current-meter measurements below 5,200 cfs; extended above on basis of float-area determination at gage height 8.85 ft. Relation subject to shifting.

Remarks. --Flood record unaffected by irrigation diversions above station. Base for partial-duration series, 2,000 cfs.

Gila River Basin

(54) Santa Cruz River at Continental, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 14, 1940	8.85	12,100
1941	July 23, 1941	5.18	3,190
	Aug. 9	5.4	3,670
1942	July 28, 1942	4.95	2,700
	Aug. 9	4.70	2,200
1943	Aug. 1, 1943	5.55	4,000
	4	4.99	2,810
	23	5.14	3,120
	25	4.60	2,010
	28	5.07	3,020
1944	Aug. 8, 1944	5.55	3,860
	12	5.80	4,440
	16	5.30	3,200
1945	Oct. 27, 1944	4.91	2,510
	July 4, 1945	4.80	2,390
	28	6.40	5,910
	29	5.41	3,670
	31	5.13	3,120
	Aug. 1	5.90	4,770
	5	5.42	3,670
	7	4.85	2,500
	9	7.25	7,820
	20	5.82	4,550
	Sept. 8	4.90	2,600
1946	Oct. 8, 1945	5.50	3,670
	July 18	5.48	2,800
	27	6.00	3,860
	Aug. 2	5.78	3,490
	4	5.40	2,590
	20	5.30	2,390
	Sept. 9	5.94	4,120
	27	5.17	2,150
1947	Oct. 1, 1946	6.40	5,330
1952	Aug. 15, 1952	4.20	1,820
1953	July 14, 1953	6.15	4,910
	15	5.0	2,920
	16	6.20	4,910

Gila River Basin

(55) Santa Cruz River at Tucson, Ariz.

Location.--Lat 32°13'15", long. 110°58'50", in NE¼NE¼ sec. 14, T. 14 S., R. 13 E., at Congress Street Bridge in Tucson.

Drainage area.--2,207 sq mi (includes about 395 sq mi in Mexico).

Gage.--Recording gage since Nov. 27, 1929. Datum of gage is 2,327.16 ft above mean sea level, datum of 1929. October 1905 to Nov. 27, 1929, non-recording gages at same site but various datums.

Stage-discharge relation.--Defined by current-meter measurements below 9,000 cfs and extended above. Relation subject to large shifts.

Historical data.--Flood of Dec. 23, 1914, was reported to be the greatest since 1905 (from University of Arizona Technical Bulletin No. 95 and earlier publications).

Remarks.--Flood records unaffected by various small diversions above station. Records prior to December 1925 furnished by University of Arizona, Agricultural Engineering Department. Flood data not available for period prior to water year 1915.

Base for partial-duration series, 1,700 cfs.

Bank-full stage.--15 ft.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1915	Dec. 23, 1914	-	[b]15,000
1916	Jan. 20, 1916	-	[b]5,000
1917	Sept. 8, 1917	-	[b]7,500
1918	Aug. 7, 1918	-	[c]4,900
1919	Aug. 2, 1919	-	[c]4,700
1920	Aug. 9, 1920	-	[c]1,950
1921	Aug. 1, 1921	-	[c]4,000
1922	July 20, 1922	-	[c]2,000
1923	Aug. 17, 1923	-	[c]1,900
1924	Nov. 17, 1923	-	[c]2,050
1925	Sept. 18, 1925	7.5	[c]3,400
1926	Sept. 28, 1926	19.5	[c]11,400
1927	Sept. 7, 1927	15.5	[c]1,950
1928	Aug. 1, 1928	14.6	[c]1,600
1929	Sept. 24, 1929	19.2	[c]10,400
1930	Aug. 7, 1930	8.00	1,770
1931	Feb. 16, 1931	7.67	2,060
	July 30	8.92	3,480
	Aug. 6	7.92	2,170
	10	11.3	9,200
	21	8.87	2,840
1932	July 9, 1932	9.26	4,160
	30	9.27	4,200
	Aug. 9	8.70	3,070
1933	July 24, 1933	8.66	3,000
	Aug. 21	10.1	6,100
	Sept. 10	8.84	3,330
	17	9.35	4,340
1934	Aug. 3, 1934	8.02	1,960
	23	10.07	6,000
	27	8.21	2,250
1935	July 17, 1935	7.76	1,730
	18	7.90	1,900
	Aug. 24	9.42	4,130
	Sept. 1	12.25	10,300
1936	July 26, 1936	10.00	5,400
	Aug. 8	8.00	1,740
1937	July 10, 1937	9.10	3,280
	Aug. 20	7.75	1,900
	24	8.08	1,920
1938	July 25, 1938	7.98	1,920
	Aug. 5	11.70	9,000
	13	8.95	3,080
1939	July 4, 1939	7.9	1,800
	Aug. 3	12.32	8,000
	5	10.72	5,300
	7	11.5	6,650
	14	9.83	3,560
	29	9.92	3,730

Gila River Basin

(55) Santa Cruz River at Tucson, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1940	July 17, 1940	7.76	1,890
	Aug. 14	13.05	11,300
1941	July 23, 1941	7.68	1,740
	Aug. 5	7.76	1,840
	14	8.48	2,490
1942	Aug. 9, 1942	7.19	1,670
1943	Aug. 2, 1943	9.85	4,510
	15	7.45	1,800
	Sept. 24	7.55	1,900
1944	Aug. 8, 1944	7.28	2,100
	13	7.68	2,450
	16	10.40	6,530
	Sept. 15	8.10	3,070
1945	July 28, 1945	8.30	3,740
	30	9.60	5,360
	Aug. 2	7.60	2,450
	10	12.70	10,800
	21	7.60	2,270
1946	July 18, 1946	6.15	2,120
	28	5.90	1,890
	Aug. 4	8.05	4,260
	20	6.28	2,230
	31	7.15	3,180
	Sept. 10	6.75	2,530
	27	6.02	1,790
1947	Oct. 1, 1946	7.20	2,960
1948	Aug. 8, 1948	6.05	2,820
	16	6.9	3,860
	Sept. 27	5.15	1,940
1949	July 23, 1949	5.05	2,010
	Aug. 5	5.60	2,670
	8	6.63	3,800
	Sept. 10	5.00	1,960
	14	5.25	2,210
	15	5.55	2,540
1950	July 8, 1950	5.15	1,800
	18	6.30	4,570
	22	8.10	7,990
	30	8.8	9,490
	Aug. 11	6.0	3,770
	12	5.0	2,340
1951	July 16, 1951	5.20	2,300
	27	4.70	1,900
	Aug. 2	6.51	5,020
1952	Aug. 12, 1952	3.90	1,780
	16	5.10	3,820
	Sept. 20	4.22	2,260
	21	4.17	2,180
1953	July 15, 1953	6.80	5,900
	16	5.7	3,950
	29	4.24	2,000

[6] Annual peak.

Gila River Basin

(56) Tucson Arroyo at Vine Avenue, Tucson, Ariz.

Location. --Lat 32°13'00", long. 110°57'00", in SW¼NE¼ sec. 18, T. 14 S., R. 14 E., at Vine Avenue, a quarter of a mile downstream from Arroyo Chico, and 2½ miles upstream from mouth.

Drainage area. --27.0 sq mi before August 1945 and 23.4 sq mi thereafter.

Gage. --Recording gage and concrete control since June 1944. Datum of gage is 2,411.9 ft above mean sea level (city of Tucson benchmark).

Stage-discharge relation. --Defined by current-meter measurements below 1,800 cfs; extended above on basis of conveyance-extension determination of peak flow at gage height 9.9 ft.

Remarks. --Runoff characteristics of this drainage area have been modified to some extent by cultural development within the period of record.

Base for partial-duration series, 150 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 13, 1940	[a] 9.2	[c] 2,700	1948	July 24, 1948	9.9	4,100
					Aug. 4	5.13	300
1943	Sept. 24, 1943	[a] 9.2	[c] 2,700		Sept. 18	4.64	190
1944	July 22, 1944	6.43	676	1949	Aug. 8, 1949	5.02	198
	Aug. 9	4.47	156		Sept. 13	4.87	212
	16	5.82	486		28	5.56	364
	Sept. 15	6.39	663				
				1950	July 22, 1950	5.18	312
1945	July 28, 1945	6.98	877		30	7.40	1,160
	Aug. 9	6.82	816		Aug. 12	4.56	174
	17	5.64	434		Sept. 7	5.13	300
	21	6.56	719				
				1951	Apr. 19, 1951	4.68	198
1946	July 17, 1946	6.45	682		Aug. 2	6.43	676
	Aug. 3	6.90	850				
	5	4.95	252	1952	Oct. 30, 1951	4.98	263
	Sept. 30	5.93	519		Aug. 14, 1952	6.55	716
					15	8.04	1,780
1947	Nov. 24, 1946	4.42	149				
				1953	July 12, 1953	4.60	182
					14	9.40	3,240
					26	5.56	413

[a] From floodmark.
[c] Annual peak.

Gila River Basin

(57) Sabino Creek near Mount Lemmon, Ariz.

Location.--Lat 32°25'20", long. 110°45'05" in SE¼NW¼ sec. 6, T. 12 S., R. 16 E., 250 ft below Bear Wallow Creek, 1½ miles south of Mount Lemmon post office, and 18 miles northeast of Tucson.

Drainage area.--3.19 sq mi.

Gage.--Recording gage since May 1951. Altitude of gage is 7,250 ft (from topographic map).

Stage-discharge relation.--Defined by current-meter measurements below 50 cfs; extended above on basis of slope-area determination in 1954 at gage height 11.3 ft. Relation is stable.

Remarks.--No regulation and only small diversions for domestic use above station.

Base for partial-duration series, 50 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1951	July 23, 1951	8.5	180	1953	July 8, 1953	8.96	210
	Aug. 2	7.65	126		12	8.94	208
	27	6.4	50		16	9.12	219
					17	7.00	85
1952	Nov. 11, 1951	6.56	59		24	7.09	91
	Dec. 31	8.0	148				
	Jan. 13, 1952	9.8	262				
	18	7.25	100				

Gila River Basin

(58) Sabino Creek near Tucson, Ariz.

Location.--Lat 32°19'00", long. 110°48'35", in SE¼NE¼ sec.9, T. 13 S., R.15 E., half a mile north of Coronado National Forest boundary, 1 3/4 miles upstream from Bear Canyon, and 12 miles northeast of business center of Tucson.

Drainage area.--35.5 sq mi.

Gage.--Recording gage and concrete control since June 27, 1932. Altitude of gage is 2,630 ft (from topographic map by Forest Service).

Stage-discharge relation.--Defined by current-meter measurements. Relation subject to shifting in higher range.

Remarks.--Flood record unaffected by several small dams above station.

Base for partial-duration series, 150 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1932	July 15, 1932	5.45	706
	26	5.00	582
	30	4.82	530
	Aug. 9	3.30	199
	25	3.04	158
1933	Sept. 8, 1933	3.40	215
	10	4.73	510
1934	Aug. 12, 1934	3.13	176
	Sept. 22	4.59	472
1935	Jan. 6, 1935	4.46	439
	Feb. 6	4.85	540
	Aug. 1	3.26	184
	24	3.15	166
	Sept. 2	3.63	252
1936	Jan. 29, 1936	4.69	500
	July 30	3.90	318
	Aug. 9	3.57	254
	Sept. 11	3.95	328
1937	Feb. 7, 1937	6.51	2,020
	16	3.53	233
	Mar. 16	4.50	451
1938	Feb. 27, 1938	3.54	255
	Mar. 3	7.13	3,200
	Aug. 7	3.30	220
	31	3.52	250
1939	Aug. 2, 1939	2.95	152
	6	3.96	385
1940	Feb. 2, 1940	3.99	396
	23	4.98	904
	June 21	4.48	431
1941	Nov. 19, 1940	4.62	483
	Dec. 12	4.38	398
	17	3.38	187
	24	5.70	1,180
	30	7.13	3,180
	Jan. 28, 1941	3.27	172
	Feb. 7	3.41	192
	23	3.21	165
	Mar. 15	4.67	525
	July 24	4.38	516
	Sept. 28	3.68	282
1942	Nov. 13, 1941	4.19	398
	Dec. 11	3.87	291
	Feb. 28, 1942	4.23	414
	Sept. 10	4.34	449
1943	Mar. 5, 1943	4.56	567
	Aug. 4	3.40	212
	6	3.25	182
	14	3.14	163
1944	July 8, 1944	3.31	175
	Aug. 9	3.28	170
1945	July 29, 1945	4.37	484
	30	5.15	916
	Aug. 9	3.30	192
	Sept. 8	4.04	375
1946	Oct. 9, 1945	3.43	219
	Aug. 23, 1946	6.30	2,000
	31	3.46	225
1947	Dec. 26, 1946	3.47	227
1948	Aug. 6, 1948	4.06	380
	11	3.30	192

Gila River Basin

(58) Sabino Creek near Tucson, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1949	Dec. 27, 1948	5.15	916	1952	Oct. 30, 1951	4.96	675
	Jan. 9, 1949	3.88	277		Nov. 11	5.90	1,290
	13	4.41	461		Dec. 31	6.05	1,410
	July 30	3.57	250		Jan. 13, 1952	6.25	1,640
	Aug. 8	5.78	1,430		18	4.93	675
	Sept. 13	4.22	430		Mar. 18	3.32	161
					Aug. 24	3.38	169
1950	July 7, 1950	6.50	2,260				
	Aug. 23	4.25	440	1953	July 16, 1953	5.31	861
					24	3.19	157
1951	July 23, 1951	4.1	340				
	Aug. 2	5.11	750				
	27	4.12	346				

[a] Peaks prior to June 27, 1932 not known.

(59) Rillito Creek near Wrightstown, Ariz.

Location.--Lat 32°15'55", long. 110°50'25", in NE¼NE¼ sec. 31, T. 13 S., R. 15 E., at highway bridge 1 mile downstream from Sabino Creek, 2 miles upstream from Pantano Wash, and 3½ miles northwest of Tucson.

Drainage area.--221 sq mi.

Gage.--Recording gage since June 21, 1940. Altitude of gage is 2,460 ft (from topographic map).

Stage-discharge relation.--Defined by current-meter measurements. Relation subject to shifting.

Remarks.--No significant regulation or diversion above station.

Base for partial-duration series, 400 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Feb. 23, 1940	-	[b]700	1942	Dec. 12, 1941	4.09	536
	Aug. 13	7.8	6,400		Feb. 28, 1942	4.12	639
1941	Dec. 12, 1940	4.25	995	1943	Mar. 5, 1943	4.59	1,090
	25	5.33	2,140		Aug. 15	4.53	1,070
	30	7.85	9,000				
	Jan. 28, 1941	4.60	906	1944	July 22, 1944	3.94	547
	Feb. 7	5.24	1,800		Aug. 9	4.20	825
	23	4.11	507				
	Mar. 15	4.84	1,540	1945	July 29, 1945	3.76	411
	July 23	4.67	1,020		Aug. 9	3.97	573

[b] Estimated.

Gila River Basin

(60) Rillito Creek near Tucson, Ariz.

Location. --Lat 32°17'40", long. 110°59'05", in SW¼SE¼ sec. 14, T. 13S., R. 13 E., 1,100 ft downstream from Pima Canyon, 2,300 ft downstream from bridge on U. S. Highway 89, 4 3/4 miles upstream from mouth, and 5 miles north of Tucson.

Drainage area. --918 sq mi; prior to July 1945, 904 sq mi.

Gage. --Recording gage at present site since July 19, 1945. Datum of gage is 2,288.23 ft above mean sea level, datum of 1929, supplementary adjustment of 1949. October 1908 to July 19, 1945, recording gage (after July 25, 1930), or staff gages at site of former highway bridge 1,800 ft upstream at various datums.

Stage-discharge relation. --Defined by current-meter measurements below 12,000 cfs, and extended above on basis of area-velocity studies. Relation subject to large shifts.

Historical data. --Flood of Dec. 23, 1914 was the greatest known in period 1908-15.

Remarks. --Flood record not affected by small irrigation diversions above station. *Records prior to 1926 were* furnished by University of Arizona, Agricultural Engineering Department, and reviewed by U.S.G.S.

Base for partial-duration series, 1,000 cfs.

Bank full stage. --6 ft, present site and datum.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1915	Dec. 23, 1914	7.75	*17,000	1931	Feb. 16, 1931	6.6	1,840
					Aug. 6	7.16	3,110
1916	Jan. 19, 1916	6.5	7,620		8	8.17	6,120
					10	8.45	7,200
1917	Aug. 11, 1917	-	10,000		14	6.35	1,090
					20	6.9	2,080
1918	Mar. 1, 1918	-	5,300				
				1932	Nov. 22, 1931	7.10	2,550
1919	July 27, 1919	-	9,250		Feb. 10, 1932	6.86	1,970
					July 8	6.90	2,060
1920	Feb. 21, 1920	-	7,800		29	8.7	7,200
1921	July 31, 1921	-	16,000	1933	Oct. 12, 1932	7.13	2,630
					Sept. 10, 1933	7.65	4,400
1922	Aug. 9, 1922	7.0	3,250				
				1934	July 17, 1934	7.25	3,000
1923	Aug. 26, 1923	-	4,000		Aug. 23	7.2	2,820
1924	Dec. 26, 1923	6.3	1,980	1935	Jan. 6, 1935	7.4	2,420
					Feb. 8	6.69	1,050
1925	Sept. 17, 1925	-	3,500		July 31	7.58	2,640
					Aug. 24	8.45	4,850
1926	Sept. 27, 1926	17.7	1,750		31	10.18	13,400
1927	Sept. 12, 1927	18.2	2,200	1936	Jan. 30, 1936	6.71	1,130
					July 26	6.97	1,270
1928	Aug. 1, 1928	19.0	4,500		Aug. 9	8.0	3,210
					17	8.25	4,500
1929	Sept. 23, 1929	24.0	24,000				
				1937	Feb. 7, 1937	7.53	2,280
1930	Mar. 17, 1930	17.0	1,920		Aug. 17	7.85	2,980
	July 9	17.0	1,310				
	13	17.0	1,030	1938	Mar. 4, 1938	7.54	3,000
	20	7.4	4,540				
	22	6.35	1,670	1939	July 2, 1939	8.75	6,100
	25	6.9	2,910		Aug. 3	9.45	9,710
	Aug. 8	7.76	4,600		14	7.5	1,310
	Sept. 7	7.14	2,660				

Gila River Basin

(60) Rillito Creek near Tucson, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	June 23, 1940	7.8	2,810	1947	Aug. 8, 1947	6.10	5,740
	Aug. 13	10.30	13,200		12	4.80	3,530
	Sept. 12	7.83	1,760		15	9.92	7,660
1941	Dec. 25, 1940	7.63	1,300	1948	Sept. 26, 1948	2.75	779
	31	9.70	9,900				
	Feb. 7, 1941	7.74	1,540	1949	Sept. 13, 1949	3.00	1,300
	Mar. 15	7.67	1,320		15	3.23	1,640
	Aug. 7	9.15	1,040				
	Sept. 18	7.38	1,640	1950	June 23, 1950	3.70	1,510
					July 19	3.25	1,110
1942	Sept. 14, 1942	7.6	1,600		21	3.85	1,710
					23	4.85	3,480
1943	Aug. 2, 1943	7.47	1,340		30	6.90	9,490
	4	7.27	1,070				
	15	8.45	3,850	1951	July 25, 1951	6.93	9,500
	25	7.81	1,710		Aug. 2	4.55	4,200
					13	3.40	2,280
1944	July 23, 1944	7.73	1,670				
	Aug. 9	8.51	4,100	1952	Nov. 11, 1951	2.97	1,630
1945	Aug. 10, 1945	5.95	7,000	1953	July 14, 1953	2.80	1,300
	22	3.0	1,010		16	5.20	5,470
1946	Aug. 4, 1946	3.75	1,560				
	23	3.85	2,000				
	29	3.42	1,300				
	31	5.03	4,160				

‡ Maximum for period 1908-15.

Note. --Annual peaks only for water years 1915 to 1929.

Gila River Basin

(61) Santa Cruz River at Cortaro, Ariz.*

Location.--Lat 32°21'10", long. 111°05'45", in SW¼SW¼ sec. 26, T. 12 S., R. 12 E., half a mile southwest of Cortaro, 3 miles downstream from Canada del Oro, and 4 miles downstream from Rillito Creek.

Drainage area.--3,503 sq mi; 53 sq mi greater at site in use October 1939 to June 1947.

Gage.--Recording gage at present site since July 8, 1950. Datum of gage is 2,137.13 ft above mean sea level (Arizona Highway Department benchmark).

Prior to Mar. 13, 1941, recording gage and auxiliary staff gages 4 3/4 miles downstream. Datum of gage is 2,053.43 ft above mean sea level, datum of 1929.

Mar. 14, 1941, to June 30, 1947, recording gage 4 3/4 miles downstream (850 ft upstream from preceding gage) at datum 1.10 ft lower.

Stage-discharge relation.--Defined by current-meter measurements below 14,000 cfs at site in use prior to July 8, 1950. Relation at present site defined by current-meter measurements below 7,200 cfs, and extended above by logarithmic plotting. Relations at both sites subject to shifting.

Remarks.--Flood record not affected by municipal and irrigation diversions above station.

Base for partial-duration series, 2,700 cfs.

Bank-full stage.--10 ft, present site and datum.

*Published as "at Rillito", 1940-47.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 14, 1940	9.9	17,000	1946	Aug. 4, 1946	10.85	4,440
					31	10.6	3,600
1941	Dec. 31, 1940	8.52	7,800		Sept. 10	10.34	2,790
	Aug. 8, 1941	12.1	6,000				
	9	10.7	2,720	1947	Aug. 15, 1947	11.8	7,500
	14	11.0	2,740				
				1950	June 22, 1950	-	[b]4,000
1942	Aug. 9, 1942	10.90	1,550		July 19	5.90	4,040
					21	6.3	5,920
1943	Aug. 2, 1943	11.3	4,080		22	7.60	8,280
	14	11.16	4,110		24	6.8	6,130
	15	11.33	4,670		30	9.1	12,900
	23	10.9	3,220		Aug. 12	4.9	3,640
	Sept. 24	11.75	5,500				
	26	10.48	2,710	1951	July 17, 1951	4.32	2,700
					25	6.50	6,820
1944	July 22, 1944	11.0	3,270		Aug. 2	5.48	4,560
	Aug. 8	11.35	4,890				
	16	11.60	5,650	1952	Aug. 14, 1952	6.2	6,100
	Sept. 16	11.15	4,310		16	5.2	3,810
1945	July 28, 1945	11.3	4,740	1953	July 14, 1953	8.10	10,800
	30	11.1	4,600		16	6.1	5,900
	Aug. 2	10.7	3,360				
	10	13.25	14,000				
	21	10.1	2,850				

[b] Estimated.

Gila River Basin

(62) Santa Cruz River near Laveen, Ariz.

Location. --Lat 33°14', long. 112°10', in NE¼NE¼ sec. 29, T. 2 S., R. 2 E., on Gila River Indian Reservation, at highway bridge 3 miles south of Komatke, 9 miles upstream from mouth, and 9½ miles south of Laveen.

Drainage area. --8,581 sq mi.

Gage. --Recording gage since Feb. 11, 1940. Datum of gage is 1,020.86 ft above mean sea level, datum of 1929, Phoenix-Picacho supplementary adjustment of 1949.

Stage-discharge relation. --Main channel relation defined by current-meter measurements. High stage flow in by-pass channel is estimated. Relation subject to shifts.

Remarks. --*Flood record affected* by spreading operations and diversions above station for irrigation.

Base for partial-duration series, 380 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 17, 1940	7.68	743	1946	Oct. 5, 1945	6.87	390
	Sept. 18	9.30	1,200		July 18, 1946	9.50	840
					Sept. 21	16.70	5,020
1941	Nov. 20, 1940	6.87	536				
	Jan. 2, 1941	9.08	1,230	1948	Aug. 7, 1948	11.85	[c] 1,200
	Mar. 2	6.12	384				
	6	7.05	548	1949	Aug. 6, 1949	12.58	1,400
	15	10.03	1,580		Sept. 11	9.56	565
	Apr. 13	8.05	908		15	12.59	1,280
	July 25	8.32	950		17	13.61	1,780
	Aug. 7	7.50	720				
	30	5.97	384	1950	Aug. 3, 1950	8.36	428
					11	10.20	685
1942	Dec. 11, 1941	6.11	413				
	Jan. 2, 1942	5.97	384	1951	July 28, 1951	9.50	502
	July 15	11.61	1,890		Aug. 4	13.83	1,510
	Aug. 5	7.19	551		7	15.73	2,810
					15	9.70	527
1943	Aug. 1, 1943	6.42	390		28	17.00	5,060
	18	7.02	480				
	Sept. 25	7.46	563	1952	July 28, 1952	11.57	805
	28	10.01	1,200		Aug. 15	14.38	1,860
1944	Feb. 25, 1944	5.10	217	1953	Nov. 16, 1952	9.54	425
					18	10.46	538
1945	July 31, 1945	7.61	488		July 17, 1953	9.05	380
	Aug. 3	8.28	592		17	10.43	555
	11	10.79	1,200				

[c] Annual peak.

Gila River Basin

(63) White River near McNary, Ariz.

Location. --Lat 34°02'45", long. 109°44'15", in E½ sec. 31, T. 8 N., R. 25 E., unsurveyed, on Fort Apache Indian Reservation, 2 miles downstream from Paradise Creek, 6 3/4 miles southeast of McNary, and 47½ miles upstream from confluence with Black River.

Drainage area. --66 sq mi, approximately.

Gage. --Recording gage since June 1945. Altitude of gage is 7,750 ft (from Indian Irrigation Service river-profile map).

Stage-discharge relation. --Defined by current-meter measurements below 550 cfs and extended above by logarithmic plotting. Relation stable.

Remarks. --No storage above station. One small canal diverting about 5 miles upstream has no effect on flood records.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1946	Sept. 19, 1946	5.36	1,290	1951	Aug. 28, 1951	2.13	167
1948	Apr. 16, 1948	5.02	[e]1,120	1952	Apr. 6, 1952	4.10	748
1949	Apr. 15, 1949	3.70	656	1953	Mar. 29, 1953	2.03	152
1950	[b]	[a]2.23	188				

[a] From floodmark.
[b] March or April 1950
[e] Maximum observed, may have been exceeded about Apr. 12.
Note. --Only annual peaks listed because of incomplete records in 1947-1950.

(64) Salt River near Chrysotile, Ariz.

Location. --Lat. 33°48', long. 110°30' in sec. 25, T. 5 N., R. 17 E., unsurveyed, on San Carlos Indian Reservation, 1,200 ft upstream from bridge on U. S. Highway 60, 5½ miles northeast of Chrysotile, 8 miles upstream from Cibecue Creek, and 33 miles downstream from confluence at Black and White Rivers.

Drainage area. --2,850 sq mi, approximately.

Gage. --Staff gage Sept. 18 to Oct. 1, 1924, and recording gage thereafter. Datum of gage is 3,354.57 ft above mean sea level, datum of 1929.

Stage-discharge relation. --Defined by current-meter measurements below 52,000 cfs, and extended above by logarithmic plotting.

Historical data. --Flood peak of 74,000 cfs (gage height, 18 ft, from floodmark) is believed to be flood of Jan. 19, 1916.

Remarks. --Flood record not materially affected by regulation and diversions above station.

Base for partial-duration series 3,500 cfs.

Gila River Basin

(64) Salt River near Chrysotile, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 19, 1916	[a] 18	74,000
1925	Mar. 8, 1925	6.5	6,930
	Sept. 3	5.38	4,400
1926	Mar. 30, 1926	5.15	4,000
	Apr. 6	8.5	13,600
	20	5.28	4,230
	29	5.82	5,270
	May 6	5.62	4,810
	July 11	7.51	9,930
	Sept. 26	5.10	3,920
1927	Feb. 17, 1927	9.9	19,900
	Mar. 15	5.33	4,240
	Sept. 17	8.78	7,750
1928	July 21, 1928	3.58	1,670
1929	Apr. 5, 1929	7.93	11,400
	July 29	5.96	5,420
	Aug. 8	4.98	3,730
	12	6.28	6,370
	Sept. 23	7.95	11,500
1930	Mar. 17, 1930	7.47	9,930
	July 9	6.04	5,820
	Aug. 11	8.0	11,700
1931	Feb. 15, 1931	6.67	7,400
	Aug. 7	5.90	5,550
	Sept. 19	5.92	5,590
1932	Oct. 2, 1931	6.25	6,240
	Feb. 10, 1932	13.3	40,000
	20	6.7	7,460
	Mar. 2	5.50	4,620
	20	4.88	3,550
	Apr. 5	5.58	4,770
	July 25	5.24	4,150
	30	5.0	3,740
1933	Feb. 28, 1933	4.40	2,880
1934	Aug. 4, 1934	6.08	3,760
	20	6.20	3,850
1935	Jan. 12, 1935	6.52	5,340
	16	6.05	4,140
	Feb. 7	8.60	14,000
	11	6.50	5,870
	15	5.58	3,760
	Mar. 15	5.90	4,200
	Apr. 9	9.00	15,700
	Aug. 29	5.70	4,020
1936	Feb. 17, 1936	8.40	13,200
	Mar. 24	5.57	4,040
	Apr. 15	5.82	4,570
1937	Feb. 7, 1937	15.18	52,900
	17	5.86	5,050
	Mar. 14	6.45	6,430
	17	7.41	9,700
	Apr. 16	6.14	5,700
1938	Mar. 4, 1938	9.68	19,000
	Aug. 5	5.51	4,400
	13	6.55	6,700
1939	Apr. 5, 1939	7.10	8,530
1940	Aug. 15, 1940	6.40	6,300
	Sept. 29	5.08	3,730
1941	Dec. 13, 1940	6.98	8,340
	25	10.36	22,500
	31	8.52	13,600
	Jan. 12, 1941	8.76	14,900
	29	6.85	7,750
	Feb. 8	5.92	5,490
	28	6.68	7,470
	Mar. 3	5.01	3,710
	14	15.08	52,200
	Apr. 3	6.45	6,670
	14	6.17	6,060
	May 6	7.12	8,640
	Aug. 10	6.19	6,180
	Sept. 29	6.33	6,420
1942	Dec. 13, 1941	5.16	3,980
	Jan. 13, 1942	5.89	5,380
	Apr. 6	5.25	4,070
1943	Jan. 24, 1934	8.2	12,400
	Mar. 5	8.32	12,800
	Sept. 26	5.54	4,750
1944	Oct. 19, 1943	4.14	2,380
1945	Mar. 27, 1945	5.41	4,450
	Apr. 23	5.36	4,360
1946	Oct. 8, 1945	5.48	4,650
	Sept. 19, 1946	7.44	9,600
1947	Sept. 18, 1947	6.97	8,160
1948	Oct. 14, 1947	5.24	3,970
	Apr. 12, 1948	6.04	5,730
1949	Jan. 14, 1949	8.65	14,200
	Mar. 8	5.50	4,510
	Apr. 16	5.40	4,310
	24	5.23	3,990
	July 23	5.64	4,790
	Aug. 8	5.66	4,840
1950	July 21, 1950	4.28	2,500
1951	Aug. 29, 1951	5.79	5,150
1952	Dec. 31, 1951	12.3	33,600
	Jan. 14, 1952	15.0	51,500
	18	14.9	50,800
	Mar. 19	5.01	3,680
	Apr. 8	6.25	6,100
	17	5.79	5,200
	28	7.00	8,270
1953	July 30, 1953	5.01	3,680

[a] From floodmark.

Gila River Basin

(65) Salt River near Roosevelt, Ariz.

Location.--Lat 33°37', long. 110°55', in NE¼ sec. 9, T. 3 N., R. 14 E., unsurveyed, 100 ft downstream from bridge on Globe-Young highway, a quarter of a mile downstream from Pinal Creek, 1 mile upstream from diversion dam for power canal, 14 miles east of village of Roosevelt, and 17 miles upstream from Roosevelt Dam.

Drainage area.--4,310 sq mi, approximately.

Gage.--Staff gage prior to Jan. 17, 1935. Recording gage thereafter. Datum of gage is 2,177.14 ft above mean sea level, datum of 1929.

Stage-discharge relation.--Defined by current-meter measurements below 55,000 cfs and extended above on basis of velocity-area studies and float-area measurements at 66,000 cfs and 102,000 cfs. Relation subject to moderate shifting.

Historical data.--Flood of Jan. 19, 1916, about 100,000 cfs by computation of flow past Roosevelt Dam, was the greatest known since 1906, and has been exceeded only in 1941 and 1952.

Remarks.--Flood record not significantly affected by regulation and diversions above station.

Base for partial-duration series 4,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	Jan. 19, 1916	-	100,000
1925	Mar. 9, 1925	7.2	[c] 9,000
1926	Apr. 7, 1926	13.0	[c] 21,000
1927	Feb. 18, 1927	16.5	[c] 40,000
1928	Feb. 5, 1928	6.5	[c] 2,600
1929	Sept. 23, 1929	13.0	[c] 15,000
1930	Mar. 17, 1930	11.5	[c] 8,300
1931	Feb. 15, 1931	14.0	[c] 22,000
1932	Feb. 10, 1932	22	[c] 57,000
1933	Feb. 28, 1933	7.8	[c] 4,200
1934	Aug. 4, 1934	9.0	[c] 5,500
1935	Jan. 13, 1935	9.87	6,180
	16	9.13	4,850
	Feb. 7	13.43	15,100
	15	8.30	4,340
	Mar. 3	8.96	5,870
	15	8.96	5,530
	Apr. 9	12.94	15,200
	Aug. 1	8.25	4,420
1936	Feb. 17, 1936	12.60	13,800
	Mar. 24	8.48	4,660
	Apr. 16	8.70	4,820
1937	Feb. 7, 1937	23.4	88,000
	17	12.53	6,470
	Mar. 14	14.09	11,200
	17	15.64	19,700
	Apr. 17	11.43	5,890
1938	Mar. 4, 1938	16.38	24,100
	Aug. 5	12.19	8,300
	14	10.95	5,700
1939	Apr. 5, 1939	12.35	9,050
1940	July 16, 1940	10.80	4,610
1941	Dec. 13, 1940	13.75	11,600
	25	17.93	31,600
	31	16.79	24,900
	Jan. 11, 1941	17.44	31,600
	29	12.82	8,620
	Feb. 8	12.10	6,290
	26	12.99	8,350
	Mar. 2	12.42	6,540
	14	24.4	117,000
	Apr. 3	13.26	8,350
	14	12.81	7,300
	May 8	13.78	9,520
	Aug. 10	12.11	6,540
	Sept. 29	12.36	6,290
1942	Jan. 13, 1942	11.80	5,140
1943	Jan. 24, 1943	14.75	14,700
	Mar. 5	15.75	16,500
	Sept. 26	11.38	4,770
1944	Sept. 26, 1944	10.60	4,560
1945	Mar. 27, 1945	11.30	5,450
	Apr. 24	10.94	4,860
1946	Sept. 19, 1946	15.62	15,100
1947	Sept. 19, 1947	12.88	6,170
1948	Apr. 13, 1948	12.16	5,960

Gila River Basin

(65) Salt River near Roosevelt, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1949	Jan. 10, 1949	12.51	6,340	1952	Dec. 31, 1951	20.03	42,300
	14	16.45	15,500		Jan. 14, 1952	22.80	74,100
	Mar. 8	12.42	5,000		18	25.3	111,000
	Apr. 17	11.98	4,260		Mar. 16	13.20	4,790
	July 24	11.65	4,120		Apr. 9	13.93	6,980
	Aug. 9	12.29	4,740		21	13.72	6,370
1950	July 21, 1950	12.47	5,930		28	14.47	9,050
				1953	Mar. 9, 1953	12.25	4,320
1951	Aug. 2, 1951	13.40	7,070				
	28	18.10	27,600				

[a] Annual peak.

(66) Tonto Creek above Gun Creek, near Roosevelt, Ariz.

Location.--Lat 33°59', long. 111°18', in NE¼SW¼ sec. 2, T. 7 N., R. 10 E., in Tonto National Forest, 600 ft upstream from Gun Creek, and 23½ miles northwest of village of Roosevelt Dam.

Drainage area.--675 sq mi.

Gage.--Recording gage since Jan. 29, 1941. Datum of gage is 2,523.14 ft above mean sea level, datum of 1929. Dec. 21, 1940 to Jan. 28, 1941, staff gage 30 ft upstream.

Stage-discharge relation.--Defined by current-meter measurements below 7,700 cfs and extended on basis of slope-area determination of 1941 peak for period prior to 1951. Validity of relations used confirmed by slope of rating developed in 1951 defined by current-meter measurements below 27,000 cfs and extended by logarithmic plotting. Relation subject to large shifts.

Remarks.--Flood record unaffected by small diversions above station.

Base for partial-duration series, 1,700 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1941	Dec. 18, 1940	#4.75	2,010	1947	Nov. 15, 1946	6.52	1,930
	25	[a]14.0	26,700		Dec. 28	8.78	7,130
	30	11.2	14,200		Aug. 16, 1947	7.10	2,800
	Feb. 7, 1941	7.02	2,840		21	6.39	1,780
	25	6.72	2,530				
	Mar. 2	8.87	6,610	1948	July 26, 1948	7.32	3,240
	5	6.91	2,680				
	14	15.1	32,000	1949	Dec. 23, 1948	6.95	2,540
	Apr. 3	6.95	2,600		28	6.45	1,770
	13	9.14	7,530		Jan. 13, 1949	9.60	9,890
	May 2	10.18	10,600		25	6.76	2,140
1942	Dec. 11, 1941	5.86	1,250	1950	July 7, 1950	[b]7.0	2,500
					16	8.25	5,500
1943	Jan. 24, 1943	8.52	5,730				
	Mar. 5	11.6	15,800	1951	Aug. 28, 1951	14.10	31,100
1944	Feb. 24, 1944	7.29	2,990	1952	Dec. 31, 1951	14.4	33,900
	Mar. 2	6.75	1,990		Jan. 14, 1952	7.30	3,560
	14	6.78	1,880		18	16.55	45,400
					Mar. 2	6.35	3,360
1945	Mar. 10, 1945	6.70	1,750		15	6.15	2,900
	16	7.29	2,760		Apr. 20	6.50	2,540
	25	7.01	2,280		29	6.24	2,100
	Aug. 11	8.5	5,320				
	17	7.18	2,780	1953	July 30, 1953	6.79	2,620
1946	Aug. 24, 1946	7.49	3,000				
	26	6.78	1,880				
	Sept. 18	9.60	10,200				

[a] From floodmarks.
[b] Estimated.
Computed from staff gage record at site 10 miles downstream from Gun Creek.

Gila River Basin

(67) Granite Creek near Prescott, Ariz.

Location.--Lat 34°34', long. 112°27', in SW¼ sec. 26, T. 14 N., R. 2 W., unsurveyed, at bridge on U. S. Highway 89, 2 miles north of Prescott, 3 miles upstream from dam forming Watson Lake, and 4½ miles upstream from Willow Creek.

Drainage area.--39.6 sq mi.

Gage.--Recording gage since July 21, 1932. Datum of gage is 5,207.3 ft above mean sea level (Arizona Highway Department benchmark).

Stage-discharge relation.--Defined by current-meter measurements below 1,400 cfs; extended above. Relation subject to large shifts.

Remarks.--Records for period July 1941 to February 1945 furnished by Bureau of Reclamation.

Flood record unaffected by small diversions above station for municipal use.

Base for partial-duration series, 200 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1932	Aug. 25, 1932	6.0	[e] 250	1940	Sept. 29, 1940	4.36	83
1933	Sept. 7, 1933	5.89	230	1941	Oct. 5, 1940	5.55	530
					Dec. 24	5.71	616
1934	Aug. 4, 1934	6.61	390		Feb. 21, 1941	5.50	487
	17	6.8	413		Mar. 1	7.00	1,530
	30	7.15	450		14	5.65	579
					Apr. 13	5.52	499
1935	Feb. 7, 1935	7.96	[b] 500		Sept. 13	5.55	411
	Aug. 25	6.6	290				
	30	7.75	600	1942	July 14, 1942	6.55	1,080
					Aug. 4	5.9	610
1936	July 31, 1936	6.4	247		17	6.95	1,110
	Sept. 11	7.41	500				
				1943	Jan. 23, 1943	6.25	750
1937	Feb. 7, 1937	9.20	2,900		Mar. 5	5.65	500
	14	7.56	1,420		Aug. 7	6.30	780
	Mar. 17	7.19	1,290		28	7.3	1,780
	Aug. 14	7.95	1,670				
				1944	Mar. 14, 1944	5.34	297
1938	Mar. 3, 1938	8.70	2,400				
	12	5.68	370	1945	Mar. 15, 1945	7.18	1,670
	Aug. 4	6.40	646		July 30	6.29	828
	Sept. 16	6.0	227		Aug. 10	8.20	2,200
1939	Aug. 4, 1939	6.45	638	1946	Dec. 23, 1945	6.21	455
	14	6.12	462		July 20, 1946	6.88	899
	Sept. 6	5.47	220		Aug. 10	5.58	202
	9	5.73	322		20	6.87	891
					24	6.09	397
				1947	July 21, 1947	5.72	251

[b] Estimated.
[e] Incomplete year; peaks prior to July 1 unknown.

Gila River Basin

(68) Oak Creek near Cornville, Ariz.

Location. --Lat 34°46', long. 111°53', in SE¼ sec. 14, T. 16 N., R. 4 E., at county highway bridge 0.2 mile upstream from Page Springs, 4 miles northeast of Cornville, and 15 miles upstream from mouth.

Drainage area. --357 sq mi.

Gage. --Recording gage since July 1940. Altitude of gage is 3,470 ft (from topographic map).

Stage-discharge relation. --Defined by current-meter measurements. Relation subject to shifting.

Historical data. --The highest stage known is that of Mar. 3, 1938, gage height 23 ft (from floodmarks), discharge unknown.

Remarks. --Flood record unaffected by irrigation diversions above station.

Base for partial-duration series, 1,300 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1938	Mar. 3, 1938	[a]23	-	1946	[b]	[a]5.25	1,200
				1947	-	-	-
1941	Oct. 5, 1940	6.8	4,100				
	Dec. 17	5.74	2,180	1948	July 26, 1948	4.71	605
	25	6.42	3,300				
	Feb. 21, 1941	6.57	3,410	1949	Mar. 20, 1949	6.18	1,470
	24	6.29	2,870		Apr. 9	6.70	1,840
	Mar. 1	6.8	3,980		Sept. 9	7.15	2,260
	14	7.36	5,280				
	Apr. 5	5.31	1,420	1950	Oct. 19, 1949	10.5	6,400
	16	6.75	3,860		Feb. 7, 1950	6.11	1,670
					27	5.77	1,390
1942	Oct. 13, 1941	6.17	2,580				
	Nov. 18	5.77	1,940	1951	Aug. 29, 1951	8.12	3,440
	Apr. 5, 1942	5.76	1,940				
	Aug. 10	5.64	1,810	1952	Dec. 30, 1951	14.5	17,200
					Jan. 18, 1952	9.35	7,240
1943	Mar. 4, 1943	6.29	2,530		Apr. 7	6.15	1,920
	10	6.72	3,640		Aug. 20	5.60	1,360
1944	Apr. 6, 1944	6.15	2,180	1953	July 14 and Aug. 28, 1953	5.10	858
	14	5.79	1,630				
1945	Mar. 16, 1945	6.30	1,500				
	Apr. 2	5.89	1,620				
	9	5.75	1,440				
	19	6.42	2,370				
	July 30	7.80	6,020				
	Aug. 9	7.75	5,850				

[a] From floodmark.
[b] Date unknown but is believed to be highest peak in water years 1946 and 1947.

Gila River Basin

(69) Verde River near Camp Verde, Ariz.

Location. --Lat 34°27', long. 111°47', in sec. 1, T. 12 N., R. 5 E., unsurveyed, 750 ft upstream from Chasm Creek, 800 ft downstream from Camp Verde dam site, and 9 miles southeast of Camp Verde.

Drainage area. --5,024 sq mi (includes 373 sq mi in Aubrey Valley Playa, a closed basin).

Gage. --Recording gage since Apr. 1, 1934. Datum of gage is 2,874.1 ft above mean sea level, datum of 1929.

Stage-discharge relation. --Defined by current-meter measurements below 32,000 cfs; extended above on basis of slope-area determination at gage height 26.1 ft, and comparison with other stations on Verde River. Relation subject to shifting.

Remarks. --Flood record unaffected by irrigation diversions above station.

Base for partial-duration series, 4,000 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1934	July 17, 1934	10.82	5,500	1941	Oct. 5, 1940	11.8	11,100
					Dec. 12	8.94	4,540
1935	Feb. 7, 1935	11.70	6,990		25	12.15	11,900
	Mar. 15	11.92	7,040		Jan. 1, 1941	8.71	4,070
	Apr. 9	13.43	11,500		Feb. 12	8.73	4,160
	Aug. 30	11.27	5,100		16	9.57	5,860
	Sept. 27	11.38	5,320		21	13.14	14,600
					25	10.73	8,370
1936	Feb. 24, 1936	12.17	6,820		Mar. 2	14.47	19,000
					14	16.85	30,000
1937	Feb. 7, 1937	19.9	41,700		Apr. 3	9.24	5,030
	15	16.5	25,700		16	13.2	14,100
	Mar. 14	12.02	10,100				
	17	15.2	19,100	1942	Oct. 13, 1941	9.68	6,080
					Mar. 5, 1942	12.25	11,600
1938	Feb. 28, 1938	13.08	12,300				
	Mar. 3	26.1	97,000	1943	Mar. 11, 1943	10.40	6,740
	13	9.84	7,230				
	Aug. 13	11.00	10,200	1944	Mar. 14, 1944	9.73	5,160
					26	9.55	4,860
1939	Aug. 4, 1939	10.88	9,720		Apr. 14	9.29	4,400
	Sept. 7	11.22	10,700				
	13	13.04	16,100	1945	Mar. 16, 1945	11.18	8,380
1940	Feb. 27, 1940	9.40	6,040				
	Aug. 4	10.2	7,560				

(70) Verde River below East Verde River, near Pine, Ariz.

Location. --Lat 34°16', long 111°41', in sec. 30, T. 11 N., R. 7 E., unsurveyed, 2½ miles downstream from East Verde River and 15 miles southwest of Pine.

Drainage area. --5,623 sq mi.

Gage. --Recording since July 4, 1934. Datum of gage is 2,401.6 ft above mean sea level, datum of 1929.

Stage-discharge relation. --Defined by current-meter measurements below 27,000 cfs; extended above on basis of slope-area determination at gage height 24.7 ft. Relation subject to shifting.

Remarks. --Flood record unaffected by irrigation diversions or power plant above station.

Base for partial-duration series, 5,000 cfs.

Gila River Basin

(70) Verde River below East Verde River, near Pine, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1934	July 17, 1934	9.45	3,400	1939	Sept. 7, 1939	11.98	10,700
					13	13.90	19,300
1935	Feb. 7, 1935	11.60	10,400				
	Mar. 15	10.80	7,460	1940	Feb. 27, 1940	10.42	5,290
	Apr. 9	11.76	10,500		Aug. 4	10.83	6,630
1936	Feb. 24, 1936	11.74	11,000	1941	Oct. 5, 1940	12.27	11,900
					Dec. 12	10.46	5,570
1937	Feb. 7, 1937	20.6	68,600		25	13.54	18,900
	15	15.25	29,600		31	10.63	6,670
	Mar. 14	11.71	11,500		Feb. 16, 1941	10.30	5,630
	16	15.32	30,000		21	13.30	17,900
					25	11.50	9,700
1938	Feb. 28, 1938	12.26	13,700		Mar. 2	14.04	21,600
	Mar. 3	24.7	110,000		14	18.2	49,700
	13	11.01	7,110		Apr. 2	10.83	7,840
	Aug. 13	11.24	7,950		13	13.12	17,400
					16	13.32	18,400

(71) Verde River below Tangle Creek, above Horseshoe Dam, Ariz.*

Location.--Lat 34°04'25", long. 111°42'50", in sec. 35, T. 9 N., R. 6 E., unsurveyed, in Tonto National Forest, $1\frac{1}{4}$ miles downstream from Tangle Creek, and 9 miles upstream from Horseshoe Dam.

Drainage area.--6,650 sq mi, approximately, prior to 1925; 6,210 sq mi 1925-38; 6,065 sq mi 1939-45; 5,872 sq mi 1946-53 (all areas include 373 sq mi in Aubrey Valley Playa, a closed basin).

Gage.--This is a combined record from the following gages:

Prior to 1925: Non-recording gages at several sites from 0.7 to 1.4 miles above mouth.

1925-38: Recording gages at two different sites, 500 ft and half a mile, respectively, above Camp Creek, at different datums.

1939-45: Recording gage, 4.5 miles downstream from Horseshoe Dam. Datum of gage is 1,829.5 ft above mean sea level, datum of 1929.

1946-53: Recording gage at present site, 9 miles upstream from Horseshoe Dam. Datum of gage is 2,029.0 ft above mean sea level, datum of 1929.

Stage-discharge relation.--

1925-38: Defined by current-meter measurements below 45,000 cfs, and estimated above on basis of basin wide runoff studies and slope-area determination at gage height 21.9 ft.

1939-45: Defined by current-meter measurements.

1946-53: Defined by current-meter measurements below 42,000 cfs and extended above by logarithmic plotting. Relation subject to shifting at all locations.

Historical data.--Flood of Feb. 24, 1891, is greatest known since 1888; record furnished by Arizona Canal Company.

Remarks.--Computation of peaks 1905, 1925-33 was made from records furnished by Salt River Valley Water Users' Association.

Flood record unaffected by irrigation diversions above station.

Base for partial-duration series, 4,000 cfs.

*Published as "above Camp Creek, near McDowell" 1925-38 and as "above Bartlett Reservoir, near Cave Creek" 1939-45.

Gila River Basin

(71) Verde River below Tangle Creek, above Horseshoe Dam, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1891	Feb. 24, 1891	-	y
1906	Nov. 27, 1905	-	96,000
1925	Sept. 17, 1925	-	b c 20,000
1926	Apr. 6, 1926	10.2	c 32,000
1927	Feb. 17, 1927	b 17.0	c 70,000
1928	Feb. 5, 1928	7.37	c 14,000
1929	Apr. 5, 1929	b 12.5	c 26,000
1930	Aug. 9, 1930	7.8	c 8,100
1931	Feb. 14, 1931	10.65	c 34,000
1932	Feb. 9, 1932	15.0	c 53,000
1933	Mar. 13, 1933	4.0	c 1,660
1934	Aug. 25, 1934	7.30	3,300
1935	Jan. 12, 1935	9.32	7,380
	16	8.40	4,790
	Feb. 7	11.56	14,300
	15	8.40	5,030
	Mar. 3	8.60	5,130
	15	9.88	7,680
	Apr. 9	10.81	11,800
	Aug. 15	9.09	5,870
1936	Feb. 24, 1936	10.89	12,000
1937	Feb. 7, 1937	18.8	63,000
	15	14.66	30,400
	Mar. 14	11.27	12,400
	17	15.03	32,300
1938	Mar. 4, 1938	21.9	95,000
	13	9.81	5,940
1939	Sept. 7, 1939	11.42	9,500
	14	13.92	17,700
1940	Feb. 3, 1940	8.36	4,740
	27	8.62	5,020
1941	Oct. 6, 1940	12.36	11,800
	Dec. 13	9.23	5,900
	18	7.93	4,210
	25	14.34	19,600
	31	11.13	10,400
	Feb. 22, 1941	13.23	16,000
	Mar. 2	14.47	23,400
	14	17.85	43,800
	Apr. 3	10.28	8,460
	13	14.14	22,300
	May 4	8.17	4,180
1942	Oct. 14, 1941	8.00	3,510
1943	Mar. 5, 1943	12.44	13,100
	11	9.56	6,520
	Aug. 14	12.98	16,600
1944	Feb. 25, 1944	8.47	4,670
	Mar. 14	10.33	7,530
	26	8.82	5,030
	Apr. 3	8.10	4,120
	14	8.43	4,720
1945	Mar. 16, 1945	11.12	9,710
	Apr. 3	8.02	4,060
1946	Apr. 8, 1946	9.90	8,660
1947	Dec. 28, 1946	8.62	6,110
	Sept. 19, 1947	11.47	11,500
1948	Mar. 25, 1948	6.45	2,560
1949	Jan. 13, 1949	11.24	11,000
	Feb. 25	7.82	4,140
	Mar. 8	8.37	4,900
	20	8.65	5,260
	Apr. 9	8.07	4,480
	Sept. 19	7.77	4,040
1950	Oct. 19, 1949	10.50	9,330
	Feb. 8, 1950	8.96	5,620
1951	Aug. 30, 1951	12.40	16,400
1952	Dec. 31, 1951	17.62	81,600
	Jan. 18, 1952	13.86	27,800
	Apr. 1	10.33	7,960
	Aug. 15	8.87	5,550
1953	Aug. 29, 1953	10.00	6,390

b Estimated
c Annual peak.
y Probably exceeded 150,000 cfs.

Gila River Basin

(72) Agua Fria River near Mayer, Ariz.

Location. --Lat 34°19', long. 112°04', in NW¼SE¼ sec. 20, T. 11 N., R. 3 E., at Sycamore Dam Site, 700 ft downstream from Bigbug Creek, and 12 miles southeast of Mayer.

Drainage area. --588 sq mi.

Gage. --Recording gage since Feb. 15, 1940, and staff gage Jan. 24 to Feb. 14, 1940. Altitude of gage is 3,434 ft (levels by Maricopa County Municipal Water Conservation District No. 1).

Stage-discharge relation. --Defined by current-meter measurements below 5,600 cfs; extended above on basis of slope-area determinations at gage heights 9.3, 9.44, and 11.97 ft. Relation subject to minor shifting.

Remarks. --Flood record unaffected by small diversions for mining and irrigation above station.

Base for partial-duration series, 1,300 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Feb. 2, 1940	5.7	1,820	1946	July 22, 1946	8.2	4,930
	June 26	8.80	5,920		Aug. 10	5.53	1,570
	Aug. 18	7.27	3,620		14	6.26	2,350
	Sept. 2	8.55	5,500		15	5.76	1,800
					30	7.0	3,230
1941	Oct. 5, 1940	5.78	1,900				
	Dec. 24	9.30	6,830	1947	Aug. 16, 1947	5.57	1,610
	30	5.59	1,710		31	5.38	1,430
	Mar. 1, 1941	11.97	13,000				
	14	9.43	7,080	1948	Aug. 4, 1948	9.30	6,830
	Apr. 13	7.92	4,510		6	7.15	3,490
	July 18	5.85	2,010				
	24	5.08	1,380	1949	Jan. 13, 1949	6.37	2,460
	Aug. 8	5.39	1,650				
	Sept. 17	5.14	6,430	1950	Oct. 18, 1949	5.66	1,690
					July 17, 1950	6.10	2,170
1942	Oct. 20, 1941	6.00	2,190		30	5.88	1,950
	July 25, 1942	5.08	1,380				
	Aug. 4	6.37	2,560	1951	July 31, 1951	6.86	3,040
	6	9.0	6,280		Aug. 19	9.23	6,230
					28	9.70	8,180
1943	Aug. 9, 1943	4.79	1,340		29	9.65	8,010
	15	4.78	1,330		Sept. 7	7.16	4,380
	Sept. 25	6.70	3,500				
				1952	Oct. 1, 1951	5.70	2,770
1944	Feb. 24, 1944	6.11	2,320		30	7.38	5,260
	Aug. 19	5.92	2,280		Dec. 30	5.20	2,140
	Sept. 14	5.78	2,140		Jan. 18, 1952	8.85	7,500
	16	7.3	3,810		Mar. 11	5.78	2,900
	26	5.08	1,500		Aug. 16	5.35	2,320
					24	5.50	2,510
1945	July 27, 1945	6.26	2,620				
	Aug. 10	6.10	2,460	1953	July 8, 1953	7.23	5,510
					26	5.37	2,510
					Aug. 28	5.02	1,880

Gila River Basin

(73) Hassayampa River near Wagoner, Ariz.

Location. --Lat 34°18', long. 112°34', in NE¼SE¼ sec. 9, T. 11 N., R. 3 W., at bridge on Kirkland Junction-Wagoner road, 5½ miles upstream from Milk Creek, and 7½ miles upstream from Wagoner.

Drainage area. --78.7 sq mi.

Gage. --Recording gage since Jan. 20, 1940. Datum of gage is 3,741.51 ft above mean sea level, unadjusted.

Stage-discharge relation. --Defined by current-meter measurements below 500 cfs and extended above. Relation subject to very large shifts and of questionable accuracy.

Historical data. --Failure of the Walnut Grove Dam, 9 miles downstream, on February 22, 1890 resulted in a catastrophic flood in which 76 persons lost their lives. This dam failure followed a period of high runoff due to melting snow. Flood discharge is not known. (See Thirteenth Annual Report of the Geological Survey 1891-92 Part III Irrigation for detailed discussion of this flood.)

Remarks. --Flood record unaffected by small irrigation diversions above station.

Base for partial-duration series, 160 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Sept. 6, 1940	3.4	171	1943	Aug. 3, 1943	4.55	945
					9	5.10	1,470
1941	Oct. 5, 1940	2.97	214				
	Feb. 21, 1941	2.9	850	1944	Sept. 27, 1944	3.43	138
	24	3.5	1,250				
	Mar. 2	5.11	1,250	1945	Mar. 16, 1945	3.54	291
	8	4.33	343		Aug. 9	5.12	1,480
	14	4.37	498		11	4.82	1,160
	Apr. 16	3.1	1,700		23	4.42	782
	24	3.93	221				
	Aug. 9	3.68	162	1946	Aug. 10, 1946	4.35	648
	29	3.78	297		Sept. 27	3.70	259
1942	July 17, 1942	3.81	323				
	Aug. 15	5.00	1,250				

(74) Hassayampa River at Box dam site, near Wickenburg, Ariz.

Location. --Lat 34°02'35", long. 112°42'35", in SE¼ sec. 7, T. 8 N., R. 4 W., unsurveyed, at Box dam site, 7½ miles upstream from Wickenburg.

Drainage area. --417 sq mi.

Gage. --Recording gage at present site since May 1946. Datum of gage is 2,236.12 ft above mean sea level, datum of 1929. May 1, 1946, to Nov. 17, 1949, at datum 2.16 ft higher. January to June 1938 at site 1 mile downstream at datum 23.76 ft lower.

All gage heights referenced to present site and datum.

Stage-discharge relation. --Defined by current-meter measurements below 2,000 cfs; extended above on basis of slope-area determinations at gage height 9.16 ft and 18.3 ft.

Historical data. --Records obtained by W. A. Farish, engineer for Joseph Wittman, show high magnitude floods on Sept. 19, 1925 (25,500 cfs), Feb. 16, 1927 (27,100 cfs), and Feb. 7, 1937 (22,000 cfs). Basis for these discharge figures is not known, and they are not included in the listing below.

Remarks. --Flood record unaffected by small diversions for mining and irrigation above station.

Base for partial-duration series, 500 cfs.

Gila River Basin

(74) *Hassayampa River at Box dam site, near Wickenburg, Ariz.*--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1938	Mar. 3, 1938	[a]10.65	[c]10,000	1950	Oct. 18, 1949	9.01	5,500
1946	July 22, 1946	5.88	664	1951	Aug. 3, 1951	6.05	2,130
	Aug. 11	7.0	1,710		20	4.80	750
	14	6.41	1,110		26	7.7	4,910
					29	18.3	27,000
1947	Aug. 8, 1947	7.41	2,300				
				1952	Oct. 30, 1951	3.70	885
1948	Aug. 5, 1948	9.16	5,600		Dec. 30	4.50	1,590
					Jan. 18, 1952	3.60	590
1949	Jan. 13, 1949	5.26	651		Mar. 11	5.35	1,410
	25	5.36	708		17	4.90	910
	July 4	7.40	2,510		Aug. 14	6.05	775
	Sept. 11	6.21	1,310		Sept. 20	5.70	580
	14	5.76	970				
	26	7.71	2,910	1953	July 18, 1953	5.95	865

[a] From floodmark.
[c] Annual peak; peaks October to December 1937 and July to September 1938 not known.

(75) Hassayampa River near Morristown, Ariz.

Location.--Lat 33°53', long. 112°39', in SE¼ sec. 3, T. 6 N., R. 4 W., 600 ft downstream from San Domingo Wash, 900 ft upstream from railroad bridge, and 3.0 miles northeast of Morristown.

Drainage area.--774 sq mi.

Gage.--Recording gage Nov. 17, 1938, to July 15, 1947. Datum of gage is 1,831.16 ft above mean sea level, datum of 1929.

Stage-discharge relation.--Defined by current-meter measurements below 1,600 cfs; extended above on basis of slope-area determination at gage height 8.36 ft. Relation subject to shifting.

Remarks.--Flood record unaffected by small diversions for mining and irrigation above gage.

Base for partial-duration series, 1,100 cfs.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1939	Dec. 20, 1938	7.30	2,700	1942	Aug. (e), 1942	[a]5.7	[b]100
	Sept. 4, 1939	6.6	1,240				
	6	8.7	6,200	1943	Aug. 3, 1943	9.9	7,700
	12	6.55	1,600		14	8.52	3,800
					Sept. 26	6.80	1,200
1940	Feb. 1, 1940	5.9	160				
				1944	Oct. 18, 1943	7.68	2,420
1941	Oct. 5, 1940	7.18	2,460		Feb. 24, 1944	7.22	1,510
	Dec. 24	7.30	3,350		Aug. 9	8.10	3,520
	Feb. 25, 1941	6.96	2,600				
	Mar. 2	8.36	6,100	1945	Aug. 2, 1945	7.55	2,200
	5	6.66	2,040		10	6.98	1,110
	14	7.90	4,060				
	Apr. 11	7.57	3,020	1946	July 22, 1946	7.38	1,510
	15	7.05	1,320		Aug. 11	7.60	2,090
	July 24	7.50	2,110		Sept. 17	7.60	2,310
	Aug. 9	7.73	3,460				
	29	7.27	2,050	1947	Aug. 8, 1947	[a]8.95	6,000

[a] From floodmark.
[b] Estimated.
[e] Probably Aug. 5.

Gila River Basin

(76) Gila River below Gillespie Dam, Ariz.*

Location. --Lat 33°13'45", long. 112°46'00", in SE¼NE¼ sec. 28, T. 2 S., R. 5 W., at Gillespie Dam, 8 miles downstream from Hassayampa River. Gila Bend Canal diverts at left side and Enterprise Canal at right side of Gillespie Dam.

Drainage area. --49,620 sq mi; contributing area, smaller because of construction of Roosevelt, Lake Pleasant, Stewart Mountain, Coolidge, and Bartlett Dams, was as follows: 1921-27, 43,730 sq mi; 1928, 42,270 sq mi; 1929, 29,380 sq mi; 1930-38, 23,170 sq mi; 1939-53, 16,990 sq mi.

Gage. --Recording gage since July 28, 1924. Datum of gage is 5.00 ft below average elevation of dam crest; crest is 753.46 ft above mean sea level, datum of 1929. Prior to July 23, 1932, datum of gage was at average elevation of dam crest. Aug. 4, 1921, to Nov. 10, 1924, depth of water over crest of dam read at left end of dam.

Stage-discharge relation. --Defined by current-meter measurements below 56,000 cfs; extended above on basis of computation of peak flow over dam. Relation affected by operation of sluice and diversion gates at dam.

Historical data. --Greatest known flood occurred in February 1891 (estimated, 250,000 cfs).

Remarks. --Flood record shown is that for uncontrolled areas below major dams as listed above except for flood of March 5, 1938, originating from upper Verde River, and those occurring during period of spill over Bartlett, Lake Pleasant, and Stewart Mountain dams January to June 1941.

Base for partial-duration series, 2,000 cfs 1925-38, 1,000 cfs 1939-53.

*Published as "at Gillespie Dam", prior to 1939.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1891	February 1891	-	[b] 250,000
1921	Aug. 22, 1921	3.25	[c] 26,800
1922	Jan. 4, 1922	3.67	[c] 32,700
1923	Sept. 20, 1923	2.00	[c] 13,100
1924	Dec. 28, 1923	6.00	[c] 85,000
1925	Sept. 2, 1925	.68	2,500
	6	1.73	9,570
	20	2.23	15,200
1926	Oct. 6, 1925	1.28	6,160
	Dec. 4	.72	2,700
	Mar. 31, 1926	.88	4,060
	Apr. 8	3.15	26,700
	21	1.02	4,760
	July 27	.87	3,520
	Sept. 9	1.05	4,620
	30	3.95	38,300
1927	Dec. 8, 1926	1.84	10,600
	15	.68	2,500
	Feb. 18, 1927	5.45	67,300
	Mar. 12	1.04	4,560
	17	.81	3,160
	Sept. 13	3.71	34,900
1928	Feb. 6, 1928	1.70	9,220
	Aug. 3	1.26	5,600
	29	.70	2,350
1929	Apr. 6, 1929	2.74	20,700
	Aug. 18	.60	2,050
	Sept. 5	.88	3,680
	26	1.15	5,210
1930	Mar. 19, 1930	0.82	3,160
	Aug. 10	2.19	13,900
1931	Feb. 16, 1931	2.50	17,500
	Aug. 6	1.20	5,470
	Aug. 12	1.45	7,530
	31	1.41	6,930
1932	Oct. 3, 1931	.73	2,360
	Dec. 11	1.00	3,690
	Feb. 11, 1932	4.47	44,500
	20	1.78	9,670
	Mar. 3	1.65	8,260
	12	.67	2,090
	22	.92	3,270
1933	Oct. 9, 1932	5.70	2,180
1934	Aug. 30, 1934	5.88	3,100
1935	Feb. 10, 1935	6.60	7,470
	17	5.73	2,240
	Mar. 17	6.06	3,890
	Aug. 25	5.84	2,380
	Sept. 1	5.71	2,140
1936	July 29, 1936	5.90	3,240
1937	Feb. 9, 1937	8.48	45,800
	17	7.67	18,400
	Mar. 16	6.00	4,520
	19	7.77	21,300
1938	Mar. 5, 1938	9.95	60,000
1939	Aug. 10, 1939	5.70	2,200
	Sept. 5	2.43	2,500
	13	5.97	3,240

Gila River Basin

(76) Gila River below Gillespie Dam, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1940	Aug. 19, 1940	5.87	2,620	1945	Aug. 14, 1945	5.53	1,350
1941	Jan. 4, 1941	6.16	5,850	1946	Sept. 19, 1946	5.85	4,290
	Feb. 10	5.68	1,910		24	5.92	2,880
	16	5.44	1,040				
	19	5.65	1,800	1947	Aug. 9, 1947	5.63	4,390
	24	6.57	7,180				
	28	6.70	7,250	1948	Aug. 9, 1948	5.23	330
	Mar. 5	7.07	10,800				
	16	9.45	45,800	1949	Aug. 7, 1949	5.42	976
	Apr. 5	5.95	3,080				
	18	8.08	25,300	1950	Oct. 19, 1949	5.56	1,460
	May 5	7.05	10,600				
	Aug. 12	5.43	1,010	1951	July 28, 1951	-	2,340
					Aug. 4	5.96	2,880
1942	Dec. 13, 1941	5.30	580		28	7.55	16,600
1943	Aug. 5, 1943	5.75	2,200	1952	Jan. 22, 1952	5.23	430
1944	Feb. 25, 1944	5.29	580	1953	Nov. 20, 1952	5.10	115

[b] Estimated.
[c] Annual peak.

Gila River Basin

(77) Gila River near Dome, Ariz.

Location.--Lat 32°45'40", long. 114°25'10", in SW¼ sec. 4, T. 8 S., R. 21 W., 440 ft upstream from bridge on Yuma-Quartzite highway, 3 miles west of Dome, and 12 miles upstream from mouth.

Drainage area.--58,080 sq mi, approximately (including 373 sq mi in Aubrey Valley Playa, a closed basin).

Gage.--Recording gage since May 1929. Datum of gage is 148.18 ft above mean sea level, datum of 1929.

Prior to Oct. 15, 1903, no gage; estimates of discharge.

Oct. 15, 1903, to Dec. 31, 1906, staff gage 4 miles upstream, with numerous supplementary staff gages following radical changes in channel in 1905 and 1906. Datum of principal gage is 158.37 ft above mean sea level, adjustment of 1912.

1907-28, no gage; estimates of discharge within the 20-mile reach upstream from mouth, between Dome and Yuma.

Stage-discharge relation.--Defined by current-meter measurements since 1929. Relation subject to large shifts.

Historical data.--Flood of Jan. 22, 1916 (estimated mean daily discharge, 200,000 cfs) was probably the greatest flood since Feb. 26, 1891, when a greater discharge may have occurred.

Remarks.--This tabulation is of annual floods only. Prior to 1929 maximum mean daily discharges are the only figures available but on the large floods they are probably close to the instantaneous maxima. Many of those figures were estimated from record of Colorado River at Yuma and scattered observations of flood flows and therefore are considered as rough estimates only. Flood record increasingly affected by diversions, and after completion of Roosevelt Dam on Salt River in 1911, by storage in major reservoirs. See record for Gila River below Gillespie Dam for details.

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1891	Feb. 26, 1891	-	(v)	1919	Aug. 6, 1919	-	3,000
1904	Aug. 30, 1904	-	4,560	1920	Feb. 25, 1920	-	95,000
1905	Mar. 20, 1905	-	95,000	1921	Aug. 24, 1921	-	25,000
1906	Nov. 29, 1905	-	95,000	1922	Jan. 6, 1922	-	36,800
1907	Mar. 7, 1907	-	50,000	1923	Sept. 21, 1923	-	8,000
1908	Feb. 7, 1908	-	37,500	1924	Dec. 30, 1923	-	46,500
1909	Dec. 19, 1908	-	62,500	1925	Sept. 22, 1925	-	6,500
1910	Jan. 5, 1910	-	45,000	1926	Apr. 11, 1926	-	20,000
1911	Jan. 15, Feb. 6, and Mar. 10, 1911	-	10,000	1927	Feb. 21, 1927	-	61,000
				1928	Feb. 9, 1928	-	1,400
1912	Mar. 15-16, 1912	-	10,000	1929	Apr. 9, 1929	-	[b] 1,500
1913	Mar. 16, 1913	-	2,500	1930	Aug. 14, 1930	10.50	3,600
1914	Feb. 22-27, 1914	-	8,000	1931	Feb. 19, 1931	13.78	11,400
1915	Feb. 3, 1915	-	80,000	1932	Feb. 15, 1932	16.75	20,700
1916	Jan. 22, 1916	-	[a] 200,000	1933	Oct. 10, 1932	3.90	770
1917	Apr. 20, 1917	-	40,000	1934	Aug. 5, 1934	3.44	200
1918	Mar. 16, 1918	-	30,900	1935	Feb. 16, 1935	5.35	757

Gila River Basin

(77) Gila River near Dome, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1936	-	-	0	1944	-	-	0
1937	Mar. 24, 1937	12.68	8,530	1945	-	-	0
1938	Mar. 10, 1938	12.92	8,670	1946	-	-	0
1939	Sept. 13, 1939	7.47	905	1947	Aug. 9, 1947	5.25	380
1940	-	-	0	1948	-	-	0
1941	Apr. 22, 1941	13.93	14,000	1949	-	-	0
1942	-	-	0	1950	-	-	0
1943	-	-	0	1951	Sept. 7, 1951	7.94	1,100
				1952	Oct. 30, 1951	5.24	293

[b] Estimated.
[y] May have exceeded flood of January 1916.
[z] Instantaneous peak discharge at mouth, near Yuma was 230,000 cfs.
Note.--Peaks prior to 1929 are maximum mean daily discharges.

Colorado River Main Stem

(78) Colorado River at Yuma, Ariz.

Location. --Lat 32°43'45", long. 114°37'15", in NW¼NE¼ sec. 35, T. 16 S., R. 22 E., San Bernardino meridian, 1,800 ft downstream from highway bridge at Yuma, half a mile upstream from Yuma Main Canal wasteway, 5 miles downstream from Gila River, 7 miles upstream from boundary between California and Mexico, and 19 miles downstream from Imperial Dam.

Drainage area. --242,900 sq mi approximately.

Gage. --Recording gage at present site since July 20, 1934. Datum of gage is 102.32 ft above mean sea level, Yuma Project datum, or 102.86 ft, datum of 1929 (datum was 0.07 ft lower prior to earthquake of May 18, 1940). Since July 6, 1945, auxiliary recording gage 20 ft upstream, at same datum, used for periods of low stage or faulty record.

Prior to May 1, 1922, staff gages at several sites about 800 ft upstream on or near original railroad bridge of Southern Pacific Company, at approximately same datum. May 1, 1922, to Oct. 21, 1928, automatic sending device actuating recording gage in office of Bureau of Reclamation, and Nov. 1, 1928, to Oct. 24, 1933, recording gage, both 800 ft upstream at same datum. Oct. 25 to Nov. 10, 1933, staff gage 680 ft upstream and Nov. 11, 1933, to July 19, 1934, staff gage at present site at same datum.

Stage-discharge relation. --Defined by current-meter measurements. Relation subject to large shifts.

Historical data. --Flood of June 27, 1884, was reported by river-boat captain to have been the highest since 1867.

Remarks. --Flood records not appreciably affected by diversions and regulation on main stem prior to Feb. 1, 1935. Since that date flow has been regulated at Hoover Dam and other points. Regulation and storage in the Gila River basin prior to 1935 probably had little effect on flood records at this station.

Construction of levees to confine channel started about 1903.

Gage-height record for 1878-1902 furnished by Southern Pacific Company.

Base for partial-duration series, 40,000 cfs.

Bank-full stage. --35.5 ft (top of levee).

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1878	June 24, 1878	23.0	-	1892	July 3, 1892	25.5	-
1879	May 12, 1879	20.0	-	1893	May 28, 1893	25.2	-
1880	May 31, 1880	24.0	-	1894	June 14, 1894	23.7	-
1881	June 14, 1881	23.5	-	1895	Jan. 20, 1895	28.2	-
1882	June 18, 1882	22.6	-	1896	Sept. 30, 1896	24.5	-
1883	July 3, 1883	24.5	-	1897	June 9, 1897	26.1	-
1884	June 27, 1884	28.5	-	1898	June 27, 1898	23.6	-
1885	June 13, 1885	24.7	-	1899	July 1, 1899	27.0	-
1886	June 6, 1886	26.8	-	1900	June 10, 1900	26.0	-
1887	June 10, 1887	23.5	-	1901	May 31, 1901	27.2	-
1888	June 25, 1888	21.8	-	1902	May 26, 1902	24.5	-
1889	June 7, 1889	22.4	-	1903	June 27, 1903	27.2	b73,000
1890	June 5, 1890	25.5	-	1904	June 7, 1904	26.0	b51,500
1891	Feb. 26, 1891	33.2	-	1905	Mar. 20, 1905	30.3	b112,000

Colorado River Main Stem

(78) Colorado River at Yuma, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1906	Nov. 30, 1905	31.8	[b]109,000
1907	June 30, 1907	28.6	[b]116,000
1908	June 26, 1908	25.45	[b]62,700
1909	Dec. 19, 1908		[b]74,000
	Apr. 1, 1909	25.0	44,900
	27	24.75	47,200
	June 24	-	[b]150,000
	July 31	-	[b]53,500
	Aug. 24	-	[b]54,800
	Sept. 4	-	[b]69,000
	13	-	[b]94,000
1910	Jan. 5, 1910	23.3	72,800
	Mar. 15	20.45	41,000
	Apr. 1	20.4	40,300
	May 7	22.95	67,700
	22	23.35	73,500
	June 12	23.55	71,200
1911	May 20, 1911	24.0	65,200
	June 24	25.95	79,400
	July 30	22.85	58,100
1912	Oct. 14, 1911	24.3	63,000
	June 22, 1912	29.15	146,000
	Aug. 2	20.8	42,200
1913	Apr. 27, 1913	21.05	41,300
	June 10	22.85	63,600
1914	June 15, 1914	29.05	141,000
	July 25	20.25	52,800
	Aug. 5	19.2	44,000
1915	Dec. 28, 1914	22.6	56,200
	Feb. 3, 1915	26.8	102,000
	Apr. 28	22.15	48,000
	May 8	24.2	69,800
	28	22.0	53,000
	June 30	21.9	58,800
1916	Jan. 22, 1916	34.0	250,000
	31	30.8	182,000
	Mar. 26	25.35	75,300
	May 24	25.1	76,800
	June 25	24.1	75,000
1917	Oct. 18, 1916	25.6	71,300
	Apr. 20, 1917	25.85	75,300
	May 8	22.9	55,300
	June 2	26.4	95,300
	July 3	29.35	144,000
1918	Mar. 16, 1918	22.35	52,100
	July 3	23.7	94,900
1919	June 6, 1919	23.3	58,100
1920	Nov. 30, 1919	28.3	84,400
	Feb. 13, 1920	22.2	43,000
	25	32.0	175,000
	June 8	30.7	190,000
1921	June 27, 1921	31.25	188,000
	Aug. 4	23.2	58,100
	29	23.8	61,800
1922	Jan. 6, 1922	23.9	55,200
	May 18	24.8	77,000
	June 10	27.4	117,000
	21	25.4	112,000
1923	June 8, 1923	25.4	101,000
	Sept. 24	24.3	60,100
1924	Dec. 30, 1923	25.1	69,800
	Apr. 22, 1924	22.2	44,800
	May 31	24.03	61,500
	June 24	24.3	66,500
1925	June 8, 1925	23.45	53,200
	30	23.60	48,900
1926	May 15, 1926	25.5	59,300
	June 16	25.20	73,200
1927	Feb. 21, 1927	29.4	92,400
	May 14	25.45	59,900
	June 2	27.0	76,200
	July 9	27.4	78,000
	Sept. 20	26.3	73,900
1928	May 23, 1928	26.52	74,200
	June 13	28.3	99,400
1929	June 7, 1929	27.26	91,000
	Aug. 11	23.05	56,100
	18	22.98	52,800
	Sept. 13	22.32	41,100
	28	23.16	43,300
1930	May 3, 1930	22.71	42,400
	June 9	25.16	54,500
	Aug. 16	24.48	49,400
1931	June 16, 1931	22.37	29,000
1932	Feb. 16, 1932	26.51	58,000
	June 5	28.56	90,800
	July 7	24.99	63,200
1933	June 23, 1933	26.10	70,700
1934	May 20, 1934	21.02	22,900
1935	June 26, 1935	21.46	15,600
1936	Aug. 1, 1936	20.17	9,520

Colorado River Main Stem

(78) Colorado River at Yuma, Ariz. --Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)	Water year	Date	Gage height (feet)	Discharge (cfs)
1937	Feb. 10, 1937	24.22	23,200	1946	Feb. 9, 1946	17.60	16,800
1938	Mar. 6, 1938	23.26	21,700	1947	Feb. 5, 1947	16.56	14,200
1939	Sept. 7, 1939	24.57	34,900	1948	Jan. 31, 1948	18.27	21,300
1940	Jan. 16, 1940	19.48	13,800	1949	Jan 13, 1949	18.07	24,000
1941	June 5, 1941	22.66	30,400	1950	Jan. 12, 1950	16.88	22,900
1942	Feb. 7, 1942	20.49	31,800	1951	Apr. 5, 1951	15.57	16,100
1943	Dec. 14, 1942	18.67	19,000	1952	Mar. 20, 1952	17.60	23,600
1944	Feb. 24, 1944	18.89	21,200	1953	Feb. 12, 1953	16.76	24,300
1945	Mar. 5, 1945	18.90	22,900				

[9] Estimated on basis of published discharge measurements and daily discharge.

Whitewater Draw Basin

(79) Whitewater Draw near Douglas, Ariz.

Location. --Lat 31°21'15", long. 109°35'00", in SW¼SE¼ sec. 10, T. 24 S., R. 27 E., at bridge on U. S. Highway 80, 1½ miles upstream from international boundary and 2 miles west of Douglas.

Drainage area. --1,023 sq mi.

Gage. --Recording gage since June 17, 1930. Datum of gage is 3,907.10 ft above mean sea level, datum of 1929. Prior to May 14, 1938, 0.03 ft higher. Prior to Apr. 30, 1922, staff gage at various sites within three-quarters of a mile at various datums.

Stage-discharge relation. --Defined by current-meter measurements below 2,000 cfs, extended above by logarithmic plotting. Relation is subject to shifting.

Remarks. --Flood record unaffected by irrigation diversions above station (mostly from groundwater).

Base for partial-duration series, 1,000 cfs.

Whitewater Draw Basin

(79) Whitewater Draw near Douglas, Ariz.--Continued

Annual peak stages and discharges

Water year	Date	Gage height (feet)	Discharge (cfs)
1916	July 11, 1916	9.5	[c] 1,600
1917	Aug. 9, 1917	7.0	[c] 720
1918	July 15, 1918	8.0	[c] 1,050
1919	July 27, 1919	14.5	[h] 4,050
1920	Nov. 23, 1919	13.3	[c] 3,400
1930	June 21, 1930	8.14	1,240
	July 23	8.73	1,490
	Sept. 7	9.11	1,700
1931	Aug. 5, 1931	11.56	3,040
	10	12.15	3,450
	30	9.56	1,710
	Sept. 1	8.61	1,170
1932	Oct. 1, 1931	8.86	1,430
	July 29, 1932	9.09	1,560
	31	9.54	1,800
1933	July 16, 1933	8.36	1,180
	23	8.10	1,060
	Sept. 20	9.36	1,730
1934	Aug. - 1934	11.65	[v] 3,100
1935	Aug. 28, 1935	10.58	2,360
	Sept. 1	11.40	2,900
	22	8.65	1,210
1936	Sept. 11, 1936	-	[b] 2,000
1937	July 20, 1937	8.27	1,260
	Aug. 19	10.30	2,770
	21	10.15	2,650
	23	10.20	2,690
	Sept. 6	8.48	1,420
1938	Dec. 4, 1937	8.09	1,170
	July 20, 1938	8.34	1,320
	Aug. 7	9.29	1,990
	Sept. 9	7.88	1,020
1939	July 17, 1939	8.17	1,110
	Aug. 5	10.25	2,690
	Sept. 17	9.21	1,900
1940	June 24, 1940	10.26	2,750
	Aug. 13	9.62	2,160
	Sept. 19	8.54	1,360
1941	July 20, 1941	8.72	1,460
	23	8.52	1,280
	Sept. 7	8.12	1,010
	29	10.27	2,750
1942	July 16, 1942	8.57	1,320
	Sept. 13	9.85	2,300
1943	June 30, 1943	10.34	2,750
	July 15	8.53	1,180
	Aug. 2	9.75	2,140
	10	10.04	2,440
	20	9.15	1,580
	24	9.29	1,710
1944	Aug. 16, 1944	9.78	2,190
	18	9.13	1,710
1945	July 31, 1945	11.16	3,100
1946	Oct. 9, 1945	9.27	1,440
	Aug. 5, 1946	8.89	1,180
	17	8.56	1,010
1947	After July 8, 1947	[a] 9.33	[w] 1,580
1948	July 22, 1948	11.10	3,170
	28	9.04	1,180
	Aug. 10	9.14	1,420
	12	9.48	1,710
	23	8.88	1,210
1949	July 11, 1949	9.38	1,450
	18	9.77	1,790
1950	July 9, 1950	8.88	1,070
	19	12.38	3,400
	22	9.31	1,070
1951	Aug. 20, 1951	9.06	1,230
1952	June 2, 1952	10.48	1,670
	Aug. 17	10.34	1,660
1953	July 7, 1953	12.2	2,950
	13	10.1	1,520
	18	9.18	1,050
	26	9.90	1,420
	31	9.90	1,420

[a] From floodmarks.
[b] Estimated.
[c] Maximum annual peak observed; other peaks not known.
[h] Maximum observed; higher peak may have occurred about July 15, 1919.
[v] Annual peak; peaks January to September 1934 not known.
[w] Annual peak; other peaks July to September 1947 not known.

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