Floods of 1951

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1227

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UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

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[The letters in parentheses preceding the titles are those used to designate the separate chapters]

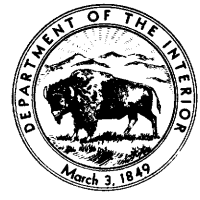
Floods of March-April 1951 in Alabama and Adjacent States

Prepared by WATER RESOURCES DIVISION

Floods of 1951

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1227–A

A presentation of data on floods in Alabama, Georgia, Mississippi, and Tennessee, collected in cooperation with State and Federal agencies.



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UNITED STATES DEPARTMENT OF THE INTERIOR

Douglas McKay, *Secretary*

GEOLOGICAL SURVEY

W. E. Wrather, *Director*

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PREFACE

This report on the floods of March-April 1951 in Alabama and adjacent States was prepared by the Geological Survey, Water Resources Division, under the general direction of C. G. Paulsen, chief hydraulic engineer, and J. V. B. Wells, chief, Surface Water Branch.

The data presented in this report were collected and compiled under the supervision of the district engineers, Surface Water Branch, as follows:

Alabama ..... M. R. Williams
Georgia ..... M. T. Thomson
Mississippi ..... I. E. Anderson
Tennessee ..... W. R. Eaton

The Montgomery, Ala., district office was responsible for the general planning and assembling of the report, and coordination of the work among the districts participating.

Financial cooperation in connection with the river-measurement program of the Geological Survey in the area covered by this report was received from the following State agencies: in Alabama, the Alabama Geological Survey; in Georgia, the Georgia Department of Mines, Mining, and Geology; in Mississippi, the Mississippi Geological Survey; and in Tennessee, the Tennessee Department of Conservation.

Federal agencies to whom acknowledgements are made for financial assistance, services rendered, or data furnished are the Corps of Engineers and the Tennessee Valley Authority.

Financial assistance was rendered by the Alabama Highway Department and the Georgia Highway Department. The Alabama Power Company furnished records for four stations.

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FLOODS OF MARCH-APRIL 1951 IN ALABAMA AND ADJACENT STATES

Prepared by WATER RESOURCES DIVISION

INTRODUCTION

Substantial floods on many streams in Alabama and adjacent States were caused by the general storm of March 27-30, 1951. High flood crests occurred on most streams in Mobile River basin and on several streams in the nearby basins of Tennessee, Pascagoula, Pearl, and Mississippi Rivers. At 32 gaging stations in the area the crest discharge for the flood exceeded the previously recorded maxima.

These floods are of special note because of the large area affected. In the Mobile River basin, only the minor tributaries draining the area south and east of Alabama, Tallapoosa, and Etowah Rivers failed to receive sufficient precipitation to produce substantial floods.

Figure 1 shows the area covered by this report. Data presented in this report include records of stage and discharge at 96 gaging stations in Mobile River and Tennessee River basins for the period of the flood, a summary of peak discharges and comparative data for past and present maxima, and 2 tables of crest stages at other places on several streams.

GENERAL FEATURES OF THE STORM AND FLOODS

Meteorology

By C. W. Cochrane

U. S. Weather Bureau, Cooperative Studies Section

Heavy rains began in southern Texas on March 25 and advanced into Louisiana and extreme southern Arkansas on the evening of March 26, Mississippi on the morning of March 27, Tennessee about mid-day on March 27, Alabama on the afternoon of March 27, Georgia in the early morning of March 28, South Carolina and western North Carolina on the morning of March 28, and northern

Florida early on March 29. At most places the heavy rains fell intermittently for 40 to 50 hours.

These rains resulted partly from the lifting of a deep layer of unstable warm moist air flowing rapidly north-northeastward from the Gulf of Mexico and partly from convective thundershowers within the warm air mass. Some of the most intense rainfall fell in these thundershowers. The lifting was produced as the warm air flowed inland over ground sloping up to the north, the effect being intensified by a wedge of cold air at the surface. Orographic lifting was particularly effective in the Coosa River basin.

The following description applies to the 850-mb. (about 5000 feet) maps except where otherwise indicated:

On the morning of March 25 cold dry air covered most of the United States except the Florida Peninsula and southern Texas, which were in the warm moist air covering the Gulf of Mexico. A ridge of high pressure just east of the Rocky Mountains was moving eastward and a NE-SW trough of low pressure was approaching the west coast. During the day the warm moist air began to flow northward over Texas, and lifting of this air over the wedge of cold air to the north resulted in rains which were heavy at a few points in southern Texas.

By the evening of March 26 the pressure systems had moved eastward--a HIGH was centered over Georgia and a LOW was situated over Colorado near the southern end of the trough. Between these two centers southerly winds (as high as 60 mph at some stations) were blowing. In the middle of this broad southerly current a tongue of unstable warm moist air, more than 20,000 feet deep in places, began to move northward from the Gulf. This tongue of moist air changed direction and advanced northeastward as winds at the 850-mb. level changed to SSW, with the supply of moist air increasing on the east side of the tongue and decreasing on its west side.

By the evening of March 27 the HIGH center had moved eastward off the coast, and the LOW center lying in a long NNE-SSW trough had advanced to the Kansas-Oklahoma area. Winds at the 850-mb. level had now changed to SSW in Louisiana, Arkansas, and Mississippi but continued strong.

On the evening of March 28 the LOW was located over Missouri, with a cold front in the NNE-SSW trough extending from Lake Superior to the Texas coast. The LOW center then began to move northeastward while the portion of the cold front extending southward from the center continued eastward. This front was preceded by a southwesterly flow of dry air from northern Mexico, which passed over the Mobile River basin between the evening of

the 28th and evening of the 29th, cutting off the flow of moist air and ending the general rainfall. Consequently, only light showers attended the cold front, which had passed over the eastern boundary of the area by early morning of the 30th.

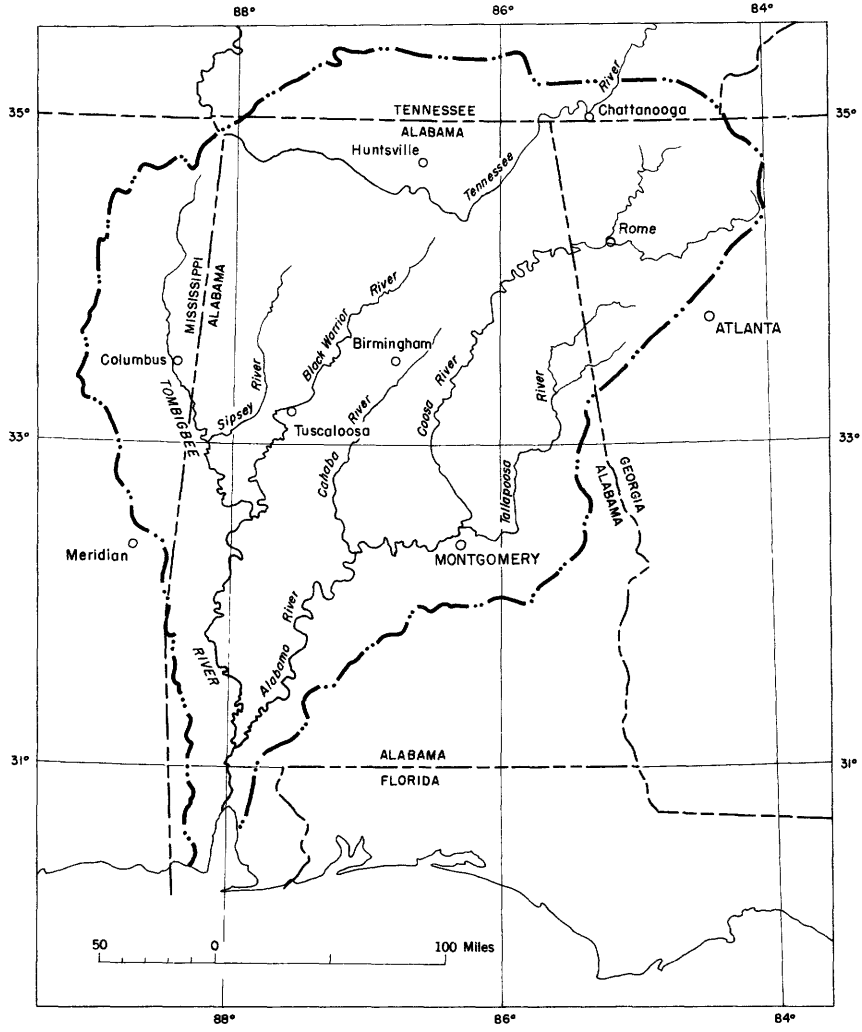

Figure 1. --Map showing area covered by this report.

Precipitation

Figure 2, developed from a more detailed isohyetal map furnished by the U. S. Weather Bureau, is an isohyetal map showing the total rainfall in the area covered by the report for the period March 27-30.

The storm progressed from southwest to northeast, the rainfall for the northeast stations being recorded about three-quarters of a day later than at the southwest stations. Figure 3 shows accumulated rainfall at selected points in Mississippi, Alabama, and Georgia. From the figure it is apparent that the center of mass of precipitation occurred near the western boundary of the report area on the early morning of March 28; at the eastern edge late in the evening of March 28. The bulk of the rain fell within a 24-hour period at each station, although the storm covered parts of 3 calendar days. More complete information can be obtained from Climatological Data published by the Weather Bureau.

Runoff

Crest discharges occurred generally on March 29 in all except the larger streams or those having substantial amounts of overbank storage. A few of the larger streams reacted rapidly to local tributary inflow, with the crest discharges being determined by the volume of that local inflow. Coosa River at Childersburg, Ala., reached a new crest discharge because of abnormally high rates of inflow from small local tributaries.

In Georgia record flood crests were established at stations on the Coosawattee, Conasauga, Chattooga, and Oostanaula Rivers. The crest on the Oostanaula River at Resaca was the greatest in 56 years of record. The Etowah River watershed in Georgia did not receive heavy amounts of precipitation. Thus, the low precipitation and the impounding reservoir at Allatoona Dam kept the Etowah River from contributing to the flood.

On the Coosa River record crest discharges were reached at two main-stem gaging stations and six tributary stations. Of these the peak on Talladega Creek at Alpine, Ala., was outstanding. Operation of the flood gates at Jordan Dam on Coosa River increased the discharge at that point and caused the crest to occur on March 29, about 30 hours before the unregulated crest at Childersburg. Figure 4 presents graphs of discharge at selected gaging stations on the Coosa River upstream from Jordan Dam; figure 5 presents similar data for Coosa-Alabama River downstream from Jordan Dam. About 50 miles downstream, at the Montgomery gage on Alabama River, the crest discharge occurred more than 2 days later and was 37 percent smaller than on Coosa

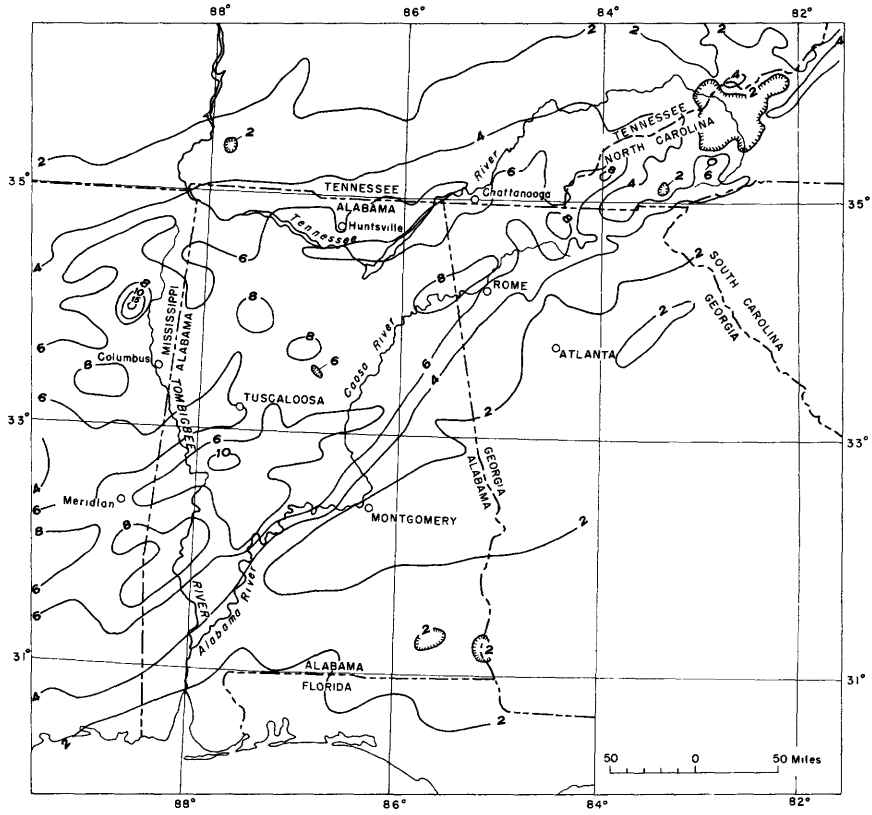

Figure 2. --Isohyetal map of rainfall during March 27-30.

River at Jordan Dam. The reduction in crest discharge at Montgomery (fig. 5) was due mainly to the large amount of Coosa River flow backed up and stored in the lower reach of Tallapoosa River. The Tallapoosa River was not contributing to the flood, as no water was spilled at Martin Dam during the flood period.

Below Montgomery only the streams draining the area north and west of the Alabama River contributed to the flood. Of these the Cahaba River contributed the largest volume to the flood as well as the most outstanding crest discharge, that at Centerville. Figure 6 presents graphs of discharge at selected gaging stations on tributaries on Coosa-Alabama River.

Above the mouth of the Black Warrior River the maximum discharges of record occurred at 10 gaging stations on tributaries on Tombigbee River. The most outstanding were on Tibbee Creek near Tibbee, Miss., and on Noxubee River near Brooksville, Miss. The large increase in flow of Tombigbee River between

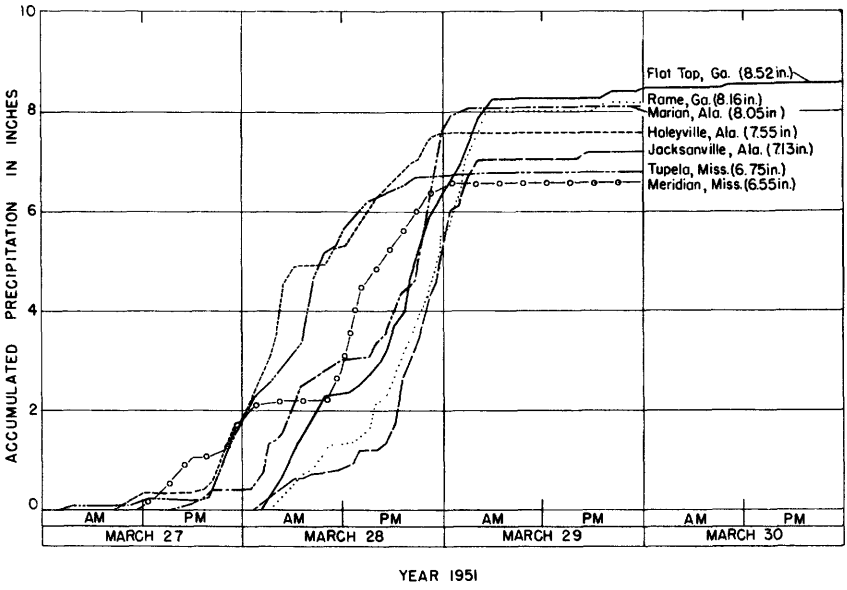

Figure 3. --Graph showing accumulated rainfall during March 27-30 at selected points.

Gainesville and Coatopa (fig. 7) is largely accounted for by Black Warrior River (fig. 8). On the Black Warrior River and its tributaries the most outstanding crests were on the main river at Tuscaloosa and at Eutaw. At both places the crest discharge is believed to be the greatest known, although a higher stage has occurred at Tuscaloosa. A minor tributary of Tombigbee River, Prairie Creek near Gallion, Ala., produced a notable flood peak although not the greatest known at that place.

In the Tennessee River basin, maximum discharges of record occurred at four gaging stations on tributary streams. Of these, the one on Cypress Creek near Florence, Ala., appears to be the most outstanding. Blue Ridge Reservoir stored sufficient water to decrease materially the crest discharges on the upper reaches of the Ocoee River. Figure 9 presents graphs of discharge at selected gaging stations on tributaries of the Tennessee River.

Figure 10 shows the maximum discharge, in cubic feet per second per square mile, for the March-April 1951 flood on the streams for which data are given in this report. From that plotting it will be noted that the crest discharges were more notable for streams draining 100 square miles or more.

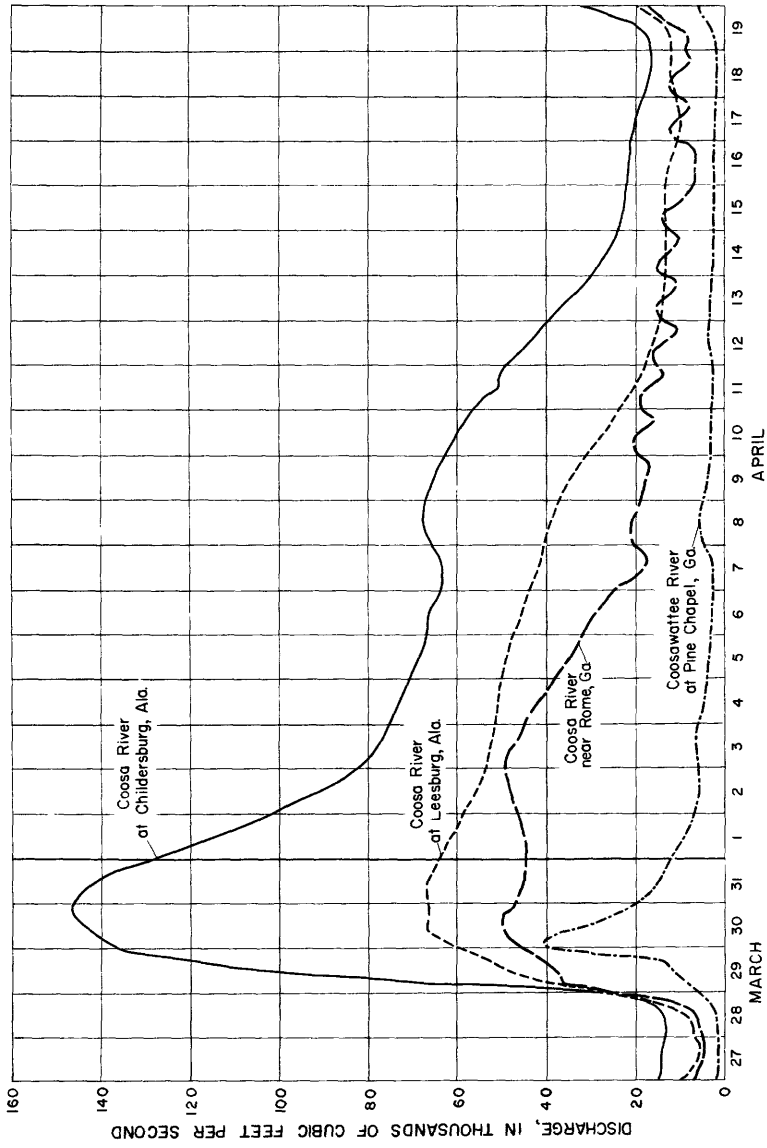

Figure 4.--Graphs of discharge at selected gaging stations on Coosa River upstream from Jordan Dam.

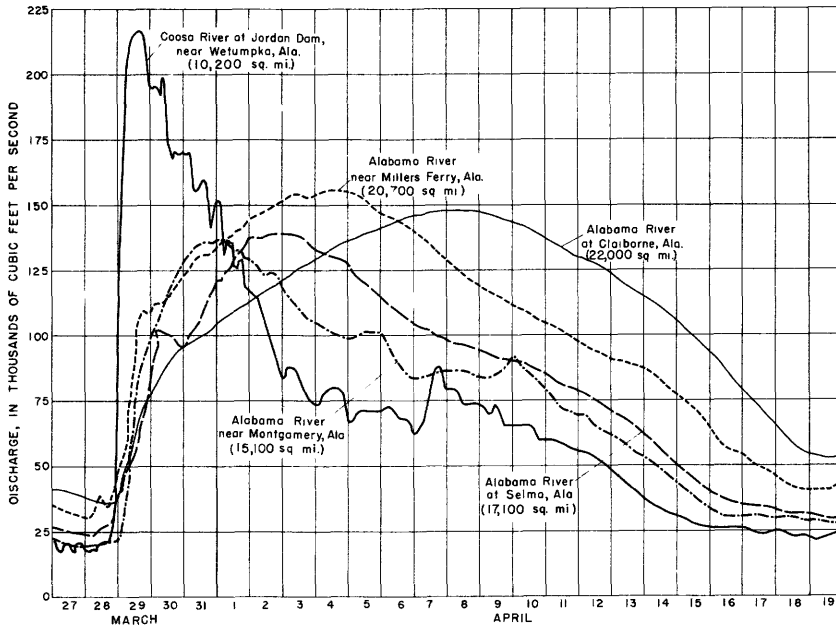

Figure 5. --Graphs of discharge at selected gaging stations on Coosa-Alabama River downstream from Jordan Dam.

The hydrographs in figures 4 to 9 show the relative flood-producing characteristics of the various streams. They also provide a quick reference as to the time of flood crests at sites on the various streams.

FLOOD DAMAGE

One man is known to have lost his life while rescuing cattle from the bottom lands along the Coosa River near Wetumpka, Ala. Disruption of traffic and damage to highways and bridges were moderate to severe. Low-lying agricultural lands were extensively inundated and a few cities suffered moderate inundations. (fig. 11). Total flood losses, however, probably were not excessive.

Modern highway bridges suffered little damage. Extensive damage was done to older bridges on rural roads in some areas. (fig. 12). Commissioner B. C. Logan reported that Gilmer County, Ga., estimated cost of damages as being more than $85,000 at 62 county bridges. A number of county bridges were damaged in Talladega and Calhoun Counties, Ala., and at other places. Many highways were inundated, disrupting travel for varying lengths of time. Main highways leading north from Tuscaloosa, Ala., were under water for 3 days.

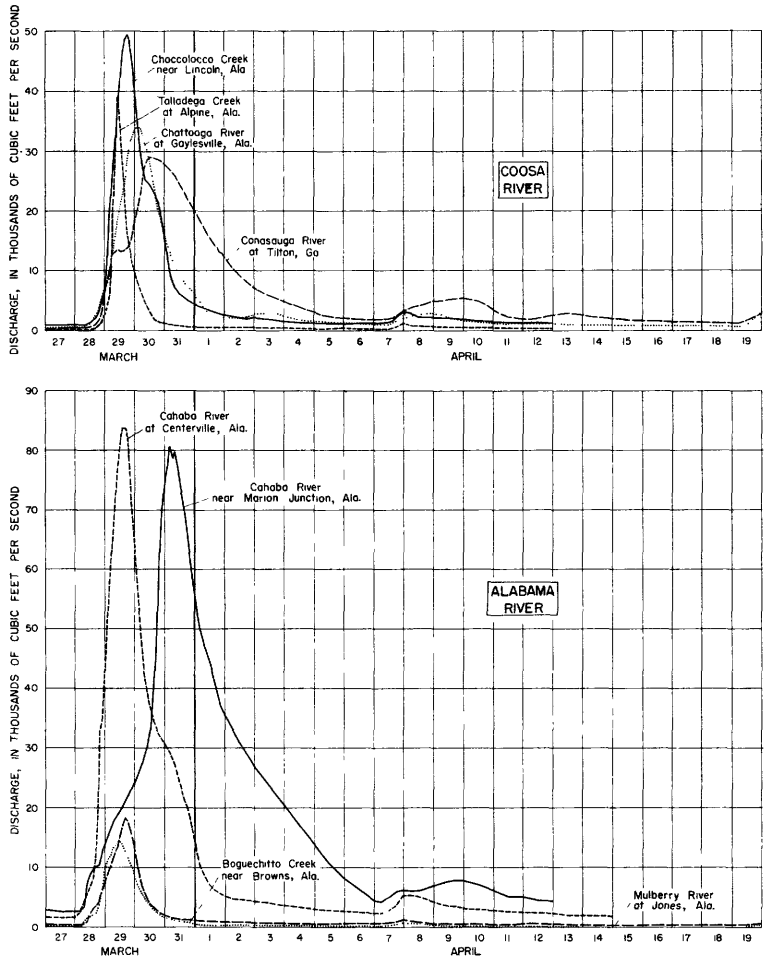

Figure 6. --Graphs of discharge at selected gaging stations on tributaries of Coosa-Alabama River.

The cities of the area are, in general, on high ground and are not subject to damaging inundation. Low-lying sections of Northport and Childersburg, Ala., were under water from 1 to 3 days. The levees at Rome, Ga., were effective in preventing inundation of the protected areas. The American Red Cross reports 2,464 families affected by the flood; assistance was rendered them as follows:

Tombigbee River and tributaries in Mississippi and Alabama:

Families affected	2,011
Families rehabilitated	345
Cost of emergency and rehabilitation	
	0 42 3[illegible]

Coosa-Alabama River and tributaries in Georgia and Alabama:

Families affected	342
Families rehabilitated	80
Cost of emergency & rehabilitation operations	$5,122.99

Tennessee River and Tributaries in Alabama, Tennessee, and Georgia:

Families affected	111
Families rehabilitated	11
Cost of emergency & rehabilitation operations	$792.75

No estimate is known to have been made of the damage to agriculture, but offices of the Department of Agriculture believe that the amount was relatively light, as the flood occurred prior to the spring planting. As usual, some cattle were lost. A number of families living on or near the bottomlands along Tombigbee River were marooned and had to be rescued at the height of the flood (fig. 13).

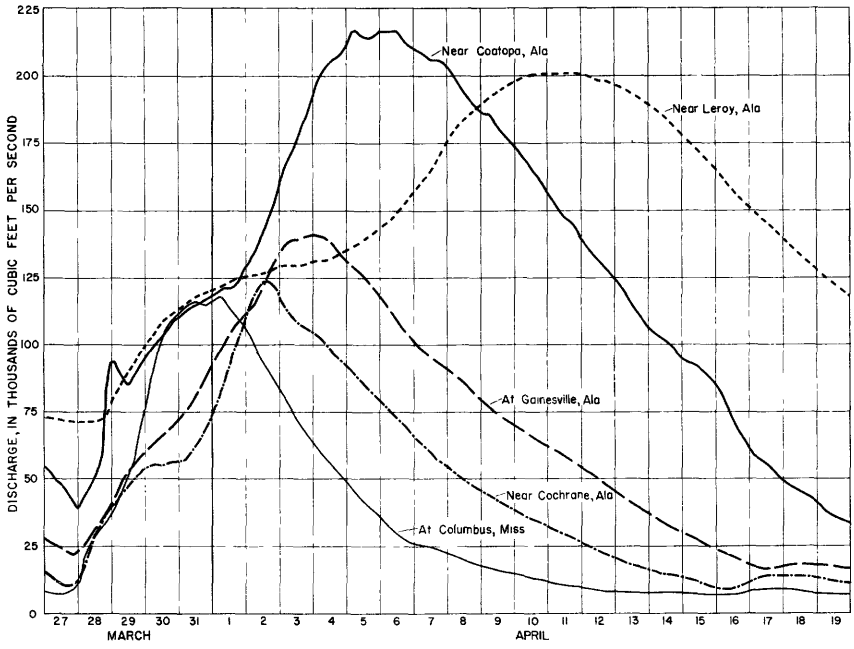

Figure 7.--Graphs of discharge at gaging stations on Tombigbee River between Columbus, Miss., and Leroy, Ala.

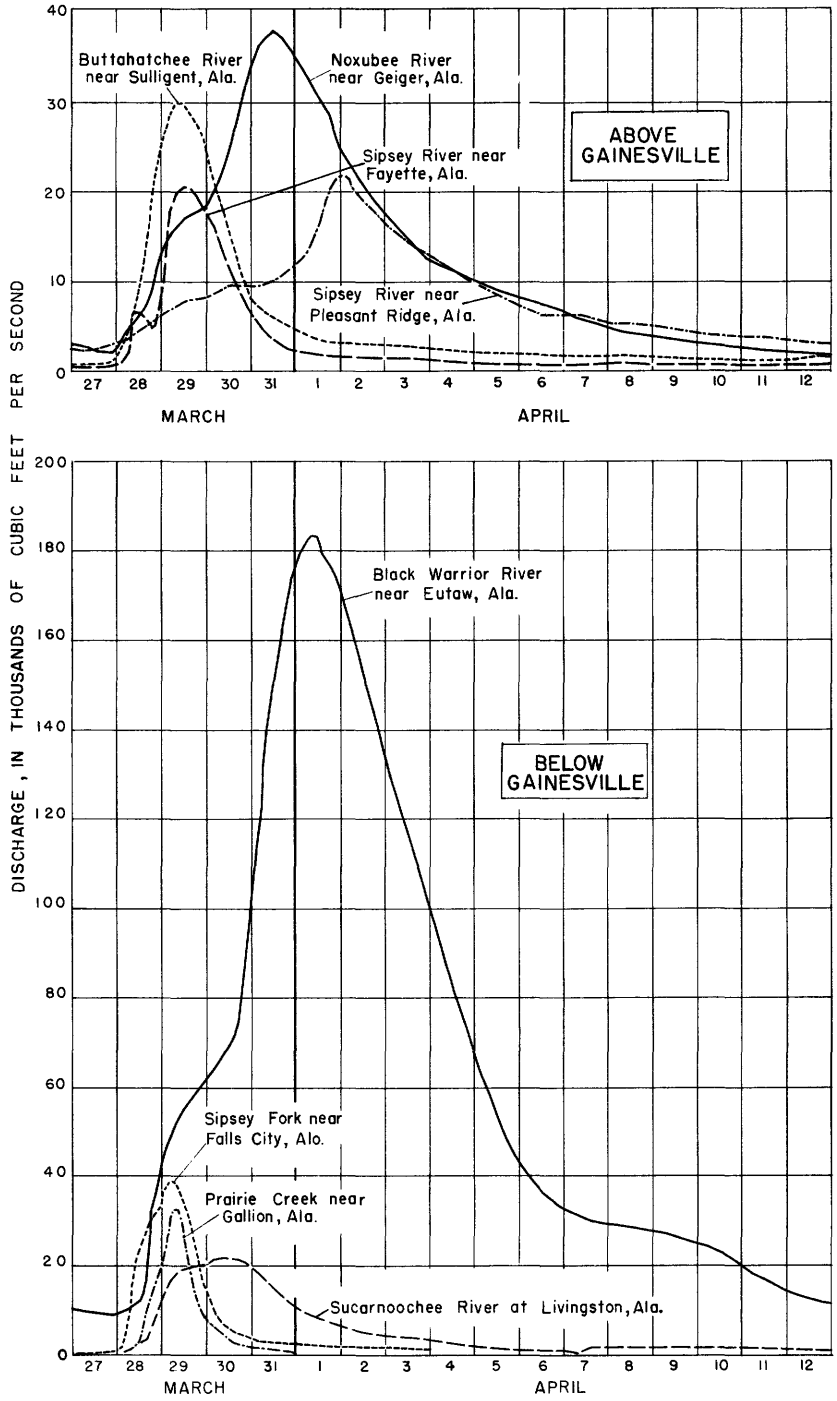

Figure 8. --Graphs of discharge at selected gaging stations on tributaries of Tombigbee River.

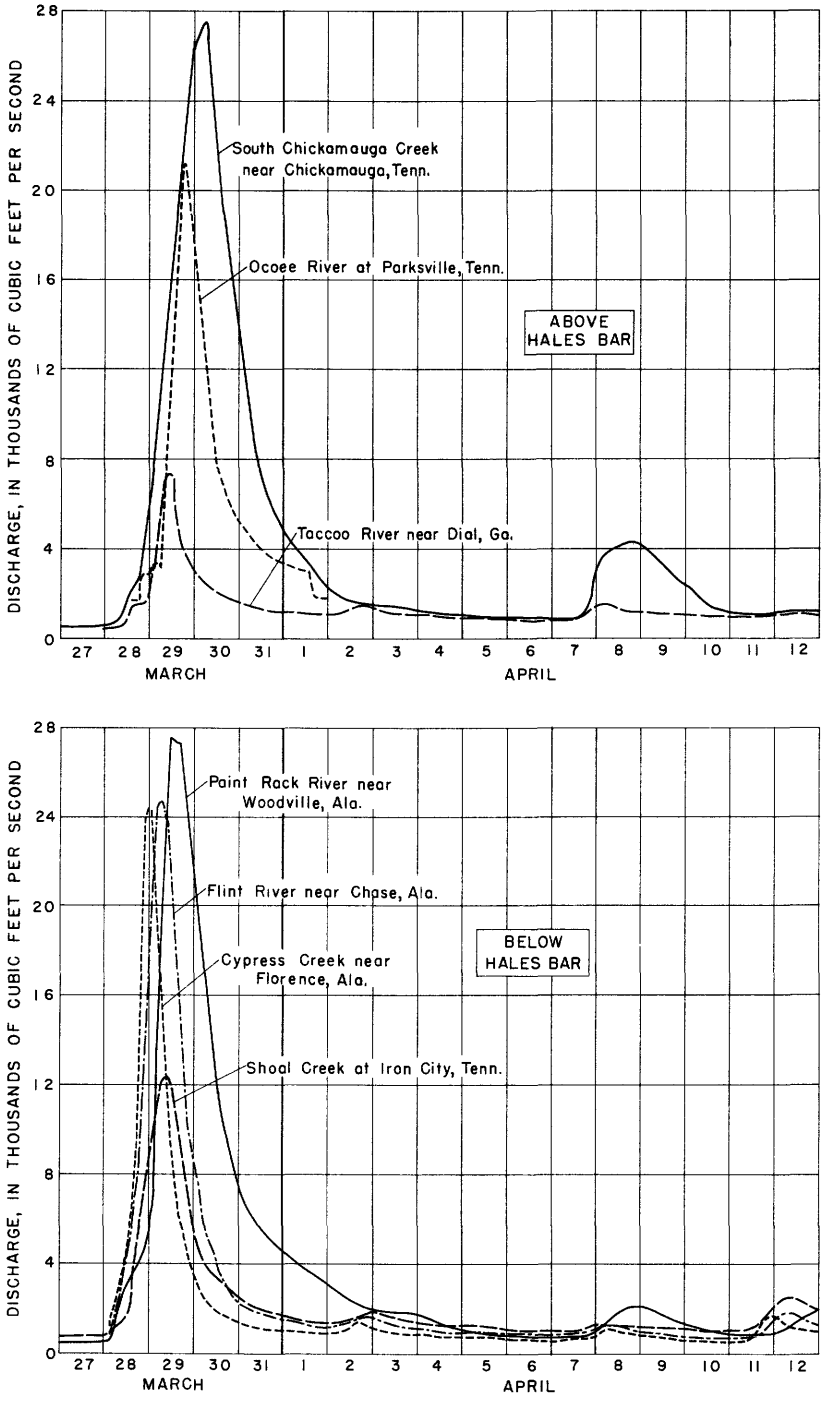

Figure 9. --Graphs of discharge at selected gaging stations on tributaries of Tennessee River.

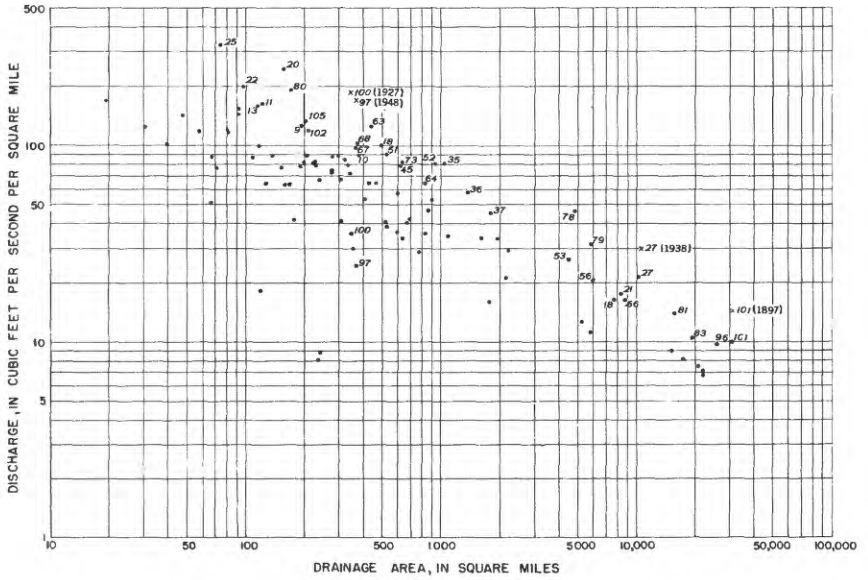

Figure 10. --Relation of unit discharge to size of drainage basin.

STAGES AND DISCHARGES AT STREAM-GAGING STATIONS

Explanation of Data

The data tabulated on the following pages for each stream-gaging station show a station description, a table showing the daily discharge through March and April, and a table showing the stage and discharge at selected intervals during each day of the period of major flood flow in sufficient detail to permit reliable definition of the flood hydrograph.

The station description gives information concerning the type, location, and datum of the gage, the drainage area above the gage, and information about stages and discharges. Information about stage and discharges includes the following: How the gage-height record was obtained--whether from a recording or nonrecording gage; the method used to define the rating curve applicable to the flood period; the maximum stage and discharge during the period March-April 1951 and for the indicated period of station records prior to March 1951, including stages, if available, of floods which occurred prior to the period of record; and remarks on pertinent miscellaneous items.

Daily discharges for the months of March and April are tabulated below the station description. In general, this period covers the flood throughout the area and gives satisfactory definition of the antecedent flow and of the recession.

A tabulation of stages and discharge at indicated time follows the tabulation of daily discharge. It is in sufficient detail to define the gage-height record and the flood hydrograph for the period March 27 to April 19, which includes the main period of the flood.

Figure 11. --Aerial view showing inundation of agricultural land by Coosa River at Childersburg, Ala. Photo by Batson Studio of Photography, Sylacauga, Ala.

Figure 12. --Newly placed fill on State Highway 40 near Linden, Ala., damaged by Chickasaw Bogue. Photo by W. E. Lockard, Montgomery, Ala.

Figure 13. --Army "ducks" used to evacuate people from flood waters of Tombigbee River north of Demopolis, Ala., along U. S. Highway 43. Photo by Alabama Highway Dept.

Mobile River Basin

Cartecay River near Ellijay, Ga.

Location.--Lat 34°41', long. 84°27', adjacent to State Highway 43, three-quarters of a mile downstream from Owltown Creek, 2 miles southeast of Ellijay, Gilmer County, and 2 miles upstream from confluence with Ellijay River. Datum of gage is 1,255.39 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (Corps of Engineers bench mark).

Drainage area.--135 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 3,500 cfs and extended on basis of slope-area determination at gage height 13.0 ft. Gage heights used to hundredths. Shifting-control method used March 1-6.

Maxima.--March-April 1951: Discharge, 12,000 cfs Mar. 29 (gage height, 10.36 ft).
1937 to February 1951: Discharge, 20,000 cfs Apr. 8, 1938 (gage height, 13.0 ft, from floodmark), on basis of slope-area determination at peak stage.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	175	667	9	373	550	17	289	401	25	263	492
2	173	817	10	308	497	18	308	390	26	252	466
3	170	760	11	333	483	19	350	577	27	245	482
4	201	597	12	373	619	20	368	518	28	617	451
5	259	528	13	359	502	21	329	446	29	5,970	550
6	211	490	14	333	472	22	300	1,020	30	1,440	466
7	864	512	15	308	446	23	285	655	31	842	
8	561	734	16	300	426	24	281	539			
Monthly mean discharge, in cfs										563	552
Runoff, in inches										4.81	4.56

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.94	248	1.93	245	4.58	2,110	4.50	2,060	3.26	967	2.89	722
4	1.93	245	1.94	248	6.50	4,440	4.30	1,840	3.21	932	2.86	704
6	1.93	245	1.98	263	9.35	9,470	4.15	1,700	3.17	904	2.85	698
8	1.93	245	2.05	289	10.26	11,700	4.00	1,570	3.13	876	2.83	685
10	1.93	245	2.15	329	9.46	9,710	3.87	1,450	3.09	848	2.82	679
N	1.93	245	2.39	441	8.85	8,400	3.75	1,350	3.06	829	2.79	661
2	1.93	245	2.68	596	8.48	7,660	3.65	1,270	3.03	810	2.78	655
4	1.93	245	2.95	759	7.89	6,580	3.56	1,200	3.00	790	2.76	643
6	1.93	245	3.18	911	6.50	4,400	3.49	1,140	2.98	778	2.75	637
8	1.93	245	3.36	1,040	5.05	2,600	3.42	1,090	2.96	765	2.74	631
10	1.93	245	3.69	1,300	5.02	2,570	3.36	1,040	2.93	747	2.73	625
12	1.93	245	4.16	1,710	4.77	2,300	3.30	995	2.91	734	2.72	619
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.68	596	3.02	803	2.72	619	2.58	539	2.50	497	2.45	472
N	2.87	710	2.90	728	2.68	596	2.56	529	2.49	492	2.44	466
6	3.63	1,250	2.82	679	2.64	573	2.53	513	2.47	482	2.50	497
12	3.34	1,020	2.76	643	2.61	556	2.51	502	2.45	472	3.08	842
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.11	862	2.64	573	2.52	508	2.45	472	2.93	747	2.52	513
N	2.88	716	2.59	545	2.50	497	2.43	461	2.70	607	2.50	497
6	2.76	643	2.56	529	2.48	487	2.42	456	2.61	556	2.49	492
12	2.67	590	2.54	518	2.46	477	2.70	607	2.56	529	2.48	487
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.47	482	2.41	451	2.37	431	2.32	406	2.29	391	2.28	387
N	2.45	472	2.40	446	2.36	426	2.31	401	2.29	301	2.47	482
6	2.43	461	2.39	441	2.35	421	2.30	396	2.28	387	3.18	911
12	2.42	456	2.38	436	2.33	411	2.29	391	2.28	387	2.80	667

Supplemental record.--Mar. 29, 7 a.m., 10.36 ft, 12,000 cfs; Apr. 2, 10 a.m., 2.67 ft, 590 cfs, 4 p.m., 3.15 ft, 890 cfs, 8 p.m., 3.60 ft, 1,230 cfs; Apr. 7, 9 p.m., 2.65 ft, 578 cfs.

Coosawattee River at Pine Chapel, Ga.

Location.--Lat 34°35', long. 84°52', at county bridge at Pine Chapel, Gordon County, 4 miles downstream from Sallacoa Creek, 5 miles east of Resaca, and 6 miles upstream from confluence with Conasauga River. Auxiliary water-stage recorder 2 miles upstream. Datum of each gage is 616.16 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (levels by Corps of Engineers).

Drainage area.--856 square miles.

Gage-height record.--Water-stage recorder graphs from base and auxiliary gages.

Discharge record.--Computed by normal-fall method. Stage-fall-discharge relations defined by current-meter measurements below 27,000 cfs and extended to peak stage. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 40,200 cfs Mar. 30 (gage height, 30.75 ft).
1938 to February 1951: Discharge, 29,100 cfs Feb. 11, 1946 (gage height, 29.6 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	964	9,370	9	3,730	3,950	17	1,550	1,960	25	1,350	2,590
2	964	6,060	10	2,120	2,870	18	1,750	1,830	26	1,270	2,280
3	928	6,320	11	1,790	2,480	19	2,320	2,900	27	1,220	2,170
4	1,000	4,800	12	2,250	3,080	20	2,510	5,030	28	2,290	2,050
5	1,790	3,190	13	2,300	2,820	21	2,030	2,970	29	14,100	2,150
6	1,510	2,680	14	2,140	2,460	22	1,750	5,050	30	31,500	2,010
7	3,850	2,730	15	1,870	2,220	23	1,550	5,370	31	15,300	
8	6,840	4,980	16	1,670	2,100	24	1,470	3,270			
Monthly mean discharge, in cfs										3,796	3,458
Runoff, in inches										5.11	4.66

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.32	1,240	4.21	1,190	18.20	6,960	30.58	39,500	27.60	19,100	25.22	11,600
4	4.30	1,230	4.21	1,190	19.60	7,990	30.75	40,200	27.40	18,100	25.02	11,200
6	4.29	1,230	4.22	1,200	20.57	9,160	30.63	38,600	27.20	17,100	24.81	10,800
8	4.28	1,220	4.30	1,230	21.30	9,850	30.35	37,000	27.02	16,100	24.61	10,300
10	4.26	1,210	4.58	1,340	21.76	10,500	30.00	34,200	26.82	15,300	24.39	9,820
N	4.25	1,210	5.40	1,550	22.16	11,200	29.60	31,700	26.63	14,700	24.17	9,320
2	4.25	1,210	6.56	2,000	22.63	11,800	29.26	29,600	26.42	14,200	23.96	8,770
4	4.24	1,210	7.76	2,470	23.21	12,500	28.92	27,300	26.23	13,700	23.71	8,220
6	4.23	1,200	9.53	2,990	24.25	15,400	28.60	25,500	26.00	13,500	23.47	7,820
8	4.22	1,200	11,90	3,890	26.26	22,400	28.30	23,600	25.78	13,200	23.22	7,510
10	4.22	1,200	14.30	4,930	28.20	30,100	28.06	21,900	25.58	12,700	22.96	7,350
12	4.21	1,190	16.54	5,760	29.83	36,300	27.81	20,600	25.40	12,200	22.69	7,180
	April 2		April 3		April 4		April 5		April 6		April 7	
6	21.88	6,470	19.72	6,360	17.23	5,400	11.58	3,380	8.04	2,700	7.41	2,480
N	20.98	5,890	19.51	6,570	15.92	4,810	10.26	3,170	7.88	2,690	7.32	2,440
6	20.42	5,370	10.06	6,480	14.54	4,190	9.17	2,990	7.75	2,640	7.90	2,740
12	19.96	5,800	18.30	5,980	13.03	3,660	8.44	2,810	7.56	2,550	10.50	3,970
	April 8		April 9		April 10		April 11		April 12		April 13	
6	12.18	4,880	12.00	4,410	9.14	2,970	7.75	2,560	7.70	2,740	8.40	2,920
N	13.05	5,330	11.12	3,900	8.82	2,850	7.42	2,460	8.88	3,360	8.04	2,800
6	13.24	5,270	10.26	3,470	8.50	2,760	7.22	2,400	9.44	3,460	7.83	2,670
12	12.80	4,890	9.62	3,170	8.15	2,660	7.14	2,370	8.97	3,190	7.64	2,580
	April 14		April 15		April 16		April 17		April 18		April 19	
6	7.46	2,540	6.80	2,250	6.40	2,10	6.16	2,010	5.80	1,840	5.66	1,770
N	7.30	2,470	6.68	2,220	6.36	2,100	6.06	1,960	5.75	1,820	6.48	2,150
6	7.13	2,380	6.60	2,180	6.36	2,100	5.95	1,900	5.75	1,820	10.50	4,150
12	6.97	2,340	6.50	2,150	6.28	2,060	5.88	1,870	5.68	1,780	12.40	5,280

Conasauga River at Tilton, Ga.

Location.--Lat 34°40', long. 84°56', 250 ft downstream from county bridge, a quarter of a mile downstream from Swamp Creek, half a mile northeast of Tilton, Whitfield County, and 12 miles upstream from confluence with the Coosawattee River. Auxiliary staff gage about 3 miles upstream. Datum of base gage is 622.28 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (levels by Corps of Engineers). Datum of Auxiliary gage about 5.0 ft higher than that of base gage.

Drainage agea.--682 square miles.

Gage-height record.--Water-stage recorder graph from base gage, and twice-daily staff-gage readings of auxiliary gage Mar. 30 to Apr. 5.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Backwater from Coosawattee River Mar. 30 to Apr. 5; computed by using fall as determined by auxiliary staff gage as a factor. Gage heights used to hundredths Mar. 27 to Apr. 19; half-tenths below 5.2 ft and tenths above Mar. 1-26, Apr. 20-30.

Maxima.--March-April 1951: Discharge, 29,000 cfs Mar. 30; maximum gage height, 30.22 ft Mar. 30.
1937 to February 1951: Discharge, 26,000 cfs Jan. 21, 1947 (gage height 27.7 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	989	15,600	9	4,450	5,000	17	1,630	1,370	25	1,190	2,700
2	884	9,320	10	2,300	4,650	18	1,540	1,230	26	1,050	1,800
3	842	5,890	11	1,630	2,440	19	1,850	1,710	27	950	1,800
4	842	3,930	12	2,250	2,130	20	2,610	2,970	28	2,130	1,450
5	1,450	2,400	13	3,070	2,650	21	2,340	2,070	29	12,900	1,270
6	1,760	1,920	14	3,160	2,190	22	1,800	3,960	30	26,600	1,230
7	3,070	2,060	15	2,660	1,750	23	1,490	5,440	31	24,200	
8	4,550	4,130	16	1,940	1,500	24	1,320	5,440			
Monthly mean discharge, in cfs										3,853	3,400
Runoff, in inches										6.51	5.57

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.93	989	4.78	926	18.50	8,180	25.44	20,200	29.85	27,600	26.65	19,000
4	4.92	968	4.78	926	20.50	10,400	26.40	22,700	29.65	26,800	26.34	18,300
6	4.90	968	4.80	926	21.90	12,600	27.42	25,200	29.46	26,200	26.01	17,500
8	4.89	968	4.89	968	22.33	13,300	28.32	27,600	29.22	25,700	25.72	16,800
10	2.87	947	5.20	1,100	22.39	13,500	29.01	28,700	28.95	25,000	25.40	16,200
N	4.87	947	5.90	1,410	22.33	13,300	29.55	29,000	28.69	24,200	25.07	15,500
2	4.83	947	6.53	1,670	22.30	13,300	29.88	28,900	28.42	23,500	24.72	14,700
4	4.82	926	7.06	1,940	22.38	13,500	30.12	28,800	28.16	22,900	24.40	14,100
6	4.80	926	8.57	2,610	22.60	13,900	30.20	28,600	27.88	22,100	24.09	13,800
8	4.80	926	11.69	4,060	23.02	14,800	30.22	28,500	27.58	21,400	23.78	13,100
10	4.79	926	14.20	5,330	23.64	16,100	30.19	28,300	27.29	20,600	23.47	12,700
12	4.78	926	16.30	6,540	24.50	18,200	30.08	27,800	26.98	19,800	23.16	12,200
	April 2		April 3		April 4		April 5		April 6		April 7	
6	22.20	10,300	18.38	6,390	14.32	4,360	9.64	2,610	7.24	2,000	6.71	1,760
N	21.31	9,160	17.28	5,770	13.27	3,980	8.59	2,350	7.06	1,920	6.59	1,710
6	20.53	8,110	16.24	5,380	12.18	3,480	7.89	2,110	6.91	1,850	7.90	2,300
12	19.47	7,250	15.23	4,760	10.90	3,010	7.49	2,010	6.81	1,810	10.40	3,440
	April 8		April 9		April 10		April 11		April 12		April 13	
6	11.38	3,900	13.30	4,860	13.85	5,140	8.80	2,700	7.20	1,980	8.73	2,670
N	11.96	4,180	13.68	5,050	13.30	4,860	7.89	2,290	7.38	2,060	8.87	2,730
6	12.40	4,400	13.90	5,170	12.12	4,260	7.40	2,070	7.79	2,250	8.75	2,680
12	12.87	4,640	14.00	5,220	10.40	3,440	7.22	1,990	8.35	2,500	8.41	2,520
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.00	2,340	6.85	1,820	6.21	1,540	5.89	1,400	5.60	1,270	5.38	1,180
N	7.62	2,170	6.66	1,740	6.13	1,510	5.83	1,370	5.51	1,230	6.15	1,520
6	7.31	2,030	6.49	1,670	6.01	1,450	5.75	1,340	5.42	1,190	7.83	2,260
12	7.07	1,920	6.33	1,600	5.95	1,430	5.68	1,310	5.36	1,170	8.61	2,610

Supplemental record.--Apr. 7, 3 p.m., 6.60 ft. 1,710 cfs.

Oostanaula River at Resaca, Ga.

Location.--Lat 34°34', long. 84°57', at bridge on U. S Highway 41 at Resaca, Gordon County, 200 ft downstream from Nashville, Chattanooga & St. Louis Railway bridge, three-quarters of a mile upstream from Camp Creek, and 3½ miles downstream from confluence of Conasauga and Coosawattee Rivers. Auxiliary wire-weight gage at bridge on State Highway 143, 6½ miles downstream. Datum of each gage is 604.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (levels by Corps of Engineers).

Drainage area.--1,610 square miles.

Gage-height record.--Water-stage recorder graph from base gage and twice-daily wire-weight gage readings from auxiliary gage. Gage heights used to tenths.

Discharge record.--Computed by constant-fall method. Stage-fall-discharge relations defined by current-meter measurements below 35,000 cfs and extended to peak stage.

Maxima.--March-April 1951: Discharge, 54,800 cfs Mar. 31; maximum gage height, 34.56 ft Mar. 31.
1896 to February 1951: Discharge, 49,600 cfs Jan. 21, 1947 (gage height, 33.5 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	2,030	35,800	9	9,410	9,100	17	3,310	3,480	25	2,700	6,220
2	1,910	24,500	10	5,180	8,100	18	3,410	3,180	26	2,430	4,170
3	1,780	19,100	11	3,460	5,610	19	4,250	4,200	27	2,280	3,960
4	1,840	14,700	12	4,220	5,000	20	5,040	7,830	28	3,790	3,560
5	3,040	8,170	13	5,350	5,460	21	4,630	5,800	29	16,300	3,450
6	3,450	4,730	14	5,370	4,870	22	3,710	7,930	30	39,500	3,230
7	5,860	4,810	15	4,790	4,180	23	3,230	10,800	31	50,000	
8	10,700	9,100	16	3,780	3,730	24	2,880	9,660			
Monthly mean discharge, in cfs										7,085	8,131
Runoff, in inches										5.07	5.63

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.48	2,360	5.28	2,250	18.00	12,600	25.76	21,100	34.50	54,800	33.09	42,100
4	5.46	2,360	5.28	2,250	20.35	14,400	26.88	23,800	34.56	54,300	32.85	40,300
6	5.43	2,290	5.27	2,250	21.72	15,300	28.22	27,600	34.54	52,800	32.60	39,000
8	5.41	2,290	5.32	2,230	22.38	15,900	29.57	32,200	34.54	52,300	32.34	37,600
10	5.40	2,290	5.47	2,360	22.72	16,300	30.80	37,400	34.47	51,800	32.10	36,900
N	5.38	2,290	6.00	2,710	23.02	16,600	31.79	41,800	34.37	50,700	31.82	35,600
2	5.36	2,290	6.71	3,190	23.32	17,100	32.56	45,400	34.23	49,100	31.57	34,500
4	5.34	2,230	7.41	3,640	23.64	17,400	33.15	49,000	34.10	48,100	31.30	33,300
6	5.32	2,230	8.46	4,390	23.95	17,800	33.60	51,300	33.91	47,000	31.00	32,200
8	5.31	2,230	10.36	5,760	24.30	18,200	33.95	53,100	33.72	46,000	30.73	31,100
10	5.30	2,230	13.00	8,020	24.63	18,700	34.20	53,900	33.52	44,500	30.45	29,800
12	5.29	2,250	15.85	10,700	25.07	19,500	34.38	54,600	33.31	43,500	30.17	29,200
	April 2		April 3		April 4		April 5		April 6		April 7	
6	29.30	26,200	26.00	20,200	22.90	16,100	17.74	9,600	10.50	4,780	8.50	4,340
N	28.34	24,000	25.24	19,000	21.92	14,800	15.85	7,960	9.54	4,590	8.32	4,240
6	27.54	22,600	24.48	18,200	20.76	13,400	13.88	6,570	9.00	4,560	9.10	4,880
12	26.74	21,200	23.73	17,100	19.35	11,700	12.00	5,400	8.70	4,460	11.46	7,090
	April 8		April 9		April 10		April 11		April 12		April 13	
6	12.84	8,000	14.45	9,310	13.42	8,420	11.15	6,350	8.68	4,550	9.88	5,530
N	13.75	8,990	14.26	9,120	13.18	8,220	10.01	5,340	9.08	4,970	9.82	5,450
6	14.26	9,400	13.96	8,920	12.79	7,840	9.20	4,810	9.66	5,370	9.74	5,420
12	14.46	9,500	13.69	8,620	12.16	7,230	8.76	4,630	9.86	5,580	9.62	5,280
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.40	5,120	8.27	4,330	7.59	3,820	7.20	3,560	6.79	3,270	6.42	2,980
N	9.10	4,880	8.06	4,180	7.45	3,670	7.08	3,490	6.62	3,120	7.15	3,390
6	8.80	4,630	7.88	4,040	7.37	3,670	6.98	3,410	6.54	3,120	9.84	5,450
12	8.52	4,430	7.70	3,890	7.29	3,600	6.88	3,340	6.46	3,070	11.58	6,910

Oostanaula River near Rome, Ga.

Location.--Lat 34°18', long. 85°08' 1½ miles upstream from Dry Creek, 3 miles downstream from Woodward Creek, 4 miles north of Rome, Floyd County, and 4½ miles above confluence with Etowah River. Auxiliary water-stage recorder at Southern Railway Bridge 3½ miles downstream. Datum of each gage is 561.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--2,120 square miles.

Gage-height record.--Water-stage recorder graphs from base and auxiliary gages except for period March 5-7 when there was no record at base gage.

Discharge record.--Computed by normal-fall method. Stage-fall-discharge relations defined by current-meter measurements. Discharge for period of no gage-height record computed on basis of records for Etowah River at Rome and Coosa River near Rome. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 44,700 cfs Apr. 2 (gage height, 35.40 ft).
1940 to February 1951: Discharge, 48,000 cfs Jan. 23, 1947 (gage height, 34.1 ft, at site of present auxiliary gage).
Maximum stage known, 40.3 ft Apr. 1, 1886 (site and datum then in use).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	2,740	41,900	9	12,900	12,000	17	4,560	4,130	25	3,670	10,100
2	2,560	44,300	10	10,300	11,100	18	4,660	3,810	26	3,270	7,220
3	2,420	40,700	11	6,060	9,160	19	6,250	5,850	27	3,020	5,350
4	2,460	33,400	12	5,020	6,520	20	7,150	10,700	28	5,400	5,020
5	4,000	27,600	13	6,350	6,440	21	7,060	10,200	29	29,400	4,550
6	4,600	20,000	14	6,950	6,240	22	6,030	11,700	30	38,200	4,380
7	9,200	9,460	15	6,580	5,680	23	4,750	14,900	31	35,300	
8	13,100	11,200	16	5,520	4,800	24	4,200	13,400			
Monthly mean discharge, in cfs										8,506	13,350
Runoff, in inches										4.62	6.03

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	9.15	2,910	8.70	2,660	22.00	17,800	34.96	43,100	33.40	33,800	33.92	38,700
4	9.20	3,020	8.83	2,720	24.53	20,700	35.00	41,800	33.28	33,900	34.15	39,900
6	9.12	3,100	8.86	2,920	26.45	22,400	34.97	40,900	33.18	33,800	34.31	40,300
8	8.96	3,130	8.88	3,030	27.99	24,500	34.90	40,100	33.10	34,200	34.47	41,100
10	8.83	3,090	9.13	3,310	29.20	26,200	34.78	38,900	33.06	34,500	34.63	41,500
N	8.71	3,080	9.72	3,910	30.30	29,000	34.63	37,800	33.07	35,200	34.77	42,300
2	8.63	3,010	10.46	4,790	31.47	31,600	34.46	37,000	33.10	35,600	34.90	42,700
4	8.57	3,070	11.35	5,650	32.65	34,000	34.28	36,300	33.17	36,000	35.01	43,100
6	8.53	3,000	12.80	7,050	33.53	37,100	34.10	35,600	33.28	36,400	35.12	43,500
8	8.49	3,000	14.56	8,930	34.20	39,900	33.88	34,800	33.41	36,700	35.20	43,900
10	8.47	3,000	16.65	11,200	34.60	41,500	33.70	34,100	33.57	37,500	35.28	44,300
12	8.50	2,810	19.30	14,500	34.83	42,300	33.54	33,800	33.75	38,300	35.33	44,300
	April 2		April 3		April 4		April 5		April 6		April 7	
6	35.34	44,300	34.85	42,300	32.92	35,000	30.03	28,800	26.50	22,900	17.95	10,400
N	35.40	44,700	34.49	41,100	32.24	33,000	29.24	27,600	25.14	20,600	15.38	8,140
6	35.34	44,300	34.05	39,100	31.57	31,800	28.40	26,200	23.18	17,500	14.65	8,220
12	35.14	43,500	33.52	37,100	30.82	30,400	27.50	24,900	20.77	13,500	16.22	9,200
	April 8		April 9		April 10		April 11		April 12		April 13	
6	17.04	10,400	17.52	12,300	17.85	10,900	16.77	9,540	14.62	6,430	14.08	5,950
N	17.52	11,400	17.34	12,100	17.52	11,300	16.22	9,630	14.00	6,780	13.95	7,030
6	17.54	12,200	17.13	11,800	16.54	11,100	14.85	9,060	12.84	6,630	13.10	7,130
12	17.61	12,400	17.54	12,300	16.55	9,860	14.57	7,050	13.31	5,440	13.50	5,810
	April 14		April 15		April 16		April 17		April 18		April 19	
6	14.10	6,030	13.35	5,200	10.78	5,060	12.13	3,940	11.80	3,570	10.22	3,980
N	13.75	6,760	12.76	5,990	10.63	4,880	11.77	4,540	11.43	4,180	11.50	4,940
6	12.69	6,670	11.65	5,850	10.52	4,790	10.67	4,620	10.28	4,240	14.29	8,600
12	12.87	5,150	11.07	5,330	11.28	3,730	11.05	3,390	10.45	3,370	16.15	8,880

Supplemental record.--Apr. 7, 4 p.m., 14.40 ft. 7,660 cfs; Apr. 10, 9 p.m., 16.35 ft, 10,900 cfs; Apr. 11, 9 p.m., 14.47 ft, 7,940 cfs; Apr. 12, 8 p.m., 12.71 ft, 6,260 cfs; Apr. 13, 9 a.m., 14.20 ft, 6,370 cfs, 8 p.m., 12.98 ft, 6,820 cfs; Apr. 14, 9 a.m., 14.10 ft, 6,280 cfs, 8 p.m., 12.48 ft, 6,340 cfs; Apr. 15, 9 a.m., 13.23 ft, 5,590 cfs; Apr. 16, 9 p.m., 10.58 ft, 4,140 cfs; Apr. 17, 9 a.m., 12.16 ft, 4,060 cfs, 9 p.m., 10.53 ft, 3,920 cfs; Apr. 18, 9 a.m., 11.82 ft, 3,810 cfs, 9 p.m., 10.07 ft, 3,580 cfs; Apr. 19, 8 a.m., 10.10 ft, 3,810 cfs.

Etowah River at Rome, Ga.

Location.--Lat 34°15', long. 85°09', at Southern Railway bridge in Rome, Floyd County, 2 miles upstream from confluence with Oostanaula River. Auxiliary water-stage recorder at Second Avenue Bridge, 1 mile downstream. Datum of each gage is 561.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--1,810 square miles.

Gage-height record.--Water-stage recorder graphs from base and auxiliary gages.

Discharge record.--Computed by unit-fall method. Stage-fall-discharge relations defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 14,800 cfs Mar. 29; maximum gage height, 30.07 ft Mar. 30.
1904-21, 1939 to February 1951: Discharge, 55,000 cfs Dec. 11, 1919 (gage height, over 28 ft at former site at Freemans Ferry), computed from data at upstream stations.

Remarks.--Flow regulated by Allatoona Reservoir.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	926	2,380	9	2,300	3,890	17	1,660	5,590	25	2,190	6,310
2	880	2,160	10	1,880	6,400	18	1,580	5,380	26	1,340	6,000
3	883	2,470	11	1,940	6,310	19	1,720	3,730	27	1,700	4,770
4	880	2,690	12	1,440	6,380	20	2,880	7,740	28	2,110	4,440
5	1,060	3,170	13	1,750	6,220	21	2,860	6,770	29	12,200	3,290
6	1,280	4,190	14	1,860	6,220	22	2,270	7,170	30	12,200	2,260
7	2,610	4,320	15	2,080	4,730	23	2,190	5,690	31	4,920	
8	4,680	5,500	16	2,000	3,370	24	2,110	6,930			
Monthly mean discharge, in cfs										2,657	4,882
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Coosa River near Rome, Ga.

Location.--Lat 34°12', long. 85°16', at Mayo Bar lock and dam, 1½ miles upstream from Webb Creek, 6 miles southwest of Rome, Floyd County, and 7½ miles downstream from confluence of Oostanaula and Etowah Rivers. Datum of gage is 553.05 ft above mean sea level (levels by Corps of Engineers).

Drainage area.--4,040 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Computed by using rate of change of stage as a factor for periods of rapidly changing stage. Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 49,400 cfs Mar. 30 (gage height, 33.6 ft).
1897-1903, 1928-31, 1937 to February 1951: Discharge, 65,000 cfs Jan. 22, 1947 (gage height, 37.0 ft).
Stage known, 40.3 ft Apr. 1, 1886 (site and datum at Rome).

Remarks.--Flow regulated by Allatoona Reservoir on Etowah River.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	3,750	45,200	9	17,300	17,700	17	6,750	10,100	25	6,350	19,000
2	3,560	48,000	10	14,200	18,100	18	6,550	9,580	26	4,950	14,700
3	3,380	46,700	11	9,240	16,300	19	8,360	10,900	27	5,080	11,000
4	3,470	41,100	12	6,750	13,500	20	10,600	18,500	28	8,500	10,300
5	5,350	34,500	13	8,150	13,000	21	10,500	18,000	29	37,800	8,690
6	6,150	27,600	14	9,020	12,600	22	8,910	19,700	30	48,100	6,750
7	12,200	19,100	15	9,020	10,800	23	7,450	20,800	31	44,300	
8	18,800	19,800	16	8,150	7,350	24	6,850	23,700			
Monthly mean discharge, in cfs										11,600	19,770
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.0	6,040	4.3	5,350	19.4	30,600	32.2	46,400	33.3	46,300	32.1	44,300
4	5.3	6,050	4.8	5,720	21.3	33,600	32.6	47,600	33.1	45,500	32.1	44,300
6	5.2	5,830	4.9	5,650	25.3	36,200	33.0	48,400	33.0	44,600	32.3	44,600
8	4.9	5,480	4.8	5,550	26.8	36,600	33.2	48,800	32.9	44,400	32.2	44,600
10	4.6	5,190	4.8	5,550	27.8	37,100	33.4	48,600	32.7	43,800	32.3	44,900
N	4.3	4,900	5.0	5,980	28.6	38,000	33.5	49,000	32.6	44,000	32.5	44,900
2	4.0	4,660	5.5	6,560	29.3	38,600	33.6	49,400	32.5	43,700	32.4	45,200
4	3.9	4,600	6.2	7,580	29.8	39,900	33.6	49,400	32.4	43,400	32.5	45,500
6	3.7	4,450	7.5	9,650	30.3	41,200	33.6	48,400	32.3	43,600	32.6	45,800
8	3.6	4,350	9.5	12,400	30.9	42,800	33.5	48,000	32.2	43,700	32.7	46,100
10	3.6	4,350	11.9	17,200	31.4	44,300	33.5	47,500	32.2	43,700	32.8	46,400
12	3.7	4,630	15.6	25,200	31.8	45,100	33.4	46,600	32.1	44,300	32.9	46,700
	April 2		April 3		April 4		April 5		April 6		April 7	
6	33.1	47,400	33.4	48,100	32.3	42,700	30.2	36,300	27.3	29,900	21.4	19,700
N	33.3	48,200	33.3	47,200	31.9	41,100	29.5	34,200	26.4	27,800	19.0	17,600
6	33.4	48,600	33.0	45,100	31.4	39,700	28.8	32,800	25.1	25,100	17.1	17,100
12	33.5	49,000	32.7	44,300	30.8	37,700	28.1	31,500	23.6	23,500	17.2	20,500
	April 8		April 9		April 10		April 11		April 12		April 13	
6	17.4	20,300	15.7	18,100	16.8	19,900	15.7	18,300	13.7	15,500	12.7	14,700
N	17.5	20,400	15.2	17,200	16.5	18,400	15.1	16,600	12.8	13,500	12.2	13,000
6	16.8	19,100	14.6	16,700	14.6	15,700	12.7	13,600	10.3	10,800	10.1	10,600
12	16.2	18,400	15.9	19,100	14.9	17,800	13.0	15,300	11.4	13,600	11.3	13,500
	April 14		April 15		April 16		April 17		April 18		April 19	
6	12.6	14,500	11.9	13,400	6.3	7,050	10.4	11,900	10.2	11,500	6.9	7,500
N	12.0	12,700	10.8	11,400	6.0	6,750	9.8	10,100	9.5	9,760	8.7	10,500
6	9.6	10,000	8.2	8,480	5.8	6,550	7.4	7,660	7.0	7,210	10.5	12,400
12	10.7	12,600	6.8	7,400	8.7	10,600	9.2	11,000	7.7	8,720	13.9	17,500

Cedar Creek near Cedartown, Ga.

Location.--Lat 34°04', long. 85°19', 700 ft downstream from bridge on State Highway 161, 4½ miles upstream from Lake Creek, and 4½ miles northwest of Cedartown, Polk County.

Drainage area.--109 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 4,500 cfs and extended to peak stage on basis of slope-conveyance studies. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 9,390 cfs Mar. 29 (gage height, 14.54 ft). 1942 to February 1951: Discharge, 12,500 cfs Nov. 28, 1948 (gage height, 16.4 ft), from curve extended above 4,500 cfs on basis of slope-conveyance studies.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	99	488	9	225	377	17	133	170	25	198	300
2	93	451	10	194	307	18	293	160	26	179	262
3	89	379	11	170	269	19	491	472	27	162	241
4	105	304	12	174	289	20	491	408	28	267	244
5	269	264	13	191	237	21	345	289	29	6,710	230
6	203	244	14	174	213	22	278	878	30	2,060	208
7	311	441	15	152	194	23	244	476	31	692	
8	278	667	16	140	184	24	225	345			
Monthly mean discharge, in cfs										504	333
Runoff, in inches										5.33	3.41

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.53	167	1.50	160	7.28	2,370	10.75	4,900	3.88	824	3.03	545
4	1.53	167	1.50	160	9.05	3,520	9.40	3,770	3.78	792	2.99	533
6	1.52	165	1.52	165	10.85	5,000	7.92	2,750	3.67	751	2.94	518
8	1.51	162	1.56	174	12.40	6,570	6.80	2,100	3.60	730	2.90	506
10	1.52	165	1.62	189	12.33	7,570	6.10	1,750	3.52	706	2.86	494
N	1.47	152	1.65	196	13.82	8,350	5.58	1,510	3.47	688	2.82	482
2	1.50	160	1.72	213	14.32	9,060	5.15	1,320	3.40	660	2.80	476
4	1.50	160	1.85	244	14.54	9,390	4.83	1,170	3.35	645	2.77	468
6	1.50	160	1.95	266	14.38	9,150	4.58	1,070	3.27	620	2.74	459
8	1.51	162	2.12	304	13.90	8,460	4.36	994	3.21	601	2.70	448
10	1.51	162	2.85	491	13.08	7,380	4.18	932	3.14	579	2.66	439
12	1.50	160	4.95	1,220	12.00	6,130	4.01	864	3.08	560	2.62	426
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.53	403	2.54	405	2.16	313	1.97	271	1.87	248	1.78	227
N	2.68	437	2.39	367	2.12	304	1.93	262	1.87	248	1.80	232
6	2.92	512	2.29	343	2.07	293	1.91	257	1.82	237	3.05	551
12	2.80	476	2.22	327	2.03	285	1.88	250	1.81	234	4.66	1,100
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.82	806	2.51	398	2.18	318	1.97	271	2.17	315	1.85	244
N	3.20	598	2.42	374	2.14	309	1.94	264	2.10	300	1.82	237
6	2.86	494	2.33	352	2.08	296	1.92	260	1.98	273	1.78	227
12	2.66	437	2.24	331	2.01	280	2.01	280	1.90	255	1.76	222
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.74	218	1.65	196	1.60	184	1.56	174	1.51	162	1.50	160
N	1.72	213	1.64	194	1.60	184	1.53	167	1.50	160	2.03	285
6	1.70	208	1.63	191	1.61	186	1.53	167	1.49	158	4.51	1,050
12	1.67	201	1.61	186	1.58	179	1.52	165	1.48	155	3.45	680

Supplemental record.--Apr. 7, 2 p.m., 1.92 ft, 260 cfs, 8 p.m., 4.18 ft, 932 cfs, 10 p.m., 4.73 ft, 1,130 cfs; Apr. 19, 3 p.m., 3.42 ft, 668 cfs.

Chattooga River at Summerville, Ga.

Location.--Lat 34°28', long. 85°20', 600 ft downstream from bridge on U. S. Highway 27, 1 mile southeast of Summerville, Chattooga County, and 4 miles upstream from Raccoon Creek. Datum of gage is 613.47 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (levels by Georgia State Highway Department).

Drainage area.--193 square miles.

Gage-height record.--Water-stage recorder graph except for 8 a.m. to 5 p.m. Mar. 29 and Apr. 4-19, when there was no gage-height record. Graph for part of day Mar. 29 drawn on basis of floodmark.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used Apr. 28-30. Discharge for period Apr. 4-19 computed on basis of records for Cedar Creek near Cedartown and Mill Creek at Dalton. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 24,500 cfs Mar. 29 (gage height, 21.00 ft, from floodmark).
1937 to February 1951: Discharge, 22,700 cfs Nov. 28, 1948 (gage height, 20.6 ft, from floodmark).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	282	1,140	9	868	1,000	17	425	450	25	372	740
2	272	1,140	10	644	800	18	538	400	26	341	644
3	254	1,310	11	526	700	19	692	1,200	27	316	816
4	272	900	12	584	700	20	868	1,520	28	1,260	644
5	458	700	13	692	600	21	668	790	29	17,700	560
6	393	650	14	668	550	22	549	2,480	30	5,460	514
7	1,370	1,000	15	549	500	23	469	1,780	31	1,830	
8	1,760	2,000	16	480	500	24	414	946			
Monthly mean discharge, in cfs										1,354	922
Runoff, in inches										8.09	5.33

Gage height, in feet and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.75	321	3.69	309	17.40	10,800	17.10	9,990	10.94	2,380	7.72	1,320
4	3.75	321	3.70	311	18.46	14,100	16.52	8,510	10.50	2,210	7.60	1,280
6	3.75	321	4.76	323	19.44	17,800	16.00	7,320	10.16	2,090	7.43	1,230
8	3.74	321	4.00	372	20.26	21,200	15.45	6,220	9.80	1,960	7.30	1,190
10	3.75	321	4.63	510	20.90	24,100	14.90	5,250	9.48	1,850	7.20	1,170
N	3.90	351	5.50	716	21.00	24,500	14.40	4,500	9.20	1,760	7.10	1,140
2	3.85	341	6.32	925	20.56	22,500	13.94	3,970	8.92	1,680	7.00	1,110
4	3.77	325	7.40	1,220	20.10	20,500	13.40	3,540	8.70	1,610	6.90	1,080
6	3.60	291	9.30	1,790	19.60	18,400	12.86	3,220	8.45	1,540	6.82	1,060
8	3.48	268	11.00	2,400	19.10	16,400	12.36	2,970	8.25	1,460	6.72	1,030
10	3.61	293	13.00	3,290	18.40	13,900	11.87	2,750	8.06	1,420	6.62	1,000
12	3.66	303	15.13	5,640	17.76	11,900	11.39	2,560	7.90	1,370	6.65	1,010
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.37	938	8.70	1,610								
N	6.55	985	7.50	1,250								
6	7.80	1,340	6.80	1,050								
12	8.96	1,690	6.46	962								
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Chattooga River at Gaylesville, Ala.

Location.--Lat 34°16', long. 85°34', in SE¼ sec. 11, T. 9 S., R. 10 E., at bridge on county road to Cedar Bluff, 0.2 mile southwest of Gaylesville, and 9 miles upstream from Little River. Datum of gage is 549.56 ft above mean sea level, datum of 1929, supplementary adjustment of 1936 (levels by Corps of Engineers).

Drainage area.--377 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 18,000 cfs and extended to peak stage on basis of velocity-area studies. Discharge obtained from backwater curve on Apr. 1, 2. Gage heights used to half-tenths below and tenths above 6.8 ft.

Maxima.--March-April 1951: Discharge, 33,700 cfs Mar. 29, 30; gage height, 25.24 ft Mar. 30.
1937 to February 1951: Discharge, 32,000 cfs Nov. 29, 1948 (gage height, 24.6 ft, from graph based on gage readings), from rating curve extended above 18,000 cfs on basis of velocity-area studies.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	516	3,310	9	2,360	2,260	17	795	744	25	740	1,550
2	493	2,160	10	1,420	1,470	18	1,130	674	26	687	1,250
3	471	2,730	11	1,120	1,200	19	1,690	1,380	27	624	1,220
4	516	1,870	12	1,000	1,280	20	1,840	3,100	28	2,250	1,250
5	1,060	1,450	13	1,280	1,030	21	1,480	1,880	29	20,600	1,000
6	881	1,220	14	1,280	900	22	1,180	2,950	30	26,200	881
7	2,680	1,380	15	1,030	809	23	970	3,930	31	9,670	
8	3,540	2,600	16	910	778	24	881	2,540			
Monthly mean discharge, in cfs										2,945	1,693
Runoff, in inches										9.01	5.01

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	6.91	661	6.77	624	19.11	8,350	25.24	33,700	20.90	14,000	17.47	5,180
4	6.86	661	6.77	624	19.80	10,300	25.17	33,700	20.55	12,900	16.95	4,630
6	6.79	636	6.81	636	20.67	13,200	25.00	32,500	20.20	11,500	16.36	4,090
8	6.71	611	7.10	713	21.42	15,700	24.71	30,800	19.91	10,600	15.74	3,630
10	6.69	611	7.91	940	22.05	18,000	24.37	29,200	19.64	9,700	15.09	3,250
N	6.69	611	9.33	1,380	22.69	20,800	23.96	27,000	19.39	9,100	14.46	2,940
2	6.69	611	10.91	1,940	23.23	23,000	23.51	24,500	19.15	8,600	13.87	2,690
4	6.69	611	12.65	2,570	23.80	26,000	23.06	22,500	18.92	7,900	13.39	2,520
6	6.69	611	14.42	3,260	24.30	28,600	22.61	20,400	18.70	7,500	13.00	2,390
8	6.70	611	16.38	4,320	24.70	30,800	22.15	18,800	18.48	7,140	12.65	2,280
10	6.72	611	17.78	6,000	25.01	32,500	21.71	16,800	18.17	6,620	12.36	2,220
12	6.76	624	18.62	7,320	25.20	33,700	21.30	15,400	17.88	5,650	12.12	2,160
	April 2		April 3		April 4		April 5		April 6		April 7	
6	11.50	2,020	13.26	2,830	11.06	2,020	9.66	1,520	8.94	1,250	8.46	1,120
N	11.54	2,050	13.40	2,870	10.54	1,800	9.45	1,420	8.80	1,220	8.44	1,090
6	11.73	2,160	12.98	2,720	10.19	1,690	9.27	1,380	8.69	1,180	9.94	1,590
12	12.77	2,640	11.97	2,340	9.96	1,620	9.14	1,310	8.64	1,150	11.87	2,300
	April 8		April 9		April 10		April 11		April 12		April 13	
6	12.52	2,530	12.87	2,680	9.77	1,550	8.88	1,250	8.69	1,180	8.35	1,090
N	12.72	2,610	11.72	2,230	9.51	1,450	8.73	1,180	8.70	1,180	8.13	1,000
6	13.00	2,720	10.72	1,870	9.28	1,380	8.63	1,150	8.68	1,180	8.02	970
12	13.17	2,800	10.18	1,690	9.13	1,310	8.68	1,180	8.59	1,150	7.99	970
	April 14		April 15		April 16		April 17		April 18		April 19	
6	7.81	910	7.50	823	7.30	767	7.30	767	6.98	687	6.85	636
N	7.72	881	7.39	795	7.31	767	7.20	740	6.88	661	7.84	910
6	7.67	881	7.36	795	7.38	795	7.11	713	6.87	661	11.65	2,200
12	7.66	881	7.31	767	7.43	795	7.10	713	6.90	661	13.50	2,910

Coosa River at Leesburg, Ala.

Location.--Lat 34°11', long. 85°45', in NW¼ sec. 12, T. 10 S., R. 8 E., at bridge on U. S. Highway 411, 1 mile east of Leesburg and 4 miles downstream from Yellow Creek. Datum of gage is 517.77 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--5,270 square miles.

Gage-height record.--Graph based on twice-daily readings of wire-weight gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge from 2 p.m. Mar. 31 to Apr. 15 determined from backwater curve. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 66,900 cfs Mar. 30, 31 (gage height, 34.1 ft). 1937 to February 1951: Discharge, 73,200 cfs Feb. 14, 1946, and Jan. 24, 1947 (gage height, 35.1 ft, from graph based on gage readings).

Remarks.--Flood runoff moderately affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	5,190	60,900	9	25,400	33,300	17	9,930	9,780	25	8,880	26,800
2	4,930	55,400	10	21,000	26,800	18	10,400	11,500	26	7,980	24,300
3	4,810	52,100	11	15,800	20,200	19	14,700	13,800	27	6,640	17,100
4	5,190	50,600	12	11,300	15,800	20	16,300	22,900	28	11,700	14,300
5	8,880	48,200	13	10,400	13,700	21	15,900	24,900	29	45,600	13,100
6	9,780	45,300	14	11,900	13,300	22	13,900	26,500	30	65,100	10,500
7	13,100	41,700	15	11,800	13,100	23	11,300	30,000	31	66,000	
8	24,400	38,400	16	11,100	11,400	24	9,930	28,800			
Monthly mean discharge, in cfs										16,430	27,150
Runoff, in inches										3.59	5.75

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	6.0	6,820	5.9	6,680	20.1	29,900	33.0	60,600	34.1	66,900	33.6	62,800
4	6.0	6,820	5.9	6,680	22.7	34,300	33.4	62,900	34.1	66,900	33.5	62,400
6	5.9	6,680	6.0	6,820	25.3	38,700	33.7	64,600	34.1	66,900	33.5	62,400
8	5.9	6,680	6.1	6,960	27.8	43,500	34.0	66,300	34.1	66,900	33.4	62,100
10	5.9	6,680	6.4	7,380	28.9	45,900	34.0	66,300	34.1	66,900	33.3	61,100
N	5.8	6,540	6.9	8,130	29.7	47,800	34.0	66,300	34.1	66,900	33.3	61,100
2	5.8	6,540	8.2	10,100	30.3	49,500	34.0	66,300	34.0	65,500	33.2	60,500
4	5.8	6,540	9.8	12,600	30.8	51,000	34.0	66,300	33.9	65,500	33.1	59,700
6	5.8	6,540	11.0	15,900	31.3	52,800	34.0	66,300	33.9	65,500	33.0	59,300
8	5.8	6,540	14.0	19,500	31.8	54,800	34.0	66,300	33.8	64,400	33.0	59,300
10	5.8	6,540	16.0	22,900	32.2	56,600	34.0	66,300	33.7	63,800	32.9	58,900
12	5.9	6,680	18.0	26,300	32.6	58,600	34.1	66,900	33.7	63,800	32.8	58,200
	April 2		April 3		April 4		April 5		April 6		April 7	
6	32.5	56,400	31.8	52,500	31.5	51,000	31.0	48,800	30.3	46,000	29.2	42,500
N	32.3	55,300	31.7	52,000	31.4	50,700	30.9	48,400	30.1	45,200	28.8	41,500
6	32.1	54,000	31.6	51,500	31.3	50,200	30.7	47,500	29.9	44,700	28.5	40,700
12	32.0	53,500	31.5	51,000	31.2	49,700	30.5	46,700	29.6	43,600	28.3	40,300
	April 8		April 9		April 10		April 11		April 12		April 13	
6	28.1	39,800	25.8	35,300	22.0	28,400	18.1	21,600	15.0	16,700	12.6	13,900
N	27.5	38,700	24.9	33,800	21.2	26,900	17.2	20,000	14.3	15,700	12.3	13,700
6	26.7	37,000	23.6	31,300	20.2	25,200	16.4	18,800	13.6	14,800	11.9	13,500
12	26.2	36,100	22.8	29,800	19.1	23,200	15.7	17,700	13.1	14,300	11.7	13,400
	April 14		April 15		April 16		April 17		April 18		April 19	
6	11.6	13,300	11.0	13,100	9.7	12,400	7.8	9,480	9.1	11,500	9.2	11,600
N	11.4	13,300	10.9	13,100	9.0	11,300	7.8	9,480	9.2	11,600	9.6	12,300
6	11.3	13,200	10.7	13,000	8.4	10,400	8.1	9,930	9.2	11,600	11.8	15,800
12	11.2	13,200	10.3	12,900	8.0	9,780	8.6	10,700	9.2	11,600	13.9	19,300

Terrapin Creek near Piedmont, Ala.

Location.--Lat 33°57', long. 85°34', in SE¼ sec. 27, T. 12 S., R. 10 E., at bridge on State Highway 74, 500 ft upstream from Southern Railway bridge, half a mile upstream from Ladiga Creek, and 3 miles northeast of Piedmont.

Drainage area.--115 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 11,000 cfs extended to peak stage by logarithmic plotting. Gage heights used to half-tenths 3.1 to 4.8 ft, with hundredths used below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 17,800 cfs Mar. 29 (gage height, 12.72 ft).
1945 to February 1951: Discharge, 21,000 cfs Nov. 28, 1948 (gage height 13.3 ft), from rating curve extended above 11,000 cfs by logarithmic plotting.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	92	359	9	249	369	17	120	147	25	147	284
2	84	338	10	191	269	18	514	134	26	129	240
3	78	294	11	157	226	19	700	936	27	119	230
4	111	237	12	155	238	20	518	626	28	445	299
5	622	198	13	177	193	21	334	367	29	10,200	334
6	575	179	14	157	170	22	243	1,490	30	1,070	240
7	510	436	15	142	152	23	197	547	31	514	
8	345	754	16	129	159	24	180	366			
Monthly mean discharge, in cfs										619	360
Runoff, in inches										6.21	3.50

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.75	122	1.72	115	10.10	7,220	5.20	1,650	3.13	606	2.63	394
4	1.75	122	1.73	117	11.92	13,800	4.86	1,490	3.13	606	2.61	387
6	1.75	122	1.76	124	12.53	16,800	4.58	1,330	3.10	583	2.66	405
8	1.74	120	1.81	137	12.72	17,800	4.34	1,200	3.00	539	2.60	383
10	1.74	120	1.86	150	12.55	17,300	4.13	1,100	2.96	522	2.55	366
N	1.74	120	1.88	155	12.00	14,300	3.93	995	2.92	505	2.52	355
2	1.73	117	1.97	180	11.28	11,200	3.77	895	2.91	501	2.51	352
4	1.73	117	2.10	218	10.64	8,700	3.65	846	2.86	481	2.47	338
6	1.73	117	2.27	271	9.82	6,380	3.47	748	2.80	457	2.45	331
8	1.73	117	2.95	518	8.28	3,830	3.36	700	2.76	442	2.43	324
10	1.73	117	5.09	1,600	6.37	2,300	3.27	652	2.68	412	2.41	317
12	1.73	117	7.92	3,390	5.68	1,920	3.20	629	2.65	401	2.38	307
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.34	294	2.47	338	2.17	240	2.05	203	1.98	182	1.94	171
N	2.52	355	2.29	278	2.20	249	2.03	197	1.97	180	1.97	180
6	2.58	376	2.24	262	2.13	227	2.01	191	1.96	177	3.03	552
12	2.50	348	2.20	249	2.09	215	1.99	185	1.94	171	4.86	1,490
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.77	895	2.66	405	2.31	284	2.13	227	2.20	249	2.03	197
N	3.21	629	2.57	372	2.26	268	2.10	218	2.21	252	2.01	191
6	2.95	518	2.42	321	2.22	255	2.11	221	2.14	230	2.00	188
12	2.80	457	2.35	298	2.17	240	2.15	234	2.07	209	1.98	182
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.95	174	1.88	155	1.85	147	1.87	152	1.81	137	1.81	137
N	1.94	171	1.87	152	1.90	160	1.85	147	1.80	134	3.60	821
6	1.91	163	1.86	150	1.96	177	1.82	139	1.80	134	6.03	2,080
12	1.90	160	1.84	144	1.91	163	1.81	137	1.78	129	4.48	1,280

Coosa River at Gadsden, Ala.

Location.--Lat 34°01', long. 86°00', in T. 12 S., R. 6 E., at Etowah County Memorial Bridge on U. S. Highway 241, in Gadsden, 700 ft downstream from Louisville & Nashville Railroad bridge and 1½ miles upstream from Big Wills Creek. Datum of gage is 485.97 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--5,800 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Relation used reflects backwater from downstream tributary inflow for rising stages. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 64,500 cfs Mar. 31, Apr. 1 (gage height, 28.9 ft).

1926 to February 1951: Discharge, 76,900 cfs Apr. 11, 1936 (gage height, 31.13 ft). Stage known, 37.9 ft Apr. 6, 1886, from floodmarks established by Corps of Engineers (discharge, about 115,000 cfs). Flood of July 15, 1916, reached a stage of 32.7 ft.

Remarks.--Flood runoff moderately affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	6,350	64,500	9	26,500	50,200	17	11,800	11,500	25	11,000	31,200
2	5,900	64,000	10	25,800	45,200	18	11,800	11,800	26	9,820	27,600
3	5,620	63,000	11	21,800	36,600	19	15,500	15,700	27	8,470	23,300
4	5,900	61,600	12	16,200	27,800	20	18,200	22,400	28	12,600	18,600
5	9,500	59,800	13	12,200	21,500	21	19,000	26,900	29	43,500	15,900
6	12,700	57,500	14	12,400	17,900	22	17,600	29,900	30	57,900	13,400
7	13,400	54,800	15	13,100	16,400	23	14,800	32,500	31	64,100	
8	20,800	53,000	16	12,700	14,700	24	12,400	33,500			
Monthly mean discharge, in cfs										17,720	34,090
Runoff, in inches										3.52	6.56

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	6.3	9,180	5.5	7,900	18.0	31,500	27.0	52,600	28.8	63,300	28.9	64,500
4	6.2	9,020	5.5	7,900	20.1	35,800	27.2	53,600	28.8	63,000	28.9	64,500
6	6.1	8,860	5.7	8,220	21.8	39,500	27.5	55,100	28.8	63,000	28.8	64,500
8	6.0	8,700	5.9	8,540	23.1	42,300	27.7	56,200	28.9	64,500	28.8	64,500
10	5.9	8,540	6.3	9,180	24.0	44,400	27.9	57,300	28.9	64,500	28.8	64,500
N	5.8	8,380	6.6	9,660	24.6	45,800	28.1	58,500	28.9	64,500	28.8	64,500
2	5.7	8,220	7.3	10,800	25.0	46,800	28.3	59,700	28.9	64,500	28.8	64,500
4	5.7	8,220	8.2	12,400	25.4	47,700	28.4	60,300	28.9	64,500	28.8	64,500
6	5.6	8,060	9.8	15,300	25.7	48,400	28.5	61,000	28.9	64,500	28.8	64,500
8	5.5	7,900	11.8	19,200	26.1	49,500	28.6	61,600	28.9	64,500	28.8	64,500
10	5.5	7,900	14.1	23,700	26.4	50,300	28.7	62,200	28.9	64,500	28.7	64,200
12	5.5	7,900	16.1	27,700	26.7	51,400	28.8	63,000	28.9	64,500	28.7	64,200
	April 2		April 3		April 4		April 5		April 6		April 7	
6	28.7	64,200	28.3	63,200	27.8	62,000	27.2	60,300	26.5	58,200	25.5	55,200
N	28.6	64,000	28.2	63,000	27.7	61,700	27.0	59,800	26.3	57,700	25.3	54,500
6	28.5	63,800	28.1	62,800	27.5	61,200	26.8	59,200	26.0	56,800	25.2	54,200
12	28.4	63,500	27.9	62,200	27.3	60,600	26.7	58,800	25.8	56,100	25.2	54,200
	April 8		April 9		April 10		April 11		April 12		April 13	
6	25.1	53,800	24.3	51,000	23.0	47,000	20.3	39,000	16.7	29,700	13.6	22,900
N	24.9	53,200	24.1	50,400	22.5	45,500	19.4	36,600	15.8	27,600	12.9	21,400
6	24.7	51,800	23.8	49,400	21.8	43,400	18.5	34,300	15.0	25,800	12.3	20,200
12	24.5	51,800	23.4	48,200	21.1	41,300	17.6	32,000	14.2	24,100	11.8	19,200
	April 14		April 15		April 16		April 17		April 18		April 19	
6	11.5	18,600	10.6	16,700	9.8	15,300	8.1	12,200	7.7	11,500	8.3	12,500
N	11.1	17,800	10.4	16,400	9.6	14,900	7.6	11,300	8.0	12,000	10.0	15,700
6	10.8	17,100	10.2	16,100	9.2	14,200	7.2	10,600	8.0	12,000	11.5	18,600
12	10.7	16,900	9.9	15,500	8.7	13,300	7.3	10,800	8.1	12,200	12.2	20,000

Big Wills Creek near Crudup, Ala.

Location.--Lat 34°06', long. 86°02', in SE¼ sec. 6, T. 11 S., R. 6 E., at county highway bridge, 1 mile upstream from Fisher Creek, 2 miles west of Crudup, and 4 miles downstream from Little Duck Creek.

Drainage area.--189 square miles.

Gage-height record.--Graph based on twice-daily readings of wire-weight gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 11,000 cfs and extended to peak stage. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 14,800 cfs Mar. 29 (gage height, 14.50 ft).
1943 to February 1951: Discharge, 11,800 cfs Jan. 5, 1949 (gage height, 14.2 ft, from graph based on gage readings).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	266	1,260	9	1,050	924	17	330	373	25	376	730
2	266	950	10	610	758	18	479	358	26	330	582
3	266	1,270	11	500	544	19	760	803	27	351	526
4	376	920	12	448	575	20	790	1,540	28	1,450	448
5	582	674	13	448	503	21	610	1,090	29	12,600	400
6	448	592	14	424	424	22	526	1,490	30	8,210	376
7	526	660	15	400	397	23	448	2,040	31	2,720	
8	1,840	924	16	352	376	24	424	950			
Monthly mean discharge, in cfs										1,265	782
Runoff, in inches										7.71	4.62

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.53	308	4.14	448	12.46	8,180	13.90	12,400	10.06	3,620	7.52	1,620
4	3.52	308	4.19	474	13.12	9,780	13.70	11,800	9.90	3,380	7.22	1,490
6	3.52	308	4.25	474	13.60	11,400	13.56	11,400	9.75	3,260	6.96	1,400
8	3.52	308	4.37	526	13.92	12,400	13.16	10,100	9.60	3,040	6.72	1,280
10	3.55	330	4.61	582	14.21	13,600	12.79	8,960	9.42	2,840	6.55	1,240
N	3.59	330	5.00	700	14.42	14,400	12.38	7,940	9.23	2,660	6.45	1,160
2	3.66	352	5.88	985	14.48	14,800	12.00	7,000	9.04	2,500	6.39	1,160
4	3.76	376	6.94	1,360	14.50	14,800	11.58	6,140	8.83	2,360	6.32	1,120
6	3.85	376	8.11	1,920	14.45	14,400	11.18	5,360	8.60	2,220	6.25	1,090
8	3.93	400	9.30	2,740	14.33	14,000	10.83	4,660	8.34	2,040	6.18	1,090
10	4.00	424	10.40	4,040	14.22	13,600	10.52	4,180	8.09	1,920	6.11	1,060
12	4.07	448	11.45	5,740	14.08	13,200	10.20	3,900	7.81	1,770	6.04	1,020
	April 2		April 3		April 4		April 5		April 6		April 7	
6	5.80	950	6.32	1,120	6.03	1,020	5.01	700	4.68	610	4.58	582
N	5.66	915	6.87	1,360	5.54	850	4.89	670	4.62	582	4.70	610
6	5.74	915	7.13	1,440	5.31	790	4.80	640	4.57	582	5.08	730
12	5.96	1,020	6.73	1,280	5.16	760	4.74	610	4.55	582	5.50	850
	April 8		April 9		April 10		April 11		April 12		April 13	
6	5.74	915	5.67	915	5.85	950	4.42	526	4.67	610	4.45	526
N	5.81	950	5.67	915	5.10	730	4.42	526	4.63	582	4.44	526
6	5.75	950	5.70	915	4.64	582	4.50	554	4.47	554	4.19	474
12	5.70	915	5.86	985	4.48	554	4.61	582	4.42	526	4.07	448
	April 14		April 15		April 16		April 17		April 18		April 19	
6	4.05	424	3.93	400	3.83	376	3.80	376	3.72	352	4.62	582
N	4.02	424	3.92	400	3.83	376	3.79	376	3.70	352	5.33	790
6	3.97	424	3.87	400	3.83	376	3.77	376	3.70	352	6.00	1,020
12	3.94	400	3.84	376	3.82	376	3.74	352	3.90	400	6.60	1,240

Big Canoe Creek near Gadsden, Ala.

Location.--Lat 33°54', long. 86°07', in SW¼ sec. 15, T. 13 S., R. 5 E., at bridge on U. S. Highway 11, 400 ft downstream from Rock Creek, 5 miles upstream from mouth, and 10 miles southwest of Gadsden. Datum of gage is 490.56 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Auxiliary staff gage 2 miles downstream at same datum.

Drainage area.--238 square miles.

Gage-height record.--Water-stage recorder graph for base gage. For auxiliary gage, graph based on twice daily readings for period Mar. 29 to Apr. 13.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements below 18,000 cfs. Gage heights used to half-tenths from 4.2 to 4.9 ft, with hundredths used below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 15,800 cfs Mar. 30 (gage height, 21.35 ft).
1938 to February 1951: Discharge, 37,900 cfs Dec. 29, 1942 (gage height, 29.1 ft, from floodmark), from rating curve extended above 18,000 cfs on basis of runoff for stations on nearby streams.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	309	3,100	9	709	976	17	299	329	25	431	976
2	281	1,360	10	551	613	18	1,120	262	26	350	642
3	260	989	11	447	516	19	2,040	1,580	27	311	508
4	688	727	12	405	502	20	1,760	2,260	28	2,270	478
5	2,510	602	13	493	408	21	852	1,960	29	13,900	399
6	2,120	534	14	493	334	22	618	2,560	30	13,900	337
7	1,720	864	15	380	297	23	508	2,410	31	6,680	
8	976	1,660	16	328	293	24	462	2,040			
Monthly mean discharge, in cfs										1,876	1,014
Runoff, in inches										9.09	4.75

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.92	324	3.86	306	18.87	10,700	21.31	15,600	18.02	9,300	13.40	4,000
4	3.91	321	3.92	324	19.79	12,400	21.35	15,800	17.55	8,780	13.10	3,750
6	3.90	318	4.13	393	20.49	13,800	21.32	15,600	17.10	8,130	12.85	3,560
8	3.89	315	4.77	578	20.78	14,500	21.25	15,300	16.65	7,520	12.60	3,400
10	3.88	312	6.05	853	20.86	14,700	21.07	15,100	16.22	6,970	12.35	3,280
N	3.87	309	7.30	1,220	20.86	14,700	20.80	14,500	15.80	6,450	12.11	3,070
2	3.86	306	8.40	1,600	20.85	14,500	20.50	13,500	15.37	5,960	11.88	2,950
4	3.86	306	10.05	2,260	20.85	14,500	20.19	13,200	14.99	5,470	11.64	2,770
6	3.85	302	12.11	3,410	20.93	14,700	19.78	12,400	14.63	5,110	11.38	2,600
8	3.85	302	14.11	4,850	21.04	14,900	19.40	11,700	14.30	4,790	11.14	2,430
10	3.85	302	16.10	6,920	21.15	15,300	18.97	10,900	14.05	4,520	10.86	2,250
12	3.85	302	17.65	8,780	21.25	15,300	18.49	10,100	13.70	4,260	10.59	2,020
	April 2		April 3		April 4		April 5		April 6		April 7	
6	9.80	1,400	9.07	1,090	8.28	749	7.73	621	7.22	536	6.80	524
N	9.47	1,200	8.86	990	8.14	715	7.58	594	7.11	522	6.90	506
6	9.41	1,240	8.65	874	7.99	701	7.46	576	7.00	542	8.17	1,210
12	9.26	1,200	8.47	804	7.86	682	7.33	549	6.89	528	9.47	1,900
	April 8		April 9		April 10		April 11		April 12		April 13	
6	9.42	1,800	8.00	1,210	6.30	650	5.22	536	4.61	521	4.27	431
N	9.07	1,650	7.35	900	6.06	614	4.94	513	4.56	517	4.18	409
6	8.77	1,530	6.86	726	5.80	575	4.72	492	4.45	493	4.09	380
12	8.55	1,460	6.56	677	5.52	548	4.59	494	4.37	462	4.04	363
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.98	344	3.87	309	3.78	281	3.99	347	3.75	272	3.67	248
N	3.95	334	3.83	296	3.80	287	3.99	347	3.71	260	8.09	1,490
6	3.91	321	3.80	287	3.86	306	3.90	318	3.68	251	11.38	2,990
12	3.88	312	3.77	278	3.90	318	3.81	290	3.66	245	11.30	2,930

Choccolocco Creek near Jenifer, Ala.

Location.--Lat 33°34', long. 85°56', on line between secs. 5 and 8, T. 17 S., R. 7 E., at Louisville & Nashville Railroad bridge, three-quarters of a mile upstream from Salt Creek and 1½ miles north of Jenifer. Datum of gage is 554.15 ft above mean sea level, adjustment of 1903.

Drainage area.--275 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 15,000 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used Apr. 1-20. Gage heights used to half-tenths 3.3 and 5.4 ft, with hundredths used below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 20,400 cfs Mar. 29 (gage height, 16.63 ft).
1903-8, 1929-32, 1935 to February 1951: Discharge, 21,900 cfs (revised) Feb. 4, 1936 (gage height, 17.2 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	318	1,960	9	526	1,380	17	308	500	25	439	912
2	295	1,130	10	447	858	18	633	449	26	398	708
3	277	945	11	394	693	19	1,150	864	27	365	616
4	321	784	12	376	687	20	1,280	1,460	28	834	594
5	731	661	13	394	622	21	912	1,420	29	16,300	616
6	940	583	14	380	541	22	661	2,090	30	13,200	547
7	756	864	15	341	498	23	547	2,170	31	4,000	
8	661	1,450	16	321	505	24	486	1,780			
Monthly mean discharge, in cfs										1,580	963
Runoff, in inches										6.63	3.91

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.86	380	2.80	358	9.81	6,760	16.38	19,800	9.04	5,600	6.35	2,580
4	2.85	376	2.83	369	13.05	12,200	16.12	19,100	8.70	5,180	6.19	2,410
6	2.84	372	2.84	372	15.10	16,600	15.63	17,800	8.40	4,780	6.02	2,330
8	2.83	369	2.89	390	16.17	19,300	15.00	16,400	8.13	4,390	5.84	2,170
10	2.82	365	3.03	443	16.63	20,300	14.26	14,900	7.85	4,030	5.68	2,020
N	2.80	358	3.14	486	16.50	20,100	13.45	13,000	7.62	3,790	5.52	1,950
2	2.80	358	3.20	510	15.96	18,800	12.62	11,400	7.40	3,570	5.36	1,810
4	2.79	355	3.27	539	15.32	17,100	11.79	9,940	7.22	3,350	5.20	1,700
6	2.80	358	3.54	661	14.96	16,400	10.99	8,600	7.03	3,150	5.07	1,600
8	2.80	358	4.53	1,220	15.26	17,100	10.36	7,660	6.84	2,950	4.94	1,530
10	2.80	358	6.16	2,410	15.89	18,600	9.85	6,760	6.68	2,850	4.82	1,420
12	2.80	358	7.86	4,150	16.32	19,600	9.40	6,160	6.51	2,670	4.71	1,360
	April 2		April 3		April 4		April 5		April 6		April 7	
6	4.46	1,180	4.09	970	3.84	830	3.56	684	3.36	594	3.26	551
N	4.31	1,090	4.07	940	3.74	780	3.50	661	3.32	572	3.45	638
6	4.27	1,060	4.02	912	3.67	731	3.44	638	3.30	572	4.66	1,320
12	4.20	1,030	3.93	833	3.61	708	3.41	616	3.29	572	4.65	1,320
	April 8		April 9		April 10		April 11		April 12		April 13	
6	4.71	1,360	4.92	1,500	4.01	912	3.60	708	3.59	708	3.48	661
N	4.90	1,500	4.86	1,460	3.86	830	3.53	684	3.56	684	3.40	616
6	4.97	1,530	4.62	1,280	3.76	780	3.49	661	3.54	684	3.34	594
12	4.94	1,530	4.26	1,060	2.68	756	3.54	684	3.51	661	3.30	572
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.26	551	3.14	506	3.09	486	3.14	506	3.03	462	2.96	435
N	3.22	539	3.12	498	3.20	530	3.14	506	2.99	447	3.78	805
6	3.20	530	3.10	490	3.15	510	3.11	494	2.96	435	4.70	1,360
12	3.17	518	3.08	482	3.14	506	3.07	478	2.94	427	4.61	1,280

Choccolocco Creek near Lincoln, Ala.

Location.--Lat 33°34', long. 86°08', in SW¼ sec. 9, T. 17 S., R. 5 E., at bridge on State Highway 102, three-eighthsof a mile downstream from Schmidt's mill, 4 miles south of Lincoln, 6 miles upstream from mouth, and 8 miles north of Talladega. Datum of gage is 448.50 ft above mean sea level, datum of 1929, unadjusted.

Drainage area.--491 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge from 2 a.m. to 2 p.m. Mar. 31 obtained from backwater curve. Gage heights used to half tenths below and tenths above 4.2 ft.

Maxima.--March-April 1951: Discharge, 49,300 cfs Mar. 29 (gage height, 25.46 ft).
1938 to February 1951: Discharge, 27,700 cfs (revised) Jan. 7, 1946 (gage height, 21.9 ft).
Stage known, about 27.5 ft in 1886, from floodmarks at former site 1,000 ft upstream.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	527	3,240	9	875	2,180	17	508	967	25	751	1,840
2	488	2,090	10	751	1,590	18	984	875	26	680	1,460
3	470	1,770	11	680	1,280	19	2,080	2,440	27	632	1,270
4	508	1,460	12	634	1,280	20	1,900	3,440	28	1,490	1,180
5	1,160	1,240	13	634	1,150	21	1,540	2,450	29	35,500	1,210
6	1,400	1,120	14	634	1,010	22	1,180	5,530	30	25,000	1,080
7	1,210	1,620	15	568	916	23	975	3,510	31	7,080	
8	1,030	2,600	16	527	974	24	850	2,870			
Monthly mean discharge, in cfs										3,008	1,855
Runoff, in inches										7.06	4.21

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.50	656	2.40	611	15.90	11,300	23.14	34,000	17.08	12,300	7.84	3,990
4	2.48	656	2.46	634	20.00	19,800	22.33	29,800	15.25	9,950	7.62	3,830
6	2.47	634	2.49	656	21.58	26,400	21.78	27,300	13.35	8,350	7.40	3,670
8	2.46	634	2.58	703	22.60	31,300	21.44	25,400	11.96	7,220	7.19	3,510
10	2.46	634	2.63	727	23.64	36,900	21.28	25,000	11.06	6,500	6.98	3,360
N	2.45	634	2.70	751	24.53	42,400	21.16	24,500	10.38	6,000	6.77	3,220
2	2.44	634	2.92	850	25.09	46,300	21.02	23,600	9.78	5,550	6.57	3,080
4	2.43	634	3.19	1,000	25.44	48,600	20.83	22,800	9.34	5,190	6.38	2,940
6	2.42	611	3.82	1,320	25.46	49,300	20.52	21,700	8.98	4,950	6.19	2,800
8	2.42	611	5.04	2,020	25.19	47,100	20.10	20,200	8.65	4,630	6.01	2,660
10	2.41	611	8.50	4,550	24.70	43,700	19.42	17,900	8.34	4,390	5.83	2,520
12	2.41	611	11.90	7,510	24.00	39,200	18.48	15,500	8.08	4,230	5.66	2,450
	April 2		April 3		April 4		April 5		April 6		April 7	
6	5.23	2,140	4.80	1,900	4.18	1,540	3.72	1,270	3.46	1,140	3.30	1,060
N	4.98	2,020	4.52	1,720	4.04	1,460	3.64	1,240	3.41	1,110	3.70	1,270
6	4.87	1,960	4.43	1,660	3.94	1,400	3.58	1,210	3.38	1,110	5.02	2,020
12	4.98	2,020	4.33	1,600	3.82	1,320	3.51	1,160	3.34	1,080	6.77	3,220
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.30	2,870	5.35	2,260	4.50	1,720	3.78	1,320	3.73	1,300	3.55	1,180
N	5.65	2,380	5.26	2,200	4.21	1,540	3.68	1,270	3.82	1,320	3.50	1,160
6	5.57	2,380	5.15	2,140	4.02	1,430	3.64	1,240	3.71	1,270	3.42	1,110
12	5.49	2,320	4.89	1,960	3.90	1,370	3.64	1,240	3.61	1,210	3.34	1,080
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.27	1,030	3.07	925	3.00	900	3.16	975	3.00	900	2.84	825
N	3.21	1,000	3.03	925	3.11	950	3.11	950	2.94	875	4.50	1,720
6	3.16	975	3.00	900	3.37	1,080	3.09	950	2.90	850	7.90	4,070
12	3.11	950	2.97	875	3.30	1,060	3.06	925	2.85	825	9.55	5,440

Coosa River near Cropwell, Ala.

Location.--Lat 33°30', long. 86°14', in SE¼ sec. 33, T. 17 S., R. 4 E., at bridge on State Highway 48, 2 miles downstream from Poorhouse Branch and 4 miles southeast of Cropwell. Datum of gage is 420.68 ft above mean sea level, datum of 1929, supplementary adjustment of 1943 (levels by Corps of Engineers).

Drainage area.--7,690 square miles.

Gage-height record.--Graph based on twice-daily readings of wire-weight gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage height used to tenths.

Maxima.--March-April 1951: Discharge, 126,000 cfs Mar. 30 (gage height, 23.7 ft). 1942 to February 1951: Discharge, 117,000 cfs Nov. 30, 1948 (gage height, 22.8 ft, from graph based on gage readings).

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	8,740	85,300	9	25,500	63,300	17	14,700	16,100	25	15,200	41,800
2	7,940	78,000	10	33,000	58,300	18	15,600	14,200	26	13,400	38,400
3	7,940	74,300	11	28,500	51,200	19	24,000	19,400	27	11,800	33,000
4	7,540	70,900	12	24,000	41,600	20	26,500	34,600	28	12,600	28,000
5	14,700	67,700	13	21,600	31,600	21	26,500	36,200	29	90,500	22,500
6	18,800	65,300	14	15,200	25,100	22	24,500	53,800	30	122,000	19,300
7	20,600	64,600	15	16,100	21,300	23	21,100	49,400	31	102,000	
8	21,600	65,900	16	16,100	18,500	24	17,900	46,700			
Monthly mean discharge, in cfs										26,650	44,540
Runoff, in inches										4.48	6.46

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.5	12,100	4.3	11,300	10.0	39,000	23.5	124,000	22.0	112,000	18.7	90,000
4	4.5	12,100	4.3	11,300	12.9	55,000	23.6	125,000	21.8	111,000	18.5	88,800
6	4.5	12,100	4.3	11,300	15.8	72,300	23.7	126,000	21.5	108,000	18.4	88,100
8	4.5	12,100	4.3	11,300	18.4	88,100	23.6	125,000	21.1	106,000	18.2	86,800
10	4.4	11,700	4.3	11,300	19.5	95,200	23.6	125,000	20.8	104,000	18.0	85,500
N	4.4	11,700	4.4	11,700	20.4	101,000	23.5	124,000	20.4	101,000	17.9	84,900
2	4.4	11,700	4.4	11,700	21.0	105,000	23.4	123,000	20.2	99,800	17.8	84,300
4	4.4	11,700	4.5	12,100	21.5	108,000	23.2	122,000	20.0	98,500	17.6	83,100
6	4.3	11,300	4.6	12,500	22.1	113,000	23.0	120,000	19.8	97,200	17.5	82,500
8	4.3	11,300	4.9	13,900	22.6	117,000	22.8	118,000	19.5	95,200	17.4	81,900
10	4.3	11,300	5.2	15,200	23.0	120,000	22.6	117,000	19.2	93,300	17.3	81,300
12	4.3	11,300	6.9	23,000	23.3	122,000	22.3	114,000	19.0	92,000	17.2	80,700
	April 2		April 3		April 4		April 5		April 6		April 7	
6	16.9	78,900	16.3	75,300	15.7	71,700	15.2	68,700	14.7	65,700	14.5	64,500
N	16.7	77,700	16.1	74,100	15.6	71,100	15.0	67,500	14.6	65,100	14.5	64,500
6	16.6	77,100	16.0	73,500	15.4	69,900	14.9	66,900	14.6	65,100	14.5	64,500
12	16.4	75,900	15.9	72,900	15.3	69,300	14.8	66,300	14.5	64,500	14.6	65,100
	April 8		April 9		April 10		April 11		April 12		April 13	
6	14.7	65,700	14.5	64,500	13.7	59,700	12.6	53,300	10.9	44,000	9.0	33,500
N	14.8	66,300	14.3	63,300	13.5	58,500	12.3	51,600	10.5	41,800	8.6	31,500
6	14.8	66,300	14.1	62,100	13.2	56,700	11.8	48,900	10.0	39,000	8.2	29,500
12	14.7	65,700	13.9	60,900	13.0	55,500	11.4	46,700	9.5	36,200	7.8	27,500
	April 14		April 15		April 16		April 17		April 18		April 19	
6	7.5	26,000	6.7	22,100	6.1	19,300	5.6	17,000	5.0	14,300	5.3	15,600
N	7.3	25,000	6.5	21,100	5.9	18,300	5.4	16,100	4.9	13,900	5.8	17,900
6	7.1	24,000	6.4	20,600	5.8	17,900	5.3	15,600	4.9	13,900	6.8	22,500
12	6.9	23,000	6.2	19,700	5.6	17,000	5.1	14,700	5.0	14,300	8.1	29,000

Talladega Creek at Alpine, Ala.

Location.--Lat 33°21', long. 86°14', in SE¼ sec. 21, T. 19 S., R 4 E., at county highway bridge, half a mile downstream from Southern Railway bridge, 1 mile north of Alpine, 9 miles southwest of Talladega, and 11 miles upstream from mouth. Datum of gage is 431.24 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--158 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 13,000 cfs and extended on basis of slope-area determination at gage height 16.6 ft. Shifting-control method used 12 m. Mar. 30 to Apr. 30. Gage heights used to hundredths below 5.0 ft, to half-tenths between 5.0 and 6.0 ft and above 12.8 ft and to tenths between 6.0 and 12.8 ft.

Maxima.--March-April 1951: Discharge, 39,000 cfs Mar. 29 (gage height, 16.6 ft).
1900-04, 1939 to February 1951: Discharge, 14,300 cfs Mar. 21, 1942 (gage height, 15.2 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	151	641	9	193	540	17	162	351	25	212	594
2	145	576	10	174	459	18	320	308	26	195	381
3	142	590	11	165	405	19	680	1,420	27	185	433
4	145	486	12	167	432	20	472	1,680	28	616	394
5	338	430	13	183	380	21	368	758	29	18,400	381
6	309	391	14	187	347	22	304	1,910	30	3,800	349
7	251	564	15	174	321	23	264	1,010	31	918	
8	218	834	16	167	372	24	237	680			
Monthly mean discharge, in cfs										976	614
Runoff, in inches										7.12	4.33

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.33	191	4.29	183	13.15	4,310	14.32	8,100	8.29	1,160	6.72	706
4	4.32	189	4.32	189	13.85	6,200	14.05	6,940	8.04	1,070	6.66	706
6	4.31	187	4.32	189	15.10	13,700	13.72	5,710	7.83	1,010	6.59	680
8	4.30	185	4.38	201	16.20	29,400	13.31	4,630	7.66	980	6.54	655
10	4.29	183	4.40	205	16.60	39,000	12.76	3,720	7.50	924	6.48	655
N	4.30	185	4.53	234	16.45	35,200	12.06	2,850	7.36	896	6.44	630
2	4.28	181	4.66	266	16.04	26,400	11.24	2,120	7.25	868	6.39	630
4	4.28	181	4.80	301	15.65	20,000	10.54	1,800	7.14	812	6.35	606
6	4.29	183	5.54	496	15.33	16,200	9.94	1,600	7.04	785	6.31	606
8	4.30	185	8.10	1,190	15.07	13,200	9.38	1,450	6.95	758	6.27	594
10	4.30	185	10.98	2,350	14.81	11,200	8.92	1,360	6.87	758	6.24	594
12	4.30	185	12.14	3,000	14.56	9,500	8.58	1,250	6.80	732	6.00	534
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.11	558	6.37	630	5.86	496	5.63	446	5.47	394	5.36	368
N	6.06	546	6.16	570	5.79	484	5.57	420	5.44	394	5.78	484
6	6.22	582	6.04	546	5.74	472	5.55	420	5.42	381	6.60	680
12	6.69	706	5.94	522	5.69	459	5.51	407	5.39	381	8.01	1,070
	April 8		April 9		April 10		April 11		April 12		April 13	
6	7.75	980	6.15	570	5.73	472	5.52	407	5.58	433	5.42	381
N	7.17	840	6.00	534	5.68	459	5.47	394	5.67	446	5.40	381
6	6.64	680	5.90	509	5.64	446	5.46	394	5.60	433	5.36	368
12	6.33	606	5.81	484	5.58	433	5.54	420	5.50	407	5.34	368
	April 14		April 15		April 16		April 17		April 18		April 19	
6	5.30	354	5.20	327	5.20	327	5.34	368	5.14	311	5.23	335
N	5.26	343	5.17	319	5.50	407	5.25	340	5.10	301	8.82	1,310
6	5.25	340	5.16	317	5.46	394	5.21	330	5.13	309	11.46	2,450
12	5.22	332	5.14	311	5.50	407	5.19	324	5.10	301	12.24	2,860

Coosa River at Childersburg, Ala.

Location.--Lat 33°17', long. 86°22', in NE¼ sec. 18, T. 20 S., R. 3 E., at Central of Georgia Railway bridge, 700 ft upstream from bridge on State Highway 91, half a mile downstream from Tallaseehatchee Creek, and 1 mile northwest of Childersburg. Datum of gage is 382.45 ft above mean sea level, datum of 1929, supplementary adjustment of 1943 (levels by Alabama Power Co.).

Drainage area.--8,390 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 146,000 cfs Mar. 30, 31 (gage height, 30.1 ft). 1914 to February 1951: Discharge, 136,000 cfs Apr. 9, 1938 and Nov. 30, 1948; gage height, 30.0 ft Apr. 9, 1938.

Remarks.--Flood runoff not appreciably affected by artificial storage. Records collected by Alabama Power Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	10,500	115,000	9	27,600	64,600	17	16,400	19,700	25	17,200	45,300
2	9,540	91,100	10	31,400	59,300	18	16,800	16,400	26	15,400	39,700
3	8,900	78,700	11	30,100	51,900	19	25,200	20,700	27	13,800	34,400
4	8,600	73,000	12	26,000	43,900	20	27,600	37,900	28	15,700	29,300
5	13,900	68,800	13	20,600	33,900	21	27,600	37,900	29	94,100	24,400
6	20,200	65,400	14	17,200	26,200	22	26,000	53,300	30	143,000	21,300
7	21,700	63,700	15	16,800	22,400	23	23,300	57,400	31	139,000	
8	21,700	67,000	16	16,800	21,200	24	19,800	49,200			
Monthly mean discharge, in cfs										29,760	47,770
Runoff, in inches										4.09	6.35

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.5	14,300	5.1	12,900	11.7	39,200	28.8	137,000	30.1	146,000	27.1	126,000
4	5.5	14,300	5.1	12,900	14.6	53,300	29.1	139,000	30.0	145,000	26.7	124,000
6	5.4	13,900	5.1	12,900	17.6	69,100	29.3	141,000	29.9	145,000	26.4	122,000
8	5.4	13,900	5.2	13,200	19.7	80,900	29.5	142,000	29.7	143,000	26.0	119,000
10	5.4	13,900	5.2	13,200	21.8	93,300	29.7	143,000	29.5	142,000	25.7	117,000
N	5.4	13,900	5.3	13,600	23.2	102,000	29.8	144,000	29.3	141,000	25.3	115,000
2	5.3	13,600	5.5	14,300	24.5	110,000	29.9	145,000	28.9	138,000	25.0	113,000
4	5.3	13,600	5.7	15,000	25.5	116,000	30.0	145,000	28.7	137,000	24.6	110,000
6	5.3	13,600	6.1	16,400	26.6	123,000	30.1	146,000	28.4	135,000	24.3	108,000
8	5.2	13,200	6.8	19,000	27.3	128,000	30.1	146,000	28.1	133,000	23.9	106,000
10	5.2	13,200	8.0	23,600	27.9	132,000	30.1	146,000	27.7	130,000	23.6	104,000
12	5.2	13,200	9.6	30,100	28.4	135,000	30.1	146,000	27.4	128,000	23.2	102,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	22.2	95,700	19.5	79,800	18.5	74,100	17.7	69,600	17.0	65,800	16.4	62,600
N	21.3	90,300	19.2	78,000	18.3	73,000	17.5	68,600	17.1	66,400	16.5	63,200
6	20.6	86,100	18.9	76,300	18.1	71,900	17.4	68,000	16.7	64,200	16.7	64,200
12	20.0	82,600	18.7	75,200	17.9	70,800	17.2	66,900	16.6	63,700	17.0	65,800
	April 8		April 9		April 10		April 11		April 12		April 13	
6	17.2	66,900	17.0	65,800	16.0	60,500	14.8	54,300	13.2	46,300	11.0	36,100
N	17.3	67,400	16.8	64,700	15.8	59,500	14.0	50,200	12.7	43,900	10.5	34,000
6	17.3	67,400	16.5	63,200	15.5	57,900	14.1	50,700	12.2	41,500	9.9	31,400
12	17.2	66,900	16.3	62,100	15.2	56,300	13.7	48,700	11.6	38,800	9.4	29,300
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.0	27,600	7.8	22,900	7.4	21,300	7.2	20,600	6.2	16,800	6.0	16,100
N	8.6	26,000	7.7	22,500	7.4	21,300	7.0	19,800	6.0	16,100	6.7	18,700
6	8.3	24,800	7.5	21,700	7.4	21,300	6.8	19,000	5.9	15,700	8.3	24,800
12	8.0	23,600	7.4	21,300	7.3	20,900	6.5	17,900	5.9	15,700	9.8	31,000

Yellowleaf Creek near Wilsonville, Ala.

Location.--Lat 33°18', long. 86°33', in NW¼ sec. 9, T. 20 S., R. 1 E., at bridge on county road, 3½ miles south of State Highway 91, 4 miles upstream from Muddy Prong, and 6 miles northwest of Wilsonville.

Drainage area.--97 square miles.

Gage-height record.--Water-stage recorder graph except for period 9 a.m. to 12 p.m. Mar. 29, which was based on graph defined by floodmark and adjacent record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 6,000 cfs and extended to peak stage on basis of velocity-area study. Gage heights used to half-tenths 4.2 to 5.6 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 19,300 cfs Mar. 29 (gage height, 23.85 ft). Station established December 1950.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	116	1,040	9	242	518	17	177	188	25	206	581
2	102	640	10	194	363	18	438	131	26	172	373
3	88	454	11	166	287	19	886	370	27	143	290
4	128	336	12	272	266	20	824	692	28	673	272
5	542	272	13	321	215	21	607	529	29	13,300	224
6	529	227	14	278	174	22	412	1,260	30	5,700	172
7	399	414	15	242	145	23	308	1,560	31	1,970	
8	308	688	16	212	175	24	254	995			
Monthly mean discharge, in cfs										974	462
Runoff, in inches										11.58	5.31

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.27	150	4.08	131	18.66	3,140	22.17	11,600	17.36	2,510	13.12	1,340
4	4.25	150	4.25	150	20.09	5,070	21.65	9.270	17.08	2,360	12.71	1,270
6	4.23	150	4.81	212	21.12	7,620	21.12	7,620	16.80	2,230	12.30	1,200
8	4.21	144	5.66	321	22.15	11,600	20.61	6,220	16.51	2,110	11.90	1,130
10	4.20	144	6.45	412	22.92	14,800	20.10	5,070	16.20	2,020	11.50	1,070
N	4.19	143	7.16	516	23.46	17,800	19.71	4,340	15.86	1,940	11.10	1,010
2	4.17	141	8.34	656	23.79	19,300	19.24	3,690	15.54	1,850	10.75	967
4	4.16	140	9.50	800	23.85	19,300	18.87	3,420	15.16	1,780	10.42	912
6	4.14	137	10.86	981	23.75	19,300	18.52	3,140	14.78	1,690	10.10	873
8	4.13	136	12.60	1,250	23.46	17,800	18.26	3,020	14.40	1,600	9.78	836
10	4.13	136	14.47	1,620	23.10	15,800	18.00	2,840	14.00	1,520	9.48	800
12	4.12	135	15.81	1,920	22.66	13,800	17.69	2,660	13.54	1,420	9.21	764
	April 2		April 3		April 4		April 5		April 6		April 7	
6	8.55	692	7.03	490	5.97	360	5.39	284	5.00	236	4.76	206
N	8.09	632	6.71	451	5.79	334	5.28	272	4.91	224	6.24	386
6	7.69	581	6.43	412	5.65	308	5.18	260	4.86	218	8.00	620
12	7.36	542	6.19	386	5.51	296	5.09	248	4.80	212	8.50	680
	April 8		April 9		April 10		April 11		April 12		April 13	
6	8.85	716	7.60	568	6.23	386	5.51	296	5.30	272	4.94	230
N	8.80	716	7.20	516	6.01	360	5.38	284	5.30	272	4.80	212
6	8.44	668	6.81	464	5.82	334	5.30	272	5.21	260	4.69	200
12	8.01	620	6.50	425	5.66	321	5.30	272	5.08	248	4.61	188
	April 14		April 15		April 16		April 17		April 18		April 19	
6	4.54	182	4.27	150	4.14	137	4.79	212	4.14	137	3.96	118
N	4.46	172	4.20	144	4.50	177	4.59	188	4.07	130	6.02	360
6	4.39	166	4.16	140	4.75	206	4.38	166	4.01	123	7.88	607
12	4.33	160	4.11	134	4.89	224	4.24	150	3.98	120	9.45	668

Hatchet Creek near Rockford, Ala.

Location.--Lat 32°57', long. 86°13', in NW¼ sec. 31, T. 23 N., R. 19 E., at bridge on county highway, half a mile downstream from State Highway 11, 1½ miles downstream from Socapatoy Creek, and 4 miles north of Rockford.

Drainage area.--225 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths above and to varying refinement below 4.2 ft.

Maxima.--March-April 1951: Discharge, 18,600 cfs Mar. 29 (gage height, 21.66 ft).
1944 to February 1951: Discharge, 22,800 cfs Jan. 6, 1946 (gage height, 24.9 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	216	854	9	232	705	17	234	416	25	286	538
2	210	713	10	216	579	18	906	384	26	260	461
3	204	639	11	212	512	19	1,170	734	27	248	400
4	234	565	12	319	574	20	651	879	28	1,390	388
5	410	528	13	330	488	21	479	565	29	15,200	354
6	330	504	14	308	440	22	398	2,630	30	4,370	330
7	286	963	15	271	412	23	352	1,010	31	1,220	
8	260	1,330	16	251	436	24	319	662			
Monthly mean discharge, in cfs										1,025	666
Runoff, in inches										5.25	3.30

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.70	253	1.65	242	16.76	8,360	18.14	10,300	6.52	1,470	5.03	942
4	1.67	247	1.67	247	18.80	11,600	16.46	8,000	6.33	1,400	4.96	942
6	1.68	249	1.72	257	20.41	15,200	14.29	5,770	6.16	1,360	4.88	910
8	1.69	251	1.80	275	21.40	17,800	12.41	4,440	6.02	1,290	4.80	879
10	1.68	249	2.05	330	21.66	18,600	11.08	3,660	5.88	1,250	4.75	879
N	1.68	249	2.76	491	21.42	17,800	10.00	3,000	5.76	1,220	4.69	849
2	1.67	247	4.34	910	21.40	17,800	9.01	2,520	5.63	1,120	4.63	819
4	1.66	245	6.00	1,500	21.50	18,000	8.31	2,200	5.53	1,110	4.57	819
6	1.66	245	7.10	1,940	21.30	17,500	7.76	1,990	5.42	1,080	4.52	790
8	1.66	245	9.10	2,800	20.80	16,200	7.34	1,780	5.31	1,040	4.47	790
10	1.66	245	12.46	4,500	20.00	14,200	7.02	1,660	5.22	1,010	4.43	761
12	1.66	245	14.67	6,130	19.26	12,700	6.76	1,580	5.12	974	4.38	761
	April 2		April 3		April 4		April 5		April 6		April 7	
6	4.27	732	4.10	676	3.75	578	3.59	538	3.48	512	3.42	486
N	4.22	704	3.95	634	3.71	565	3.56	525	3.46	499	3.54	525
6	4.17	690	3.87	606	3.67	552	3.53	525	3.45	499	6.63	1,510
12	4.13	690	3.80	592	3.62	538	3.50	512	3.44	499	8.25	2,160
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.98	1,660	4.37	761	3.84	606	3.51	512	3.80	592	3.44	499
N	5.76	1,220	4.14	690	3.76	578	3.46	499	3.86	606	3.38	486
6	5.04	942	4.00	648	3.66	552	3.46	499	3.70	565	3.33	474
12	4.64	819	3.91	620	3.58	538	3.60	538	3.54	525	3.29	461
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.25	448	3.12	412	3.12	412	3.20	436	3.00	388	2.96	376
N	3.21	436	3.10	412	3.28	461	3.10	412	2.99	388	3.96	634
6	3.19	436	3.09	412	3.27	448	3.05	400	2.97	376	5.60	1,150
12	3.14	424	3.07	400	3.27	448	3.02	388	2.96	376	5.69	1,180

Weogufka Creek near Weogufka, Ala.

Location.--Lat 32°59', long. 86°18', in NE¼ sec. 18, T. 23 N., R. 18 E., at bridge on county road 2 miles south of Weogufka and 6 miles upstream from Phinikochika Creek.

Drainage area.--74 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--No discharge record available for this report except the determination of peak discharge, which was based on a partly-completed current-meter measurement.

Maxima.--March-April 1951: Discharge, about 24,000 cfs Mar. 29 (gage height 16.83 ft). Station established December 1950.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1			9			17			25		
2			10			18			26		
3			11			19			27		
4			12			20			28		
5			13			21			29		
6			14			22			30		
7			15			23			31		
8			16			24					
Monthly mean discharge, in cfs											
Runoff, in inches											

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.25		3.24		13.90		11.29		5.53		4.80	
4	3.25		3.26		15.28		10.62		5.41		4.76	
6	3.24		3.35		16.19		9.98		5.32		4.74	
8	3.24		3.78		16.66		9.21		5.25		4.70	
10	3.23		5.44		16.83		8.36		5.19		4.67	
N	3.23		6.84		16.69		7.51		5.14		4.65	
2	3.23		7.64		16.23		6.85		5.08		4.62	
4	3.23		8.05		15.49		6.45		5.02		4.59	
6	3.23		8.83		14.60		6.17		4.97		4.56	
8	3.23		9.90		13.70		5.96		4.94		4.54	
10	3.23		11.26		12.84		5.80		4.79		4.51	
12	3.23		12.59		12.04		5.65		4.84		4.49	
	April 2		April 3		April 4		April 5		April 6		April 7	
6	4.44		4.46		4.15		4.01		3.94		3.89	
N	4.43		4.35		4.12		4.00		3.93		4.96	
6	4.4		4.26		4.09		3.98		3.91		6.85	
12	4.38		4.20		4.04		3.95		3.90		7.36	
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.56		4.44		4.23		4.03		4.66		4.07	
N	5.37		4.34		4.19		4.01		4.54		4.03	
6	4.81		4.28		4.13		4.05		4.31		4.00	
12	4.58		4.26		4.08		4.43		4.16		3.96	
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.93		3.84		3.81		3.80		3.70		3.69	
N	3.91		3.83		3.89		3.77		3.70		5.05	
6	3.88		3.80		3.92		3.75		3.70		5.67	
12	3.86		3.79		3.88		3.73		3.69		5.39	

Coosa River at Jordan Dam, near Wetumpka, Ala.

Location.--Lat 32°37', long. 86°15', in S½ sec. 22, T. 19 N., R 18 E., half a mile downstream from Jordan Dam, 4 miles upstream from Corn Creek, 5½ miles northwest of Wetumpka, and 12 miles upstream from confluence with Tallapoosa River. Datum of gage is 141.6 ft above mean sea level (levels by Alabama Power Co.).

Drainage area.--10,200 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements except during backwater periods, which were computed on basis of records at Jordan Dam hydroelectric plant. Discharges 10 p.m. Mar. 29 to Apr. 5 computed on basis of power-plant records. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 217,000 cfs Mar. 29 (gage height, 38.2 ft). 1912-14, 1925 to February 1951: Discharge, 298,000 cfs Apr. 8, 1938 (gage height 46.4 ft), computed on basis of power-plant records and flow over spillway.

Remarks.--Flood flow partly regulated by upstream reservoirs and power plants. Records collected by Alabama Power Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	13,500	133,000	9	22,600	69,900	17	19,300	24,100	25	22,300	51,900
2	12,400	100,000	10	32,500	63,600	18	19,300	23,200	26	21,300	48,900
3	11,000	82,900	11	32,000	57,800	19	33,200	23,000	27	18,700	40,500
4	8,940	78,100	12	33,000	52,600	20	35,900	35,400	28	23,000	36,400
5	15,200	69,800	13	27,800	42,400	21	33,700	42,300	29	183,000	31,000
6	19,300	69,200	14	23,400	33,800	22	29,800	72,100	30	181,000	25,800
7	19,800	73,000	15	19,300	27,900	23	28,300	68,100	31	158,000	
8	19,300	75,000	16	19,800	25,600	24	25,300	54,300			
Monthly mean discharge, in cfs										37,800	54,390
Runoff, in inches										4.28	5.95

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	11.7	20,300	10.9	16,500	27.4	118,000	36.3	194,000	33.8	169,000	31.8	151,000
4	11.0	17,000	10.9	16,500	32.6	163,000	36.2	195,000	33.8	170,000	31.8	148,000
6	11.0	17,000	11.4	18,800	35.5	190,000	36.1	194,000	33.7	169,000	31.3	131,000
8	11.0	17,000	11.0	17,000	36.8	203,000	36.0	192,000	33.6	156,000	30.7	137,000
10	11.7	20,300	11.7	20,300	37.5	211,000	35.8	198,000	33.2	156,000	30.8	136,000
N	11.7	20,300	11.7	20,300	37.9	213,000	35.5	183,000	33.2	157,000	30.6	136,000
2	11.0	17,000	11.7	20,300	38.1	216,000	34.8	172,000	33.2	159,000	29.7	125,000
4	10.9	16,500	11.8	20,800	38.2	217,000	34.2	167,000	33.0	159,000	29.8	128,000
6	11.7	20,300	12.2	22,800	38.2	217,000	34.2	170,000	32.9	157,000	29.6	128,000
8	11.7	20,300	12.7	25,300	38.1	216,000	34.1	169,000	32.3	141,000	29.6	129,000
10	11.7	20,300	14.3	33,700	37.8	207,000	34.0	169,000	32.3	146,000	28.9	118,000
12	10.9	16,500	21.0	74,700	36.6	196,000	33.9	170,000	32.1	151,000	28.4	117,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	27.5	114,000	24.0	88,500	22.2	77,800	20.7	69,300	20.7	72,700	19.7	66,100
N	26.6	103,000	23.5	85,700	22.1	79,500	20.8	70,600	20.1	68,800	21.5	78,000
6	25.3	93,200	22.4	76,500	22.0	79,500	20.8	70,500	20.0	68,100	22.3	83,300
12	23.8	82,600	22.2	73,800	21.0	66,300	20.8	70,700	19.0	61,500	21.6	78,700
	April 8		April 9		April 10		April 11		April 12		April 13	
6	21.7	79,300	20.2	69,400	19.6	65,500	18.7	59,700	18.0	55,500	16.3	45,300
N	20.7	72,700	20.8	73,400	19.6	65,500	18.4	57,900	17.5	52,500	15.7	41,700
6	20.8	73,400	19.6	65,500	18.7	59,700	18.1	56,100	17.2	50,700	15.3	39,300
12	20.8	73,400	19.6	65,500	18.7	59,700	18.0	55,500	16.8	48,300	15.0	37,600
	April 14		April 15		April 16		April 17		April 18		April 19	
6	14.6	35,400	13.5	29,300	12.8	25,800	12.6	24,800	12.5	24,300	12.0	21,800
N	14.2	33,200	13.1	27,300	12.7	25,300	12.2	22,800	12.1	22,300	12.2	22,800
6	14.0	32,000	12.9	26,300	12.7	25,300	12.4	23,800	12.2	22,800	12.4	23,800
12	13.9	31,500	12.8	25,800	12.7	25,300	12.6	24,800	12.1	22,300	12.5	24,300

Tallapoosa River below Tallassee, Ala.

Location.--Lat 32°31', long. 85°53', in E½ sec. 30, T. 18 N., R. 22 E., 1½ miles downstream from Benjamin Fitzpatrick Highway Bridge and Thurlow Dam at Tallassee and 3½ miles upstream from Uphapee Creek. Datum of gage is 162.03 ft above mean sea level (levels by Alabama Power Co.).

Drainage area.--3,320 square miles.

Gage-height record.--Water-stage recorder graph except Mar. 4-7 when there was no record.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge for periods Mar. 1-3, Mar. 8 to Apr. 30 determined by mechanical integration. Discharge for period Mar. 4-7 computed on basis of power-plant records.

Maxima.--March-April 1951: Discharge, 9,920 cfs Apr. 24 (gage height, 8.3 ft).
1928 to February 1951: Discharge, 115,000 cfs Mar. 15, 1929 (gage height, 51.35 ft, from floodmarks), computed on basis of power-plant records.

Remarks.--Flood runoff completely controlled by storage in Lake Martin and hydroelectric plants above station. Records collected by Alabama Power Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,550	275	9	3,730	1,340	17	1,010	1,950	25	92	9,570
2	1,390	1,310	10	555	1,410	18	134	1,680	26	1,010	8,380
3	1,570	1,660	11	90	1,410	19	3,020	2,440	27	2,480	6,960
4	90	1,670	12	2,750	1,740	20	2,940	2,240	28	2,280	7,270
5	1,060	1,520	13	3,620	1,700	21	2,360	1,910	29	2,510	2,900
6	3,030	2,960	14	3,200	600	22	2,200	4,020	30	3,080	6,130
7	2,550	2,260	15	1,980	1,150	23	2,090	6,800	31	1,600	
8	2,200	112	16	3,520	791	24	1,740	9,660			
Monthly mean discharge, in cfs										1,982	3,127
Runoff, in inches										0.69	1.05

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Alabama River near Montgomery, Ala.

Location.--Lat 32°24'42", long. 86°24'32", in NW¼ sec. 31, T. 17 N., R. 17 E., at bridge on U. S. Highway 31, 4 miles upstream from Autauga Creek and 6 miles northwest of Montgomery. Datum of gage is 97.90 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Auxiliary gage is U. S. Weather Bureau staff gage at Montgomery, 6 miles upstream, at datum 5.40 ft higher.

Drainage area.--15,100 square miles.

Gage-height record.--Water-stage recorder graph for base gage except Mar. 10-16 when there was no record; once-daily readings of auxiliary gage.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Gage heights used to tenths. Discharge for period of no gage-height record computed on basis of readings from auxiliary gage.

Maxima.--March-April 1951: Discharge, 137,000 cfs Apr. 1; gage-height, 46.2 ft Apr. 1. 1927 to February 1951: Discharge, 256,000 cfs Mar. 17, 1929 (gage-height, 59.6 ft).

Remarks.--Flood runoff affected by artificial storage. Records collected by Alabama Power Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	19,400	133,000	9	21,400	85,500	17	21,600	30,000	25	26,000	71,900
2	17,400	124,000	10	28,000	85,400	18	21,100	29,400	26	22,700	67,800
3	13,600	110,000	11	33,000	72,700	19	27,400	28,200	27	20,200	60,900
4	13,000	101,000	12	34,000	64,800	20	38,900	31,000	28	20,100	52,200
5	13,000	101,000	13	30,000	56,900	21	41,300	43,300	29	61,400	44,700
6	17,100	90,000	14	29,000	48,100	22	38,900	53,900	30	116,000	36,100
7	20,600	84,600	15	24,000	37,600	23	34,700	73,300	31	134,000	
8	21,400	85,400	16	20,000	30,900	24	30,500	76,400			
Monthly mean discharge, in cfs										32,570	67,000
Runoff, in inches										2.49	4.95

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	8.2	21,100	7.5	19,400	8.6	22,200	33.4	102,000	42.2	130,000	45.4	137,000
4	8.2	21,100	7.6	19,600	10.0	26,500	34.5	106,000	42.6	132,000	45.6	137,000
6	8.1	20,900	7.6	19,600	12.8	35,200	35.4	109,000	43.0	133,000	45.7	135,000
8	8.0	20,600	7.6	19,600	15.9	45,300	36.3	112,000	43.3	134,000	45.9	135,000
10	7.9	20,400	7.7	19,800	18.9	55,400	37.2	114,000	43.6	135,000	46.0	134,000
N	7.8	20,100	7.8	20,100	22.0	66,300	37.9	117,000	44.0	135,000	46.1	133,000
2	7.7	19,800	7.8	21,100	24.2	73,300	38.6	119,000	44.2	136,000	46.2	132,000
4	7.6	19,600	7.9	20,400	26.3	80,000	39.2	121,000	44.4	135,000	46.2	132,000
6	7.6	19,600	8.0	20,600	28.3	86,300	40.0	123,000	44.7	136,000	46.2	132,000
8	7.6	19,600	8.1	20,900	29.8	91,000	40.7	126,000	45.0	135,000	46.2	130,000
10	7.5	19,400	8.2	21,100	31.1	95,100	41.3	128,000	45.2	136,000	46.2	130,000
12	7.5	19,400	8.3	21,400	32.2	99,000	41.8	129,000	45.3	136,000	46.2	129,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	46.1	127,000	44.5	114,000	41.8	103,000	38.6	99,400	35.5	94,200	32.6	83,600
N	45.9	123,000	43.9	109,000	40.9	101,000	37.8	103,000	34.8	88,400	32.0	84,600
6	45.4	124,000	43.3	106,000	40.1	98,900	37.0	102,000	34.1	85,700	31.6	86,200
12	44.9	119,000	42.6	105,000	39.3	99,100	36.3	101,000	33.4	82,900	31.6	85,300
	April 8		April 9		April 10		April 11		April 12		April 13	
6	31.6	86,200	30.8	83,100	29.5	87,600	27.7	74,400	25.5	66,900	23.0	59,400
N	31.5	85,900	30.5	84,800	29.1	85,600	27.2	71,500	25.0	64,900	22.3	56,300
6	31.2	85,000	30.2	86,400	28.7	82,800	26.6	70,600	24.4	62,600	21.3	54,800
12	31.0	83,600	30.0	91,600	28.2	79,700	26.1	68,600	23.7	61,300	20.2	52,900
	April 14		April 15		April 16		April 17		April 18		April 19	
6	18.9	50,300	14.9	39,800	11.9	31,300	11.5	30,200	11.2	29,400	10.8	28,200
N	18.0	48,800	14.1	37,500	11.5	30,200	11.5	30,200	11.4	29,900	10.8	28,200
6	16.9	45,600	13.3	35,200	11.5	30,200	11.3	29,600	11.2	29,400	10.7	28,000
12	15.9	42,700	12.5	33,000	11.6	30,500	11.1	29,100	11.0	28,800	10.7	28,000

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Autauga Creek at Prattville, Ala.

Location.--Lat 32°27'30", long. 86°28'30", in N½ sec. 17, T. 17 N., R. 16 E., at Bridge Street Bridge in Prattville, 500 ft downstream from dam and 5 miles upstream from mouth. Datum of gage is 164.38 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--119 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 2.3 and 4.4 ft, and to hundredths below and tenths above these limits.

Maxima.--March-April 1951: Discharge, 2,160 cfs Mar. 30 (gage height, 4.05 ft).
1939 to February 1951: Discharge, 21,800 cfs Aug. 16, 17 1939 (gage height, 18.35 ft, present datum, prior to major channel improvement).

Remarks.--Flood runoff affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	129	338	9	127	346	17	119	178	25	135	268
2	129	282	10	116	274	18	227	170	26	127	207
3	127	240	11	116	216	19	387	192	27	125	179
4	129	214	12	143	235	20	369	226	28	217	168
5	143	194	13	148	224	21	297	210	29	685	165
6	148	184	14	140	200	22	198	360	30	1,590	179
7	140	223	15	129	178	23	151	532	31	554	
8	135	358	16	122	175	24	140	391			
Monthly mean discharge, in cfs										240	244
Runoff, in inches										2.33	2.28

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	0.79	122	0.80	124	1.85	522	3.45	1,620	2.37	800	1.57	387
4	.79	122	.82	129	1.89	542	3.78	1,930	2.33	800	1.53	369
6	.79	122	.83	132	1.91	552	4.00	2,110	2.19	706	1.49	352
8	.80	124	.86	140	1.93	563	4.05	2,160	1.70	447	1.46	340
10	.81	127	1.12	217	1.94	568	3.88	2,020	1.77	481	1.46	340
N	.81	127	1.30	278	1.92	558	3.68	1,840	1.86	527	1.44	332
2	.82	129	1.28	271	2.17	695	3.43	1,620	1.82	506	1.42	324
4	.82	129	1.28	271	2.35	800	3.21	1,410	1.77	481	1.42	324
6	.81	127	1.28	271	2.39	830	2.95	1,210	1.69	442	1.40	316
8	.81	124	1.29	274	2.45	862	2.81	1,100	1.67	433	1.40	316
10	.81	124	1.31	282	2.62	960	2.68	1,030	1.63	414	1.38	308
12	.81	124	1.37	305	2.98	1,250	2.40	830	1.60	400	1.36	301
	April 2		April 3		April 4		April 5		April 6		April 7	
6	1.32	286	1.21	246	1.12	217	1.05	194	1.01	182	1.00	179
N	1.33	289	1.18	236	1.11	213	1.05	194	1.02	185	1.11	213
6	1.28	271	1.17	233	1.10	210	1.05	194	1.02	185	1.26	264
12	1.25	260	1.15	226	1.08	204	1.03	188	1.01	182	1.33	289
	April 8		April 9		April 10		April 11		April 12		April 13	
6	1.42	324	1.55	378	1.33	289	1.12	217	1.14	223	1.15	226
N	1.52	365	1.45	336	1.30	278	1.10	210	1.17	233	1.13	220
6	1.58	391	1.39	312	1.25	260	1.10	210	1.22	250	1.12	217
12	1.63	414	1.36	301	1.19	240	1.12	217	1.23	254	1.10	210
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.08	204	1.00	179	.97	171	.99	176	.96	168	.98	173
N	1.07	201	1.00	179	.99	176	1.00	179	.98	173	1.07	201
6	1.06	198	.99	176	1.00	179	1.00	179	.97	171	1.09	207
12	1.03	188	.96	168	1.00	179	.97	171	.95	165	1.11	213

Big Swamp Creek near Lowndesboro, Ala.

Location.--Lat 32°16', long. 86°42', in NE¼ sec. 19, T. 15 N., R. 14 E., at bridge on U. S. Highway 80, 1 mile downstream from Panther Creek, 5 miles west of Lowndesboro, and 12 miles upstream from mouth. Datum of gage is 127.95 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--242 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used Apr. 27-30. Gage heights used to hundredths below 3.2 ft, to half-tenths between 3.2 and 5.5 ft and above 14.2 ft, and to tenths between 5.5 and 14.2 ft.

Maxima.--March- April 1951: Discharge, 2,130 cfs Apr. 22 (gage height, 15.00 ft). 1938, 1940 to February 1951: Discharge, 37,000 cfs Nov. 27, 1948 (gage height, 21.3 ft, from floodmark).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	43	627	9	38	331	17	19	724	25	86	1,020
2	38	242	10	32	215	18	239	498	26	61	483
3	34	104	11	27	93	19	1,020	507	27	49	130
4	32	67	12	25	85	20	862	642	28	52	69
5	29	50	13	25	92	21	822	464	29	857	49
6	44	40	14	24	72	22	890	1,480	30	867	36
7	69	77	15	23	48	23	478	1,560	31	707	
8	49	288	16	21	532	24	144	1,210			
Monthly mean discharge, in cfs										249	394
Runoff, in inches										1.18	1.82

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.94	53	2.79	47	4.61	138	12.50	1,030	10.58	757	10.16	705
4	2.91	52	2.79	47	6.50	287	12.12	964	10.47	744	10.18	705
6	2.90	51	2.79	47	8.98	558	11.77	918	10.36	731	10.16	705
8	2.87	50	2.81	47	10.48	744	11.49	876	10.26	718	10.10	692
10	2.86	49	2.85	49	11.71	904	11.30	848	10.20	705	10.00	679
N	2.84	49	2.86	49	12.59	1,050	11.17	835	10.10	692	9.92	666
2	2.82	48	2.90	51	13.11	1,150	11.07	822	10.04	679	9.71	642
4	2.81	47	2.94	53	13.40	1,210	10.99	809	10.00	679	9.44	606
6	2.80	47	2.97	54	13.53	1,230	10.93	796	10.00	679	9.11	570
8	2.80	47	3.02	57	13.48	1,230	10.84	783	10.02	679	8.73	522
10	2.79	47	3.07	59	13.28	1,190	10.76	783	10.09	692	8.32	475
12	2.79	47	3.32	69	12.92	1,110	10.68	770	10.13	692	7.87	431
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.63	296	4.25	117	3.37	72	2.93	52	2.67	42	2.54	37
N	5.72	218	3.94	102	3.24	67	2.85	49	2.62	40	2.63	40
6	5.10	171	3.72	89	3.12	61	2.79	47	2.59	39	3.52	79
12	4.61	138	3.52	79	3.02	57	2.73	44	2.56	37	6.32	269
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.78	316	6.89	326	6.32	269	4.00	104	3.41	74	3.81	94
N	6.35	278	7.06	346	5.64	210	3.70	89	3.58	84	3.75	92
6	6.36	278	7.06	346	4.97	160	3.48	79	3.87	96	3.70	89
12	6.62	296	6.84	316	4.42	126	3.38	74	3.89	99	3.63	86
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.51	79	2.93	52	3.70	89	10.85	783	9.21	582	6.26	269
N	3.37	72	2.81	47	9.43	606	10.02	679	8.72	522	7.65	398
6	3.22	65	2.71	43	11.92	933	9.68	642	7.83	420	10.55	757
12	3.07	59	2.62	40	12.09	964	9.47	618	6.82	316	11.58	890

Mulberry River at Jones, Ala.

Location.--Lat 32°35', long. 86°54', in E½ sec. 31, T. 19 N., R. 12 E., at bridge on county highway, 0.4 mile west of Jones, 6 miles upstream from Buck Creek, and 11 miles upstream from mouth. Datum of gage is 165.23 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--205 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used below 1,200 cfs Mar. 1-28. Gage heights used to half-tenths between 2.5 and 4.5 ft Mar. 1-28, between 2.2 and 4.5 ft Mar. 29 to Apr. 30, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 18,200 cfs Mar. 29 (gage height, 23.84 ft). 1938 to February 1951: Discharge, 32,800 cfs Aug. 16, 1939 (gage height, 30.4 ft). Stage known, 33.6 ft in April 1938, from information by local residents.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	213	1,020	9	188	582	17	185	408	25	306	460
2	205	838	10	178	529	18	981	355	26	281	406
3	198	705	11	175	492	19	1,540	394	27	274	371
4	218	628	12	290	578	20	650	529	28	2,400	444
5	306	568	13	275	478	21	511	397	29	13,700	430
6	253	545	14	231	428	22	426	1,910	30	5,060	396
7	221	794	15	208	404	23	374	970	31	1,470	
8	210	940	16	192	426	24	337	547			
Monthly mean discharge, in cfs										1,034	599
Runoff, in inches										5.82	3.26

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.94	275	1.98	287	14.50	8,700	16.70	10,500	5.02	1,800	3.90	1,140
4	1.94	275	2.03	302	16.00	9,900	14.10	8,380	4.86	1,740	3.83	1,120
6	1.93	272	2.25	374	17.12	10,800	11.76	6,570	4.71	1,620	3.80	1,090
8	1.93	272	2.58	492	18.44	11,900	10.20	5,370	4.60	1,560	3.74	1,060
10	1.91	267	3.72	1,030	20.23	13,500	9.03	4,550	4.48	1,500	3.68	1,040
N	1.93	272	5.58	2,170	21.99	15,500	8.22	3,990	4.40	1,440	3.64	1,020
2	1.93	272	6.40	2,730	23.25	17,200	7.61	3,570	4.28	1,380	3.60	990
4	1.93	272	7.19	3,290	23.84	18,200	7.00	3,150	4.22	1,320	3.56	966
6	1.93	272	7.75	3,710	23.54	17,700	6.48	2,800	4.14	1,290	3.53	966
8	1.94	275	8.62	4,270	22.60	16,300	5.97	2,450	4.08	1,260	3.50	942
10	1.96	281	11.36	6,270	21.10	14,400	5.56	2,170	4.00	1,200	3.47	918
12	1.98	287	12.90	7,420	19.09	12,500	5.25	1,920	3.96	1,170	3.44	918
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.36	870	3.06	732	2.84	646	2.70	585	2.61	547	2.55	529
N	3.29	847	2.99	710	2.79	625	2.67	566	2.59	547	3.16	777
6	3.20	800	2.92	667	2.76	605	2.62	547	2.58	547	3.58	990
12	3.12	754	2.89	667	2.74	605	2.62	547	2.57	529	4.05	1,230
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.90	1,140	2.74	605	2.58	547	2.45	494	2.68	585	2.46	494
N	3.46	918	2.64	566	2.54	529	2.40	477	2.74	605	2.38	477
6	3.08	754	2.60	547	2.50	511	2.41	477	2.68	585	2.32	444
12	2.88	667	2.58	547	2.49	511	2.53	529	2.58	547	2.30	444
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.28	444	2.20	412	2.19	409	2.28	444	2.05	364	2.00	349
N	2.23	430	2.17	402	2.25	430	2.18	406	2.01	352	2.06	368
6	2.22	412	2.15	396	2.28	444	2.08	374	1.98	343	2.19	409
12	2.21	412	2.15	396	2.31	444	2.08	374	2.00	349	2.59	547

Alabama River at Selma, Ala.

Location.--Lat 32°24', long. 87°01', in T. 17 N., R. 10 E., at Edmond Pettus Bridge on U. S. Highway 80, in Selma, 1 mile upstream from Valley Creek. Datum of gage is 61.80 ft above mean sea level, datum of 1929.

Drainage area.--17,100 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge adjusted for rate-of-change-of-stage and backwater effect. Shifting-control method used Apr. 20-30. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 139,000 cfs Apr. 2, 3 (gage height, 48.0 ft).
1899-1913, 1928 to February 1951: Discharge, 204,000 cfs Mar. 19, 1929; gage height, 56.0 ft Dec. 3, 1948.
Stage-known, 57.0 ft Apr. 8, 1886, from floodmarks established by Corps of Engineers (discharge, 221,000 cfs).

Remarks.--Flood runoff affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	21,100	128,000	9	23,600	92,000	17	23,800	33,800	25	32,200	77,800
2	18,800	138,000	10	25,300	87,800	18	25,100	31,400	26	28,300	74,600
3	17,100	138,000	11	31,900	81,400	19	30,500	30,700	27	25,000	66,700
4	15,800	130,000	12	33,400	74,300	20	39,100	30,300	28	27,000	58,800
5	14,800	120,000	13	34,100	66,700	21	45,300	36,800	29	57,900	50,600
6	15,200	110,000	14	32,700	56,700	22	45,200	51,600	30	98,100	42,500
7	19,300	101,000	15	30,200	44,900	23	41,100	67,300	31	107,000	
8	22,900	96,000	16	26,700	36,700	24	35,700	76,500			
Monthly mean discharge, in cfs										33,680	74,360
Runoff, in inches										2.27	4.85

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	11.4	26,200	10.2	23,300	15.9	42,100	29.8	93,600	40.0	98,300	45.1	120,000
4	11.3	26,000	10.0	23,100	17.2	45,800	31.6	103,000	40.5	100,000	45.5	123,000
6	11.2	25,700	10.1	23,100	18.4	48,400	33.1	102,000	40.9	101,000	45.7	124,000
8	11.1	25,500	10.1	24,100	19.6	50,400	34.2	102,000	41.4	102,000	46.0	126,000
10	11.0	25,200	10.5	26,000	20.4	52,100	35.2	101,000	41.8	105,000	46.2	126,000
N	10.9	25,000	11.1	26,400	21.4	55,200	35.9	99,800	42.3	106,000	46.5	128,000
2	10.8	24,800	11.6	27,300	22.4	59,600	36.6	99,000	42.8	108,000	46.6	129,000
4	10.7	24,500	11.9	27,200	23.5	63,500	37.2	98,000	43.2	111,000	46.8	132,000
6	10.6	24,300	12.2	28,200	24.7	68,900	37.8	97,000	43.7	114,000	47.0	132,000
8	10.5	24,100	12.8	31,100	26.0	71,800	38.3	96,400	44.1	117,000	47.2	136,000
10	10.4	23,800	13.6	33,300	27.3	78,300	38.9	95,800	44.5	118,000	47.3	136,000
12	10.3	23,600	14.5	37,400	28.4	80,900	39.6	96,000	44.8	121,000	47.4	138,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	47.7	137,000	48.0	139,000	47.1	131,000	45.3	122,000	42.7	113,000	39.6	102,000
N	47.9	138,000	47.8	138,000	46.8	130,000	44.7	120,000	42.0	110,000	39.1	102,000
6	48.0	139,000	47.6	137,000	46.4	129,000	44.1	118,000	41.2	107,000	38.5	99,800
12	48.0	139,000	47.4	133,000	45.9	127,000	43.4	115,000	40.5	104,000	38.0	97,900
	April 8		April 9		April 10		April 11		April 12		April 13	
6	37.5	96,000	36.0	93,200	34.7	89,100	33.1	84,100	31.1	76,200	28.7	68,800
N	37.0	96,500	35.6	91,900	34.3	87,800	32.6	80,800	30.6	74,700	28.1	67,000
6	36.7	95,500	35.3	90,900	33.9	86,600	32.1	79,300	30.0	72,900	27.4	64,300
12	36.3	94,200	35.0	90,100	33.5	85,400	31.6	77,800	29.4	71,000	26.6	62,000
	April 14		April 15		April 16		April 17		April 18		April 19	
6	25.8	59,800	21.6	47,300	17.6	37,900	15.6	34,600	14.7	31,600	14.2	31,000
N	24.9	57,400	20.4	44,100	17.0	36,700	15.4	33,900	14.5	31,100	14.1	30,800
6	23.9	53,400	19.5	42,900	16.4	35,000	15.2	33,400	14.3	31,300	14.0	30,500
12	22.7	50,200	18.4	40,100	15.8	34,400	15.0	32,200	14.2	31,000	13.9	30,300

Cahaba River near Acton, Ala.

Location.--Lat 33°22', long. 86°49', in SE¼ sec. 23, T. 19 S., R. 3 W., at bridge on U. S. Highway 31, half a mile upstream from Patton Creek, 1 mile northwest of Acton, and 16 miles south of Birmingham. Datum of gage is 375.00 ft above mean sea level, adjustment of 1912.

Drainage area.--229 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge adjusted for rate-of-change-of-stage effect 8 p.m. Mar. 28 to 12 m. Mar. 31, Apr. 22. Gage heights used to half-tenths between 3.9 and 5.4 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 18,100 cfs Mar. 29 (gage height, 36.80 ft).
1938 to February 1951: Discharge, 25,500 cfs Dec. 28, 1942; gage height, 44.23 ft Dec. 29, 1942.

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	284	1,420	9	550	892	17	336	438	25	379	949
2	257	1,090	10	433	661	18	1,120	346	26	318	716
3	231	858	11	366	541	19	2,150	1,410	27	277	625
4	397	676	12	476	494	20	1,320	2,890	28	2,390	595
5	1,510	550	13	535	410	21	949	1,610	29	15,300	447
6	1,320	449	14	535	339	22	732	4,660	30	12,000	352
7	949	875	15	447	291	23	565	2,830	31	3,500	
8	732	1,300	16	392	409	24	476	1,420			
Monthly mean discharge, in cfs										1,652	1,018
Runoff, in inches										8.32	4.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.65	288	3.71	304	26.46	10,800	37.05	16,700	24.00	5,730	8.19	1,670
4	3.64	286	4.26	447	28.36	12,000	36.70	16,100	22.26	5,080	8.00	1,610
6	3.63	284	5.08	701	30.00	13,100	36.07	14,900	20.36	4,580	7.82	1,550
8	3.62	281	5.60	856	31.41	14,400	35.24	14,100	18.31	4,150	7.65	1,480
10	3.61	278	5.85	918	32.63	15,100	34.30	12,800	16.15	3,820	7.50	1,450
N	3.60	276	6.04	980	33.76	16,400	33.20	11,800	13.91	3,500	7.36	1,420
2	3.58	271	6.84	1,230	34.76	16,900	32.04	10,800	11.63	2,830	7.24	1,350
4	3.57	269	8.96	1,930	35.61	17,700	30.86	10,000	10.38	2,380	7.11	1,320
6	3.57	269	13.70	3,430	36.30	18,100	29.60	9,160	9.46	2,090	6.98	1,290
8	3.57	269	18.16	5,990	36.80	18,100	28.36	8,280	8.99	1,930	6.87	1,260
10	3.57	269	21.14	7,280	37.09	17,900	27.06	7,440	8.66	1,830	6.76	1,230
12	3.57	269	23.80	9,010	37.13	17,700	25.60	6,530	8.40	1,740	6.64	1,170
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.37	1,100	5.84	918	5.13	716	4.69	580	4.31	461	4.10	406
N	6.35	1,100	5.61	856	5.00	670	4.59	550	4.24	447	5.35	778
6	6.29	1,070	5.43	794	4.89	640	4.48	520	4.20	433	7.19	1,350
12	5.06	980	5.26	747	4.78	610	4.38	490	4.13	420	7.67	1,510
	April 8		April 9		April 10		April 11		April 12		April 13	
6	7.52	1,450	5.95	980	5.10	701	4.62	550	4.50	520	4.18	433
N	7.00	1,290	5.66	887	4.96	655	4.53	535	4.42	490	4.10	406
6	6.62	1,170	5.45	794	4.84	625	4.49	520	4.36	476	4.04	392
12	6.27	1,070	5.25	748	4.70	580	4.53	535	4.26	447	3.96	366
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.91	352	3.70	301	3.71	304	4.34	476	3.94	366	3.75	314
N	3.85	339	3.66	291	4.26	447	4.22	433	3.86	342	5.38	794
6	3.80	326	3.62	281	4.44	505	4.11	406	3.81	329	11.00	2,570
12	3.74	311	3.58	271	4.40	490	4.00	379	3.76	316	14.16	3,590

Cahaba River at Centerville, Ala.

Location.--Lat 32°56', long. 87°08', in E½ sec. 26, T. 23 N., R. 9 E., at bridge on State Highway 6, a quarter of a mile west of Centerville, half a mile upstream from Gulf, Mobile & Ohio Railroad bridge, and 2½ miles upstream from Sandy Creek. Datum of gage is 180.74 ft above mean sea level, datum of 1929, supplementary adjustment of 1944.

Drainage area.--1,030 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge adjusted for rate-of-change-of-stage effect Mar. 5, 18, 20, 28, Mar. 31 to Apr. 4, Apr. 7-10, 19. Gage heights used to half-tenths below 4.7 ft Mar. 1-30, and to tenths elsewhere

Maxima.--March-April 1951: Discharge, 83,600 cfs Mar. 29 (gage height, 34.80 ft). 1901-8, 1929-32, 1935 to February 1951: Discharge, 82,800 cfs Apr. 8, 1938 (gage height, 36.63 ft).

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,400	7,940	9	2,090	3,790	17	1,710	1,940	25	1,930	3,980
2	1,320	4,750	10	1,770	2,970	18	3,300	1,740	26	1,710	3,100
3	1,240	4,030	11	1,610	2,650	19	7,810	2,140	27	1,550	2,580
4	1,260	3,340	12	2,250	2,500	20	5,400	5,530	28	13,000	2,340
5	3,130	2,880	13	2,500	2,240	21	3,950	5,000	29	71,300	2,160
6	3,800	2,540	14	2,300	1,980	22	3,100	15,600	30	40,600	1,800
7	3,050	3,170	15	2,090	1,760	23	2,600	12,100	31	23,900	
8	2,500	4,950	16	1,870	1,720	24	2,250	6,110			
Monthly mean discharge, in cfs										7,042	3,978
Runoff, in inches										7.88	4.31

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.06	1,610	5.19	1,830	31.95	52,800	32.51	56,600	27.61	30,100	22.10	12,500
4	5.04	1,560	6.08	2,500	32.70	58,300	31.84	51,400	27.38	29,300	21.15	10,700
6	5.02	1,560	7.08	3,370	33.42	64,900	31.12	46,800	27.12	28,300	20.16	9,120
8	5.00	1,560	8.88	4,720	33.90	70,900	30.44	42,800	26.85	26,700	19.10	8,270
10	4.99	1,560	10.78	5,850	34.32	76,300	29.79	39,600	26.52	25,700	18.12	7,600
N	4.97	1,560	12.33	6,760	34.56	80,600	29.30	37,200	26.17	24,400	17.25	7,120
2	4.95	1,560	13.84	7,860	34.75	83,600	28.87	35,400	25.81	23,000	16.48	6,600
4	4.92	1,500	15.95	11,500	34.80	83,600	28.56	34,100	25.35	21,400	15.74	6,300
6	4.91	1,500	20.00	19,800	34.69	82,100	28.34	32,800	24.90	20,300	15.09	5,060
8	4.91	1,500	25.56	33,000	34.44	77,700	28.15	32,400	24.38	18,300	14.44	5,640
10	4.94	1,500	28.84	34,900	33.88	70,900	27.98	31,600	23.70	16,400	13.87	5,460
12	4.96	1,560	30.90	45,600	33.25	62,800	27.79	30,800	22.94	14,400	13.42	5,370
	April 2		April 3		April 4		April 5		April 6		April 7	
6	12.44	4,930	10.74	4,220	9.38	3,470	8.47	2,990	7.86	2,640	7.46	2,400
N	11.79	4,680	10.42	4,040	9.11	3,310	8.28	2,880	7.73	2,520	7.87	2,750
6	11.34	4,580	10.06	3,860	8.88	3,210	8.13	2,760	7.60	2,460	9.10	3,670
12	10.98	4,400	9.68	3,630	8.66	3,100	7.98	2,700	7.50	2,400	11.53	5,310
	April 8		April 9		April 10		April 11		April 12		April 13	
6	12.67	5,420	10.61	3,990	8.93	3,210	8.05	2,700	7.73	2,520	7.37	2,340
N	12.53	5,300	10.06	3,710	8.66	3,100	7.87	2,640	7.74	2,520	7.20	2,220
6	11.90	4,740	9.59	3,580	8.46	2,990	7.76	2,580	7.68	2,520	7.07	2,160
12	11.26	4,400	9.23	3,370	8.25	2,820	7.72	2,520	7.54	2,400	6.96	2,100
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.86	2,040	6.52	1,800	6.34	1,680	6.75	1,980	6.49	1,800	6.20	1,620
N	6.75	1,980	6.45	1,740	6.34	1,680	6.76	1,980	6.40	1,740	6.39	1,740
6	6.66	1,920	6.39	1,740	6.40	1,740	6.67	1,920	6.30	1,680	7.32	2,510
12	6.59	1,860	6.32	1,680	6.57	1,860	6.56	1,860	6.24	1,620	9.17	3,740

Cahaba River at Sprott, Ala.

Location.--Lat 32°40', long. 87°14', in NE¼ sec. 35, T. 20 N., R. 8 E., at bridge on State Highway 43, half a mile upstream from Goose Creek, 1 mile west of Sprott, and 5½ miles northeast of Marion. Datum of gage is 129.51 ft above mean sea level, datum of 1929, supplementary adjustment of 1943 (levels by Corps of Engineers).

Drainage area.--1,380 square miles.

Gage-height record.--Water-stage recorder graph fragmentary and available only for record listed.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths below and tenths above 7.7 ft. Shifting-control method used Mar. 1-19 and Apr. 20-30.

Maxima.--March-April 1951: Discharge recorded, 80,000 cfs Mar. 30 (gage height, 27.2 ft). 1938 to February 1951: Discharge, 85,200 cfs Aug. 16, 1939 (gage height, 27.5 ft). Flood of Apr. 9, 1938, reached a stage of 28.55 ft, from floodmark (discharge 95,000 cfs).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,770	30,500	9	2,600		17	2,040	2,180	25	-	-
2	1,660	17,200	10	2,160		18	2,930	2,160	26	-	-
3	1,550	-	11	1,880		19	7,670	2,090	27	-	3,350
4	1,550	-	12	2,480		20	-	3,470	28	-	2,930
5	2,040	-	13	3,230		21	-	5,910	29	-	2,700
6	4,190	-	14	2,930		22	-	-	30	-	2,430
7	4,070	-	15	2,600		23	-	-	31	51,800	-
8	3,110	-	16	2,320		24	-	-			
Monthly mean discharge, in cfs										-	-
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2					-	-	-	-	25.9	66,600	22.0	36,100
4					-	-	-	-	25.6	63,700	21.8	35,100
6					-	-	-	-	25.2	59,800	21.5	33,600
8					-	-	-	-	24.8	56,200	21.3	32,500
10					-	-	-	-	24.5	53,600	21.1	31,500
N					-	-	-	-	24.1	50,100	20.9	30,500
2					-	-	27.2	80,000	23.8	47,800	20.6	29,100
4					-	-	27.1	79,000	23.5	45,600	20.4	28,200
6					-	-	26.9	76,900	23.2	43,400	20.2	27,200
8					22.4	38,500	26.8	75,800	22.9	41,400	20.0	26,300
10					23.5	45,600	26.5	72,800	22.6	39,600	19.7	25,000
12					-	-	26.2	69,700	22.3	37,900	19.4	23,700
	April 2		April 3		April 4		April 5		April 6		April 7	
6	18.6	20,600	12.9	8,990								
N	17.5	17,200	11.8	7,780								
6	16.1	13,800	-	-								
12	14.4	10,900	-	-								
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6					-	-	7.17	2,100	7.27	2,210	7.09	2,040
N					7.16	2,100	7.21	2,160	7.22	2,160	7.12	2,040
6					7.16	2,100	7.29	2,260	7.16	2,100	7.22	2,160
12					7.16	2,100	7.30	2,260	7.11	2,040	7.24	2,210

Cahaba River near Marion Junction, Ala.

Location.--Lat 32°27', long. 87°11', on line between secs. 16 and 21, T. 17 N., R. 9 E., at bridge on U. S. Highway 80, half a mile upstream from Southern Railway bridge, 3 miles downstream from Oakmulgee Creek, 3½ miles east of Marion Junction, and 20 miles upstream from mouth. Datum of gage is 86.72 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Auxiliary wire-weight gage at Beloit, 12 miles downstream, at datum 15.2 ft lower.

Drainage area.--1,780 square miles.

Gage-height record.--Water-stage recorder graph for base gage. For auxiliary gage, graph based on once-daily readings for period Mar. 30 to Apr. 12.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Discharge adjusted for backwater from 4 a.m. Mar. 30 to 6 a.m. Apr. 12. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 80,400 cfs Mar. 31; gage height, 41.76 ft Mar. 31. 1939 to February 1951: Discharge, 83,400 cfs Aug. 16, 1939 (gage height, 42.95 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	2,310	44,000	9	3,270	7,680	17	2,530	2,700	25	3,450	14,500
2	2,150	31,000	10	2,750	6,980	18	4,040	2,770	26	2,970	12,600
3	1,990	23,700	11	2,360	5,200	19	7,090	2,730	27	2,660	6,740
4	1,940	17,100	12	2,470	4,380	20	8,900	3,090	28	7,880	4,360
5	2,100	11,100	13	3,450	3,930	21	9,880	5,700	29	19,700	3,930
6	3,570	5,850	14	3,630	3,460	22	8,410	8,550	30	40,800	3,630
7	4,810	5,170	15	3,270	3,050	23	5,180	9,740	31	71,600	
8	3,990	6,350	16	2,860	2,820	24	4,050	12,100			
Monthly mean discharge, in cfs										7,937	9,164
Runoff, in inches										5.14	5.74

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	6.53	2,750	6.21	2,580	24.98	16,100	33.56	25,300	41.53	77,400	40.40	53,200
4	6.48	2,750	6.32	2,640	26.02	17,100	34.34	26,400	41.67	80,400	40.22	50,400
6	6.45	2,690	7.34	3,210	26.70	17,800	35.10	27,600	41.74	78,700	40.04	47,700
8	6.40	2,690	11.00	5,500	27.29	18,200	35.85	28,600	41.76	79,600	39.90	46,700
10	6.36	2,690	14.50	7,850	27.91	18,800	36.54	30,300	41.72	76,900	39.73	44,800
N	6.31	2,640	16.45	9,180	28.61	19,600	37.30	32,800	41.64	74,200	39.56	44,400
2	6.27	2,640	17.30	9,810	29.40	20,400	38.20	37,600	41.52	71,600	39.40	42,300
4	6.22	2,580	17.80	10,200	30.16	21,100	39.08	45,000	41.38	69,000	39.23	39,900
6	6.20	2,580	18.10	10,400	30.89	22,000	39.90	53,900	41.22	65,500	39.09	39,400
8	6.20	2,580	19.64	11,500	31.56	22,700	40.54	62,300	41.04	61,300	38.94	37,000
10	6.18	2,580	21.77	13,200	32.23	23,500	41.00	70,100	40.85	58,600	38.80	37,100
12	6.18	2,580	22.96	14,300	32.90	24,400	41.30	75,200	40.62	55,900	38 65	35,300
	April 2		April 3		April 4		April 5		April 6		April 7	
6	38.26	33,300	36.21	25,200	31.84	18,600	25.58	12,700	17.14	6,670	12.59	4,170
N	37.86	30,800	35.44	23,600	30.40	17,000	23.64	11,000	15.34	5,550	13.53	5,190
6	37.40	28,800	34.46	22,300	28.92	15,500	21.65	9,560	14.12	4,800	14.19	5,980
12	36.86	26,700	33.24	20,500	27.26	14,000	19.53	8,320	13.29	4,470	14.18	6,210
	April 8		April 9		April 10		April 11		April 12		April 13	
6	13.96	6,090	15.05	7,460	14.71	7,590	11.58	5,530	9.98	4,500	9.14	3,990
N	13.87	6,180	15.28	7,820	14.03	7,060	11.04	5,090	9.72	4,360	9.01	3,930
6	14.20	6,510	15.35	7,970	13.15	6,400	10.62	4,900	9.49	4,240	8.86	3,870
12	14.68	7,030	15.17	7,920	12.33	5,840	10.31	4,690	9.28	4,110	8.66	3,750
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.42	3,570	7.67	3,150	7.17	2,860	6.94	2,690	7.08	2,800	6.90	2,690
N	8.20	3,450	7.51	3,030	7.12	2,800	6.90	2,690	7.10	2,800	7.00	2,750
6	8.01	3,330	7.37	2,970	7.10	2,800	6.92	2,690	7.01	2,750	6.99	2,750
12	7.83	3,210	7.23	2,860	7.00	2,750	7.00	2,750	6.92	2,690	7.05	2,800

Boguechitto Creek near Browns, Ala.

Location.--Lat 32°26', long. 87°20', in NW¼ sec. 24, T. 17 N., R. 7 E., at bridge on U. S. Highway 80, a third of a mile upstream from Southern Railroad bridge, 2 miles east of Browns, and 2½ miles downstream from Washington Creek. Datum of gage is 129.39 ft above mean sea level, datum of 1929, supplementary adjustment of 1943 (levels by Corps of Engineers).

Drainage area.--93 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 2.6 and 5.2 ft, and to hundredths below and tenths above those limits. Shifting-control method used below 150 cfs Mar. 1-28.

Maxima.--March-April 1951: Discharge, 14,200 cfs Mar. 29 (gage height, 18.97 ft).
1944 to February 1951: Discharge, 9,440 cfs Mar. 26, 1945 (gage height, 17.16 ft, from graph based on gage readings).
Flood of Dec. 28, 1942, reached a stage of 20.7 ft, from floodmarks.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	49	343	9	46	246	17	32	68	25	62	127
2	47	229	10	43	128	18	580	54	26	52	101
3	46	180	11	39	105	19	1,790	77	27	51	98
4	45	143	12	38	102	20	804	144	28	2,410	89
5	60	124	13	51	95	21	174	98	29	12,000	77
6	64	110	14	44	76	22	98	874	30	4,060	67
7	54	299	15	38	65	23	77	936	31	1,050	
8	50	535	16	34	64	24	70	261			
Monthly mean discharge, in cfs										776	197
Runoff, in inches										9.62	2.37

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.36	50	2.78	72	17.86	11,300	16.41	7,230	12.84	1,570	6.83	435
4	2.35	50	5.71	309	18.19	12,100	16.03	6,190	12.51	1,460	6.56	411
6	2.34	50	9.79	864	18.52	12,900	15.71	5,420	12.15	1,340	6.35	387
8	2.34	50	12.22	1,370	18.84	13,700	15.39	4,700	11.76	1,260	6.16	364
10	2.33	49	12.97	1,650	18.97	14,200	15.13	4,070	11.35	1,180	6.05	342
N	2.33	49	13.41	1,850	18.91	14,000	14.89	3,680	10.82	1,060	5.90	331
2	2.33	49	13.69	2,060	18.69	13,400	14.62	3,140	10.22	940	5.76	320
4	2.33	49	13.86	2,230	18.37	12,600	14.38	2,830	9.38	796	5.64	299
6	2.35	50	14.71	3,310	18.00	11,500	14.10	2,440	8.69	692	5.53	289
8	2.39	52	15.62	5,170	17.60	10,500	13.80	2,140	8.05	594	5.44	279
10	2.50	57	16.45	7,230	17.20	9,380	13.50	1,910	7.55	538	5.36	279
12	2.62	63	17.30	9,650	16.80	8,300	13.16	1,740	7.15	466	5.27	269
	April 2		April 3		April 4		April 5		April 6		April 7	
6	5.06	244	4.43	192	3.92	148	3.61	127	3.40	113	3.30	107
N	4.84	226	4.28	180	3.81	141	3.56	124	3.34	110	5.20	259
6	4.71	213	4.15	168	3.74	138	3.50	120	3.30	107	7.29	499
12	4.57	200	4.03	160	3.66	130	3.44	116	3.28	107	7.74	552
	April 8		April 9		April 10		April 11		April 12		April 13	
6	7.86	580	5.54	289	3.70	134	3.33	110	3.13	98	3.24	104
N	7.81	566	4.96	236	3.56	124	3.24	104	3.19	101	3.11	95
6	7.46	525	4.38	188	3.50	120	3.17	98	3.29	107	2.97	86
12	6.45	387	3.95	152	3.43	116	3.13	98	3.32	107	2.88	83
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.84	80	2.61	67	2.54	64	2.69	72	2.38	56	2.30	52
N	2.77	74	2.57	66	2.53	64	2.68	72	2.34	54	2.48	61
6	2.71	72	2.51	62	2.55	64	2.58	66	2.28	51	3.20	101
12	2.64	70	2.48	61	2.60	67	2.46	60	2.26	50	3.80	141

Alabama River near Millers Ferry, Ala.

Location.--Lat 32°07', long. 87°24', in NW¼ sec. 8, T. 13 N., R. 7 E., at bridge on State Highway 28, just downstream from Prairie Creek and 2½ miles northwest of Millers Ferry. Datum of gage is 26.82 ft above mean sea level, datum of 1929, supplementary adjustment of 1943 (levels by Corps of Engineers). Auxiliary staff gage at site 9¾ miles downstream at different datum.

Drainage area.--20,700 square miles.

Gage-height record.--Graph based on twice-daily wire-weight gage readings.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 155,000 cfs Apr. 4, 5; gage height, 49.9 ft Apr. 4. 1937 to February 1951: Discharge, 237,000 cfs Apr. 14, 1938 (gage height, 56.6 ft). Flood in March 1929 reached a stage of 56.8 ft, from floodmarks. Flood in April 1886 reached a stage from 1 to 5 ft higher than that of March 1929.

Remarks.--Flood runoff affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	26,300	138,000	9	27,500	116,000	17	29,700	49,800	25	42,700	91,100
2	24,200	147,000	10	27,800	108,000	18	30,400	42,500	26	36,200	91,600
3	21,900	153,000	11	30,000	101,000	19	41,400	41,300	27	32,300	86,800
4	20,200	155,000	12	34,400	94,100	20	50,600	42,200	28	35,500	79,500
5	18,700	152,000	13	36,900	89,200	21	55,500	41,900	29	81,900	70,800
6	18,100	144,000	14	37,000	82,000	22	58,100	57,500	30	115,000	61,100
7	20,700	135,000	15	35,900	71,500	23	54,800	74,700	31	128,000	
8	25,600	124,000	16	33,100	57,600	24	49,300	84,300			
Monthly mean discharge, in cfs										41,280	92,750
Runoff, in inches										2.30	5.00

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	17.5	34,200	16.0	30,600	26.0	46,900	40.3	110,000	43.1	123,000	45.6	134,000
4	17.4	34,000	16.1	31,400	27.4	51,300	40.7	112,000	43.3	124,000	45.8	135,000
6	17.2	33,500	16.2	32,300	29.0	55,000	41.0	111,000	43.6	126,000	46.0	136,000
8	17.0	32,900	16.5	34,000	30.5	62,000	41.2	112,000	43.8	127,000	46.2	136,000
10	16.9	32,700	16.9	36,600	32.2	74,900	41.4	113,000	44.0	128,000	46.3	137,000
N	16.8	32,400	17.4	39,000	34.1	86,400	41.6	113,000	44.2	129,000	46.5	137,000
2	16.6	32,000	18.1	37,100	35.7	96,600	41.8	114,000	44.4	130,000	46.7	139,000
4	16.5	31,200	18.9	34,800	37.1	105,000	42.1	115,000	44.6	130,000	46.9	139,000
6	16.4	30,900	19.9	33,700	38.3	109,000	42.3	118,000	44.8	130,000	47.0	140,000
8	16.2	30,500	21.4	37,800	39.0	110,000	42.5	119,000	45.0	131,000	47.2	141,000
10	16.1	30,200	22.9	40,800	39.4	109,000	42.7	122,000	45.2	132,000	47.3	142,000
12	16.1	30,800	24.4	44,300	39.8	108,000	42.9	123,000	45.4	133,000	47.5	143,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	47.8	145,000	49.1	153,000	49.8	155,000	49.9	155,000	49.5	146,000	48.6	138,000
N	48.2	147,000	49.3	154,000	49.8	155,000	49.8	152,000	49.3	145,000	48.3	135,000
6	48.5	149,000	49.5	152,000	49.9	155,000	49.7	149,000	49.1	142,000	48.0	132,000
12	48.8	151,000	49.6	153,000	49.9	155,000	49.6	147,000	48.8	141,000	47.7	130,000
	April 8		April 9		April 10		April 11		April 12		April 13	
6	47.4	126,000	45.9	117,000	44.2	110,000	42.5	103,000	40.6	94,800	38.3	90,900
N	47.0	123,000	45.5	116,000	43.8	107,000	42.0	101,000	40.0	94,200	37.7	89,100
6	46.7	121,000	45.1	114,000	43.4	106,000	41.6	99,400	39.5	93,400	37.1	88,100
12	46.3	119,000	44.7	112,000	42.9	105,000	41.1	97,700	38.9	90,600	36.5	87,200
	April 14		April 15		April 16		April 17		April 18		April 19	
6	35.8	84,900	32.2	74,900	27.9	59,800	24.3	51,500	21.3	43,700	20.5	41,400
N	34.9	82,100	31.2	72,400	26.9	56,700	23.6	49,800	20.7	41,900	20.8	40,900
6	34.0	79,100	30.2	68,400	26.0	55,100	22.8	48,300	20.4	41,100	21.1	41,400
12	33.1	77,000	29.0	63,900	25.2	53,800	22.0	45,800	20.3	40,800	21.2	42,100

Alabama River at Claiborne, Ala.

Location.--Lat 31°32', long. 87°31', in sec. 25, T. 7 N., R. 5 E., at bridge on U. S. Highway 84 at Claiborne and half a mile downstream from Limestone Creek. Datum of gage is 0.4 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--22,000 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 148,000 cfs Apr. 7, 8 (gage height, 45.7 ft). 1930 to February 1951: Discharge, 227,000 cfs Apr. 16, 17, 1938; gage height, 52.25 ft Apr. 17, 1933.

Remarks.--Flood runoff affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	30,200	108,000	9	24,100	146,000	17	33,900	71,800	25	49,000	77,300
2	28,400	117,000	10	26,500	140,000	18	32,200	58,800	26	44,100	82,500
3	26,300	126,000	11	27,200	134,000	19	38,000	53,300	27	39,600	85,400
4	24,400	133,000	12	29,200	127,000	20	47,600	53,300	28	36,600	85,900
5	23,200	139,000	13	32,600	119,000	21	51,800	49,700	29	59,900	82,500
6	21,900	144,000	14	35,200	110,000	22	54,100	54,100	30	87,000	76,000
7	20,500	147,000	15	36,200	98,800	23	54,900	65,800	31	99,500	
8	21,400	148,000	16	35,700	85,900	24	53,000	72,000			
Monthly mean discharge, in cfs										39,490	99,700
Runoff, in inches										2.07	5.06

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	24.6	41,200	23.1	37,300	25.0	42,300	34.6	79,200	37.8	95,300	39.5	105,000
4	24.5	41,000	23.0	37,000	26.2	46,000	35.0	81,000	38.0	96,400	39.6	106,000
6	24.4	40,700	22.9	36,700	27.4	50,000	35.4	83,000	38.2	97,500	39.7	106,000
8	24.2	40,100	22.8	36,500	28.3	53,300	35.7	84,400	38.3	98,100	39.8	107,000
10	24.1	39,900	22.7	36,200	29.4	57,600	36.0	85,900	38.4	98,700	40.0	108,000
N	24.0	39,600	22.6	36,000	30.4	61,500	36.3	87,400	38.6	99,800	40.1	109,000
2	23.9	39,300	22.5	35,700	31.2	64,600	36.6	89,000	38.7	100,000	40.2	109,000
4	23.7	38,800	22.5	35,700	31.9	67,400	36.9	90,500	38.8	101,000	40.3	110,000
6	23.6	38,600	22.6	36,000	32.6	70,300	37.1	91,500	39.0	102,000	40.4	110,000
8	23.5	38,300	22.8	36,500	33.1	72,400	37.3	92,600	39.1	103,000	40.5	111,000
10	23.4	38,000	23.2	37,500	33.7	75,100	37.5	93,700	39.2	103,000	40.6	112,000
12	23.2	37,500	23.8	39,100	34.1	76,900	37.7	94,800	39.4	104,000	40.8	113,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	41.1	115,000	42.5	124,000	43.6	131,000	44.4	137,000	45.1	143,000	45.5	146,000
N	41.5	117,000	42.8	126,000	43.8	139,000	44.6	139,000	45.2	144,000	45.6	147,000
6	41.9	119,000	43.0	127,000	44.0	134,000	44.8	140,000	45.3	145,000	45.7	148,000
12	42.2	121,000	43.3	129,000	44.2	136,000	44.9	141,000	45.4	146,000	45.7	148,000
	April 8		April 9		April 10		April 11		April 12		April 13	
6	45.7	148,000	45.5	146,000	45.0	142,000	44.2	136,000	43.2	128,000	42.4	121,000
N	45.7	148,000	45.4	146,000	44.8	140,000	43.9	133,000	43.0	127,000	41.8	119,000
6	45.7	148,000	45.3	145,000	44.6	139,000	43.7	132,000	42.8	126,000	41.5	117,000
12	45.6	147,000	45.1	143,000	44.4	137,000	43.5	130,000	42.4	123,000	41.1	115,000
	April 14		April 15		April 16		April 17		April 18		April 19	
6	40.7	112,000	39.0	102,000	36.7	89,500	33.7	75,100	30.5	61,800	28.2	53,000
N	40.3	110,000	38.5	99,200	36.0	85,900	33.0	72,000	29.6	58,300	28.3	53,300
6	39.9	107,000	37.9	95,900	35.3	82,500	32.1	68,200	28.9	55,600	28.3	53,300
12	39.4	104,000	37.3	92,600	34.5	78,700	31.3	65,000	28.4	53,700	28.4	53,700

Mackys Creek near Dennis, Miss.

Location.--Lat 34°32', long. 88°20', in sec. 26, T. 6 S., R. 9 E. Chickasaw meridian, at bridge on county highway at Narrows dam site, 6 miles southwest of Dennis and about 10 miles upstream from confluence with Browns Creek. Datum of gage is 333.47 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--66 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 3.2 and 3.7 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 3,380 cfs Mar. 29 (gage height, 20.44 ft).
1938 to February 1951: Discharge, 3,520 cfs Feb. 13, 1948 (gage height, 22.08 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; occasional discharge measurements made and record of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	132	238	9	130	158	17	121	130	25	122	158
2	125	314	10	121	142	18	324	124	26	116	146
3	124	261	11	122	192	19	377	158	27	129	142
4	153	186	12	164	285	20	324	230	28	1,560	130
5	217	160	13	165	167	21	189	224	29	2,720	124
6	148	151	14	136	144	22	153	696	30	796	116
7	195	196	15	124	137	23	142	297	31	316	
8	162	242	16	119	164	24	130	185			
Monthly mean discharge, in cfs										318	200
Runoff, in inches										5.55	3.38

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.72	114	5.35	409	20.36	3,380	12.22	1,390	5.08	382	3.71	260
4	2.72	114	6.29	495	20.44	3,380	11.20	1,810	4.83	357	3.66	254
6	2.72	114	7.05	565	20.32	3,350	10.22	1,030	4.63	341	3.60	249
8	2.72	114	7.75	664	19.89	3,230	9.26	883	4.44	324	3.56	243
10	2.72	114	9.19	867	19.26	3,060	8.57	775	4.31	315	3.53	243
N	2.73	116	12.58	1,460	18.57	2,870	7.94	677	4.21	306	3.60	237
2	2.75	119	14.56	1,870	17.74	2,630	7.42	613	4.12	297	3.46	230
4	2.79	125	16.16	2,250	16.94	2,420	6.94	555	4.04	288	3.43	230
6	2.84	134	17.44	2,550	15.99	2,200	6.50	515	3.96	288	3.41	224
8	2.89	142	18.44	2,820	15.08	1,980	6.12	475	3.88	279	3.38	224
10	3.02	165	19.31	3,060	14.16	1,780	5.72	436	3.81	270	3.34	217
12	3.53	243	19.94	3,230	13.24	1,580	5.37	409	3.76	270	3.32	210
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.71	260	4.05	288	3.20	195	3.01	164	2.95	153	2.92	148
N	4.17	306	3.56	243	3.14	185	2.99	160	2.94	151	3.08	176
6	5.19	391	3.37	217	3.10	179	2.97	157	2.93	149	3.61	249
12	5.20	391	3.26	202	3.04	169	2.95	153	2.92	148	3.77	270
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.99	288	3.01	164	2.90	144	2.84	134	4.89	363	3.07	174
N	3.66	254	2.96	155	2.88	141	2.92	148	4.04	288	3.02	165
6	3.26	202	2.94	151	2.87	139	3.64	254	3.41	224	2.98	158
12	3.08	176	2.92	148	2.85	136	4.51	333	3.17	190	2.95	153
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.92	148	2.84	134	3.15	187	2.83	132	2.79	125	2.77	122
N	2.90	144	2.83	132	3.05	170	2.82	130	2.78	124	2.91	146
6	2.88	141	2.83	132	2.93	149	2.81	129	2.77	122	3.17	190
12	2.86	137	3.00	162	2.86	137	2.79	125	2.76	121	3.44	230

East Fork Tombigbee River near Marietta, Miss.

Location.--Lat 34°26', long. 88°25', in SE¼ sec. 35, T. 7 S., R. 8 E. Chickasaw meridian, at Walkers Bridge, half a mile downstream from confluence of Browns Creek Canal and Mackys Creek, 3 miles upstream from Donovan Creek Canal, 6 miles southeast of Marietta, and 10 miles north of Fulton. Datum of gage is 282.10 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--305 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths below 4.0 ft and above 8.9 ft, to half-tenths between 4.0 and 5.6 ft and between 8.2 and 8.9 ft, and to tenths between 5.6 and 8.2 ft.

Maxima.--March-April 1951: Discharge, 20,500 cfs Mar. 29 (gage height, 11.45 ft).
1938-47, 1948 to February 1951: Discharge, 13,300 second-feet Jan. 4, 1949 (gage height, 10.90 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; occasional discharge measurement made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	470	1,200	9	575	736	17	440	548	25	500	660
2	450	1,200	10	500	608	18	750	504	26	470	575
3	450	1,120	11	470	691	19	1,760	648	27	456	545
4	500	794	12	575	860	20	2,000	759	28	4,630	500
5	620	640	13	575	761	21	1,000	766	29	16,600	470
6	575	580	14	530	623	22	724	3,000	30	6,240	430
7	680	680	15	490	549	23	605	2,200	31	2,510	
8	660	826	16	450	566	24	545	1,000			
Monthly mean discharge, in cfs										1,542	835
Runoff, in inches										5.83	3.05

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	8.00	450	9.03	816	11.28	18,100	10.51	9,000	9.71	3,250	9.35	1,600
4	7.98	450	9.09	886	11.39	19,700	10.43	8,270	9.67	3,050	9.32	1,480
6	7.97	450	9.17	1,040	11.45	20,500	10.36	7,640	9.64	2,900	9.29	1,370
8	7.96	450	9.29	1,370	11.43	20,200	10.29	7,020	9.61	2,750	9.27	1,310
10	7.96	450	9.55	2,450	11.39	19,700	10.22	6,460	9.58	2,600	9.24	1,220
N	7.95	450	9.82	3,820	11.30	18,400	10.17	6,090	9.55	2,450	9.22	1,160
2	7.95	450	10.05	5,250	11.20	17,100	10.10	5,600	9.52	2,300	9.19	1,080
4	7.96	450	10.21	6,380	11.08	15,500	10.01	4,970	9.50	2,200	9.17	1,040
6	7.98	450	10.34	7,460	10.95	13,900	9.95	4,600	9.47	2,080	9.15	1,000
8	8.03	450	10.47	8,630	10.85	12,700	9.90	4,300	9.45	2,000	9.13	960
10	8.17	490	10.66	10,600	10.76	11,700	9.83	3,880	9.42	1,880	9.11	920
12	8.35	520	10.90	13,300	10.65	10,400	9.78	3,600	9.36	1,760	9.09	888
	April 2		April 3		April 4		April 5		April 6		April 7	
6	9.17	1,040	9.23	1,190	9.05	840	8.79	660	8.62	590	8.49	560
N	9.26	1,280	9.21	1,130	8.99	773	8.74	640	8.57	575	8.89	710
6	9.30	1,400	9.18	1,060	8.95	745	8.71	620	8.55	575	8.96	752
12	9.26	1,280	9.13	960	8.85	680	8.66	605	8.51	560	9.05	840
	April 8		April 9		April 10		April 11		April 12		April 13	
6	9.05	840	8.98	766	8.72	620	8.47	545	9.08	876	9.01	792
N	9.04	828	8.94	738	8.66	605	8.48	560	9.05	840	8.98	766
6	9.03	816	8.88	710	8.60	590	9.10	900	9.05	840	8.93	731
12	9.02	804	8.80	660	8.54	575	9.12	940	9.04	828	8.86	680
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.76	640	8.48	560	8.53	575	8.49	560	8.29	510	8.16	490
N	8.70	620	8.44	545	8.53	575	8.47	545	8.26	500	8.41	530
6	8.64	605	8.40	530	8.52	560	8.44	545	8.23	500	9.10	900
12	8.57	575	8.46	545	8.50	560	8.36	520	8.19	490	9.06	852

East Fork Tombigbee River near Fulton, Miss.

Location.--Lat 34°15'55", long. 88°26'42", in SE¼ sec. 27, T. 9 S., R. 8 E. Chickasaw meridian, at bridge on U. S. Highway 78, 1,000 feet downstream from Twentymile-Fulton Canal, 2 miles west of Fulton, 6¼ miles upstream from Mantachie Creek Canal, and 13½ miles downstream from Twentymile Creek Canal. Datum of gage is 242.70 ft above mean sea level, datum of 1929.

Drainage area.--605 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths between 15.5 and 16.7 ft to half-tenths between 15.1 and 15.5 ft, and between 16.7 and 18.0 ft, and to tenths below 15.1 ft and above 18.0 ft.

Maxima.--March-April 1951: Discharge, 34,500 cfs Mar. 29 (gage height, 20.70 ft).
1928 to February 1951: Discharge, 47,700 cfs Feb. 14, 1948 (gage height, 22.24 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,270	3,890	9	1,720	1,920	17	1,170	1,390	25	1,440	2,600
2	1,170	2,730	10	1,600	1,830	18	1,380	1,270	26	1,270	1,880
3	1,090	2,420	11	1,480	1,680	19	1,680	1,290	27	1,150	1,600
4	1,090	2,260	12	1,560	1,680	20	3,180	1,320	28	3,340	1,410
5	1,230	1,950	13	1,520	1,760	21	4,030	1,380	29	25,100	1,230
6	1,380	1,720	14	1,410	1,680	22	2,750	1,820	30	19,200	1,090
7	1,440	1,600	15	1,320	1,560	23	2,030	3,660	31	6,690	
8	1,680	1,680	16	1,250	1,510	24	1,720	4,030			
Monthly mean discharge, in cfs										3,172	1,928
Runoff, in inches										6.05	3.56

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	12.98	1,190	13.89	1,410	17.29	10,800	20.10	29,700	17.01	9,000	16.17	4,630
4	12.93	1,170	14.30	1,560	17.72	13,200	19.79	27,400	16.89	8,400	16.13	4,450
6	12.87	1,170	14.63	1,680	18.26	16,900	19.55	26,000	16.78	7,820	16.10	4,320
8	12.82	1,160	14.85	1,770	18.82	20,400	19.12	22,500	16.69	7,210	16.06	4,150
10	12.76	1,160	15.15	1,990	19.41	24,600	18.80	20,400	16.60	6,720	16.03	4,030
N	12.71	1,140	15.37	2,190	19.95	28,900	18.45	17,600	16.52	6,300	15.99	3,860
2	12.69	1,140	15.70	2,850	20.34	31,300	18.19	16,200	16.47	6,050	15.96	3,740
4	12.64	1,120	16.03	4,030	20.57	33,700	17.92	14,400	16.40	5,700	15.91	3,540
6	12.62	1,120	16.22	4,850	20.70	34,500	17.69	13,200	16.34	5,410	15.89	3,460
8	12.61	1,120	16.44	5,900	20.66	34,500	17.48	12,000	16.31	5,270	15.86	3,360
10	12.70	1,140	16.65	6,990	20.54	32,900	17.29	10,800	16.26	5,040	15.82	3,220
12	13.25	1,230	16.90	8,400	20.34	31,300	17.14	9,900	16.21	4,810	15.79	3,120
	April 2		April 3		April 4		April 5		April 6		April 7	
6	15.72	2,910	15.50	2,400	15.49	2,400	15.18	2,030	14.84	1,770	14.41	1,600
N	15.64	2,700	15.50	2,400	15.41	2,250	15.11	1,950	14.74	1,720	14.38	1,600
6	15.57	2,540	15.52	2,440	15.32	2,130	15.02	1,880	14.63	1,680	14.36	1,600
12	15.51	2,420	15.52	2,440	15.24	2,080	14.93	1,820	14.51	1,640	14.44	1,600
	April 8		April 9		April 10		April 11		April 12		April 13	
6	14.52	1,640	14.98	1,880	15.04	1,880	14.60	1,680	14.58	1,680	14.79	1,770
N	14.60	1,680	15.10	1,950	14.92	1,820	14.54	1,640	14.59	1,680	14.81	1,770
6	14.69	1,720	15.13	1,990	14.80	1,770	14.57	1,680	14.64	1,680	14.80	1,770
12	14.82	1,770	15.11	1,950	14.70	1,720	14.57	1,680	14.72	1,720	14.73	1,720
	April 14		April 15		April 16		April 17		April 18		April 19	
6	14.68	1,720	14.42	1,600	14.27	1,560	13.95	1,440	13.51	1,290	13.32	1,250
N	14.60	1,680	14.34	1,560	14.24	1,520	13.85	1,380	13.40	1,270	13.61	1,320
6	14.54	1,640	14.25	1,520	14.14	1,480	13.74	1,350	13.28	1,250	13.64	1,320
12	14.49	1,640	14.24	1,520	14.04	1,440	13.62	1,320	13.18	1,230	13.60	1,320

Bull Mountain Creek near Smithville, Miss.

Location.--Lat 34°05', long. 88°24', in SE¼ sec. 30, T. 11 S., R. 9 E. Chickasaw meridian, at bridge on State Highway 25, 0.8 mile upstream from Mississippian Railway bridge, 1.1 miles north of Smithville, and 3½ miles upstream from mouth. Datum of gage is 234.81 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--335 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage height used to half-tenths below and tenths above 6.3 ft.

Maxima.--March-April 1951: Discharge, 26,700 cfs Mar. 29 (gage height, 15.48 ft).
1940 to February 1951: Discharge, 24,800 cfs Feb. 13, 1948 (gage height 15.25 ft, from graph based on gage readings).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; occasional discharge measurement made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	636	3,310	9	786	926	17	680	841	25	849	2,650
2	579	2,520	10	801	951	18	914	922	26	710	1,930
3	526	1,990	11	695	831	19	1,220	1,150	27	634	1,330
4	565	1,600	12	755	796	20	1,410	1,330	28	3,350	981
5	801	1,410	13	881	813	21	1,580	1,300	29	16,200	801
6	849	1,190	14	947	835	22	1,630	2,170	30	14,300	710
7	849	986	15	947	729	23	1,490	2,560	31	5,500	
8	755	918	16	801	765	24	1,160	3,090			
Monthly mean discharge, in cfs										2,058	1,411
Runoff, in inches										7.08	4.70

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.75	650	6.43	849	12.18	6,470	14.93	21,900	12.48	7,310	10.95	4,010
4	5.73	650	8.19	1,490	12.24	6,470	14.70	20,300	12.30	6,730	10.85	3,670
6	5.71	636	9.35	2,170	12.35	7,010	14.46	18,700	12.14	6,230	10.78	3,670
8	5.69	636	10.22	2,860	12.63	7,650	14.23	16,300	11.99	6,000	10.70	3,510
10	5.67	621	10.65	3,360	13.25	10,000	14.02	14,900	11.84	5,560	10.62	3,360
N	5.65	621	10.84	3,670	14.17	16,300	13.81	13,500	11.70	5,350	10.53	3,220
2	5.65	621	10.94	3,840	14.99	22,700	13.61	12,200	11.59	5,150	10.45	3,090
4	5.64	621	10.97	4,010	15.33	25,100	13.41	11,000	11.45	4,750	10.40	3,090
6	5.63	621	11.10	4,190	15.48	26,700	13.22	10,000	11.34	4,560	10.33	2,970
8	5.64	621	11.44	4,750	15.44	25,900	13.03	9,100	11.23	4,370	10.25	2,860
10	5.70	636	11.83	5,560	15.33	25,100	12.83	8,350	11.14	4,190	10.21	2,860
12	5.90	695	12.09	6,230	15.14	23,500	12.64	7,650	11.04	4,010	10.14	2,750
	April 2		April 3		April 4		April 5		April 6		April 7	
6	9.99	2,650	9.33	2,110	8.56	1,690	8.10	1,450	7.61	1,260	6.86	1,020
N	9.98	2,560	9.11	1,990	8.40	1,580	8.02	1,410	7.39	1,190	6.76	981
6	9.70	2,390	8.90	1,870	8.28	1,530	7.93	1,370	7.19	1,120	6.70	947
12	9.53	2,240	8.72	1,750	8.18	1,490	7.79	1,330	7.02	1,050	6.69	947
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.64	914	6.56	914	6.75	981	6.45	849	6.26	801	6.23	801
N	6.58	914	6.61	914	6.74	947	6.32	817	6.23	801	6.29	817
6	6.56	914	6.67	947	6.69	947	6.25	801	6.20	786	6.34	817
12	6.55	914	6.72	947	6.58	914	6.27	801	6.19	786	6.40	849
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.41	849	6.12	755	5.94	710	6.29	817	6.59	914	6.77	981
N	6.40	849	6.00	725	6.19	786	6.36	849	6.64	914	7.21	1,120
6	6.34	817	5.92	695	6.32	817	6.44	849	6.69	947	7.77	1,330
12	6.24	801	5.85	680	6.30	817	6.52	881	6.71	947	7.94	1,370

West Fork Tombigbee River near Nettleton, Miss.

Location.--Lat 34°03'32", long. 88°37'40", in NW¼ sec. 12, T. 12 S., R. 6 E. Chickasaw meridian, at bridge on U. S. Highway 45, 1.9 miles downstream from Tallabinnela Creek, 2 miles downstream from Tubbalubba Creek, and 2.1 miles south of Nettleton. Datum of gage is 194.01 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--617 square miles.

Gage-height record.--Water-stage recorder graph above 11.0 ft and twice-daily readings of wire-weight gage below. Doubtful gage height record Mar. 12-17.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage-heights used to half-tenths below and tenths above 9.2 ft. Shifting-control method used Mar. 1-18. Discharge during period of doubtful gage-height record computed on basis of records for other stations in basin.

Maxima.--March-April 1951: Discharge, 49,200 cfs Mar. 29 (gage height, 29.31 ft).
1939 to February 1951: Discharge, 56,300 cfs Feb. 14, 1948; gage height, 31.18 ft Mar. 28, 1944.
Flood of Dec. 24, 1926, reached a stage of 32.5 ft, present datum, from floodmark.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	730	2,110	9	1,140	1,090	17	780	894	25	549	865
2	775	1,960	10	895	556	18	6,220	655	26	496	805
3	895	1,520	11	1,010	655	19	6,280	2,390	27	735	760
4	1,170	971	12	2,600	1,360	20	3,050	1,560	28	22,700	576
5	2,300	750	13	1,400	484	21	1,280	1,990	29	41,400	535
6	1,140	1,030	14	1,050	458	22	865	10,300	30	15,900	432
7	1,740	1,730	15	860	772	23	730	3,180	31	4,760	
8	1,620	2,860	16	800	1,350	24	631	925			
Monthly mean discharge, in cfs										4,081	1,517
Runoff, in inches										7.62	2.74

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	8.16	483	20.20	7,290	29.31	49,200	26.94	23,500	20.44	7,530	14.22	2,750
4	8.19	496	22.93	11,000	29.30	49,200	26.63	21,300	19.61	6,610	13.90	2,600
6	8.22	496	24.04	12,800	29.27	49,200	26.30	19,300	18.80	5,750	13.57	2,450
8	8.32	522	24.78	14,200	29.15	47,800	25.96	17,600	18.10	5,050	13.27	2,300
10	8.46	562	25.56	16,000	29.00	45,000	25.59	16,000	17.52	4,550	12.98	2,170
N	8.60	603	26.05	17,600	28.86	43,700	25.18	15,000	16.98	4,200	12.69	2,050
2	8.78	659	26.66	22,000	28.66	41,100	24.73	14,000	16.55	3,960	12.42	1,930
4	8.92	687	27.39	27,600	28.43	37,500	24.26	13,300	16.12	3,700	12.15	1,850
6	9.16	760	28.05	33,200	28.19	35,300	23.76	12,500	15.69	3,500	11.88	1,730
8	9.50	865	28.58	39,900	27.89	32,200	22.98	11,200	15.30	3,300	11.68	1,650
10	9.97	1,030	28.99	45,000	27.56	29,400	22.16	10,000	14.89	3,100	11.51	1,570
12	14.40	2,850	29.19	47,800	27.24	25,900	21.29	8,720	14.54	2,900	11.40	1,530
	April 2		April 3		April 4		April 5		April 6		April 7	
6	11.14	1,420	12.12	1,810	10.12	1,060	9.16	760	9.10	745	11.22	1,450
N	12.90	2,130	11.06	1,420	9.84	960	9.06	730	9.83	960	10.92	1,340
6	13.42	2,350	10.26	1,140	9.60	895	9.03	730	10.83	1,310	11.06	1,420
12	13.27	2,300	10.19	1,100	9.35	835	9.06	730	11.26	1,490	16.56	3,960
	April 8		April 9		April 10		April 11		April 12		April 13	
6	15.74	3,500	10.80	1,310	8.51	576	8.16	483	12.10	1,810	8.11	470
N	14.57	2,950	10.06	1,060	8.37	535	8.12	470	11.08	1,420	8.04	457
6	13.07	2,210	9.38	835	8.30	522	8.48	576	10.03	1,030	8.04	457
12	11.62	1,610	8.90	687	8.22	496	11.80	1,690	8.73	645	8.03	457
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.03	457	8.66	617	11.62	1,610	9.84	960	9.08	745	8.92	687
N	8.01	445	9.20	775	11.46	1,570	9.60	895	8.79	659	15.38	3,350
6	8.02	445	9.70	925	10.40	1,170	9.32	805	8.42	549	16.32	3,800
12	8.25	509	9.98	1,030	10.06	1,060	9.20	775	8.45	562	14.38	2,850

Tombigbee River near Amory, Miss.

Location.--Lat 33°59'10", long. 88°33'05", in NE¼ sec. 3, T. 13 S., R. 7 E. Chickasaw meridian, at bridge on State Highway 41, 0.3 mile downstream from confluence of East and West Forks of Tombigbee River, and 3½ miles west of Amory. Datum of gage is 178.34 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Auxiliary gage 20 miles downstream at datum 23.63 ft lower.

Drainage area.--1,941 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph. Auxiliary gage-height record is water-stage recorder graph except 12 p.m. Mar. 31 to noon Apr. 3.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge computed using fall as determined by auxiliary gage as a factor. Discharge during period of no auxiliary gage-height record computed on basis of records for station at Aberdeen. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 64,700 cfs Mar. 30 (gage height, 30.85 ft)
1938 to February 1951: Discharge, 89,100 cfs Feb. 14, 1948 (gage height, 32.55 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers, occasional discharge measurements made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	3,950	30,000	9	3,790	5,090	17	3,500	4,110	25	4,680	6,930
2	3,830	17,000	10	3,700	3,940	18	8,260	3,760	26	4,040	7,520
3	3,550	11,600	11	3,790	4,100	19	14,100	6,020	27	3,850	6,600
4	3,700	8,920	12	7,420	5,300	20	11,400	7,070	28	17,500	5,130
5	5,110	6,460	13	5,110	4,200	21	6,140	4,870	29	58,600	4,090
6	4,040	5,160	14	4,170	3,910	22	4,860	16,200	30	62,100	3,870
7	4,400	4,780	15	3,950	3,750	23	5,480	15,900	31	52,800	
8	4,870	7,670	16	3,750	4,800	24	5,700	7,750			
Monthly mean discharge, in cfs										10,710	7,550
Runoff, in inches										6.36	4.34

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	9.87	3,910	13.54	6,890	27.34	44,100	30.16	59,100	30.64	61,900	27.67	
4	9.80	3,870	15.50	8,900	28.28	50,800	30.15	58,800	30.52	60,600	27.36	
6	9.74	3,830	17.06	10,800	29.06	56,400	30.24	58,800	30.35	59,700	27.07	
8	9.68	3,830	18.31	13,000	29.60	59,700	30.36	60,600	30.15	57,500	26.75	
10	9.61	3,790	19.38	15,200	30.00	62,100	30.49	61,500	29.89	55,000	26.44	
N	9.59	3,790	20.37	17,300	30.25	63,500	30.61	62,400	29.63	52,600	26.13	
2	9.56	3,790	21.28	19,300	30.37	64,400	30.72	63,500	29.38	50,900	25.80	
4	9.51	3,750	22.15	21,200	30.44	64,400	30.80	64,500	29.12	48,100	25.49	
6	9.49	3,750	23.01	23,200	30.46	64,200	30.84	64,700	28.85	46,400	25.21	
8	9.53	3,750	24.06	26,900	30.43	62,400	30.84	64,700	28.57	45,300	24.92	
10	9.79	3,870	25.22	32,000	30.38	61,900	30.81	64,400	28.27	43,600	24.65	
12	10.95	4,670	26.36	38,700	30.30	60,500	30.75	64,200	27.98	41,000	24.36	
	April 2		April 3		April 4		April 5		April 6		April 7	
6	23.59		21.39		18.81	9,720	16.54	6,810	14.53	5,420	12.87	4,490
N	22.93		20.77	13,500	18.23	8,850	16.00	6,400	14.10	5,050	12.56	4,340
6	22.41		20.09	11,900	17.67	8,070	15.48	6,070	13.70	4,930	12.93	4,760
12	21.95		19.42	10,700	17.09	7,360	14.99	5,720	13.31	4,710	14.39	6,330
	April 8		April 9		April 10		April 11		April 12		April 13	
6	15.66	7,960	13.53	5,660	11.17	3,990	10.47	3,980	12.10	5,580	10.72	4,300
N	15.86	8,270	12.61	4,840	10.91	3,880	10.36	4,010	12.34	5,710	10.40	4,150
6	15.51	7,800	11.94	4,330	10.73	3,880	10.34	4,100	11.92	5,280	10.22	4,050
12	14.67	6,960	11.50	4,110	10.61	3,940	11.07	4,680	11.25	4,570	10.10	4,000
	April 14		April 15		April 16		April 17		April 18		April 19	
6	10.00	3,950	9.64	3,790	9.86	3,910	10.61	4,250	9.61	3,790	9.46	3,750
N	9.88	3,910	9.53	3,750	11.79	5,560	10.13	4,000	9.52	3,750	11.53	5,350
6	9.80	3,870	9.43	3,700	11.94	5,470	9.84	3,870	9.48	3,750	14.37	8,410
12	9.72	3,830	9.44	3,700	11.30	4,780	9.70	3,830	9.44	3,700	15.39	9,410

Supplemental record.--Mar. 30, 7 a.m., 30.85 ft, 64,700 cfs.

Tombigbee River at Aberdeen, Miss.

Location.--Lat 33°49'14", long. 88°31'07", in N½ sec. 27, T. 14 S., R. 19 W. Huntsville meridian, at bridge on U. S. Highway 45, 1.3 miles downstream from former site at St. Louis-San Francisco Railway bridge, 1.5 miles east of Aberdeen, 2 miles downstream from Mattuby Creek, 6 miles downstream from Halfway Creek, and 13¼ miles upstream from McKinley Creek. Datum of gage is 154.71 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark.) Auxiliary gage 20 miles upstream at datum 23.63 ft higher.

Drainage area.--2,210 square miles.

Gage-height record.--Water-stage recorder graph except 12 p.m. Mar. 31 to 6 a.m. Apr. 13. Auxiliary gage-height record is water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge computed by using fall as determined by auxiliary gage as a factor. Discharge during period of no gage-height record computed on basis of Weather Bureau gage, 1.3 miles upstream.

Maxima.--March-April 1951: Discharge, 64,300 cfs 6 a.m. Mar. 31; gage height, 40.60 ft noon Mar. 31.
1928 to February 1951: Discharge, 97,000 cfs Feb. 15, 1948 (gage height, 42.04 ft). Stage known, 44.8 ft, former site, present datum, Apr. 20, 1892.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	5,220	45,200	9	4,300	7,830	17	3,600	4,650	25	6,040	9,890
2	4,070	29,200	10	3,720	6,420	18	5,630	3,960	26	4,960	9,200
3	3,550	20,200	11	3,680	5,100	19	9,860	4,220	27	4,120	8,480
4	3,640	15,200	12	5,680	4,980	20	11,100	6,130	28	13,100	7,390
5	6,230	12,500	13	6,190	4,780	21	9,560	5,880	29	38,900	6,020
6	5,920	10,500	14	5,280	4,130	22	8,180	9,360	30	59,900	4,590
7	5,140	8,900	15	4,410	3,800	23	7,350	11,900	31	61,400	
8	5,200	8,970	16	3,930	4,160	24	6,800	11,100			
Monthly mean discharge, in cfs										10,540	9,818
Runoff, in inches										5.50	4.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	15.67	4,360	17.42	5,500	35.03	24,400	39.85	55,100	40.42	63,400		
4	15.48	4,300	19.80	6,850	35.65	26,600	39.95	57,400	40.50	63,900		
6	15.29	4,210	22.28	8,370	36.23	29.200	40.05	57,400	40.52	64,300		50,000
8	15.14	4,130	24.30	9,770	36.83	32,400	40.13	58,900	40.55	63,700		
10	14.96	4,090	26.30	11,500	37.40	36,300	40.16	60,500	40.57	63,500		
N	14.83	4,030	28.09	13,300	37.82	39,500	40.20	60,500	40.60	63,100		45,000
2	14.72	4,010	29.60	14,900	38.22	42,500	40.24	60,700	40.54	61,800		
4	14.62	3,950	31.02	16,300	38.60	45,300	40.25	61,700	40.50	60,500		
6	14.51	3,920	32.06	17,700	38.93	47,900	40.31	62,400	40.44	59,200		40,000
8	14.49	3,930	33.00	19,300	39.26	51,200	40.33	62,800	40.38	57,900		
10	14.79	4,050	33.72	20,800	39.49	52,700	40.35	63,000	40.34	56,900		
12	15.72	4,500	34.44	22,600	39.68	54,500	40.40	63,300	40.26	55,100		36,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6		32,000		22,000	34.06	16,100	31.41	13,000	28.88	11,000	26.54	9,070
N		29,000	35.92	20,000	33.40	15,200	30.75	12,400	28.26	10,700	25.95	8,730
6		26,000	35.32	18,400	32.76	14,400	30.15	12,000	27.68	9.960	25.40	8,630
12		24,000	34.72	17,000	32.10	13,600	29.48	11,400	27.10	9,500	24.89	8,870
	April 8		April 9		April 10		April 11		April 12		April 13	
6	24.50	9,120	23.89	8,200	21.80	6,800	18.28	5,360	16.23	4,820	17.16	5,020
N	24.31	9,100	23.58	7,760	21.00	6,420	17.45	5,020	16.67	5,050	16.73	4,780
6	24.20	8,910	23.13	7,460	20.14	6,020	16.75	4,820	17.08	5,160	16.21	4,580
12	24.06	8,640	22.49	7,150	19.14	5,680	16.21	4,690	17.30	5,130	15.72	4,390
	April 14		April 15		April 16		April 17		April 18		April 19	
6	15.29	4,240	14.30	3,870	13.81	3,730	16.93	4,870	14.88	4,080	13.86	3,730
N	14.93	4,090	14.13	3,730	14.23	4,060	16.61	4,710	14.49	3,930	13.86	3,930
6	14.69	4,020	13.98	3,760	15.65	4,560	16.00	4,460	14.19	3,830	15.00	4,590
12	14.49	3,940	13.85	3,700	16.72	4,900	15.38	4,250	13.97	3,760	16.89	5,580

Buttahatchee River below Hamilton, Ala.

Location.--Lat 34°08', long. 87°58', on line between secs. 14 and 15, T. 11 S., R. 14 W., at bridge on U. S. Highway 78, ½ mile downstream from Woods Creek and 2 miles south of Hamilton. Datum of gage is 360.50 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--276 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used below 1,340 cfs. Gage heights used to half-tenths below and tenths above 4.6 ft.

Maxima.--March-April 1951: Discharge, 24,200 cfs Mar. 29 (gage height, 26.31 ft). December 1950 to February 1951: Discharge, 23,800 cfs Feb. 1, 1951 (gage height, 26.10 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	512	1,380	9	610	670	17	495	595	25	590	995
2	478	1,560	10	570	610	18	1,590	550	26	530	838
3	453	1,320	11	530	652	19	1,730	1,950	27	573	870
4	512	1,120	12	630	790	20	1,400	1,730	28	16,200	928
5	650	956	13	630	638	21	1,060	1,880	29	20,200	770
6	610	838	14	590	585	22	860	3,900	30	3,970	620
7	792	834	15	550	550	23	730	1,850	31	1,870	
8	710	797	16	512	696	24	670	1,260			
Monthly mean discharge, in cfs										1,994	1,091
Runoff, in inches										8.33	4.41

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.78	512	7.20	2,920	26.20	24,000	11.87	6,810	6.15	2,270	4.90	1,500
4	2.77	495	10.50	5,550	26.31	24,200	10.35	5,460	5.96	2,150	4.83	1,450
6	2.76	495	14.76	9,700	26.20	24,000	9.46	4,700	5.84	2,030	4.76	1,450
8	2.76	495	19.00	14,400	25.85	23,400	8.75	4,140	5.71	1,970	4.72	1,400
10	2.76	495	21.60	17,700	25.39	22,900	8.20	3,660	5.59	1,910	4.68	1,400
N	2.77	495	23.40	20,100	24.64	21,700	7.80	3,340	5.48	1,850	4.66	1,400
2	2.80	512	24.22	21,200	23.75	20,600	7.45	3,060	5.40	1,790	4.65	1,340
4	2.85	530	24.62	21,700	22.68	19,100	7.18	2,920	5.30	1,730	4.62	1,340
6	2.93	570	24.90	22,200	21.46	17,600	6.93	2,710	5.20	1,670	4.58	1,320
8	3.02	590	25.20	22,600	20.00	15,600	6.70	2,570	5.10	1,620	4.55	1,290
10	3.30	710	25.60	23,100	17.40	12,500	6.53	2,450	5.02	1,560	4.56	1,290
12	4.75	1,450	25.96	23,700	14.40	9,300	6.32	2,330	4.98	1,560	4.52	1,260
	April 2		April 3		April 4		April 5		April 6		April 7	
6	4.54	1,290	4.70	1,400	4.28	1,160	3.94	995	3.65	860	3.49	792
N	5.46	1,850	4.51	1,260	4.18	1,120	3.86	950	3.62	838	3.56	815
6	5.27	1,730	4.48	1,260	4.09	1,060	3.78	928	3.56	815	3.68	882
12	4.90	1,500	4.38	1,220	4.01	1,020	3.71	882	3.51	792	3.73	905
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.62	838	3.24	690	3.08	630	2.98	590	3.64	860	3.16	650
N	3.50	792	3.21	670	3.04	610	2.96	570	3.50	792	3.12	630
6	3.40	750	3.17	650	3.02	590	3.23	690	3.32	710	3.09	630
12	3.31	710	3.10	630	3.00	590	3.78	928	3.22	670	3.04	610
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.01	590	2.92	550	3.25	690	3.06	610	2.92	550	3.20	670
N	2.99	590	2.90	550	3.54	815	3.00	590	2.90	550	7.26	2,990
6	2.96	570	2.89	550	3.24	690	2.96	570	2.88	550	6.94	2,710
12	2.93	570	2.87	530	3.14	650	2.94	570	2.87	530	6.30	2,330

Buttahatchee River near Sulligent, Ala.

Location.--Lat 33°55', long. 88°09', in NE¼ sec. 19, T. 13 S., R. 15 W., at bridge on county road, 1 mile upstream from Bogue Creek, 1½ miles northwest of Sulligent, and 2 miles downstream from Beaver Creek. Datum of gage is 287.58 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Auxiliary gage on side channel at datum 10.00 ft lower.

Drainage area.--460 square miles.

Gage-height record.--Graphs based on twice-daily readings of wire-weight gages at base and auxiliary gages.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights for base gage used to tenths; those for auxiliary gage used to half-tenths below 20.3 ft and between 21.3 and 22.8 ft to hundredths between 20.3 and 21.3 ft, and to tenths above 22.8 ft. Discharge computed by summation of flow in main and side channels.

Maxima.--March-April 1951: Discharge, 29,700 cfs Mar. 29 (gage height, 15.67 ft).
1939 to February 1951: Discharge, 33,000 cfs Jan. 8, 1946; gage height 16.4 ft Jan. 7, 1950.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	932	3,780	9	1,000	1,480	17	830	1,160	25	1,140	2,030
2	863	3,000	10	998	1,240	18	1,180	1,010	26	998	1,650
3	843	2,740	11	929	1,160	19	2,170	1,210	27	986	1,390
4	849	2,310	12	976	1,460	20	2,900	2,470	28	10,600	1,380
5	1,220	1,940	13	1,040	1,350	21	2,470	2,290	29	28,000	1,270
6	1,260	1,690	14	1,010	1,160	22	1,760	3,730	30	16,100	1,070
7	1,190	1,570	15	918	1,070	23	1,430	6,310	31	6,300	
8	1,070	1,590	16	873	1,090	24	1,230	2,990			
Monthly mean discharge, in cfs										3,034	1,953
Runoff, in inches										7.60	4.74

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	7.50	947	12.40	2,220	15.43	26,600	15.27	23,900	14.12	8,080	13.96	4,710
4	7.46	947	13.88	3,300	15.58	28,000	15.11	22,000	14.10	7,420	13.91	4,360
6	7.44	926	14.11	4,190	15.65	28,700	14.96	20,500	14.10	6,980	13.87	4,280
8	7.43	923	14.22	5,310	15.67	29,700	14.84	18,800	14.10	6,580	13.83	3,950
10	7.43	923	14.26	6,800	15.67	29,700	14.70	17,400	14.10	6,340	13.78	3,880
N	7.43	923	14.23	8,650	15.67	29,700	14.59	16,000	14.10	6,110	13.74	3,590
2	7.45	923	14.20	11,000	15.66	29,000	14.48	14,200	14.09	5,890	13.70	3,520
4	7.50	944	14.22	13,900	15.64	28,700	14.38	12,900	14.08	5,680	13.66	3,440
6	7.58	964	14.30	16,700	15.60	28,000	14.30	11,700	14.07	5,480	13.64	3,240
8	7.73	992	14.48	19,600	15.56	27,300	14.24	10,200	14.06	5,380	13.60	3,190
10	8.40	1,160	14.77	22,300	15.50	26,300	14.19	9,380	14.03	4,980	13.57	3,150
12	10.00	1,570	15.14	24,400	15.40	25,400	14.14	8,340	14.00	4,890	13.55	3,120
	April 2		April 3		April 4		April 5		April 6		April 7	
6	13.51	3,020	13.48	2,810	12.48	2,430	11.21	1,990	10.36	1,730	9.81	1,570
N	13.50	3,000	13.32	2,750	12.10	2,330	11.02	1,930	10.21	1,680	9.79	1,570
6	13.49	2,970	12.90	2,580	11.76	2,200	10.85	1,860	10.07	1,650	9.82	1,570
12	13.50	2,940	12.63	2,490	11.45	2,080	10.59	1,800	9.93	1,600	9.84	1,570
	April 8		April 9		April 10		April 11		April 12		April 13	
6	9.86	1,590	9.77	1,570	8.72	1,270	8.26	1,150	9.16	1,370	9.15	1,400
N	9.88	1,590	9.47	1,490	8.59	1,240	8.24	1,140	9.76	1,530	8.87	1,340
6	9.90	1,590	9.12	1,380	8.46	1,210	8.33	1,170	9.97	1,570	8.69	1,280
12	9.86	1,590	8.88	1,330	8.34	1,160	8.61	1,240	9.66	1,510	8.51	1,240
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.36	1,140	7.92	1,070	7.94	1,060	8.28	1,150	7.71	1,000	7.79	974
N	8.23	1,140	7.92	1,070	7.94	1,060	8.28	1,150	7.71	1,000	7.79	1,060
6	8.13	1,110	7.89	1,070	8.30	1,140	8.09	1,100	7.59	977	9.14	1,330
12	8.04	1,090	7.85	1,050	8.61	1,210	7.95	1,080	7.52	953	11.75	2,010

Buttahatchee River near Caledonia, Miss.

Location.--Lat 33°42'10", long. 88°20'50", in SW¼ sec. 5, T. 16 S., R. 17 W. Huntsville meridian, at bridge on county road 600 ft downstream from Elbethel Creek, 2 miles northwest of Caledonia, 2 miles upstream from Dry Creek, 16 miles north of Columbus, and 19 miles upstream from mouth. Datum of gage is 198.59 ft above mean sea level (levels by Corps of Engineers).

Drainage area.--823 square miles (authority, Corps of Engineers).

Gage-height record.--Graph based on twice-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge observed, 29,400 cfs Mar. 30 (gage height, 18.36 ft). 1928-32, 1939 to February 1951: Discharge observed, 30,800 cfs Jan. 6, 1949 (gage height, 18.65 ft).

Flood in July 1916 reached a stage about 4 ft higher than that of Jan. 6, 1949, from information by local residents.

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; occasional discharge measurements made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,660	10,600	9	1,950	2,360	17	1,570	1,580	25	2,360	6,300
2	1,500	7,510	10	1,820	2,230	18	1,820	1,540	26	1,950	5,100
3	1,420	5,790	11	1,660	2,000	19	2,640	1,500	27	1,950	3,700
4	1,340	4,660	12	1,580	1,860	20	2,570	1,460	28	5,910	2,640
5	1,660	4,220	13	1,580	1,820	21	3,400	1,950	29	13,300	1,950
6	1,950	3,900	14	1,700	1,900	22	3,900	3,300	30	27,000	1,860
7	2,050	3,300	15	1,740	1,780	23	3,900	4,330	31	21,700	
8	1,950	2,710	16	1,580	1,660	24	3,120	4,990			
Monthly mean discharge, in cfs										4,008	3,350
Runoff, in inches										5.61	4.54

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Chookatonchee Creek near West Point, Miss.
(Formerly published as Sakatonchee River near West Point)

Location.--Lat 33°36', long. 88°42', on line between secs. 7 and 18, T. 17 S., R. 6 E. Chickasaw meridian, at bridge on State Highway 10, 3 miles west of West Point and 3½ miles upstream from mouth. Datum of gage is 170.10 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--514 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 45,800 cfs Mar. 29 (gage height 23.55 ft).
1943-46, 1947 to February 1951: Discharge, 38,300 cfs Mar. 29, 1944; gage height, 22.32 ft Jan. 5, 1949.

Remarks.--Flood runoff not affected by artificial storage. Base data furnished by Corps of Engineers; occasional discharge measurement made and records of daily discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	482	4,600	9	995	1,020	17	366	866	25	526	4,120
2	416	2,520	10	570	705	18	1,560	656	26	406	2,000
3	356	1,600	11	616	454	19	3,060	442	27	462	666
4	829	1,150	12	1,300	497	20	3,880	764	28	8,910	438
5	2,900	712	13	1,570	539	21	4,150	984	29	39,200	336
6	3,700	512	14	1,020	392	22	3,460	3,060	30	23,800	269
7	3,700	544	15	678	312	23	1,590	3,790	31	8,970	
8	2,480	925	16	460	486	24	678	4,250			
Monthly mean discharge, in cfs										3,971	1,320
Runoff, in inches										8.91	2.87

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.62	356	13.48	2,900	20.95	27,000	22.22	34,900	18.20	12,100	16.17	5,780
4	4.56	356	14.60	3,790	21.72	31,400	21.86	32,800	17.98	11,300	16.01	5,390
6	4.51	346	15.50	4,670	22.35	36,300	21.51	30,000	17.78	10,600	15.87	5,220
8	4.46	346	16.15	5,780	22.88	40,200	21.09	27,600	17.62	9,900	15.70	4,920
10	4.42	336	16.62	6,720	23.24	42,600	20.70	25,200	17.42	9,200	15.55	4,790
N	4.43	336	16.97	7,900	23.45	44,200	20.32	22,800	17.25	8,500	15.36	4,560
2	4.47	346	17.29	8,900	23.55	45,800	19.95	21,000	17.10	8,200	15.17	4,350
4	4.66	366	17.68	10,200	23.53	45,000	19.58	18,700	16.95	7,900	14.98	4,150
6	4.87	386	18.14	12,100	23.42	44,200	19.26	17,200	16.78	7,300	14.77	3,970
8	5.45	438	18.74	14,200	23.23	42,600	18.97	15,700	16.64	6,720	14.56	3,790
10	8.77	844	19.42	17,700	23.00	41,000	18.68	14,200	16.48	6,460	14.30	3,540
12	11.86	1,810	20.20	22,200	22.71	38,600	18.42	12,900	16.31	5,990	14.07	3,380
	April 2		April 3		April 4		April 5		April 6		April 7	
6	13.32	2,760	11.71	1,690	11.05	1,300	8.32	777	6.32	537	5.73	471
N	12.93	2,480	11.55	1,630	10.57	1,160	7.71	702	6.05	504	6.13	515
6	12.52	2,200	11.43	1,510	9.84	990	7.19	642	5.83	482	6.90	606
12	12.05	1,870	11.30	1,450	9.04	872	6.73	582	5.69	471	7.71	702
	April 8		April 9		April 10		April 11		April 12		April 13	
6	8.75	844	10.33	1,080	8.40	790	5.85	482	5.11	406	6.67	582
N	9.48	945	10.12	1,040	7.67	702	5.47	449	5.92	493	6.33	537
6	9.98	1,020	9.69	975	6.97	618	5.21	416	6.72	582	5.95	504
12	10.30	1,080	9.12	886	6.32	537	5.07	406	6.88	606	5.56	460
	April 14		April 15		April 16		April 17		April 18		April 19	
6	521	416	4.28	326	4.61	356	8.99	872	8.09	751	5.22	416
N	4.92	386	4.15	316	5.39	438	9.24	900	7.35	666	5.07	406
6	4.67	366	4.00	296	7.04	618	9.10	886	6.52	559	5.49	449
12	4.45	336	3.94	287	8.28	777	8.66	830	5.74	471	6.24	526

Tibbee Creek near Tibbee, Miss.

(Formerly published as Tibbee River near Tibbee)

Location.--Lat 33°32'17", long. 88°38'00", in SW¼ sec. 4, T. 19 N., R. 16 E. Choctaw meridian, at bridge on old State Highway 25, 560 ft upstream from Gulf, Mobile & Ohio Railroad bridge, 0.7 mile north of Tibbee, 4½ miles upstream from Magee Creek, 5 miles south of West Point, and 9¾ miles upstream from Catalpa Creek. Datum of gage is 154.07 ft above mean sea level, datum of 1929, supplementary adjustment of 1941 (levels by Corps of Engineers).

Drainage area.--928 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 75,200 cfs Mar. 29 (gage height, 30.82 ft). 1928-30, 1939 to February 1951: Discharge, 67,300 cfs Jan. 5, 1949 (gage height, 30.15 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	630	10,500	9	3,460	1,640	17	573	1,320	25	750	7,100
2	573	7,000	10	1,250	1,210	18	1,770	1,250	26	592	5,000
3	501	5,020	11	1,040	668	19	4,760	656	27	660	2,140
4	925	3,730	12	2,790	574	20	7,020	870	28	11,100	670
5	3,220	2,490	13	3,950	648	21	7,020	1,480	29	66,300	501
6	6,940	1,350	14	3,240	522	22	6,090	3,740	30	52,300	402
7	7,730	900	15	1,760	426	23	4,050	8,300	31	21,700	
8	6,020	1,330	16	810	687	24	1,660	8,800			
Monthly mean discharge, in cfs										7,458	2,698
Runoff, in inches										9.26	3.24

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.46	537	15.12	2,990	28.86	48,700	30.40	69,600	27.29	29,500	24.80	13,200
4	5.42	519	17.14	3,950	29.32	54,200	30.18	66,800	27.05	27,000	24.61	12,200
6	5.38	519	19.02	5,000	29.70	59,800	29.96	64,000	26.80	25,600	24.44	11,400
8	5.33	501	20.42	5,880	30.02	64,000	29.70	59,800	26.57	24,200	24.27	11,100
10	5.31	501	21.54	6,700	30.30	68,200	29.43	55,600	26.36	22,800	24.12	10,600
N	5.30	501	22.30	7,490	30.53	71,000	29.17	52,800	26.13	20,900	23.97	10,300
2	5.29	501	23.10	8,460	30.71	73,800	28.90	48,700	25.93	19,700	23.81	9,820
4	5.32	501	23.72	9,600	30.81	75,200	28.60	44,800	25.73	18,500	23.67	9,600
6	5.42	519	24.62	12,200	30.82	75,200	28.30	40,900	25.54	17,300	23.52	9,180
8	6.26	690	26.07	20,900	30.78	75,200	28.06	38,300	25.34	16,100	23.36	8,980
10	9.10	1,310	27.33	29,500	30.70	73,800	27.79	34,600	25.15	15,500	23.20	8,620
12	12.34	2,120	28.22	39,600	30.55	72,400	27.52	31,400	24.97	14,300	23.03	8,300
	April 2		April 3		April 4		April 5		April 6		April 7	
6	22.48	7,610	19.64	5,360	17.25	4,000	14.58	2,790	10.25	1,580	6.92	810
N	21.78	6,940	18.98	5,000	16.72	3,750	13.59	2,480	9.21	1,340	6.91	810
6	21.06	6,380	18.36	4,640	16.13	3,450	12.56	2,200	8.26	1,100	7.61	950
12	20.40	5,880	17.78	4,300	15.41	3,110	11.39	1,880	7.45	910	8.50	1,150
	April 8		April 9		April 10		April 11		April 12		April 13	
6	8.74	1,200	10.39	1,630	9.63	1,430	6.48	730	5.55	555	6.24	670
N	9.15	1,340	10.56	1,680	8.76	1,230	6.10	650	5.52	537	6.19	670
6	9.65	1,430	10.50	1,660	7.81	990	5.83	592	5.80	592	6.04	630
12	10.07	1,560	10.19	1,580	7.05	830	5.66	573	6.14	650	5.84	592
	April 14		April 15		April 16		April 17		April 18		April 19	
6	5.64	555	4.95	450	5.87	611	8.54	1,150	9.74	1,450	6.34	690
N	5.42	519	4.83	418	6.40	710	9.31	1,360	9.15	1,340	5.93	611
6	5.25	484	4.73	402	6.62	750	9.88	1,500	8.02	1,030	5.78	592
12	5.10	467	4.72	402	7.62	950	10.14	1,560	7.00	830	5.97	630

Tombigbee River at Columbus, Miss.

Location.--Lat 33°29'21", long. 88°25'57", in NW¼ sec. 20, T. 18 S., R. 18 W. Huntsville meridian, in Columbus, 1,400 ft upstream from Gulf, Mobile & Ohio Railroad bridge, 1,600 ft downstream from bridge on U. S. Highway 45, 2.3 miles upstream from Luxapalila Creek, and 6.7 miles downstream from Tibbee Creek. Datum of gage is 128.91 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Auxiliary staff gage 3.7 miles upstream at different datum.

Drainage area.--4,490 square miles.

Gage-height record.--Water-stage recorder graph. Twice-daily auxiliary staff-gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to tenths. Discharge computed by using fall as determined by twice-daily readings of auxiliary gage as a factor.

Maxima.--March-April 1951: Discharge, 118,000 cfs Apr. 1; gage height, 37.85 ft Mar. 31.
1900-1912, 1928 to February 1951: Discharge, 148,000 cfs Jan. 7, 1949 (gage height, 39.32 ft).
Stage known, 42.6 ft, present datum, Apr. 8, 1892.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	9,850	113,000	9	12,300	16,200	17	6,700	8,600	25	11,300	23,400
2	7,940	94,900	10	9,020	13,200	18	10,700	8,000	26	9,500	22,200
3	6,620	73,300	11	7,700	10,500	19	16,900	7,000	27	8,560	19,700
4	7,920	56,200	12	11,400	8,790	20	19,300	7,740	28	26,900	14,600
5	13,900	41,900	13	12,300	8,160	21	20,400	10,900	29	53,600	11,300
6	15,700	30,000	14	12,000	7,830	22	20,300	17,000	30	99,000	8,950
7	16,600	24,600	15	10,200	7,040	23	18,500	20,300	31	115,000	
8	15,700	19,700	16	7,320	7,450	24	14,400	22,100			
Monthly mean discharge, in cfs										20,240	24,490
Runoff, in inches										5.20	6.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	10.81	8,460	14.05	14,700	28.12	39,100	35.68	83,600	37.48	113,000	37.82	117,000
4	10.69	8,360	16.64	19,000	28.82	41,100	36.00	87,700	37.52	113,000	37.80	117,000
6	10.56	8,240	18.60	22,300	29.50	43,300	36.32	91,900	37.58	114,000	37.78	118,000
8	10.43	7,990	20.10	24,800	30.20	45,700	36.55	96,800	37.64	114,000	37.72	116,000
10	10.32	7,880	21.31	26,600	30.90	48,100	36.74	98,200	37.70	116,000	37.64	114,000
N	10.23	7,800	22.31	28,200	31.63	51,100	36.89	102,000	37.73	116,000	37.60	114,000
2	10.13	7,980	23.19	29,800	32.38	54,800	37.02	103,000	37.80	116,000	37.52	113,000
4	10.06	8,530	24.04	31,100	33.00	58,300	37.12	105,000	37.82	115,000	37.44	111,000
6	10.02	8,780	24.84	32,500	33.62	62,600	37.22	107,000	37.85	115,000	37.36	111,000
8	10.12	8,990	25.62	33,900	34.22	67,600	37.29	109,000	37.85	115,000	37.28	110,000
10	10.84	9,940	26.42	35,400	34.79	73,200	37.33	109,000	37.85	115,000	37.18	108,000
12	11.50	11,000	27.32	37,300	35.27	78,600	37.40	111,000	37.84	116,000	37.06	106,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	36.80	101,000	35.24	78,100	33.36	60,200	31.02	44,800	28.01	32,200	24.64	25,600
N	36.44	94,200	34.80	73,000	32.92	56,200	30.32	41,900	27.23	29,400	23.83	25,000
6	36.07	89,500	34.32	68,000	32.32	52,000	29.59	38,900	26.38	27,400	23.05	23,500
12	35.67	84,000	33.87	64,400	31.68	48,500	28.80	35,500	25.52	26,100	22.38	22,200
	April 8		April 9		April 10		April 11		April 12		April 13	
6	21.72	20,300	18.92	16,800	16.48	13,800	14.00	11,200	11.63	8,800	11.06	8,270
N	21.04	19,600	18.25	16,000	15.88	13,100	13.32	10,400	11.29	8,760	11.06	8,120
6	20.36	19,000	17.65	15,500	15.30	12,400	12.72	9,800	11.08	8,690	10.98	8,050
12	19.63	17,900	17.06	14,800	14.66	11,800	12.18	9,450	11.02	8,400	10.82	7,990
	April 14		April 15		April 16		April 17		April 18		April 19	
6	10.63	8,100	9.76	7,200	9.58	7,000	11.08	8,520	11.08	8,420	9.90	7,050
N	10.39	7,900	9.62	7,010	10.00	7,440	11.34	8,720	10.83	8,000	9.67	6,930
6	10.18	7,650	9.48	6,920	10.45	7,900	11.39	8,770	10.54	7,600	9.58	6,900
12	9.94	7,320	9.38	6,780	10.71	8,160	11.28	8,650	10.22	7,320	9.65	6,940

Luxapalila Creek near Fayette, Ala.

Location.--Lat 33°43', long. 87°52', in SW¼ sec. 26, T. 15 S., R. 13 W., at bridge on State Highway 18, 3 miles northwest of Fayette. Datum of gage is 322.33 ft above mean sea level, datum of 1929, supplementary adjustment of 1944 (levels by Corps of Engineers).

Drainage area.--127 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 2.8 and 4.5 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 8,150 cfs Mar. 29 (gage height, 13.16 ft).
1945 to February 1951: Discharge, 9,910 cfs Jan. 5, 1949 (gage height, 13.8 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	175	525	9	224	286	17	158	226	25	189	292
2	163	680	10	199	258	18	1,160	215	26	172	253
3	156	475	11	187	282	19	818	411	27	215	227
4	491	384	12	232	334	20	540	339	28	5,620	206
5	594	335	13	232	257	21	370	609	29	6,770	190
6	388	310	14	192	236	22	283	1,600	30	1,250	180
7	350	391	15	172	223	23	240	492	31	677	
8	278	364	16	163	286	24	235	350			
Monthly mean discharge, in cfs										738	374
Runoff, in inches										6.70	3.28

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.94	168	7.65	2,320	13.15	8,150	7.12	2,090	3.92	764	3.34	573
4	1.94	168	11.12	4,500	13.16	8,150	6.18	1,690	3.85	746	3.30	556
6	1.93	165	11.64	5,060	13.15	8,150	5.58	1,430	3.79	728	3.28	556
8	1.92	163	11.92	5,460	13.12	7,880	5.21	1,260	3.74	710	3.25	540
10	1.92	163	12.14	5,750	13.04	7,610	4.94	1,140	3.69	692	3.23	540
N	1.92	163	12.25	5,910	12.94	7,350	4.74	1,060	3.64	675	3.20	524
2	1.94	168	12.35	6,260	12.82	7,100	4.56	1,020	3.59	658	3.18	524
4	1.98	177	12.47	6,450	12.67	6,870	4.41	948	3.54	641	3.15	508
6	2.07	199	12.64	6,650	12.33	6,080	4.30	910	3.50	624	3.12	492
8	2.24	242	12.83	7,100	11.55	5,060	4.20	872	3.45	607	3.10	492
10	2.53	322	13.00	7,610	10.00	3,550	4.09	836	3.40	590	3.07	476
12	4.00	800	13.08	7,880	8.40	2,690	4.00	800	3.36	573	3.04	476
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.10	492	3.13	508	2.80	400	2.61	345	2.50	314	2.45	300
N	4.64	1,020	3.01	460	2.76	388	2.58	336	2.50	314	2.85	415
6	3.71	692	2.93	445	2.70	370	2.54	325	2.46	303	3.03	476
12	3.30	556	2.86	415	2.54	353	2.51	317	2.45	300	2.94	445
	April 8		April 9		April 10		April 11		April 12		April 13	
6	2.76	388	2.43	294	2.32	264	2.26	248	2.69	367	2.32	264
N	2.66	359	2.40	286	2.30	258	2.26	248	2.54	325	2.30	258
6	2.56	331	2.37	278	2.28	253	2.43	294	2.42	292	2.26	248
12	2.48	308	2.34	269	2.26	248	2.91	430	2.35	272	2.24	242
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.23	240	2.17	224	2.67	362	2.19	229	2.15	219	2.16	222
N	2.22	237	2.17	224	2.45	300	2.17	224	2.14	216	3.05	476
6	2.20	232	2.16	222	2.29	255	2.16	222	2.13	214	3.50	624
12	2.17	224	2.15	219	2.22	237	2.15	219	2.07	199	2.94	445

Luxapalila Creek at Steens, Miss.

Location.--Lat 33°34', long. 88°19', in NE¼ sec. 27, T. 17 S., R. 17 W. Huntsville meridian, at bridge on county road, a quarter of a mile southeast of Steens, 1 mile upstream from Yellow Creek, and 6½ miles northeast of Columbus. Datum of gage is 179.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--309 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 8,200 cfs and extended to peak stage. Shifting-control method used April 1-22. Gage heights used to half-tenths below 5.8 ft and tenths above.

Maxima.--March-April 1951: Discharge 12,700 cfs Mar. 30 (gage height, 18.55 ft). 1943-47, 1949 to February 1951: Discharge 11,500 cfs Jan. 7, 8, 1950; gage height 18.34 ft Jan. 8.
A stage of 19.2 ft occurred Jan. 6, 1949 (discharge, about 16,000 cfs).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; occasional discharge measurements made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	493	3,840	9	720	1,070	17	482	998	25	651	1,060
2	460	1,820	10	582	858	18	840	756	26	559	792
3	438	1,850	11	559	795	19	3,230	744	27	554	651
4	582	1,330	12	912	888	20	2,570	1,040	28	6,250	559
5	1,760	1,090	13	960	864	21	1,510	912	29	11,600	515
6	1,640	954	14	768	723	22	1,110	2,720	30	12,300	460
7	1,080	979	15	605	662	23	864	3,610	31	10,400	
8	912	1,260	16	526	834	24	720	1,640			
Monthly mean discharge, in cfs										2,150	1,209
Runoff, in inches										8.02	4.37

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.68	537	8.38	1,180	18.03	10,500	18.47	12,300	18.42	11,900	16.00	6,220
4	5.67	526	9.71	1,540	18.17	11,100	18.48	12,300	18.38	11,900	15.48	5,480
6	5.65	526	11,42	2,220	18.27	11,500	18.49	12,300	18.32	11,500	14.95	4,860
8	5.64	526	13.30	3,330	18.35	11,900	18.50	12,300	18.26	11,500	14.41	4,230
10	5.62	515	15.04	4,860	18.39	11,900	18.51	12,300	18.18	11,100	13.95	3,870
N	5.61	515	16.32	6,720	18.40	11,900	18.53	12,300	18.09	10,800	13.46	3,470
2	5.66	526	17.04	8,000	18.42	11,900	18.54	12,300	17.98	10,500	13.01	3,120
4	5.70	537	17.33	8,600	18.43	11,900	18.55	12,700	17.82	9,900	12.60	2,880
6	5.77	548	17.47	9,100	18.44	11,900	18.53	12,300	17.63	9,350	12.19	2,640
8	5.83	559	17.58	9,350	18.45	11,900	18.51	12,300	17.37	8,850	11,83	2,420
10	6.18	651	17.70	9,600	18.45	11,900	18.49	12,300	17.00	8,000	11.50	2,270
12	7.05	840	17.87	10,200	18.45	11,900	18.47	12,300	16.56	7,250	11.20	2,120
	April 2		April 3		April 4		April 5		April 6		April 7	
6	10.54	1,910	10.91	2,030	8.78	1,400	7.74	1,140	7.07	960	6.81	912
N	10.23	1,790	10.76	1,950	8.49	1,310	7.57	1,080	6.98	960	7 17	985
6	9.69	1,630	10.12	1,750	8.19	1,240	7.36	1,040	6.87	936	7.19	1,010
12	10.22	1,790	9.46	1,570	7.95	1,180	7.23	1,010	6.79	912	7.65	1,110
	April 8		April 9		April 10		April 11		April 12		April 13	
6	8.20	1,240	7.79	1,140	6.69	888	6.27	792	6.35	816	6.82	912
N	8.53	1,310	7.46	1,060	6.57	864	6.20	768	6.68	888	6.60	864
6	8.51	1,310	7.16	985	6.43	816	6.35	816	7.00	960	6.38	816
12	8.22	1,240	6.89	936	6.32	792	6.39	816	7.03	960	6.23	768
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.11	744	5.77	674	6.17	768	7.56	1,110	6.27	792	5.89	697
N	6.00	720	5.70	651	6.26	792	7.23	1,010	6.12	744	6.15	768
6	5.91	697	5.67	651	6.85	912	6.81	912	5.97	720	6.07	744
12	5.85	697	5.72	651	7.59	1,080	6.49	840	5.87	697	6.47	840

Tombigbee River near Cochrane, Ala.

Location.--Lat 33°05', long. 88°14', in sec. 7, T. 24 N., R. 2 W., at bridge on State Highway 17, 200 ft upstream from Alabama, Tennessee & Northern Railroad bridge, 1¼ miles northeast of Cochrane, 2½ miles downstream from Boguechitto Creek, and 7 miles southwest of Aliceville. Datum of gage is 89.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1946. Auxiliary staff gage at Vienna Ferry, 12 miles downstream, at datum 7.5 ft lower.

Drainage area.--5,990 square miles.

Gage-height record.--Water-stage recorder graph for base gage. Graph based on twice-daily readings of auxiliary staff gage.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements.

Maxima.--March-April 1951: Discharge, 124,000 cfs Apr. 2 (gage height, 45.0 ft Apr. 2, 3).

1939 to February 1951: Discharge, 163,000 cfs Jan. 9, 1949 (gage height, 46.9 ft). Stage known, 50.2 ft in April 1892, present datum, from reports of U. S. Weather Bureau.

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	14,700	91,900	9	20,000	41,400	17	10,200	12,900	25	21,700	29,200
2	12,200	120,000	10	18,800	34,700	18	11,500	13,000	26	15,800	29,800
3	9,810	110,000	11	12,100	28,500	19	21,000	11,600	27	11,900	28,700
4	9,700	98,400	12	12,300	22,500	20	24,400	10,900	28	26,800	27,400
5	17,200	85,200	13	16,000	17,400	21	25,400	12,300	29	46,500	23,200
6	21,000	72,200	14	16,600	13,700	22	26,400	21,000	30	54,800	17,400
7	20,700	60,000	15	15,800	10,600	23	26,400	25,100	31	62,900	
8	20,500	49,800	16	13,100	9,130	24	25,000	28,500			
Monthly mean discharge, in cfs										21,330	38,550
Runoff, in inches										4.10	7.18

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1			
2	16.1	13,600	15.6	13,500	29.4	40,200	36.1	53,700	38.5	56,400	41.2	76,500		
4	15.8	13,200	16.6	16,000	30.0	40,700	36.4	54,300	38.6	56,800	41.5	79,800		
6	15.5	12,800	17.9	19,200	30.7	42,000	36.7	54,800	38.8	57,800	41.8	83,200		
8	15.2	12,300	19.1	22,100	31.4	43,500	36.9	54,300	39.0	59,600	42.1	85,500		
10	15.0	12,100	20.5	24,600	32.0	45,300	37.1	55,100	39.2	60,600	42.4	88,600		
N	14.7	11,500	21.8	27,200	32.7	46,500	37.3	54,600	39.4	61,600	42.6	91,300		
2	14.5	11,200	23.4	30,400	33.3	48,300	37.5	54,800	39.6	63,500	42.8	94,800		
4	14.3	10,800	24.7	33,000	33.9	49,100	37.7	55,600	39.8	65,400	43.1	97,200		
6	14.2	10,500	25.7	35,100	34.4	50,800	37.9	55,800	40.1	67,100	43.4	102,000		
8	14.2	10,700	26.7	36,900	34.9	51,800	38.0	55,400	40.4	70,000	43.6	104,000		
10	14.3	11,100	27.7	38,400	35.4	53,100	38.1	55,200	40.7	72,000	43.8	108,000		
12	14.8	12,100	28.7	39,500	35.8	53,200	38.3	55,400	40.9	73,300	44.0	111,000		
	April 2		April 3		April 4		April 5		April 6		April 7			
6	44.4	118,000	45.0	112,000	44.4	102,000	43.4	88,900	42.1	75,500	40.8	63,800		
N	44.8	124,000	44.9	109,000	44.2	98,000	43.0	85,400	41.8	72,400	40.2	59,400		
6	45.0	124,000	44.8	108,000	43.9	95,100	42.7	81,400	41.4	68,600	39.9	56,900		
12	45.0	119,000	44.7	105,000	43.7	91,700	42.3	78,700	41.0	66,000	39.5	54,200		
	April 8		April 9		April 10		April 11		April 12		April 13			
6	39.2	52,100	37.6	43,300	35.8	36,300	33.4	29,900	30.5	23,700	26.4	18,700		
N	38.8	49,600	37.2	41,200	35.2	34,900	32.8	28,700	29.5	22,400	25.3	17,500		
6	38.4	47,900	36.7	39,600	34.6	32,900	32.1	26,800	28.5	21,100	24.1	15,900		
12	38.0	45,400	36.3	37,700	34.0	31,600	31.3	25,400	27.5	20,000	23.0	14,800		
	April 14		April 15		April 16		April 17		April 18		April 19			
6	21.8	13,900	17.0	11,700	13.5	8,060	14.2	12,500	14.5	13,300	13.6	11,900		
N	20.6	13,800	16.0	10,600	13.4	8,430	14.4	13,000	14.3	13,100	13.4	11,700		
6	19.4	13,300	15.0	9,510	13.6	9,910	14.6	13,400	14.1	12,800	13.1	11,200		
12	18.2	12,700	14.1	8,570	14.0	11,700	14.6	13,500	13.9	12,400	12.9	10,800		

Sipsey River near Fayette, Ala.

Location.--Lat 33°40', long. 87°49', in SW¼ sec. 8, T. 16 S., R. 12 W., at bridge on county road, 1 mile southeast of Fayette and 1½ miles downstream from Southern Railroad bridge. Datum of gage is 296.72 ft above mean sea level, datum of 1929, supplementary adjustment of 1941 (levels by Corps of Engineers).

Drainage area.--275 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used below 640 cfs Apr. 9-30. Gage heights used to half-tenths below and tenths above 9.6 ft.

Maxima.--March-April 1951: Discharge, 20,500 cfs Mar. 29 (gage height, 21.20 feet). 1939 to February 1951: Discharge, 20,500 cfs Jan. 7, 1950; gage height, 21.75 ft Jan. 8, 1946.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	440	2,080	9	684	668	17	380	485	25	596	1,360
2	400	1,660	10	552	554	18	852	428	26	500	846
3	370	1,340	11	500	518	19	1,600	530	27	484	596
4	519	1,080	12	520	624	20	1,750	966	28	4,420	500
5	1,330	840	13	520	610	21	1,750	1,020	29	18,300	440
6	1,300	712	14	490	520	22	1,260	1,690	30	12,200	375
7	918	718	15	440	471	23	822	1,720	31	3,970	
8	798	810	16	400	482	24	684	1,920			
Monthly mean discharge, in cfs										1,927	885
Runoff, in inches										8.08	3.59

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	9.17	460	10.88	846	19.70	12,500	20.64	17,000	18.00	6,000	15.59	2,330
4	9.15	460	12.32	1,200	20.50	16,500	20.47	16,500	17.76	5,600	15.49	2,270
6	9.13	460	14.66	1,880	20.94	18,700	20.32	15,500	17.52	5,000	15.39	2,210
8	9.10	450	17.64	5,200	21.06	19,900	20.14	14,500	17.30	4,600	15.30	2,150
10	9.09	450	18.20	6,600	21.13	19,900	19.86	13,500	17.05	4,020	15.22	2,100
N	9.07	440	18.16	6,600	21.15	20,500	19.60	12,000	16.81	3,660	15.13	2,050
2	9.07	440	17.92	5,800	21.20	20,500	19.36	11,000	16.56	3,320	15.05	2,000
4	9.08	450	17.65	5,200	21.18	20,500	19.12	9,700	16.36	3,040	14.96	2,000
6	9.11	450	17.47	5,000	21.11	19,900	18.91	8,900	16.15	2,820	14.88	1,960
8	9.17	460	17.49	5,000	21.02	19,300	18.70	8,100	15.98	2,630	14.77	1,920
10	9.34	500	17.88	5,800	20.90	18,700	18.46	7,500	15.84	2,470	14.66	1,880
12	9.92	618	18.45	7,200	20.77	18,100	18.25	6,600	15.70	2,400	14.55	1,840
	April 2		April 3		April 4		April 5		April 6		April 7	
6	14.26	1,750	12.85	1,330	12.15	1,150	11.05	870	10.44	728	10.09	662
N	14.20	1,720	12.90	1,350	11.77	1,070	10.87	846	10.34	706	10.26	706
6	13.55	1,550	12.85	1,330	11.46	990	10.71	798	10.24	684	10.48	750
12	13.01	1,380	12.55	1,280	11.25	918	10.55	774	10.15	684	10.76	822
	April 8		April 9		April 10		April 11		April 12		April 13	
6	10.78	822	10.30	706	9.70	574	9.42	508	9.76	596	10.04	640
N	10.79	822	10.10	662	9.61	550	9.38	505	9.90	618	9.88	618
6	10.73	798	9.94	618	9.55	535	9.47	515	10.07	662	9.73	574
12	10.55	774	9.80	596	9.47	515	9.68	574	10.11	662	9.62	550
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.53	535	9.31	479	9.29	479	9.38	508	9.09	440	8.98	416
N	9.45	515	9.25	470	9.34	492	9.36	492	9.03	428	9.63	550
6	9.39	508	9.21	460	9.30	479	9.26	470	8.99	416	9.81	596
12	9.35	492	9.18	460	9.33	492	9.17	450	8.95	406	10.32	706

Sipsey River at Moores Bridge, Ala.

Location.--Lat 33°27', long. 87°46', in NW¼ sec. 35, T. 18 S., R. 12 W., at bridge on county road, 1 mile east of Moores Bridge and 6 miles downstream from Bear Creek. Datum of gage is 240.95 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--406 square miles.

Gage-height record.--Graph based on twice-daily readings of wire-weight gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 16,000 cfs and extended to peak stage by logarithmic plotting. Gage height used to half-tenths between 12.8 and 13.6 ft, and to tenths elsewhere.

Maxima.--March-April 1951: Discharge, 21,700 cfs Mar. 30 (gage height, 16.47 ft). 1939 to February 1951: Discharge, 23,600 cfs Jan. 10, 1946 (gage height, 16.78 ft, from floodmark).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	898	7,390	9	1,610	1,400	17	775	918	25	1,800	2,330
2	789	5,040	10	1,360	1,280	18	884	910	26	1,360	2,620
3	708	3,540	11	1,110	1,170	19	1,170	894	27	1,100	2,330
4	735	2,800	12	1,060	1,060	20	1,800	959	28	2,110	1,800
5	975	2,250	13	1,070	998	21	2,040	1,110	29	12,100	1,330
6	1,110	1,900	14	1,060	959	22	2,120	1,910	30	19,400	991
7	1,330	1,700	15	959	919	23	2,330	2,460	31	13,500	
8	1,650	1,530	16	856	904	24	2,220	2,220			
Monthly mean discharge, in cfs										2,645	1,921
Runoff, in inches										7.51	5.28

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	9.94	1,150	10.54	1,300	13.85	6,700	15.60	16,300	15.71	16,900	14.28	9,200
4	9.80	1,130	10.85	1,390	14.41	9,700	15.81	17,500	15.60	16,300	14.20	8,700
6	9.70	1,110	11.12	1,490	14.75	11,700	16.02	18,700	15.49	15,700	14.12	8,200
8	9.60	1,090	11.37	1,610	14.91	12,200	16.23	19,900	15.35	15,100	14.06	8,200
10	9.53	1,070	11.60	1,700	15.01	12,700	16.36	21,100	15.22	13,900	13.99	7,700
N	9.48	1,070	11.85	1,800	15.09	13,300	16.44	21,100	15.10	13,300	13.92	7,200
2	9.47	1,070	12.10	1,970	15.11	13,300	16.47	21,700	14.96	12,700	13.86	7,200
4	9.47	1,070	12.32	2,120	15.12	13,300	16.44	21,100	14.83	11,700	13.80	6,700
6	9.51	1,070	12.56	2,460	15.15	13,900	16.34	20,500	14.70	11,200	13.74	6,250
8	9.63	1,090	12.82	2,810	15.21	13,900	16.20	19,900	14.59	10,700	13.68	6,250
10	9.91	1,150	13.10	3,650	15.30	14,500	16.02	18,700	14.48	10,200	13.62	5,800
12	10.24	1,220	13.41	4,900	15.44	15,100	15.86	18,100	14.38	9,700	13.58	5,800
	April 2		April 3		April 4		April 5		April 6		April 7	
6	13.50	5,350	13.15	3,850	12.85	2,920	12.50	2,330	12.08	1,970	11.70	1,750
N	13.44	5,120	13.05	3,490	12.80	2,810	12.41	2,220	11.96	1,910	11.62	1,700
6	13.35	4,680	12.96	3,180	12.73	2,620	12.31	2,120	11.85	1,800	11.51	1,650
12	13.25	4,250	12.89	3,040	12.71	2,620	12.20	2,040	11.76	1,800	11.40	1,610
	April 8		April 9		April 10		April 11		April 12		April 13	
6	11.28	1,570	10.91	1,420	10.54	1,300	10.10	1,200	9.56	1,090	9.08	1,010
N	11.17	1,530	10.84	1,390	10.45	1,270	9.96	1,170	9.41	1,060	9.02	991
6	11.07	1,490	10.75	1,390	10.35	1,270	9.81	1,130	9.29	1,040	8.97	991
12	11.00	1,450	10.64	1,330	10.23	1,220	9.69	1,110	9.16	1,020	8.90	975
	April 14		April 15		April 16		April 17		April 18		April 19	
6	8.85	959	8.63	928	8.31	884	8.51	913	8.55	928	8.14	856
N	8.81	959	8.54	913	8.43	898	8.54	913	8.46	913	8.33	884
6	8.76	959	8.46	913	8.59	928	8.56	928	8.36	898	8.60	928
12	8.70	943	8.39	898	8.54	913	8.56	928	8.24	870	8.69	943

Sipsey River near Elrod, Ala.

Location.--Lat 33°15', long. 87°46', in NE¼ sec. 3, T. 21 S., R. 12 W., at bridge on U. S. Highway 82, a quarter of a mile upstream from Gulf, Mobile & Ohio Railroad bridge, 1 mile east of Elrod, and 2 miles downstream from Box Creek. Datum of gage is 197.81 ft above mean sea level, datum of 1929, supplementary adjustment of 1944.

Drainage area.--515 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 15,000 cfs and extended to peak stage by logarithmic plotting. Gage heights used to half-tenths between 12.2 and 14.2 ft and between 14.6 and 16.4 ft to hundredths between 14.2 and 14.6 ft and to tenths below 12.2 ft and above 16.4 ft.

Maxima.--March-April 1951: Discharge, 21,000 cfs Mar. 31 (gage height, 18.09 ft).
1928-32, 1939 to February 1951: Discharge, 21,000 cfs Jan. 9, 1950 (gage height, 18.1 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,770	13,000	9	1,350	2,070	17	1,220	1,250	25	2,500	2,570
2	1,520	7,560	10	1,560	1,810	18	1,300	1,180	26	2,360	2,430
3	1,270	4,990	11	1,720	1,670	19	1,820	1,200	27	2,090	2,500
4	1,140	3,710	12	1,960	1,710	20	1,860	1,320	28	3,220	2,640
5	1,140	3,060	13	2,020	1,580	21	1,720	1,320	29	9,310	2,360
6	1,140	2,640	14	1,680	1,390	22	1,860	2,020	30	14,400	1,960
7	1,180	2,470	15	1,420	1,240	23	2,180	2,500	31	19,700	
8	1,220	2,350	16	1,300	1,220	24	2,360	2,500			
Monthly mean discharge, in cfs										2,945	2,674
Runoff, in inches										6.59	5.79

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	13.39	2,180	13.43	2,240	15.07	6,800	16.43	12,800	17.77	19,500	17.13	16,200
4	13.37	2,120	13.51	2,300	15.26	7,600	16.53	13,300	17.94	20,000	16.98	15,700
6	13.35	2,120	13.57	2,360	15.43	8,400	16.60	13,700	18.04	20,500	16.83	14,700
8	13.33	2,120	13.61	2,430	15.55	8,800	16.66	14,200	18.09	21,000	16.69	14,200
10	13.30	2,070	13.66	2,500	15.63	9,200	16.69	14,200	18.09	21,000	16.55	13,700
N	13.28	2,070	13.76	2,640	15.68	9,400	16.70	14,200	18.04	20,500	16.43	12,800
2	13.27	2,020	13.92	2,890	15.73	9,650	16.70	14,200	17.98	20,500	16.30	12,300
4	13.26	2,020	14.14	3,450	15.78	9,900	16.73	14,200	17.87	20,000	16.19	11,800
6	13.26	2,020	14.34	4,020	15.88	10,400	16.81	14,700	17.74	19,100	16.07	11,000
8	13.29	2,070	14.50	4,610	16.02	10,800	16.98	15,700	17.60	18,600	15.95	10,600
10	13.31	2,070	14.64	5,200	16.15	11,600	17.24	16,600	17.46	18,100	15.84	10,200
12	13.35	2,120	14.84	6,000	16.30	12,300	17.53	18,100	17.30	17,100	15.73	9,650
	April 2		April 3		April 4		April 5		April 6		April 7	
6	15.43	8,400	14.70	5,400	14.32	3,950	14.04	3,200	13.78	2,720	13.61	2,430
N	15.20	7,400	14.58	4,920	14.23	3,670	13.98	3,090	13.73	2,640	13.67	2,500
6	15.00	6,600	14.48	4,530	14.16	3,450	13.90	2,890	13.68	2,570	13.65	2,500
12	14.84	6,000	14.40	4,230	14.10	3,320	13.85	2,800	13.62	2,430	13.64	2,500
	April 8		April 9		April 10		April 11		April 12		April 13	
6	13.51	2,300	13.37	2,120	13.11	1,860	12.88	1,680	12.93	1,720	12.84	1,640
N	13.58	2,430	13.31	2,070	13.05	1,820	12.84	1,640	12.94	1,720	12.79	1,600
6	13.51	2,300	13.23	2,020	12.98	1,770	12.88	1,680	12.93	1,720	12.71	1,520
12	13.44	2,240	13.17	1,910	12.92	1,680	12.91	1,680	12.89	1,680	12.65	1,480
	April 14		April 15		April 16		April 17		April 18		April 19	
6	12.58	1,450	12.29	1,270	12.15	1,220	12.30	1,270	12.16	1,220	11.97	1,140
N	12.50	1,380	12.23	1,240	12.18	1,220	12.30	1,270	12.11	1,180	12.10	1,180
6	12.43	1,350	12.16	1,220	12.22	1,220	12.25	1,240	12.05	1,140	12.19	1,220
12	12.35	1,300	12.10	1,180	12.27	1,240	12.21	1,220	12.00	1,140	12.28	1,270

Sipsey River near Pleasant Ridge, Ala.

Location.--Lat 33°02', long. 88°07', in S½ sec. 20, T. 24 N., R. 1 W., at bridge on State Highway 40, 450 ft downstream from Hughes Creek, 2½ miles northwest of Pleasant Ridge, 6 miles upstream from mouth, and 6 miles south of Aliceville. Datum of gage is 105.13 ft above mean sea level, datum of 1929, supplementary adjustment of 1946. Auxiliary staff gage at Vienna Ferry on Tombigbee River, 2 miles upstream from mouth of Sipsey River, at datum 23.06 ft lower.

Drainage area.--766 square miles.

Gage-height record.--Graphs based on twice-daily readings of base and auxiliary gages.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 21,900 cfs Apr. 2 (gage height, 25.5 ft).
1939 to February 1951: Discharge, 19,100 cfs Jan. 11, 1950; gage height, 25.8 ft Jan. 10, 1949.

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	2,270	16,300	9	1,500	4,580	17	2,010	2,000	25	2,160	2,650
2	2,320	19,500	10	1,460	4,000	18	2,770	1,840	26	2,270	2,720
3	2,270	14,600	11	1,460	3,640	19	3,300	1,750	27	2,480	2,830
4	2,140	11,400	12	1,540	3,200	20	3,400	1,740	28	4,460	2,860
5	2,050	8,570	13	1,700	2,830	21	3,230	1,790	29	7,540	2,810
6	1,920	6,470	14	1,920	2,510	22	2,830	2,640	30	9,170	2,770
7	1,790	5,980	15	2,050	2,270	23	2,430	2,270	31	10,200	
8	1,620	5,200	16	2,010	2,120	24	2,240	3,070			
Monthly mean discharge, in cfs										2,920	4,897
Runoff, in inches										4.39	7.13

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	9.0	2,360	10.6	3,110	16.8	6,490	19.8	8,400	21.2	9,320	22.7	12,200
4	9.1	2,410	11.1	3,350	17.3	6,880	20.2	8,650	21.3	9,440	22.8	12,400
6	9.1	2,410	11.7	3,650	17.8	7,270	20.4	8,860	21.4	9,590	23.0	13,000
8	9.1	2,410	12.2	3,900	18.3	7,600	20.6	9,120	21.5	9,700	23.3	14,000
10	9.2	2,450	12.7	4,150	18.5	7,700	20.8	9,460	21.6	9,930	23.5	14,600
N	9.2	2,450	13.3	4,450	18.7	7,870	20.9	9,520	21.7	10,000	23.8	15,700
2	9.3	2,500	13.8	4,730	18.8	7,870	21.0	9,580	21.8	10,300	24.1	16,600
4	9.3	2,500	14.3	4,980	18.9	7,870	21.0	9,500	22.0	10,800	24.5	18,600
6	9.3	2,500	14.8	5,280	19.0	7,870	21.1	9,450	22.1	11,000	24.8	19,700
8	9.4	2,540	15.3	5,520	19.2	7,960	21.1	9,400	22.2	11,100	25.1	20,700
10	9.6	2,640	15.8	5,840	19.3	7,960	21.1	9,350	22.3	11,200	25.3	21,400
12	10.0	2,820	16.3	6,180	19.6	8,180	21.2	9,300	22.5	11,700	25.4	21,800
	April 2		April 3		April 4		April 5		April 6		April 7	
6	25.5	21,000	24.9	15,600	23.9	12,000	22.8	9,070	21.6	6,710	20.9	6,380
N	25.4	19,300	24.6	14,500	23.6	11,300	22.5	8,530	21.3	6,290	20.7	6,160
6	25.3	18,400	24.4	13,500	23.4	10,800	22.2	7,990	21.1	6,030	20.3	5,610
12	25.1	17,000	24.2	13,000	23.1	9,840	21.9	7,510	21.0	6,160	20.0	5,340
	April 8		April 9		April 10		April 11		April 12		April 13	
6	19.8	5,380	18.7	4,720	17.3	4,110	15.7	3,770	13.8	3,310	11.6	2,880
N	19.6	5,240	18.3	4,510	16.9	3,930	15.2	3,620	13.2	3,210	11.2	2,860
6	19.3	5,040	18.0	4,440	16.6	3,920	14.8	3,570	12.2	3,000	10.7	2,690
12	19.0	4,960	17.7	4,300	16.2	3,810	14.3	3,420	12.2	3,000	10.3	2,690
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.9	2,580	8.9	2,300	8.5	2,140	8.3	2,050	7.9	1,880	7.6	1,740
N	9.6	2,530	8.8	2,270	8.5	2,140	8.2	2,010	7.8	1,830	7.6	1,740
6	9.3	2,420	8.7	2,230	8.4	2,100	8.1	1,960	7.7	1,790	7.6	1,740
12	9.1	2,360	8.6	2,180	8.3	2,050	8.0	1,920	7.7	1,790	7.6	1,740

Supplemental record.--Apr. 2, 2 a.m., 25.5 ft., 21,900 sec.-ft.; Apr. 2, 4 a.m., 25.5 ft., 21,600 sec.-ft.

Noxubee River near Brooksville, Miss.

Location.--Lat 33°13'30", long. 88°42'10", in center of sec. 19, T. 16 N., R. 16 E. Choctaw meridian, at bridge on county road a quarter of a mile downstream from Shotbag Creek, 3½ miles upstream from Lynn Creek, 4½ miles downstream from Octoc Creek, 5¾ miles upstream from Yellow Creek, and 7 miles west of Brooksville.

Drainage area.--440 square miles (authority, Corps of Engineers).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 13,200 cfs and extended to peak stage. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 55,000 cfs Mar. 29 (gage height, 23.88 ft). 1940-42, 1944 to February 1951: Discharge, 46,600 cfs Jan. 6, 1949 (gage height, 23.26 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data furnished by Corps of Engineers; occasional discharge measurement made and records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	464	4,890	9	1,840	1,090	17	401	1,450	25	1,040	4,250
2	413	3,210	10	1,330	1,020	18	1,130	1,340	26	568	2,980
3	321	2,330	11	676	876	19	2,130	1,410	27	497	2,130
4	494	1,790	12	542	664	20	2,310	1,480	28	11,200	1,250
5	1,660	1,280	13	620	519	21	2,980	1,200	29	45,400	581
6	1,600	848	14	760	450	22	3,230	1,900	30	20,400	425
7	1,690	786	15	746	390	23	2,530	2,130	31	8,320	
8	1,880	1,230	16	542	996	24	1,940	3,530			
Monthly mean discharge, in cfs										3,860	1,614
Runoff, in inches										10.11	4.09

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.89	477	11.31	1,260	22.48	35,400	22.16	31,400	20.11	10,900	18.99	5,900
4	5.83	464	16.26	2,200	23.18	45,200	21.94	27,600	19.98	10,300	18.91	5,600
6	5.77	464	18.67	5,030	23.61	50,800	21.72	25,200	19.86	9,700	18.83	5,310
8	5.71	451	19.80	9,100	23.84	53,600	21.52	23,000	19.75	9,100	18.76	5,310
10	5.65	438	20.40	13,000	23.88	55,000	21.31	20,900	19.65	8,100	18.70	5,030
N	5.61	438	20.53	13,800	23.79	53,600	21.14	18,900	19.56	8,100	18.63	4,760
2	5.58	438	20.47	13,800	23.60	50,800	20.94	17,100	19.47	7,700	18.57	4,760
4	5.56	438	20.45	13,000	23.38	48,000	20.78	16,200	19.40	7,300	18.49	4,500
6	5.56	438	20.49	13,800	23.14	43,800	20.63	14,600	19.31	6,920	18.43	4,250
8	5.85	464	20.70	15,400	22.88	41,000	20.48	13,800	19.23	6,560	18.36	4,250
10	7.38	676	21.17	19,900	22.64	36,800	20.36	13,000	19.14	6,220	18.30	4,030
12	10.00	1,060	21.75	26,400	22.39	34,000	20.24	11,600	19.06	6,220	18.23	3,830
	April 2		April 3		April 4		April 5		April 6		April 7	
6	18.02	3,500	16.96	2,480	15.00	1,920	12.19	1,410	9.17	935	7.29	662
N	17.80	3,230	16.59	2,310	14.33	1,790	11.42	1,280	8.50	830	7.63	704
6	17.54	2,870	16.14	2,160	13.66	1,680	10.63	1,150	7.96	760	8.94	890
12	17.26	2,670	15.60	2,040	12.94	1,530	9.90	1,040	7.53	690	10.23	1,090
	April 8		April 9		April 10		April 11		April 12		April 13	
6	11.28	1,260	10.40	1,120	9.89	1,040	9.20	935	7.58	704	6.43	542
N	11.43	1,280	10.12	1,070	9.85	1,020	8.76	875	7.26	662	6.21	516
6	11.19	1,250	9.99	1,060	9.74	1,010	8.36	816	6.96	620	6.01	490
12	10.77	1,180	9.92	1,040	9.55	995	7.98	760	6.69	581	5.87	477
	April 14		April 15		April 16		April 17		April 18		April 19	
6	5.76	464	5.33	401	6.87	607	12.93	1,530	11.74	1,330	12.00	1,380
N	5.66	451	5.20	389	9.50	980	12.36	1,450	11.75	1,350	12.24	1,410
6	5.55	438	5.09	377	12.18	1,410	11.93	1,360	11.78	1,350	12.44	1,450
12	5.43	413	5.07	377	13.26	1,600	11.75	1,350	11.84	1,350	12.60	1,480

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Noxubee River at Macon, Miss.

Location.--Lat 33°06'05", long. 88°33'40", in NE¼ sec. 4, T. 14 N., R. 17 E. Choctaw meridian, at bridge on U. S. Highway 45, in Macon, a quarter of a mile upstream from Cedar Creek, 1 mile downstream from Gulf, Mobile & Ohio Railroad bridge, 1½ miles downstream from Horse Hunters Creek, and 6¼ miles upstream from Running Water Creek. Datum of gage is 142.38 ft above mean sea level, datum of 1929 (level by Corps of Engineers).

Drainage area.--812 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths below 9.1 ft and tenths above.

Maxima.--March-April 1951: Discharge, 52,000 cfs Mar. 30 (gage height, 32.97 ft).
1928-32, 1938 to February 1951: Discharge, 50,000 cfs Jan. 6, 1949 (gage height, 32.73 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	754	9,710	9	2,140	2,160	17	754	1,940	25	2,860	3,240
2	662	6,680	10	2,100	1,670	18	2,760	1,910	26	1,890	3,110
3	610	5,450	11	1,720	1,400	19	4,630	1,740	27	1,020	3,220
4	1,330	4,570	12	1,150	1,190	20	5,330	1,840	28	7,500	3,040
5	3,090	3,590	13	1,090	965	21	4,980	1,920	29	34,000	2,100
6	3,140	2,300	14	1,090	764	22	4,050	3,680	30	45,400	863
7	2,840	1,720	15	1,090	659	23	3,490	3,850	31	21,600	
8	2,260	2,220	16	976	1,180	24	3,220	3,710			
Monthly mean discharge, in cfs										5,469	2,746
Runoff, in inches										7.76	3.77

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	10.49	1,060	18.90	2,980	30.20	22,400	32.93	50,700	31.11	29,900	28.60	12,100
4	10.25	976	22.20	3,880	30.61	25,600	32.97	52,000	30.88	28,100	28.44	11,200
6	10.06	947	23.78	4,490	30.89	28,100	32.95	52,000	30.65	25,600	28.29	10,800
8	9.89	891	25.31	5,230	31.09	29,900	32.89	50,700	30.42	24,000	28.14	10,100
10	9.75	863	26.35	6,120	31.23	30,900	32.78	49,400	30.20	22,400	28.00	9,800
N	8.66	835	26.89	7,100	31.39	32,900	32.64	46,800	29.98	21,000	27.88	9,510
2	9.59	808	27.30	7,980	31.58	35,000	32.46	45,500	29.77	19,600	27.75	9,230
4	9.45	754	27.56	8,700	31.80	37,200	32.28	43,100	29.55	18,200	27.63	8,700
6	9.70	835	27.82	9,230	32.08	40,700	32.06	40,700	29.35	16,900	27.52	8,450
8	10.48	1,060	28.22	10,400	32.37	44,300	31.83	37,200	29.16	15,600	27.41	8,210
10	12.04	1,500	28.11	13,700	32.61	46,800	31.62	35,000	28.98	14,300	27.30	7,980
12	15.51	2,200	29.57	18,200	32.76	49,400	31.37	32,900	28.78	13,100	27.20	7,750
	April 2		April 3		April 4		April 5		April 6		April 7	
6	26.92	7,100	25.98	5,630	24.48	4,830	22.11	3,850	17.50	2,640	11.87	1,470
N	26.67	6,690	25.70	5,440	23.95	4,580	21.26	3,620	15.85	2,260	12.70	1,670
6	26.44	6,120	25.36	5,280	23.32	4,290	20.29	3,350	14.20	1,960	13.78	1,890
12	26.21	5,830	24.95	5,080	22.75	4,090	19.00	3,010	12.76	1,700	14.41	1,990
	April 8		April 9		April 10		April 11		April 12		April 13	
6	15.17	2,140	15.96	2,300	13.16	1,780	11.76	1,440	11.10	1,240	10.41	1,030
N	15.71	2,240	15.39	2,180	12.61	1,650	11.60	1,380	10.93	1,180	10.17	976
6	16.12	2,330	14.67	2,040	12.22	1,550	11.46	1,360	10.77	1,150	9.94	891
12	16.20	2,350	13.89	1,910	11.96	1,500	11.26	1,300	10.62	1,090	9.74	835
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.56	808	9.12	675	8.89	623	13.72	1,870	14.35	1,990	12.92	1,720
N	9.42	754	9.05	662	11.10	1,240	14.32	1,970	13.94	1,910	12.78	1,700
6	9.28	727	8.97	626	12.66	1,670	14.63	2,030	13.52	1,840	13.10	1,760
12	99.20	701	8.92	623	13.07	1,760	14.61	2,030	13.16	1,780	13.27	1,800

Noxubee River near Geiger, Ala.

Location.--Lat 32°55', long. 88°18', in SE¼ sec. 33, T. 23 N., R. 3 W., at bridge on State Highway 17, half a mile upstream from Woodards Creek, 1 mile upstream from Alabama, Tennessee & Northern Railroad bridge, and 4 miles north of Geiger. Datum of gage is 86.08 ft above mean sea level, datum of 1929, supplementary adjustment of 1946. Water-stage recorder for station at Gainesville on Tombigbee River, 1½ miles downstream from mouth of Noxubee River, is used as auxiliary gage.

Drainage area.--1,080 square miles.

Gage-height record.--Water-stage recorder graphs for base and auxiliary gages.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Shifting-control method used below 830 cfs. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 37,600 cfs Mar. 31 (gage height, 42.69 ft). 1939-40, 1944 to February 1951: Discharge, 27,900 cfs Jan. 8, 1949 (gage height, 41.6 ft, from graph based on gage readings).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,160	30,900	9	2,720	3,440	17	1,030	1,180	25	5,430	5,080
2	855	21,400	10	2,370	2,800	18	2,980	1,890	26	3,710	4,430
3	730	14,900	11	2,260	2,230	19	7,540	1,910	27	2,480	3,960
4	1,180	11,300	12	2,450	1,950	20	8,960	1,700	28	6,510	3,860
5	3,890	9,150	13	1,900	1,760	21	8,450	1,830	29	16,500	3,710
6	4,430	7,440	14	1,430	1,480	22	7,460	4,870	30	24,800	2,830
7	4,080	5,680	15	1,260	1,010	23	6,680	6,430	31	36,600	
8	3,440	4,370	16	1,160	786	24	5,590	5,900			
Monthly mean discharge, in cfs										5,779	5,673
Runoff, in inches										6.17	5.86

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	15.60	3,060	16.47	3,320	34.69	13,700	38.07	19,100	42.17	35,000	42.10	34,500
4	15.20	2,950	18.34	3,860	35.49	14,800	38.35	19,800	42.37	36,100	41.97	34,000
6	14.73	2,810	20.38	4,530	36.11	15,600	38.69	20,600	42.55	37,100	41.82	33,000
8	14.26	2,690	22.04	5,080	36.53	16,200	39.08	21,700	42.64	37,100	41.68	32,500
10	13.74	2,530	23.39	5,590	36.83	16,700	39.45	22,800	42.67	37,600	41.53	31,500
N	13.21	2,390	24.57	6,060	37.04	17,000	39.83	24,100	42.69	37,600	41.38	31,000
2	12.69	2,260	25.88	6,600	37.18	17,400	40.25	25,600	42.67	37,600	41.23	30,000
4	12.18	2,130	27.48	7,320	37.29	17,500	40.58	27,300	42.64	37,100	41.06	29,500
6	11.73	2,000	29.00	8,100	37.40	17,700	40.93	28,600	42.57	37,100	40.90	28,600
8	11.84	2,030	30.74	9,360	37.53	17,900	41.28	30,500	42.50	36,600	40.75	28,200
10	12.25	2,130	32.28	10,900	37.66	18,300	41.62	32,000	42.39	36,100	40.59	27,300
12	13.50	2,480	33.63	12,300	37.83	18,400	41.92	33,500	42.27	35,600	40.45	25,400
	April 2		April 3		April 4		April 5		April 6		April 7	
6	39.97	23,300	38.11	16,000	36.47	11,800	35.20	9,500	33.82	7,810	32.06	5,780
N	39.51	21,300	37.68	14,800	36.17	11,400	34.88	9,100	33.46	7,560	31.87	5,670
6	39.04	19,300	37.21	13,600	35.87	10,800	34.55	8,700	33.03	6,960	31.56	5,510
12	38.56	17,700	36.82	12,500	35.53	10,200	34.20	8,380	32.56	6,500	31.10	5,040
	April 8		April 9		April 10		April 11		April 12		April 13	
6	30.66	4,490	29.08	3,510	27.59	2,870	25.82	2,360	24.02	1,980	21.69	1,890
N	30.33	4,340	28.70	3,410	27.19	2,800	25.32	2,160	23.50	1,910	20.94	1,690
6	29.95	4,140	28.34	3,320	26.74	2,710	24.90	2,100	22.94	1,940	20.13	1,680
12	29.53	3,970	27.97	3,100	26.30	2,570	24.48	2,050	22.33	1,870	19.24	1,700
	April 14		April 15		April 16		April 17		April 18		April 19	
6	18.24	1,570	13.43	1,100	8.31	754	7.13	855	10.96	1,830	11.56	1,980
N	17.19	1,520	12.10	992	7.60	745	8.38	1,180	11.38	1,930	11.39	1,930
6	16.03	1,370	10.70	915	7.12	855	9.49	1,460	11.61	1,980	11.12	1,860
12	14.74	1,210	9.36	829	6.82	755	10.32	1,660	11.65	1,980	10.80	1,780

Tombigbee River at Gainesville, Ala.

Location.--Lat 32°49', long. 88°09', in SE¼ sec. 2, T. 21 N., R. 2 W., at bridge on State Highway 39 at Gainesville, 2 miles downstream from Noxubee River. Datum of gage is 63.29 ft above mean sea level, datum of 1929, supplementary adjustment of 1946. Auxiliary gage is water-stage recorder at Epes, 19 miles downstream at datum 10.08 ft lower.

Drainage area.--8,700 square miles.

Gage-height record.--Water-stage recorder graphs for base and auxiliary gages.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 141,000 cfs Apr. 3; gage height, 52.9 ft Apr. 4. 1938 to February 1951: Discharge, 168,000 cfs Jan. 11, 1949 (gage height, 53.9 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	24,000	103,000	9	28,300	75,100	17	16,400	17,800	25	34,900	37,200
2	19,500	122,000	10	26,300	66,100	18	20,200	17,900	26	30,200	37,200
3	15,800	138,000	11	21,800	58,300	19	33,400	17,300	27	24,100	36,300
4	14,400	137,000	12	19,400	50,000	20	39,800	16,100	28	31,400	35,700
5	19,400	125,000	13	20,600	41,600	21	40,400	16,300	29	51,500	34,400
6	27,300	110,000	14	21,400	33,400	22	39,800	27,300	30	66,000	29,300
7	29,200	96,500	15	21,500	26,800	23	39,100	34,800	31	81,700	
8	29,400	86,000	16	19,600	20,900	24	37,400	36,700			
Monthly mean discharge, in cfs										30,460	56,130
Runoff, in inches										4.04	7.20

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	25.6	27,100	22.5	24,000	38.7	42,800	44.7	61,100	46.8	72,900	49.1	95,700
4	25.1	26,200	23.2	24,900	39.7	44,900	45.0	62,100	47.0	74,100	49.2	96,100
6	24.7	25,700	24.1	26,600	40.6	47,000	45.2	63,100	47.2	76,300	49.4	98,800
8	24.3	25,200	25.0	28,100	41.3	49,000	45.4	64,000	47.4	77,800	49.5	100,000
10	23.8	24,600	25.9	29,700	41.9	51,000	45.5	64,400	47.6	79,400	49.6	101,000
N	23.3	23,700	27.0	31,800	42.4	52,300	45.7	66,100	47.8	80,900	49.8	104,000
2	22.9	23,500	28.6	34,200	42.8	53,600	45.9	67,000	48.0	82,400	49.8	103,000
4	22.4	22,600	30.2	35,300	43.2	54,900	46.0	67,500	48.2	85,200	50.0	106,000
6	22.0	22,100	32.0	35,900	43.6	56,400	46.2	68,700	48.4	87,300	50.1	107,000
8	21.7	21,700	33.8	36,400	43.9	57,100	46.4	70,500	48.6	89,300	50.2	109,000
10	21.6	21,800	35.7	37,900	44.2	58,600	46.5	71,100	48.8	92,200	50.3	110,000
12	21.9	22,700	37.4	40,800	44.5	59,700	46.7	72,400	48.9	92,500	50.4	111,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	50.7	114,000	52.3	138,000	52.9	140,000	52.6	128,000	51.9	113,000	51.0	99,900
N	51.2	123,000	52.5	139,000	52.9	139,000	52.5	126,000	51.7	111,000	50.8	96,100
6	51.6	128,000	52.7	140,000	52.8	135,000	52.3	121,000	51.4	105,000	50.6	93,400
12	52.0	134,000	52.8	141,000	52.7	131,000	52.1	118,000	51.2	103,000	50.4	91,700
	April 8		April 9		April 10		April 11		April 12		April 13	
6	50.2	89,800	49.1	78,400	47.9	68,200	46.5	59,900	44.9	52,400	42.4	43,500
N	49.9	86,200	48.7	74,000	47.6	66,200	46.2	58,400	44.4	50,300	41.7	42,000
6	49.6	83,000	48.5	73,100	47.2	63,700	45.8	56,600	43.8	47,500	40.8	39,400
12	49.8	79,700	48.2	70,500	46.9	61,900	45.4	54,400	43.1	45,600	39.8	37,400
	April 14		April 15		April 16		April 17		April 18		April 19	
6	38.8	35,400	33.9	28,400	27.4	22,600	21.2	18,000	19.1	17,800	17.9	17,600
N	37.6	33,400	32.5	27,200	25.5	20,800	20.3	17,500	18.9	18,000	17.6	17,200
6	36.5	31,400	30.8	25,000	23.8	19,400	19.7	17,500	18.6	18,000	17.4	17,100
12	35.2	29,400	29,1	23,500	22.3	18,400	19.4	17,800	18.3	17,800	17.0	16,800

Mulberry Fork near Garden City, Ala.

Location.--Lat 34°00', long. 86°45', in NE¼ sec. 16, T. 12 S., R. 2 W., at bridge on U. S. Highway 31, 1,000 ft downstream from Louisville & Nashville Railroad bridge, 1 mile southwest of Garden City, and 5½ miles downstream from Mud Creek. Datum of gage is 380.54 ft above mean sea level, datum of 1929.

Drainage area.--365 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used Apr. 13-18. Gage heights used to half-tenths between 4.9 and 7.7 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 35,200 cfs Mar. 29 (gage height, 20.62 ft). 1928 to February 1951: Discharge, 46,600 cfs Feb. 4, 1936 (gage height, 24.0 ft, from floodmarks).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	648	2,340	9	1,280	954	17	569	508	25	738	1,450
2	569	2,270	10	1,080	785	18	2,350	419	26	648	1,120
3	522	1,760	11	920	710	19	2,400	2,440	27	574	905
4	913	1,430	12	870	806	20	1,720	2,180	28	19,800	1,010
5	1,770	1,220	13	927	602	21	1,400	1,950	29	23,700	792
6	1,240	1,030	14	792	540	22	1,160	7,580	30	5,770	691
7	1,540	1,100	15	672	474	23	1,010	2,680	31	3,220	
8	1,680	1,340	16	612	542	24	971	1,870		2,647	
Monthly mean discharge, in cfs										2,647	1,450
Runoff, in inches										8.36	4.43

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.30	574	5.48	1,450	20.62	35,200	9.80	8,040	7.50	3,790	6.64	2,620
4	4.28	564	6.96	3,000	20.55	35,200	9.47	7,410	7.40	3,640	6.59	2,560
6	4.27	560	10.45	9,360	20.19	34,100	9.16	6,800	7.31	3,490	6.54	2,500
8	4.27	560	13.20	15,800	19.45	31,800	8.90	6,210	7.23	3,420	6.50	2,450
10	4.30	574	15.11	20,400	18.54	29,400	8.69	5,830	7.15	3,270	6.44	2,400
N	4.33	590	16.30	23,500	17.22	25,800	8.49	5,470	7.08	3,200	6.40	2,340
2	4.32	585	17.14	25,600	15.50	21,400	8.31	5,110	7.00	3,060	6.34	2,280
4	4.30	574	18.35	29,100	13.71	17,000	8.15	4,940	6.94	3,000	6.30	2,230
6	4.28	564	18.56	29,600	12.05	13,000	8.00	4,600	6.88	2,930	6.26	2,180
8	4.28	564	18.90	30,400	11.04	10,700	7.87	4,430	6.81	2,800	6.21	2,120
10	4.30	574	19.35	31,800	10.42	9,360	7.74	4,110	6.76	2,740	6.17	2,070
12	4.41	635	20.27	34,400	10.11	8,690	7.62	3,950	6.69	2,680	6.13	2,070
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.05	1,970	5.94	1,870	5.54	1,500	5.34	1,320	5.01	1,040	4.84	927
N	6.38	2,340	5.80	1,720	5.48	1,450	5.25	1,240	4.98	1,040	4.93	1,010
6	6.71	2,680	5.70	1,630	5.40	1,360	5.13	1,160	4.93	1,010	5.20	1,200
12	6.22	2,120	5.60	1,540	5.30	1,280	5.06	1,080	4.88	956	5.60	1,540
	April 8		April 9		April 10		April 11		April 12		April 13	
6	5.46	1,400	4.93	1,010	4.69	820	4.51	698	4.75	862	4.40	624
N	5.49	1,450	4.86	942	4.63	779	4.48	677	4.74	855	4.35	596
6	5.20	1,200	4.80	898	4.59	751	4.53	711	4.62	772	4.31	569
12	5.03	1,080	4.74	855	4.55	724	4.64	786	4.49	685	4.28	555
	April 14		April 15		April 16		April 17		April 18		April 19	
6	4.24	536	4.11	475	4.09	467	4.24	536	4.00	426	4.05	446
N	4.29	560	4.11	475	4.21	522	4.14	487	3.97	414	6.77	2,740
6	4.25	540	4.11	475	4.42	635	4.10	471	3.97	414	8.10	4,770
12	4.16	496	4.06	450	4.42	635	4.04	442	3.94	402	7.11	3,200

Sipsey Fork near Falls City, Ala.

Location.--Lat 34°03', long. 87°16', in NE¼ sec. 33, T. 11 S., R. 7 W., at bridge on county highway, 1½ miles downstream from Clifty Fork, 1⅞ miles north of Falls City, and 2½ miles upstream from Clear Creek.

Drainage area.--375 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 16,000 cfs and extended to peak stage. Gage heights used to hundredths below 4.2 ft, to half-tenths between 4.2 and 7.8 ft, and to tenths above 7.8 ft.

Maxima.--March-April 1951: Discharge, 39,000 cfs Mar. 29 (gage height, 25.80 ft). 1943 to February 1951: Discharge, 48,400 cfs Jan. 8, 1946 (gage height, 29.6 ft), from rating curve extended above 16,000 cfs.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	534	2,000	9	920	632	17	570	628	25	688	1,260
2	463	1,720	10	752	555	18	1,760	602	26	590	985
3	437	1,500	11	648	546	19	3,000	1,510	27	566	785
4	463	1,200	12	648	628	20	2,210	2,180	28	19,900	690
5	628	1,020	13	668	578	21	1,680	1,580	29	30,400	670
6	628	882	14	648	541	22	1,260	4,290	30	6,690	590
7	846	794	15	628	527	23	1,020	2,670	31	2,970	
8	1,110	754	16	609	524	24	846	1,690			
Monthly mean discharge, in cfs										2,735	1,151
Runoff, in inches										8.41	3.42

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.58	571	5.98	1,260	25.15	37,600	13.80	11,600	8.64	3,600	7.40	2,270
4	4.58	571	8.40	3,350	25.80	39,000	12.70	9,590	8.49	3,470	7.33	2,220
6	4.58	571	11.70	7,950	25.68	38,800	11.80	8,100	8.39	3,350	7.27	2,140
8	4.58	571	15.60	15,300	25.29	37,800	11.08	7,050	8.25	3,110	7.20	2,090
10	4.57	552	18.18	21,100	24.51	35,800	10.56	6,320	8.15	3,110	7.14	2,040
N	4.57	552	19.33	23,600	23.50	33,400	10.20	5,740	8.03	2,890	7.08	2,000
2	4.56	552	20.33	25,900	22.33	30,500	9.85	5,170	7.92	2,780	7.02	1,920
4	4.56	552	21.16	28,000	20.91	27,300	9.55	4,900	7.82	2,670	6.96	1,880
6	4.56	552	22.20	30,300	19.32	23,600	9.34	4,510	7.72	2,570	6.90	1,840
8	4.56	552	22.76	31,700	17.78	20,200	9.12	4,250	7.64	2,520	6.84	1,800
10	4.62	571	23.07	32,400	16.30	16,900	8.96	4,120	7.56	2,420	6.78	1,760
12	4.89	688	23.92	34,400	15.00	14,000	8.80	3,860	7.48	2,370	6.74	1,720
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.66	1,660	6.59	1,620	6.04	1,260	5.70	1,060	5.40	910	5.18	810
N	6.80	1,760	6.40	1,480	5.96	1,200	5.62	1,010	5.34	885	5.14	785
6	6.76	1,720	6.26	1,380	5.87	1,140	5.55	985	5.28	860	5.16	785
12	6.74	1,720	6.14	1,320	5.78	1,110	5.46	935	5.22	810	5.15	785
	April 8		April 9		April 10		April 11		April 12		April 13	
6	5.13	785	4.86	650	4.64	571	4.53	534	4.78	630	4.70	590
N	5.10	760	4.80	630	4.60	552	4.53	534	4.80	630	4.66	571
6	5.04	735	4.74	610	4.57	534	4.58	552	4.83	650	4.63	571
12	4.94	690	4.68	590	4.55	534	4.72	590	4.76	610	4.60	552
	April 14		April 15		April 16		April 17		April 18		April 19	
6	4.58	552	4.53	534	4.50	515	4.91	670	4.74	610	5.00	710
N	4.57	534	4.53	534	4.51	515	4.81	630	4.73	610	6.93	1,880
6	4.55	534	4.51	515	4.52	515	4.76	610	4.70	590	7.02	1,920
12	4.54	534	4.50	515	4.70	590	4.75	610	4.69	590	7.60	2,470

Clear Creek at Falls City, Ala.

Location.--Lat 34°02', long. 87°16', in NE¼ sec. 9, T. 12 S., R. 7 W., at bridge on county highway a quarter of a mile upstream from Clear Creek Falls, half a mile south of Falls City and 2 miles upstream from mouth.

Drainage area.--151 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 6,800 cfs and extended to peak stage by logarithmic plotting. Gage heights used to half- tenths between 2.8 and 4.3 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 11,700 cfs Mar. 29 (gage height, 10.28 ft). 1939 to February 1951: Discharge, 13,000 cfs Jan. 8, 1946 (gage height, 10.97 ft), from rating curve extended above 6,800 cfs by logarithmic poltting.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	245	937	9	350	300	17	226	224	25	293	517
2	222	813	10	303	275	18	635	211	26	264	402
3	213	692	11	274	262	19	1,060	642	27	252	345
4	236	528	12	274	302	20	816	1,030	28	5,890	356
5	356	441	13	278	276	21	609	617	29	10,100	329
6	334	385	14	274	253	22	460	1,850	30	3,510	278
7	428	362	15	254	236	23	384	1,080	31	1,410	
8	414	350	16	236	231	24	350	684			
Monthly mean discharge, in cfs										998	507
Runoff, in inches										7.62	3.75

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.42	250	1.82	474	9.78	10,900	7.15	6,770	3.06	1,680	2.50	1,070
4	1.42	250	2.55	1,130	10.20	11,600	6.43	5,730	3.00	1,630	2.48	1,050
6	1.42	250	4.05	2,750	10.28	11,700	5.60	4,730	2.95	1,570	2.44	1,010
8	1.42	250	5.75	4,980	10.13	11,400	4.88	3,850	2.89	1,510	2.41	979
10	1.42	250	7.03	6,510	9.87	11,000	4.34	3,110	2.84	1,460	2.39	959
N	1.41	245	7.68	7,450	9.60	10,500	3.94	2,700	2.78	1,380	2.36	930
2	1.41	245	7.86	7,750	9.33	10,000	3.72	2,410	2.74	1,330	2.33	900
4	1.41	245	8.00	7,900	9.06	9,670	3.55	2,240	2.69	1,280	2.31	881
6	1.42	250	8.31	8,380	8.78	9,180	3.43	2,130	2.65	1,240	2.28	853
8	1.43	254	8.62	8,860	8.52	8,700	3.32	1,960	2.61	1,190	2.26	834
10	1.44	259	8.92	9,340	8.17	9,340	3.23	1,900	2.58	1,160	2.24	816
12	1.52	298	9.32	10,000	7.70	7,450	3.14	1,800	2.54	1,120	2.22	797
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.17	753	2.17	753	1.93	554	1.80	460	1.70	395	1.63	356
N	2.23	807	2.07	667	1.89	524	1.77	440	1.68	384	1.63	356
6	2.28	853	2.01	617	1.86	503	1.74	421	1.66	373	1.65	367
12	2.31	881	1.97	586	1.83	481	1.72	408	1.65	367	1.64	367
	April 8		April 9		April 10		April 11		April 12		April 13	
6	1.65	367	1.54	308	1.49	283	1.44	259	1.51	293	1.49	283
N	1.62	350	1.52	298	1.47	274	1.43	254	1.54	308	1.47	274
6	1.60	339	1.50	288	1.46	269	1.44	259	1.56	319	1.46	269
12	1.57	324	1.49	283	1.45	264	1.50	288	1.51	293	1.45	264
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.44	259	1.40	240	1.38	231	1.38	231	1.34	213	1.36	222
N	1.43	254	1.39	236	1.38	231	1.37	226	1.34	213	1.57	324
6	1.41	245	1.38	231	1.38	231	1.35	218	1.33	208	2.61	1,190
12	1.41	245	1.38	231	1.38	231	1.34	213	1.33	208	2.83	1,460

Blackwater Creek near Manchester, Ala.

Location.--Lat 33°55', long. 87°15', in SE¼ sec. 15, T. 13 S., R. 7 W., at bridge on county highway, a quarter of a mile downstream from unnamed tributary, 2 miles east of Manchester, and 5½ miles north of Jasper. Datum of gage is 401.04 ft above mean sea level, datum of 1929, unadjusted.

Drainage area.--177 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 4.7 and 6.8 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 7,350 cfs Mar. 30 (gage height, 10.95 ft).
1938 to February 1951: Discharge, 8,050 cfs Jan. 9, 1946 (gage height 11.49 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	300	4,140	9	399	374	17	229	284	25	362	960
2	269	2,230	10	343	316	18	617	242	26	306	613
3	247	1,030	11	306	298	19	1,060	692	27	286	461
4	378	736	12	294	370	20	995	1,180	28	3,540	375
5	825	580	13	318	338	21	825	1,220	29	5,610	375
6	646	482	14	297	288	22	655	1,880	30	7,050	328
7	537	447	15	266	264	23	504	1,610	31	6,260	
8	469	454	16	239	307	24	428	1,340			
Monthly mean discharge, in cfs										1,126	807
Runoff, in inches										7.32	5.09

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.50	280	5.08	1,030	9.70	5,710	10.47	6,690	10.72	6,950	9.08	5,010
4	3.49	277	6.32	2,060	9.78	5,830	10.64	6,820	10.66	6,950	8.90	4,790
6	3.49	277	7.56	3,360	9.54	5,470	10.84	7,080	10.54	6,690	8.78	4,680
8	3.48	274	7.87	3,690	50	5,470	10.75	7,080	10.46	6,690	8.59	4,460
10	3.48	274	7.95	3,800	32	5,230	10.81	7,080	10.31	6,430	8.44	4,240
N	3.47	272	8.03	3,800	9.28	5,230	10.75	7,080	10.21	6,310	8.30	4,130
2	3.47	272	8.07	3,910	9.30	5,230	10.75	7,080	10.15	6,310	8.16	4,020
4	3.48	274	8.34	4,130	9.46	5,470	10.91	7,210	9.90	5,950	8.00	3,800
6	3.49	277	8.70	4,570	9.60	5,590	10.86	7,210	9.68	5,710	7.86	3,690
8	3.52	285	8.79	4,680	9.92	5,950	10.95	7,350	9.57	5,590	7.68	3,470
10	3.59	306	8.82	4,680	10.25	6,310	10.85	7,080	9.43	5,350	7.53	3,250
12	3.99	438	9.24	5,120	10.35	6,560	10.75	7,080	9.27	5,230	7.38	3,150
	April 2		April 3		April 4		April 5		April 6		April 7	
6	6.94	2,650	5.23	1,140	4.73	795	4.40	608	4.15	500	3.98	435
N	6.48	2,250	5.03	995	4.63	723	4.33	576	4.10	480	3.98	435
6	5.98	1,790	4.92	890	4.54	675	4.26	550	4.05	461	4.03	453
12	5.52	1,340	4.83	858	4.48	646	4.20	524	4.01	446	4.11	484
	April 8		April 9		April 10		April 11		April 12		April 13	
6	4.09	476	3.86	392	3.66	328	3.53	289	3.81	375	3.74	353
N	4.04	457	3.79	369	3.62	315	3.51	283	3.81	375	3.69	337
6	3.98	435	3.75	356	3.58	303	3.56	297	3.81	375	3.65	324
12	3.92	413	3.70	340	3.56	297	3.72	346	3.79	369	3.60	309
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.56	297	3.45	266	3.56	297	3.57	300	3.38	247	3.34	236
N	3.52	286	3.42	258	3.62	315	3.52	286	3.36	242	4.57	690
6	3.49	277	3.40	252	3.63	318	3.45	266	3.33	234	5.25	1,140
12	3.47	272	3.52	286	3.61	312	3.42	258	3.31	229	5.32	1,180

Locust Fork near Cleveland, Ala.

Location.--Lat 34°02', long. 86°34', in NE¼ sec. 6, T. 12 S., R. 1 E., at bridge on State Highway 38, 2 miles north of Cleveland and 2½ miles downstream from Graves Creek. Datum of gage is 536.94 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--300 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used from 8 a.m. Apr. 1 to Apr. 30. Gage heights used to half-tenths between 3.1 and 5.1 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 26,700 cfs Mar. 29 (gage height, 14.54 ft). 1936 to February 1951: Discharge, 47,000 cfs Dec. 28, 1942 (gage height, 19.2 ft, from gage then in use).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	486	2,200	9	1,260	1,030	17	564	435	25	733	1,080
2	436	2,130	10	973	818	18	1,270	361	26	610	843
3	394	1,960	11	843	713	19	2,130	1,420	27	537	810
4	609	1,280	12	772	786	20	1,720	2,080	28	7,160	772
5	1,680	1,000	13	836	630	21	1,300	1,340	29	24,800	677
6	1,540	848	14	810	526	22	1,040	3,700	30	11,600	513
7	1,590	986	15	683	455	23	876	2,500	31	3,510	
8	1,640	1,480	16	622	451	24	824	1,500			
Monthly mean discharge, in cfs										2,382	1,177
Runoff, in inches										9.15	4.38

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.64	558	2.73	610	13.71	22,700	12.95	19.500	7.00	4,470	5.16	2,600
4	2.62	546	3.06	817	14.10	24,700	12.56	17,900	6.76	4,250	5.07	2,450
6	2.61	541	3.74	1,300	14.34	25,700	12.12	16,100	6.54	3,920	4.99	2,310
8	2.61	541	4.54	2,000	14.48	26,700	11.67	14,700	6.33	3,700	4.90	2,310
10	2.60	535	5.90	3,300	14.54	26,700	11.10	12,800	6.17	3,600	4.84	2,220
N	2.59	530	7.23	4,700	14.54	26,700	10.46	11,100	6.00	3,400	4.78	2,180
2	2.59	530	7.97	5,670	14.48	26,700	9.68	9.050	5.84	3,200	4.72	2,130
4	2.59	530	9.48	8,560	14.30	25,700	9.04	7,400	5.71	3,100	4.65	2,040
6	2.59	530	11.12	12,800	14.08	24,700	8.47	6,420	5.59	3,000	4.59	2,000
8	2.58	524	12.22	16,400	13.94	23,700	8.00	5,670	5.47	2,900	4.53	1,900
10	2.59	530	12.90	19,100	13.68	22,700	7.64	5,180	5.36	2,800	4.47	1,860
12	2.60	535	13.33	20,800	13.30	20,800	7.30	4,820	5.27	2,700	4.42	1,820
	April 2		April 3		April 4		April 5		April 6		April 7	
6	4.33	1,720	4.96	2,360	3.93	1,420	3.56	1,040	3.31	876	3.14	772
N	4.63	2,000	4.48	1,860	3.81	1,220	3.48	1,010	3.27	843	3.25	843
6	5.21	2,600	4.22	1,590	3.73	1,180	3.42	940	3.22	824	3.69	1,140
12	5.22	2,600	4.07	1,460	3.64	1,110	3.36	908	3.17	791	4.21	1,590
	April 8		April 9		April 10		April 11		April 12		April 13	
6	4.27	1,640	3.65	1,110	3.26	843	3.05	714	3.21	817	2.97	671
N	4.13	1,500	3.52	1,010	3.21	817	3.01	689	3.21	817	2.90	628
6	3.99	1,380	3.42	940	3.16	784	3.03	702	3.15	778	2.85	598
12	3.80	1,220	3.33	908	3.10	746	3.10	746	3.06	720	2.80	569
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.76	546	2.62	471	2.53	426	2.60	466	2.40	372	2.44	390
N	2.72	524	2.59	456	2.58	451	2.54	436	2.38	364	3.33	908
6	2.69	508	2.56	441	2.63	476	2.48	408	2.34	346	5.40	2,800
12	2.64	481	2.53	426	2.63	476	2.43	385	2.33	342	5.43	2,800

Locust Fork at Trafford, Ala.

Location.--Lat 33°50', long. 86°45', in SW¼ sec. 9, T. 14 S., R. 2 W., at highway bridge three-quarters of a mile northwest of Trafford, 1½ miles east of Coaldale and 2¾ miles upstream from Curley Creek. Datum of gage is 309.12 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--622 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge adjusted for rate-of-change-of-stage effect 2 p.m. Mar. 28 to 10 p.m. Mar. 31. Gage heights used to half-tenths below and tenths above 5.7 ft.

Maxima.--March-April 1951: Discharge, 51,100 cfs Mar. 29; gage height, 53.40 ft Mar. 29.
1930 to February 1951: Discharge, 60,700 cfs Jan. 6, 1949 (gage height, 59.1 ft).

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	842	4,750	9	2,260	2,410	17	914	864	25	1,350	2,400
2	734	3,610	10	1,790	1,840	18	2,210	743	26	1,120	1,830
3	662	3,770	11	1,510	1,540	19	5,000	3,150	27	966	1,550
4	1,080	2,510	12	1,350	1,520	20	3,560	5,850	28	11,900	1,550
5	3,980	2,010	13	1,350	1,450	21	2,580	3,330	29	46,100	1,430
6	3,440	1,700	14	1,350	1,090	22	2,000	8,610	30	40,400	1,120
7	2,980	1,940	15	1,150	950	23	1,630	6,320	31	14,300	
8	2,880	3,040	16	1,000	880	24	1,510	3,560			
Monthly mean discharge, in cfs										5,287	2,577
Runoff, in inches										9.80	4.62

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.93	1,000	5.92	1,000	42.22	37,400	53.22	49,600	38.90	23,500	15.80	6,190
4	5.90	1,000	6.52	1,230	44.50	39,700	52.86	48,600	36.95	21,000	14.98	5,650
6	5.87	1,000	8.36	2,000	46.47	42,900	52.30	47,100	34.92	18,700	14.35	5,260
8	5.85	968	10.48	2,980	48.02	44,700	51.56	45,500	32.84	16,800	13.86	4,940
10	5.82	968	12.94	4,340	49,33	46,100	50.66	43,600	30.73	14,500	13.48	4,700
N	5.78	968	15.20	5,870	50.48	47,900	49.59	41,400	28.57	13,000	13.18	4,520
2	5.76	968	17.46	7,880	51.40	49,000	48.36	39,100	26.43	11,500	12.90	4,340
4	5.74	932	20,00	10,500	52.20	49,900	47.02	36,600	24.30	10,200	12.68	4,220
6	5.72	932	27.93	24,300	52.78	50,500	45.64	33,800	22.27	9,180	12.45	4,040
8	5.72	932	33.00	28,600	53.21	51,100	44.12	31,700	20.35	8,440	12.24	3,920
10	5.72	932	36.70	31,500	53.40	51,000	42.54	29,300	18.49	7,490	12.04	3,800
12	5.74	932	39.60	34,700	53.40	50,500	40.89	26,700	16.97	7,020	11.88	3,740
	April 2		April 3		April 4		April 5		April 6		April 7	
6	11.48	3,500	12.43	4,040	9.82	2,630	8.64	2,090	7.83	1,750	7.31	1,550
N	11.62	3,560	12.91	4,340	9.48	2,490	8.50	2,000	7.68	1,710	7.97	1,830
6	11.64	3,560	11.12	3,280	9.16	2,350	8.20	1,910	7.53	1,630	8.96	2,260
12	12.21	3,920	10.36	2,930	8.88	2,220	8.02	1,830	7.42	1,590	9.79	2,630
	April 8		April 9		April 10		April 11		April 12		April 13	
6	10.87	3,180	9.70	2,580	8.24	1,910	7.40	1,590	7.20	1,510	6.98	1,430
N	11.00	3,230	9.26	2,400	7.98	1,830	7.24	1,510	7.24	1,510	7.77	1,750
6	10.62	3,030	8.87	2,220	7.78	1,750	7.14	1,470	7.31	1,550	6.60	1,270
12	10.18	2,830	8.53	2,040	7.59	1,670	7.16	1,510	7.20	1,510	6.43	1,190
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.18	1,120	5.85	968	5.58	896	5.59	896	5.26	770	5.40	824
N	6.16	1,120	5.75	968	5.57	878	5.55	878	5.17	734	11.45	3,440
6	6.04	1,040	5.66	914	5.52	860	5.46	842	5.09	716	13.78	4,880
12	5.94	1,000	5.59	896	5.54	878	5.34	806	5.03	698	15.90	6,250

Turkey Creek at Morris, Ala.

Location.--Lat 33°44'25", long. 86°48'45", in SE¼ sec. 12, T. 15 S., R. 3 W., at bridge on U. S. Highway 31 at Morris, three-quarters of a mile downstream from Cunningham Creek and 4 miles upstream from mouth. Datum of gage is 345.15 ft above mean sea level, unadjusted.

Drainage area.--81 square miles.

Gage-height record.--Graph based on twice-daily readings of staff gage and crest readings from maximum-stage gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths between 1.5 and 2.7 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 9,500 cfs Mar. 29 (gage height, 20.12 ft). 1944 to February 1951: Discharge, 11,600 cfs Nov. 28, 1948 (gage height, 23.1 ft, from graph based on gage readings).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	96	368	9	162	176	17	103	108	25	126	242
2	88	284	10	126	153	18	982	94	26	110	201
3	81	225	11	110	140	19	642	1,170	27	122	162
4	162	189	12	126	138	20	373	614	28	2,770	153
5	569	166	13	144	115	21	275	822	29	5,500	126
6	323	151	14	126	101	22	211	1,380	30	1,050	110
7	242	249	15	110	101	23	182	512	31	542	
8	191	231	16	110	124	24	162	348			
Monthly mean discharge, in cfs										513	298
Runoff, in inches										7.31	4.11

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.66	110	2.65	311	20.12	9,500	6.80	1,610	3.89	656	3.07	428
4	1.65	110	3.09	428	20.10	9,500	6.18	1,400	3.81	627	3.02	400
6	1.65	110	3.76	627	19.30	8,950	5.67	1,220	3.73	598	2.98	400
8	1.63	110	4.70	890	16.70	7,190	5.37	1,120	3.65	569	2.94	373
10	1.60	103	5.80	1,260	14.58	5,790	5.13	1,010	3.58	569	2.90	373
N	1.59	103	7.10	1,720	13.82	5,260	4.92	950	3.49	540	2.87	373
2	1.60	103	8.55	2,270	11.52	3,810	4.75	920	3.42	512	2.84	348
4	1.61	103	10.25	3,050	10.55	3,280	4.54	830	3.33	484	2.81	348
6	1.72	118	12.56	4,490	9.70	2,770	4.37	801	3.26	484	2.77	348
8	1.87	144	14.88	5,980	8.90	2,390	4.24	743	3.21	456	2.74	323
10	2.07	182	17.30	7,590	8.15	2,130	4.12	714	3.16	456	2.71	323
12	2.32	231	19.35	9,020	7.45	1,830	4.00	685	3.11	428	2.68	323
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.60	299	2.35	242	2.12	191	2.00	172	1.91	153	1.78	135
N	2.53	287	2.27	221	2.08	191	1.97	162	1.90	153	1.97	162
6	2.47	264	2.20	211	2.05	182	1.95	162	1.88	153	3.25	456
12	2.40	252	2.16	201	2.03	182	1.92	153	1.80	135	2.78	348
	April 8		April 9		April 10		April 11		April 12		April 13	
6	2.32	231	2.06	182	1.92	153	1.83	144	1.89	153	1.72	118
N	2.23	221	2.01	172	1.92	153	1.78	135	1.83	144	1.69	118
6	2.17	201	1.99	172	1.88	153	1.80	135	1.77	126	1.67	110
12	2.08	191	1.95	162	1.86	144	1.83	144	1.71	118	1.67	110
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.62	103	1.57	96	1.70	118	1.67	110	1.53	96	3.30	484
N	1.58	103	1.58	103	1.74	126	1.63	110	1.52	89	7.20	1,760
6	1.56	96	1.62	103	1.80	135	1.59	103	1.51	89	7.40	1,830
12	1.56	96	1.66	110	1.74	126	1.57	96	1.59	103	5.28	1,080

Locust Fork at Sayre, Ala.

Location.--Lat 33°42'35", long. 86°59'00", in NW¼ sec. 29, T. 15 S., R. 4 W., at bridge on county highway at Sayre, 1½ miles downstream from Camp Creek. Datum of gage is 258.64 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--885 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to half-tenths below and tenths above 6.4 ft.

Maxima.--March-April 1951: Discharge, 47,200 cfs Mar. 30 (gage height, 43.87 ft). 1928-32, 1942 to February 1951: Discharge, 55,300 cfs Jan. 7, 1949 (gage height, 47.9 ft).

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,180	15,600	9	3,230	3,720	17	1,280	1,220	25	1,900	3,730
2	1,080	5,240	10	2,600	2,790	18	3,160	1,110	26	1,570	2,810
3	980	4,760	11	2,110	2,300	19	7,230	4,170	27	1,350	2,250
4	1,270	3,790	12	1,830	2,080	20	5,460	8,560	28	9,730	2,040
5	4,850	2,920	13	1,760	1,950	21	3,880	5,540	29	37,900	2,040
6	5,150	2,420	14	1,760	1,600	22	3,020	10,300	30	46,400	1,600
7	4,170	2,720	15	1,600	1,370	23	2,460	10,100	31	38,600	
8	3,800	3,970	16	1,420	1,280	24	2,110	5,620			
Monthly mean discharge, in cfs										6,608	3,987
Runoff, in inches										8.61	5.03

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.84	1,420	5.92	1,450	34.35	29,700	42.98	45,300	42.90	45,100	31.87	26,100
4	5.80	1,390	6.70	1,970	35.75	31,900	43.20	45,700	42.50	44,300	30.17	23,800
6	5.78	1,390	8.38	3,160	36.90	33,700	43.38	46,100	42.00	43,300	28.40	21,500
8	5.76	1,360	9.70	4,100	37.90	35,500	43.54	46,400	41.42	42,100	26.42	19,100
10	5.74	1,360	10.83	4,920	38.80	37,100	43.70	46,800	40.80	40,900	24.43	16,900
N	5.72	1,330	11.85	5,700	39.60	38,600	43.81	47,000	40.08	39,600	22.40	14,900
2	5.71	1,330	14.05	7,480	40.44	40,200	43.87	47,200	39.19	37,900	20.40	13,000
4	5.70	1,330	18.85	11,500	41.08	41,500	43.86	47,200	38.27	36,200	18.04	10,800
6	5.69	1,330	24.35	16,900	41.65	42,500	43.80	47,000	37.23	34,300	15.82	8,970
8	5.68	1,330	28.04	21,000	42.06	43,500	43.69	46,800	36.05	32,200	14.10	7,560
10	5.67	1,300	30.65	24,300	42.42	44,100	43.50	46,400	34.75	30,300	13.00	6,660
12	5.67	1,300	32.68	27,200	42.75	44,900	43.25	45,700	33.36	28,200	12.26	6,100
	April 2		April 3		April 4		April 5		April 6		April 7	
6	11.27	5,310	10.53	4,690	9.69	4,100	8.26	3,090	7.50	2,530	6.98	2,180
N	11.23	5,230	10.72	4,850	9.20	3,730	8.04	2,880	7.34	2,390	7.88	2,810
6	10.86	5,000	10.68	4,850	8.81	3,440	7.84	2,740	7.21	2,320	8.24	3,020
12	10.56	4,770	10.30	4,540	8.51	3,230	7.66	2,670	7.09	2,250	8.88	3,510
	April 8		April 9		April 10		April 11		April 12		April 13	
6	9.25	3,730	9.55	4,020	8.14	2,950	7.29	2,390	6.86	2,110	6.79	2,040
N	9.55	4,020	9.19	3,730	7.88	2,810	7.15	2,320	6.84	2,040	6.72	1,970
6	9.92	4,240	8.80	3,440	7.65	2,600	7.03	2,180	6.82	2,040	6.58	1,900
12	9.87	4,240	8.45	3,160	7.44	2,460	6.95	2,180	6.80	2,040	6.40	1,760
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.26	1,660	5.83	1,420	5.60	1,280	5.50	1,230	5.34	1,160	5.20	1,080
N	6.14	1,600	5.75	1,360	5.59	1,280	5.44	1,200	5.26	1,100	9.22	3,730
6	6.04	1,540	5.68	1,330	5.60	1,280	5.44	1,200	5.18	1,080	13.40	6,990
12	5.93	1,480	5.60	1,280	5.60	1,280	5.40	1,180	5.12	1,030	15.47	8,720

Yellow Creek near Tuscaloosa, Ala.

Location.--Lat 33°18'20", long. 87°28'40", in NE¼ sec. 16, T. 20 S., R. 9 W., at county road 8 miles upstream from mouth, and 8 miles northeast of Tuscaloosa.

Drainage area.--24 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--No discharge record available for this report.

Maxima.--March-April 1951: Gage height, 9.35 ft Mar. 29.

Remarks.--Station established January 1951. Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1			9			17			25		
2			10			18			26		
3			11			19			27		
4			12			20			28		
5			13			21			29		
6			14			22			30		
7			15			23			31		
8			16			24					
Monthly mean discharge, in cfs											
Runoff, in inches											

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.45		2.31		9.02		3.54		2.94		2.59	
4	1.45		2.85		9.29		3.38		2.91		2.56	
6	1.45		3.46		9.23		3.21		2.87		2.53	
8	1.45		3.71		8.49		3.20		2.84		2.50	
10	1.45		3.58		7.16		3.19		2.82		2.48	
N	1.46		3.35		5.93		3.17		2.80		2.46	
2	1.46		3.57		5.15		3.14		2.79		2.43	
4	1.47		5.30		5.14		3.10		2.75		2.40	
6	1.51		6.59		4.52		3.07		2.72		2.37	
8	1.59		7.81		4.18		3.03		2.68		2.35	
10	1.70		8.40		3.93		3.00		2.65		2.32	
12	1.85		8.62		3.69		2.97		2.62		2.30	
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.30		2.08		1.91		1.81		1.73		1.72	
N	2.24		2.04		1.88		1.79		1.72		1.86	
6	2.18		1.99		1.85		1.76		1.71		1.93	
12	2.14		1.95		1.83		1.74		1.70		1.97	
	April 8		April 9		April 10		April 11		April 12		April 13	
6	1.08		1.94		1.84		1.74		1.81		1.72	
N	1.98		1.91		1.82		1.72		1.79		1.71	
6	1.97		1.89		1.80		1.78		1.77		1.69	
12	1.96		1.87		1.77		1.80		1.75		1.66	
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.64		1.58		1.64		1.71		1.66		1.64	
N	1.63		1.57		1.70		1.70		1.64		1.86	
6	1.62		1.56		1.72		1.69		1.63		2.12	
12	1.60		1.55		1.72		1.67		1.62		2.20	

North River near Samantha, Ala.

Location.--Lat 33°28'45", long. 87°35'50", in SW¼ sec. 16, T. 18 S., R. 10 W., at county highway bridge half a mile east of Crump's store, 1½ miles upstream from Cripple Creek, and 4 miles north of Samantha. Datum of gage is 232.39 ft above mean sea level, datum of 1929.

Drainage area.--220 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 14,000 cfs and extended to peak stage on basis of velocity-area studies. Shifting-control method used 6 p.m. Apr. 3 to Apr. 30. Gage heights used to half-tenths between 3.1 and 4.8 ft, and to hundredths below and tenths above those limits.

Maxima.--March-April 1951: Discharge, 18,000 cfs Mar. 29 (gage height, 30.68 ft).
1938 to February 1951: Discharge, 14,000 cfs Mar. 13, 1950 (gage height, 26.0 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	304	968	9	474	638	17	367	520	25	443	690
2	278	1,010	10	407	542	18	2,250	432	26	387	535
3	256	891	11	426	531	19	3,200	1,010	27	382	443
4	691	718	12	790	787	20	1,700	1,430	28	7,990	387
5	2,800	617	13	600	662	21	990	1,210	29	17,000	336
6	1,400	542	14	509	547	22	690	5,100	30	10,600	283
7	790	745	15	453	454	23	580	2,460	31	1,510	
8	570	787	16	402	625	24	520	965			
Monthly mean discharge, in cfs										1,928	896
Runoff, in inches										10.10	4.54

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.55	362	3.88	1,040	28.45	15,800	27.45	15,000	5.68	2,000	4.00	1,100
4	2.55	362	9.10	3,650	29.34	16,600	26.70	14,500	5.28	1,800	3.94	1,070
6	2.55	362	12.30	5,250	30.00	17,300	25.90	14,000	5.06	1,700	3.88	1,040
8	2.54	356	14.04	6,220	30.45	17,700	25.00	13,400	4.87	1,590	3.82	990
10	2.54	356	15.28	7,020	30.64	17,900	23.96	12,600	4.74	1,510	3.78	990
N	2.54	356	16.35	7,720	30.68	18,000	22.68	11,800	4.60	1,430	3.74	965
2	2.54	356	17.54	8,420	30.54	17,800	21.20	10,800	4.48	1,370	3.69	940
4	2.55	362	20.70	10,500	30.24	17,500	19.30	9,590	4.38	1,320	3.65	915
6	2.58	377	22.76	11,900	29.77	17,100	16.70	7,910	4.31	1,260	3.61	890
8	2.61	392	24.25	12,800	29.26	16,600	12.75	5,500	4.23	1,240	3.57	865
10	2.70	438	25.50	13,700	28.70	16,100	9.00	3,600	4.15	1,180	3.53	865
12	3.09	635	27.08	14,800	28.11	15,600	6.34	2,280	4.06	1,120	3.50	840
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.47	815	3.71	940	3.52	740	3.30	640	3.12	550	3.04	509
N	4.02	1,100	3.55	865	3.46	715	3.26	620	3.10	540	3.69	840
6	4.10	1,150	3.63	815	3.40	690	3.20	590	3.09	535	3.89	940
12	3.98	1,100	3.58	790	3.35	665	3.16	570	3.06	520	3.76	865
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.72	840	3.35	665	3.14	560	2.99	484	3.68	840	3.38	690
N	3.60	790	3.30	640	3.10	540	2.95	464	3.63	815	3.34	665
6	3.50	740	3.24	610	3.07	525	3.13	555	3.54	765	3.28	630
12	3.41	690	3.19	585	3.02	499	3.51	740	3.45	715	3.24	610
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.18	580	2.97	474	3.18	580	3.12	550	2.92	448	2.87	423
N	3.10	540	2.93	453	3.51	740	3.04	509	2.88	428	3.57	765
6	3.06	520	2.89	433	3.35	665	2.99	484	2.86	418	5.39	1,750
12	3.00	489	2.88	428	3.23	605	2.96	469	2.83	402	5.51	1,800

Black Warrior River at Tuscaloosa, Ala.

Location.--Lat 33°12'45", long. 87°34'35", in NW¼ sec. 22, T. 21 S., R. 10 W., in Tuscaloosa, 55 ft downstream from Gulf, Mobile & Ohio Railroad bridge. Navigation dam at Tuscaloosa lock and dam, half a mile downstream, is control at low and medium stages. Datum of gage is 83.29 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Auxiliary water-stage recorder 500 ft downstream from Tuscaloosa lock and dam, at datum 1.16 ft lower.

Drainage area.--4,830 square miles.

Gage-height record.--Water-stage recorder graph at base gage until Mar. 19 when gage structure was destroyed by flood; thereafter, graph based on once-daily reading of upper gage at lock and dam. Water-stage recorder graph at auxiliary gage.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Discharge for Apr. 2 estimated because stage-discharge relation was indefinite.

Maxima.--March-April 1951: Discharge, 223,000 cfs 8 to 10 p.m. Mar. 29 (gage height, 66.0 ft).
1889-1905, 1928 to February 1951: Discharge, 215,000 cfs Apr. 18, 1900 (gage height, 67.7 ft).

Remarks.--Flood runoff not appreciably affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	6,900	103,000	9	13,900	15,000	17	7,670	7,400	25	9,680	19,900
2	6,370	47,000	10	11,200	11,200	18	21,900	7,500	26	8,320	14,200
3	6,010	23,400	11	9,680	9,090	19	45,200	15,800	27	7,950	11,200
4	8,500	17,600	12	13,600	10,300	20	31,800	35,400	28	63,700	9,090
5	28,200	13,200	13	12,800	9,380	21	21,500	34,500	29	184,000	8,520
6	23,900	10,900	14	12,200	7,950	22	16,800	72,000	30	201,000	6,900
7	18,000	11,800	15	9,980	7,950	23	12,500	56,700	31	183,000	
8	15,700	17,600	16	8,230	9,090	24	10,300	32,200			
Monthly mean discharge, in cfs										33,240	21,860
Runoff, in inches										7.93	5.05

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Black Warrior River near Eutaw, Ala.

Location.--Lat 32°49'05", long. 87°49'00", in SE¼ sec. 6, T. 21 N., R. 3 E., at bridge on State Highway 41 between Eutaw and Wedgeworth, 1¼ miles downstream from Big Creek and 4 miles southeast of Eutaw. Navigation dam at lock 7, 3 miles downstream, is control at low stages. Auxiliary staff gage at lock 7. Datum of gages is 53.11 ft above mean sea level, adjustment of 1912.

Drainage area.--5,820 square miles.

Gage-height record.--Water-stage recorder graph for base gage except Apr. 20-30. For auxiliary gages, graphs based on at least once-daily readings of staff gages.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements. Discharge for Apr. 20-30 computed from record of auxiliary gage. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 183,000 cfs Apr. 1; gage height, 59.1 ft Apr. 1. 1932 to February 1951: Discharge, 158,000 cfs Jan. 9, 1949; gage height, 56.8 ft Jan. 9, 1949.

Remarks.--Flood runoff affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	9,630	179,000	9	15,100	26,400	17	9,380	9,740	25	13,300	40,000
2	8,130	154,000	10	13,900	22,900	18	10,400	9,220	26	11,100	37,000
3	7,290	118,000	11	11,900	17,000	19	26,900	8,930	27	9,820	29,000
4	7,150	83,900	12	11,300	12,900	20	36,200	13,000	28	19,000	17,000
5	12,400	54,400	13	13,300	11,300	21	36,200	22,000	29	54,200	10,000
6	23,800	37,200	14	13,200	12,700	22	33,000	28,000	30	73,900	11,000
7	25,400	30,400	15	12,100	10,700	23	25,700	32,000	31	147,000	
8	21,400	28,300	16	10,800	9,240	24	16,600	37,000			
Monthly mean discharge, in cfs										23,860	37,070
Runoff, in inches										4.73	7.11

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	23.6	10,200	23.5	9,900	38.0	45,600	48.0	63,300	54.0	112,000	58.3	179,000
4	23.6	10,200	23.6	10,200	39.5	47,800	48.4	64,300	54.6	122,000	58.4	180,000
6	23.5	10,000	23.8	10,600	40.9	51,100	48.8	65,200	55.1	130,000	58.6	182,000
8	23.4	9,780	24.0	10,900	42.0	52,100	49.2	66,800	55.6	139,000	58.7	183,000
10	23.4	9,880	24.2	11,300	43.0	53,400	49.6	68,000	56.1	147,000	58.8	183,000
N	23.4	9,880	24.4	11,700	44.0	55,200	50.0	69,200	56.4	151,000	58.9	183,000
2	23.3	9,630	25.1	13,300	44.8	56,400	50.5	71,300	56.7	156,000	59.0	180,000
4	23.3	9,630	26.6	16,900	45.5	58,000	51.1	74,400	57.1	162,000	59.0	178,000
6	23.3	9,630	29.3	32,100	46.1	59,000	51.7	79,600	57.4	166,000	59.1	177,000
8	23.3	9,530	31.6	35,600	46.6	60,000	52.3	86,500	57.6	170,000	59.1	176,000
10	23.3	9,530	33.7	38,800	47.1	60,900	52.9	95,500	57.9	173,000	59.1	174,000
12	23.4	9,780	36.0	42,300	47.6	62,400	53.4	103,000	58.1	177,000	59.1	172,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	59.0	162,000	57.6	126,000	55.5	91,900	53.4	60,200	51.5	40,000	49.5	31,300
N	58.8	154,000	57.2	118,000	55.0	83,400	52.9	54,600	51.0	36,600	49.0	30,200
6	58.5	144,000	56.6	109,000	54.5	76,100	52.4	47,800	50.5	34,600	48.5	29,200
12	58.2	136,000	56.1	101,000	53.9	67,300	51.9	43,200	50.0	32,400	47.9	29,000
	April 8		April 9		April 10		April 11		April 12		April 13	
6	47.4	28,800	45.5	27,100	43.5	24,300	40.8	18,100	37.6	13,700	34.9	11,000
N	46.9	28,300	45.0	26,400	42.9	23,000	40.0	17,100	36.9	12,900	34.2	11,200
6	46.4	27,800	44.5	25,700	42.2	21,700	39.2	15,600	36.2	12,100	33.7	11,300
12	46.0	27,500	44.0	25,000	41.5	20,400	38.5	14,400	35.5	11,500	33.0	11,900
	April 14		April 15		April 16		April 17		April 18		April 19	
6	32.4	12,800	29.5	11,500	26.4	9,260	24.6	10,100	23.5	9,490	22.9	8,630
N	31.9	12,900	28.7	10,300	25.7	8,900	24.2	9,760	23.3	9,240	23.0	8,880
6	31.2	12,800	27.9	9,940	25.2	9,200	23.9	9,550	23.1	9,040	23.0	8,880
12	30.5	12,400	27.1	9,500	24.9	9,730	23.6	9,360	23.0	8,880	23.4	9,780

Prairie Creek near Gallion, Ala.

Location.--Lat 32°32', long. 87°41', in SE¼ sec. 9, T. 18 N., R. 4 E., at bridge on State Highway 13, 4 miles upstream from Little Prairie Creek and 4 miles northeast of Gallion. Auxiliary staff gage is lock 5 on Black Warrior River, three quarters of a mile upstream from mouth of Prairie Creek.

Drainage area.--170 square miles.

Gage-height record.--Water-stage recorder graph at base gage. Graph for auxiliary gage based on one to four gage readings daily.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements below 31,000 cfs and extended above. Discharge for backwater period, Apr. 1-13, determined from smoothed graph based on computed figures. Gage heights used to hundredths below 1.5 ft, to half-tenths between 1.5 and 4.0 ft, and to tenths above 4.0 ft.

Maxima.--March-April 1951: Discharge, 32,400 cfs Mar. 29 (gage height, 18.6 ft).
1940 to February 1951: Discharge, 39,000 cfs Dec. 28, 1942 (gage height in well, 19.3 ft; from outside gage, 20.1 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	52	60	9	46	370	17	33	81	25	69	107
2	48	-10	10	40	220	18	672	64	26	57	84
3	46	0	11	37	220	19	3,780	116	27	61	72
4	48	10	12	41	190	20	1,360	191	28	6,720	66
5	79	80	13	51	152	21	261	109	29	21,400	64
6	74	130	14	46	99	22	119	2,240	30	3,440	53
7	65	335	15	38	73	23	95	1,840	31	850	
8	53	744	16	34	82	24	79	307			
Monthly mean discharge, in cfs										1,284	272
Runoff, in inches										8.70	1.78

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.31	54	4.00	228	17.41	22,800	14.65	5,900	11.03	1,330	6.51	260
4	1.31	54	8.50	750	18.14	28,400	14.35	5,500	10.79	1,240	6.51	200
6	1.31	54	10.40	1,120	18.60	32,400	14.05	4,820	10.55	1,170	6.57	130
8	1.31	54	11.30	1,480	18.58	32,400	13.70	4,190	10.28	1,070	6.67	80
10	1.30	54	12.17	2,100	18.25	29,200	13.35	3,620	9.96	980	6.81	30
N	1.30	54	12.98	3,100	17.74	25,200	12.96	3,030	9.56	884	6.98	10
2	1.29	54	14.74	6,200	17.19	21,200	12.61	2,580	8.95	759	7.21	-10
4	1.29	54	15.62	9,900	16.68	17,400	12.25	2,190	8.28	628	7.46	-30
6	1.31	54	16.05	12,500	16.18	13,900	11.95	1,920	7.66	513	7.76	-40
8	1.49	54	16.46	16,000	15.75	11,100	11.67	1,700	7.15	440	8.11	-30
10	2.13	98	16.70	17,400	15.35	8,900	11.44	1,570	6.80	370	8.47	-30
12	2.75	134	17.00	19,600	14.98	7,200	11.24	1,430	6.60	310	8.85	-30
	April 2		April 3		April 4		April 5		April 6		April 7	
6	10.16	-20	12.85	0	13.10	0	12.66	60	11.96	120	11.11	180
N	11.33	0	13.03	0	13.04	0	12.51	80	11.76	130	11.30	320
6	12.08	0	13.13	0	12.94	10	12.33	100	11.55	140	11.28	460
12	12.55	0	13.13	0	12.81	30	12.15	110	11.32	150	11.40	616
	April 8		April 9		April 10		April 11		April 12		April 13	
6	11.44	722	9.99	485	8.00	210	6.75	230	5.35	200	3.79	162
N	11.34	755	9.11	278	7.69	220	6.40	220	4.98	190	3.31	150
6	11.30	829	8.64	230	7.38	220	6.09	210	4.65	190	2.86	140
12	10.89	722	8.31	220	7.07	230	5.74	200	4.25	180	2.45	130
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.15	113	1.47	74	1.36	69	1.69	86	1.29	60	1.48	76
N	1.85	95	1.45	74	1.46	74	1.60	82	1.26	64	2.00	104
6	1.63	84	1.40	72	2.00	104	1.46	74	1.21	62	2.90	162
12	1.50	76	1.35	69	1.85	95	1.34	69	1.20	62	3.20	183

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Tombigbee River near Coatopa, Ala.

Location.--Lat 32°26', long. 88°02', in sec. 19, T. 17 N., R. 1 E., at Moscow Memorial Bridge on U. S. Highway 80, 2 miles upstream from Sucarnoochee River and 5 miles southeast of Coatopa. Navigation dam at lock 3, 10 miles downstream, is control at low stages. Datum of gage is 29.30 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Auxiliary staff gage at lock 3 at different datum.

Drainage area.--15,500 square miles.

Gage-height record.--Water-stage recorder graph at base gage. Graph based on twice-daily readings of auxiliary staff gage at lock 3.

Discharge record.--Fall-stage-discharge relation defined by current-meter measurements except for periods of abnormal tributary inflow into reach between gages. Discharge for Mar. 30, 31 adjusted for effect of abnormal tributary inflow. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 217,000 cfs Apr. 5, 6; gage height, 52.4 ft Apr. 6, 7.
1928 to February 1951: Discharge, 199,000 cfs Jan. 14, 1949; gage height, 51.4 ft Mar. 29, 1929.

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	47,700	122,000	9	49,100	181,000	17	31,100	54,600	25	63,200	73,000
2	36,300	142,000	10	46,100	166,000	18	26,700	44,700	26	56,500	76,200
3	27,700	175,000	11	42,400	148,000	19	48,000	35,800	27	47,500	76,600
4	25,300	203,000	12	35,900	131,000	20	61,000	33,900	28	56,200	74,300
5	23,900	215,000	13	32,000	115,000	21	68,500	38,600	29	89,500	67,500
6	36,000	215,000	14	34,400	100,000	22	72,100	50,800	30	103,000	57,600
7	46,600	207,000	15	35,300	91,700	23	73,400	61,900	31	114,000	
8	50,500	196,000	16	33,800	72,800	24	69,000	69,800			
Monthly mean discharge, in cfs										51,050	109,900
Runoff, in inches										3.79	7.91

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	29.7	53,300	26.5	39,800	37.2	93,700	44.6	96,000	46.6	111,000	46.8	119,000
4	29.4	51,700	26.6	41,800	38.3	91,100	44.9	98,000	46.7	112,000	46.8	119,000
6	29.1	50,300	26.8	44,600	39.3	88,800	45.2	99,000	46.7	112,000	46.9	121,000
8	28.9	50,000	27.1	47,600	40.1	87,100	45.5	100,000	46.7	113,000	46.9	121,000
10	28.6	48,600	27.4	48,900	40.8	86,100	45.7	102,000	46.7	114,000	46.9	121,000
N	28.3	48,100	27.9	50,000	41.4	85,400	45.9	103,000	46.8	115,000	46.9	121,000
2	28.0	46,700	28.6	48,600	42.0	86,600	46.1	104,000	46.8	115,000	47.0	123,000
4	27.7	45,400	29.8	55,900	42.5	88,500	46.2	105,000	46.8	116,000	47.0	123,000
6	27.5	45,100	31.4	68,100	43.0	89,000	46.3	107,000	46.8	117,000	47.0	123,000
8	27.2	43,600	32.8	76,800	43.5	90,900	46.4	108,000	46.8	117,000	47.1	125,000
10	26.9	41,500	34.3	86,300	43.9	93,000	46.5	109,000	46.8	118,000	47.2	128,000
12	26.6	39,200	35.8	93,600	44.3	95,000	46.6	110,000	46.8	118,000	47.3	129,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	47.6	134,000	49.3	168,000	51.0	200,000	52.0	217,000	52.4	217,000	52.4	209,000
N	48.0	142,000	49.8	175,000	51.3	205,000	52.1	215,000	52.4	217,000	52.3	206,000
6	48.5	150,000	50.2	183,000	51.3	207,000	52.2	215,000	52.4	213,000	52.3	206,000
12	48.9	158,000	50.6	191,000	51.7	209,000	52.3	217,000	52.4	211,000	52.2	204,000
	April 8		April 9		April 10		April 11		April 12		April 13	
6	52.1	200,000	51.5	186,000	50.7	169,000	49.8	153,000	48.7	135,000	47.5	120,000
N	51.9	195,000	51.3	182,000	50.5	166,000	49.5	147,000	48.4	132,000	47.1	114,000
6	51.8	193,000	51.1	177,000	50.3	163,000	49.3	145,000	48.1	127,000	46.8	112,000
12	51.6	187,000	50.9	174,000	50.0	157,000	49.0	139,000	47.8	124,000	46.4	106,000
	April 14		April 15		April 16		April 17		April 18		April 19	
6	46.1	104,000	44.5	93,300	42.3	78,500	38.8	57,700	34.5	46,400	30.3	36,500
N	45.7	101,000	44.0	91,300	41.6	72,300	37.8	54,800	33.4	44,700	29.4	35,300
6	45.3	96,800	43.6	92,700	40.8	67,400	36.7	51,300	32.3	43,000	28.4	34,200
12	44.9	93,900	43.0	85,200	39.8	61,000	35.6	48,100	31.4	41,700	27.7	33,300

Sucarnoochee River at Livingston, Ala.

Location.--Lat 32°34', long. 88°12', in SE¼ sec. 33, T. 19 N., R. 2 W., at bridge on U. S. Highway 80, 500 ft upstream from Southern Railway bridge, three quarters of a mile southwest of Livingston, and 9 miles upstream from Alamuchee Creek. Datum of gage is 90.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1944.

Drainage area.--635 square miles.

Gage-height record.--Water-stage recorder graph, except Apr. 20, 21 when there was no record.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used Mar. 1-18. Discharge for Apr. 20, 21 estimated. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 21,500 cfs Mar. 30 (gage height, 27.64 ft). 1938 to February 1951: Discharge, 17,600 cfs Nov. 30, 1948 (gage height, 26.9 ft).

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	716	8,800	9	698	1,850	17	477	656	25	1,650	2,130
2	681	5,470	10	614	1,830	18	1,340	705	26	847	1,830
3	647	3,820	11	582	1,400	19	2,380	668	27	811	970
4	630	2,660	12	551	1,030	20	2,680	647	28	4,150	681
5	681	1,410	13	582	985	21	2,880	681	29	18,400	598
6	827	930	14	664	906	22	3,060	1,950	30	21,100	551
7	949	1,180	15	582	755	23	3,200	2,110	31	15,500	
8	847	1,740	16	521	670	24	2,790	2,130			
Monthly mean discharge, in cfs										2,969	1,725
Runoff, in inches										5.39	3.03

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	8.60	734	13.45	1,780	25.80	14,800	27.43	20,800	26.86	19,100	24.37	10,800
4	8.56	734	15.80	2,360	26.22	16,800	27.50	21,100	26.66	18,500	24.20	10,200
6	8.51	716	16.52	2,540	26.54	17,800	27.58	21,500	26.45	17,500	24.04	9,680
8	8.46	716	16.45	2,510	26.70	18,500	27.62	21,500	26.23	16,800	23.89	9,420
10	8.43	698	16.23	2,460	26.81	18,800	27.64	21,500	26.01	16,100	23.75	9,170
N	8.39	698	16.24	2,460	26.90	19,100	27.63	21,500	25.80	15,500	23.61	8,680
2	8.36	698	16.84	2,620	26.96	19,500	27.60	21,500	25.58	14,800	23.48	8,440
4	8.39	698	19.80	3,620	27.02	19,500	27.55	21,500	25.36	14,100	23.34	7,970
6	8.50	716	22.15	5,670	27.09	19,800	27.46	21,100	25.15	13,500	23.20	7,740
8	9.34	867	23.24	7,740	27.18	20,100	27.36	20,800	24.45	12,800	23.08	7,510
10	11.36	1,330	23.88	9,420	27.25	20,100	27.20	20,100	24.75	12,100	22.94	7,050
12	12.21	1,510	24.68	11,800	27.34	20,500	27.04	19,500	24.54	11,100	22.80	6,830
	April 2		April 3		April 4		April 5		April 6		April 7	
6	22.40	6,020	20.73	4,070	18.04	2,970	12.72	1,620	9.79	970	9.20	847
N	22.00	5,360	20.20	3,790	17.05	2,680	11.53	1,350	9.54	908	11.40	1,330
6	21.60	4,860	19.58	3,540	15.80	2,360	10.70	1,170	9.39	888	11.48	1,350
12	21.18	4,460	18.90	3,270	14.28	1,990	10.13	1,040	9.26	867	12.28	1,530
	April 8		April 9		April 10		April 11		April 12		April 13	
6	12.96	1,690	13.66	1,850	13.75	1,880	12.40	1,560	10.16	1,060	9.88	990
N	13.36	1,780	13.70	1,850	13.68	1,850	11.60	1,380	9.97	1,020	9.90	990
6	13.54	1,810	13.73	1,850	13.48	1,810	10.96	1,240	9.86	990	9.98	990
12	13.61	1,830	13.76	1,880	13.06	1,710	10.58	1,150	9.85	970	9.84	970
	April 14		April 15		April 16		April 17		April 18		April 19	
6	9.72	949	8.87	789	8.28	681	8.09	647	8.44	698	8.30	681
N	9.54	908	8.69	752	8.18	664	8.10	647	8.50	716	8.20	664
6	9.31	867	8.53	716	8.16	664	8.18	664	8.48	716	8.12	647
12	9.08	827	8.39	698	8.14	647	8.30	681	8.41	698	8.19	664

Tombigbee River near Leroy, Ala.

Location.--Lat 31°34', long. 88°02', in sec. 13, T. 7 N., R. 1 W., 4 miles upstream from Jackson Creek and 5 miles northwest of Leroy. Datum of gage is 7.28 ft below mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--19,100 square miles.

Gage-height record.--Graph based on twice-daily readings of staff gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge adjusted for rate-of-change-of-stage Mar. 1-23. Gage heights used to tenths.

Maxima.--March-April 1951: Discharge, 201,000 cfs Apr. 10, 11 (gage height, 45.8 ft). 1928 to February 1951: Discharge, 192,000 cfs Apr. 10, 1938; gage height, 46.0 ft Apr. 2, 1929.

Remarks.--Flood runoff not affected by artificial storage. Base data collected by Corps of Engineers; records of discharge computed by Geological Survey.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	74,600	123,000	9	46,300	194,000	17	33,900	146,000	25	70,800	76,000
2	68,100	127,000	10	47,700	199,000	18	36,300	134,000	26	72,000	75,300
3	57,400	130,000	11	46,600	201,000	19	51,300	123,000	27	72,000	75,300
4	46,800	132,000	12	44,200	199,000	20	57,400	111,000	28	72,300	76,000
5	37,200	139,000	13	39,700	193,000	21	60,700	98,000	29	89,000	77,500
6	33,500	150,000	14	37,100	184,000	22	64,300	86,000	30	107,000	78,200
7	38,200	165,000	15	36,500	172,000	23	67,200	80,400	31	117,000	
8	43,700	183,000	16	35,400	159,000	24	69,400	76,800			
Monthly mean discharge, in cfs										57,210	132,100
Runoff, in inches										3.45	7.72

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	34.6	72,700	34.4	71,400	35.8	81,100	37.9	100,000	39.2	114,000	39.7	120,000
4	34.6	72,700	34.3	70,800	36.0	82,600	38.1	102,000	39.3	116,000	39.7	120,000
6	34.6	72,700	34.3	70,800	36.2	84,300	38.2	103,000	39.3	116,000	39.8	122,000
8	34.5	72,000	34.3	70,800	36.4	86,000	38.4	105,000	39.3	116,000	39.8	122,000
10	34.5	72,000	34.3	70,800	36.6	87,600	38.5	106,000	39.4	117,000	39.8	122,000
N	34.5	72,000	34.4	71,400	36.8	89,300	38.6	108,000	39.4	117,000	39.9	123,000
2	34.5	72,000	34.4	71,400	37.0	91,000	38.8	110,000	39.4	117,000	39.9	123,000
4	34.5	72,000	34.5	72,000	37.1	92,000	38.9	111,000	39.5	118,000	40.0	124,000
6	34.4	71,400	34.6	72,700	37.3	94,000	38.9	111,000	39.5	118,000	40.0	124,000
8	34.4	71,400	34.8	74,000	37.4	95,000	39.0	112,000	39.6	119,000	40.1	125,000
10	34.4	71,400	35.1	76,000	37.5	96,000	39.1	113,000	39.6	119,000	40.1	125,000
12	34.4	71,400	35.5	79,000	37.8	99,000	39.1	113,000	39.6	119,000	40.1	125,000
	April 2		April 3		April 4		April 5		April 6		April 7	
6	40.2	126,000	40.4	129,000	40.6	131,000	41.1	137,000	41.8	146,000	42.8	159,000
N	40.2	126,000	40.4	129,000	40.7	132,000	41.2	139,000	42.0	149,000	43.2	165,000
6	40.3	128,000	40.5	130,000	40.8	134,000	41.4	141,000	42.3	153,000	43.6	170,000
12	40.4	129,000	40.6	131,000	40.9	135,000	41.6	144,000	42.6	157,000	44.0	176,000
	April 8		April 9		April 10		April 11		April 12		April 13	
6	44.2	179,000	45.1	191,000	45.6	198,000	45.8	201,000	45.7	200,000	45.4	196,000
N	44.5	183,000	45.3	194,000	45.7	200,000	45.8	201,000	45.6	198,000	45.2	193,000
6	44.7	186,000	45.4	196,000	45.8	201,000	45.8	201,000	45.6	198,000	45.1	191,000
12	44.9	189,000	45.5	197,000	45.8	201,000	45.8	201,000	45.5	197,000	45.0	190,000
	April 14		April 15		April 16		April 17		April 18		April 19	
6	44.8	187,000	43.9	175,000	43.0	162,000	42.0	149,000	41.0	136,000	40.1	125,000
N	44.6	184,000	43.7	172,000	42.7	158,000	41.8	146,000	40.8	134,000	39.9	123,000
6	44.4	182,000	43.5	169,000	42.5	156,000	41.6	144,000	40.5	130,000	39.7	120,000
12	44.2	179,000	43.2	165,000	42.2	152,000	41.3	140,000	40.3	128,000	39.5	118,000

Tennessee River Basin

Toccoa River near Dial, Ga.

Location.--Lat 34°47'24", long. 84°14'24", 1.4 miles upstream from Shallow Ford bridge, 1.8 miles upstream from Stanley Creek, and 2.5 miles northwest of Dial, Fannin County. Datum of gage is 1,782.08 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--177 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 5,000 cfs and extended to peak stage. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 7,410 cfs Mar. 29 (gage height, 9.04 ft).
1913 to February 1951: Discharge, 9,200 cfs July 9, 1916 (gage height, 10.0 ft), from rating curve extended above 5,000 cfs.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	390	1,170	9	630	1,030	17	531	740	25	495	834
2	382	1,250	10	555	932	18	540	725	26	472	795
3	374	1,140	11	675	900	19	615	850	27	459	795
4	446	1,010	12	700	1,040	20	615	784	28	1,050	756
5	504	927	13	670	910	21	565	710	29	4,710	1,190
6	430	878	14	615	888	22	536	1,360	30	2,160	990
7	1,090	960	15	570	828	23	518	1,010	31	1,430	
8	812	1,340	16	545	784	24	513	888			
Monthly mean discharge, in cfs										793	947
Runoff, in inches										5.17	5.97

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.83	464	1.82	459	5.50	3,140	5.20	2,840	3.76	1,590	3.28	1,260
4	1.83	464	1.83	464	6.44	4,140	5.00	2,650	3.71	1,560	3.25	1,240
6	1.82	459	1.90	495	7.35	5,230	4.85	2,520	3.65	1,520	3.23	1,220
8	1.82	459	2.03	555	8.70	6,970	4.67	2,350	3.60	1,480	3.20	1,200
10	1.82	459	2.34	710	9.01	7,370	4.52	2,220	3.55	1,440	3.18	1,190
N	1.82	459	3.00	1,080	8.35	6,520	4.38	2,090	3.51	1,420	3.16	1,180
2	1.82	459	3.50	1,410	7.46	5,360	4.26	1,990	3.48	1,400	3.14	1,160
4	1.82	459	3.58	1,470	6.86	4,640	4.16	1,910	3.43	1,360	3.12	1,150
6	1.82	459	3.59	1,470	6.36	4,060	4.07	1,840	3.40	1,340	3.10	1,140
8	1.82	459	3.58	1,470	5.88	3,530	3.98	1,760	3.37	1,320	3.08	1,130
10	1.82	459	3.92	1,720	5.60	3,240	3.90	1,700	3.33	1,290	3.06	1,120
12	1.82	459	4.57	2,260	5.38	3,020	3.83	1,640	3.31	1,280	3.04	1,100
	April 2		April 3		April 4		April 5		April 6		April 7	
6	2.99	1,070	3.15	1,170	2.92	1,030	2.77	944	2.67	888	2.62	861
N	3.28	1,260	3.07	1,120	2.88	1,010	2.74	927	2.65	878	2.60	850
6	3.57	1,460	3.00	1,080	2.84	984	2.71	910	2.63	866	2.87	1,000
12	3.37	1,320	2.96	1,060	2.80	960	2.68	894	2.62	861	3.71	1,560
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.69	1,540	2.96	1,060	2.79	954	2.66	883	3.12	1,150	2.72	916
N	3.29	1,260	2.90	1,020	2.76	938	2.64	872	2.88	1,010	2.69	900
6	3.14	1,160	2.86	996	2.72	916	2.62	861	2.79	954	2.67	888
12	3.03	1,100	2.83	978	2.68	894	3.07	1,120	2.74	927	2.72	916
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.69	900	2.58	839	2.48	784	2.42	751	2.38	730	2.35	715
N	2.67	888	2.57	834	2.48	784	2.40	740	2.38	730	2.52	806
6	2.64	872	2.55	822	2.46	773	2.38	730	2.35	720	2.96	1,060
12	2.58	839	2.48	784	2.45	768	2.37	725	2.35	715	2.67	888

Supplemental record.--Mar. 29, 9:30 a.m., 9.04 ft, 7,410 cfs.

Blue Ridge Reservoir

Location.--Lat 34°52'52", long. 84°16'49", 400 ft upstream from Blue Ridge Dam on Toccoa River and 2½ miles northeast of Blue Ridge, Fannin County, Ga. To convert elevations given herein to datum of 1929 supplementary adjustment of 1936, 0.18 ft should be subtracted.

Drainage area.--232 square miles.

Gage-height record.--Water-stage recorder graph.

Maxima.--March-April 1951: Contents, 93,600 cfs-days Apr. 30 (elevation, 1,686.33 ft). 1930 to February 1951: Contents, 100,900 cfs-days Feb. 11, 1946 (elevation, 1,690.83 ft).

Remarks.--Storage capacity, 99,600 cfs-days, of which 92,300 cfs-days is controlled storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	1,649.35	45,500	1,669.10	68,400
2	1,649.35	45,500	1,670.21	69,900
3	1,649.77	46,000	1,671.14	71,200
4	1,650.28	46,500	1,671.96	72,300
5	1,650.47	46,700	1,672.70	73,300
6	1,650.44	46,600	1,673.40	74,300
7	1,650.51	46,700	1,674.27	75,600
8	1,652.42	48,700	1,675.32	77,000
9	1,653.13	49,400	1,675.95	77,900
10	1,653.31	49,600	1,676.66	79,000
11	1,654.09	50,500	1,677.40	80,000
12	1,654.28	50,700	1,678.17	81,200
13	1,654.46	50,900	1,678.85	82,200
14	1,654.66	51,100	1,679.48	83,100
15	1,654.94	51,400	1,680.11	84,000
16	1,655.38	51,900	1,680.53	84,600
17	1,655.62	52,200	1,681.06	85,400
18	1,656.22	52,800	1,681.41	86,000
19	1,656.68	53,300	1,681.91	86,700
20	1,656.79	53,500	1,682.41	87,500
21	1,656.69	53,400	1,682.94	88,300
22	1,656.56	53,200	1,683.98	90,000
23	1,656.42	53,000	1,684.68	91,100
24	1,656.55	53,200	1,685.18	91,800
25	1,657.04	53,700	1,685.53	92,400
26	1,656.91	53,600	1,685.95	93,000
27	1,656.86	53,500	1,686.13	93,300
28	1,658.53	55,500	1,686.07	93,200
29	1,664.71	62,900	1,686.27	93,600
30	1,666.79	65,500	1,686.33	93,600
31	1,668.07	67,100		

Toccoa River near Blue Ridge, Ga.

Location.--Lat 34°53'14", long. 84°17'07", three-eights of a mile downstream from Blue Ridge Dam of Tennessee Valley Authority, 2¼ miles west of Morganton, and 2⅝ miles northeast of Blue Ridge, Fannin County. Datum of gage is 1,538.77 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--233 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 4,000 cfs and extended to peak stage. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 1,870 cfs 8:30 p.m. Apr. 28 (gage height, 5.10 ft). 1913 to February 1951: Discharge, 13,900 cfs July 9, 1916 (gage height, 13.0 ft, site and datum then in use), from rating curve extended above 5,000 cfs.

Remarks.--Almost complete regulation by Blue Ridge Reservoir.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	18	18	9	19	208	17	342	21	25	18	359
2	468	86	10	421	19	18	18	286	26	656	203
3	18	19	11	77	19	19	228	224	27	570	604
4	18	19	12	664	21	20	547	84	28	72	1,020
5	478	19	13	554	19	21	716	21	29	279	996
6	540	19	14	562	19	22	741	22	30	19	1,010
7	272	20	15	301	19	23	741	23	31	19	
8	19	20	16	138	151	24	441	178			
Monthly mean discharge, in cfs										321	192
Runoff, in inches										1.59	0.917

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Ocoee River at Copperhill, Tenn.

Location.--Lat 34°59'29", long. 84°22'36", 0.2 mile upstream from Fightingtown Creek and 0.4 mile downstream from Copperhill, Polk County. Datum of gage is 1,445.28 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--352 square miles.

Gage-height record.--Water-stage recorder graph except for period Mar. 22-28, for which graph was reconstructed on basis of normal daily pattern.

Discharge record.--Stage-discharge relation defined by current-meter measuremente below 6,000 cfs and extended on basis of slope-area determination at gage height 9.83 ft. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 10,500 cfs Mar. 29 (gage height, 9.83 ft). 1903-13, 1918-25, 1942 to February 1951: Gage height observed, 18.5 ft Nov. 19, 1906, site and datum then in use (discharge not determined).

Remarks.--Flow regulated by Blue Ridge Reservoir. Highwater discharge affected by backwater from Fightingtown Creek.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	176	511	9	284	624	17	488	307	25	288	604
2	514	664	10	638	377	18	293	368	26	735	539
3	240	539	11	398	354	19	440	715	27	767	772
4	189	444	12	861	464	20	671	312	28	974	1,230
5	634	401	13	862	383	21	745	364	29	5,680	1,240
6	694	377	14	850	354	22	1,060	527	30	1,180	1,300
7	885	407	15	522	338	23	922	360	31	651	
8	401	546	16	448	474	24	673	475			
Monthly mean discharge, in cfs										779	546
Runoff, in inches										2.55	1.73

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.50	715	2.35	598	5.15	4,100	3.50	1,780	2.54	749	2.29	553
4	2.22	504	1.97	349	5.69	4,800	3.37	1,620	2.52	732	2.28	546
6	1.98	354	1.78	258	6.72	6,040	3.24	1,460	2.48	699	2.27	539
8	1.81	271	1.82	275	8.78	8,920	3.08	1,280	2.46	684	2.26	532
10	1.73	239	2.13	444	9.78	10,400	2.98	1,170	2.43	659	2.24	518
N	3.08	1,280	3.18	1,390	9.22	9,580	2.88	1,060	2.42	651	2.24	518
2	3.47	1,740	2.86	1,040	7.80	7,490	2.82	1,000	2.39	628	2.23	511
4	3.32	1,560	2.81	995	6.58	5,870	2.77	956	2.37	612	2.21	497
6	2.48	699	2.90	1,080	5.48	4,520	2.71	900	2.35	598	2.20	490
8	2.06	401	3.25	1,480	4.50	3,200	2.67	863	2.33	582	2.18	477
10	1.92	323	3.69	2,030	3.87	2,280	2.62	818	2.32	575	2.17	470
12	3.16	1,370	4.36	3,000	3.61	1,920	2.58	783	2.31	568	2.17	470
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Supplemental record.--Mar. 29, 10:30 a.m., 9.83 ft, 10,500 cfs.

Fightingtown Creek at McCaysville, Ga.

Location.--Lat 34°58'53", long. 84°23'12", 0.2 mile upstream from county highway bridge, 0.9 mile upstream from mouth, and 0.9 mile west of McCaysville, Fannin County. Datum of gage is 1,449.75 ft above mean sea level, datum of 1929 supplementary adjustment of 1936.

Drainage area.--70.9 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 5,420 cfs Mar. 29 (gage height, 11.92 ft).
1942 to February 1951: Discharge, 5,280 cfs Jan. 20, 1947 (gage height, 11.32 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	172	580	9	265	446	17	232	325	25	202	325
2	164	596	10	238	414	18	229	322	26	199	316
3	161	556	11	295	394	19	247	340	27	193	310
4	190	480	12	283	460	20	250	325	28	686	298
5	229	439	13	283	390	21	235	307	29	3,470	298
6	190	414	14	265	369	22	223	496	30	1,080	289
7	418	450	15	250	352	23	217	380	31	723	
8	331	588	16	241	337	24	214	340			
Monthly mean discharge, in cfs										399	398
Runoff, in inches										6.49	6.26

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.16	193	2.15	190	8.40	2,780	5.45	1,350	3.86	814	3.40	620
4	2.16	193	2.17	196	9.35	3,440	5.21	1,270	3.79	786	3.38	612
6	2.16	193	2.21	208	10.60	4,360	5.00	1,210	3.74	766	3.36	604
8	2.16	193	2.40	265	11.60	5,160	4.79	1,150	3.70	750	3.34	596
10	2.16	193	2.85	408	11.92	5,420	4.63	1,100	3.65	728	3.32	588
N	2.16	193	3.46	644	11.65	5,200	4.47	1,040	3.62	714	3.30	580
2	2.16	193	3.97	858	11.00	4,680	4.35	998	3.59	700	3.28	572
4	2.16	193	4.10	910	9.85	3,800	4.24	959	3.55	682	3.26	564
6	2.16	193	4.04	886	8.45	2,820	4.14	924	3.51	664	3.24	556
8	2.16	193	4.48	1,040	7.03	2,020	4.06	894	3.48	652	3.22	548
10	2.15	190	5.85	1,500	6.22	1,650	3.98	862	3.45	640	3.20	540
12	2.15	190	7.23	2,120	5.76	1,460	3.91	834	3.42	628	3.19	536
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.16	524	3.29	576	3.08	492	2.92	446	2.87	414	2.82	397
N	3.19	536	3.21	544	3.06	484	2.93	436	2.86	411	2.81	394
6	3.64	723	3.16	524	3.02	468	2.90	425	2.84	404	3.00	460
12	3.50	660	3.12	508	2.98	453	2.88	418	2.82	397	3.86	814
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.51	664	2.99	456	2.89	422	2.80	390	3.21	544	2.83	400
N	3.21	544	2.96	446	2.87	414	2.79	386	2.98	453	2.82	397
6	3.10	500	2.93	436	2.85	408	2.77	380	2.99	422	2.80	390
12	3.04	476	2.90	425	2.82	397	2.89	422	2.85	408	2.78	383
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.77	380	2.70	355	2.66	343	2.62	331	2.58	319	2.58	319
N	2.75	372	2.69	352	2.66	343	2.61	328	2.58	319	2.62	331
6	2.72	362	2.67	346	2.64	337	2.60	325	2.57	316	2.74	369
12	2.70	355	2.66	343	2.62	331	2.58	319	2.56	313	2.69	352

Ocoee No. 3 Reservoir

Location.--Lat 35°02'25", long. 84°28'00", at Ocoee No. 3 Dam on Ocoee River, 5 miles west of Ducktown, Polk County, Tenn. Datum of gage is 1,410.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1936; gage readings have been adjusted to mean sea level.

Drainage area.--496 square miles.

Gege-height record.--Water-stage recorder graph.

Maxima.--March-April 1951: Contents, 6,000 cfs-days Mar. 29 (elevation, 1,435.24 ft).
1942 to February 1951: Contents, 7,800 cfs-days Jan. 8, 1946 (elevation, 1,436.7 ft, estimated).

Remarks.--Storage capacity, 5,900 cfs-days, of which,3,700 cfs-days is controlled storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	1,429.91	4,500	1,434.83	5,800
2	1,430.36	4,600	1,434.66	5,800
3	1,430.01	4,500	1,432.18	5,100
4	1,429.84	4,500	1,431.49	4,900
5	1,430.22	4,600	1,431.47	4,900
6	1,430.20	4,600	1,430.80	4,700
7	1,431.92	5,000	1,431.17	4,800
8	1,431.87	5,000	1,432.23	5,100
9	1,430.46	4,600	1,433.21	5,400
10	1,430.26	4,600	1,432.99	5,300
11	1,429.48	4,400	1,432.81	5,200
12	1,430.49	4,600	1,433.27	5,400
13	1,431.45	4,900	1,432.96	5,300
14	1,432.46	5,200	1,432.42	5,100
15	1,432.24	5,100	1,431.62	4,900
16	1,431.65	4,900	1,431.37	4,900
17	1,430.95	4,800	1,430.20	4,600
18	1,429.30	4,400	1,431.02	4,800
19	1,428.42	4,200	1,432.22	5,100
20	1,428.35	4,200	1,431.20	4,800
21	1,428.80	4,300	1,430.10	4,600
22	1,430.65	4,700	1,431.90	5,000
23	1,431.60	4,900	1,431.65	4,900
24	1,431.41	4,900	1,431.45	4,900
25	1,429.60	4,400	1,430.67	4,700
26	1,429.31	4,400	1,428.02	4,100
27	1,429.70	4,500	1,426.07	3,800
28	1,435.24	6,000	1,426.70	3,900
29	1,434.23	5,600	1,427.92	4,100
30	1,433.73	5,500	1,429.41	4,400
31	1,433.87	5,600		

Ocoee River at Emf, Tenn.

Location.--Lat 35°05'48", long. 84°32'07", 700 ft downstream from Tennessee Valley Authority power plant, half a mile upstream from Emf, Polk County, and 2 miles downstream from Goforth Creek. Datum of gage is 837.88 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--524 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 17,000 cfs and extended to peak stage. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 19,800 cfs Mar. 29 (gage height, 11.30 ft).
1913 to February 1951: Discharge, 29,400 cfs July 10, 1916 (gage height, 13.7 ft), from rating curve extended above 17,000 cfs.

Remarks.--Almost complete regulation by Blue Ridge and Ocoee No. 3 Reservoirs and by power plant above station.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	658	1,350	9	1,190	1,300	17	1,150	1,170	25	1,120	1,350
2	698	1,660	10	1,170	1,240	18	1,150	754	26	1,120	1,680
3	674	2,480	11	1,210	1,130	19	1,150	1,150	27	1,030	1,670
4	613	1,550	12	1,370	1,280	20	1,180	1,150	28	1,860	1,670
5	970	1,170	13	1,310	1,250	21	1,180	1,150	29	14,800	1,660
6	1,170	1,270	14	1,240	1,210	22	1,180	1,310	30	3,840	1,640
7	1,500	1,250	15	1,160	1,170	23	1,170	1,270	31	2,180	
8	1,300	1,670	16	1,140	1,180	24	1,180	1,220			
Monthly mean discharge, in cfs										1,699	1,367
Runoff, in inchee										3.74	2.91

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Die-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.09	851	4.36	1,130	9.70	13,900	7.14	6,050	5.44	2,570	4.88	1,770
4	4.00	770	4.38	1,150	9.70	13,900	7.14	6,050	5.44	2,570	4.87	1,760
6	4.24	1,000	4.40	1,170	9.70	13,900	6.58	4,680	5.43	2,560	4.87	1,760
8	4.29	1,050	4.47	1,250	11.10	19,100	6.58	4,680	5.40	2,510	4.86	1,750
10	4.28	1,040	4.57	1,370	11.20	19,500	5.94	3,400	5.40	2,510	4.48	1,270
N	4.36	1,130	4.65	1,480	11.10	19,100	5.50	2,670	5.08	2,040	4.03	797
2	4.37	1,140	4.68	1,510	11.10	19,100	5.22	2,240	4.95	1,860	3.90	690
4	4.36	1,130	4.72	1,570	11.00	18,700	5.90	3,330	4.92	1,830	3.87	666
6	4.36	1,130	4.77	1,630	9.65	13,700	5.86	3,260	4.91	1,810	4.10	860
8	4.36	1,130	5.15	2,140	8.58	10,100	5.85	3,240	4.90	1,800	4.34	1,100
10	4.36	1,130	6.57	4,660	7.32	6,510	5.45	2,590	4.89	1,790	4.85	1,740
12	4.37	1,140	7.10	5,950	7.15	6,080	5.45	2,590	4.88	1,770	4.85	1,740
	April 2		April 3		April 4		April 5		April 6		April 7	
6 N 6 12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6 N 6 12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6 N 6 12												

Supplemental record.--Mar. 29, 1 p.m., 11:30 ft, 19,800 cfs.

Parksville (Ocoee No. 1) Reservoir

Location.--Lat 35°05'44", long. 84°38'51", at Parksville Dam on Ocoee River at Parksville, Polk County, Tenn., 13½ miles east of Cleveland. To convert elevations given herein to datum of 1929, supplementary adjustment of 1936, 7.0 ft should be added.

Drainage area.--595 square miles.

Gage-height record.--Indicator gage read hourly.

Maxima.--March-April 1951: Contents, 45,500 cfs-days Mar. 29 (elevation, 830.2 ft).
1914 to February 1951: Contents, 53,300 cfs-days July 9, 1916.

Remarks.--Storage capacity, 45,900 cfs days, of which 16,600 cfs-days is controlled storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	819.9	36,400	824.3	40,100
2	819.7	36,300	823.9	39,700
3	820.3	36,700	823.5	39,400
4	820.9	37,200	823.3	39,200
5	820.8	37,100	822.6	38,600
6	820.7	37,000	822.0	38,100
7	821.1	37,400	823.5	39,400
8	821.2	37,400	825.0	40,700
9	820.6	37,000	824.9	40,600
10	821.0	37,300	824.3	40,100
11	822.4	38,400	823.6	39,500
12	822.4	38,400	823.0	38,900
13	822.2	38,300	823.3	38,400
14	821.6	37,800	823.6	39,500
15	821.0	37,300	824.8	40,500
16	820.7	37,000	824.2	40,000
17	820.9	37,200	823.8	39,600
18	822.1	38,200	822.9	38,900
19	821.8	37,900	822.4	38,400
20	821.4	37,600	822.0	38,100
21	821.0	37,300	823.1	39,000
22	820.5	36,900	824.7	40,400
23	819.9	36,400	824.5	40,200
24	821.1	37,400	824.3	40,100
25	822.2	38,300	824.2	40,000
26	821.7	37,800	824.4	40,200
27	821.3	37,500	824.2	40,000
28	824.4	40,200	825.8	41,400
29	830.2	45,500	827.3	42,800
30	826.7	42,200	826.7	42,200
31	825.3	41,000		

Ocoee River at Parksville, Tenn.

Location.--Lat 35°05'48", long. 84°39'15", 0.4 mile downstream from dam and Ocoee No. 1 power plant of Tennessee Valley Authority at Parksville, Polk County. Datum of gage is 716.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--595 square miles.

Gage-height record.--Water-stage recorder graph except for period 4:30 p.m. to 8:30 p.m. Mar. 29, for which graph was drawn on basis of floodmark. Gage heights used to hundredths.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 15,000 cfs and extended to peak stage.

Maxima.--March-April 1951: Discharge, 21,700 cfs Mar. 29 (gage height, 20.22 ft). 1911-16, 1921 to February 1951: Discharge, 19,000 cfs Apr. 6, 1936 (gage height, 18.32 ft).

Remarks.--Almost complete regulation by Blue Ridge, Ocoee No. 3, and Parksville Reservoirs.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,070	2,610	9	1,840	1,650	17	1,080	1,610	25	190	1,480
2	912	2,220	10	900	1,930	18	200	1,640	26	1,610	1,500
3	200	2,860	11	205	2,020	19	1,610	1,660	27	1,390	1,830
4	195	1,960	12	1,640	2,100	20	1,610	1,660	28	1,550	225
5	1,180	1,900	13	1,850	2,050	21	1,630	215	29	12,000	236
6	1,300	1,860	14	1,900	220	22	1,750	215	30	9,440	2,060
7	1,540	215	15	1,850	215	23	1,720	1,620	31	4,060	
8	1,410	749	16	1,530	1,790	24	190	1,530			
Monthly mean discharge, in cfs										1,921	1,461
Runoff, in inches										3.72	2.74

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	3.14	195	3.17	210	6.48	3,330	16.23	16,100	7.75	4,850	6.46	3,300
4	3.14	195	3.15	200	6.54	3,400	14.92	14,300	7.56	4,620	6.36	3,180
6	3.14	195	3.15	200	6.41	3,240	13.56	12,400	7.42	4,450	6.31	3,120
8	6.00	2,750	5.75	2,460	7.50	4,550	12.18	10,500	7.29	4,300	6.27	3,070
10	6.13	2,910	6.20	2,990	11.45	9,550	11.09	9,060	7.15	4,130	6.26	3,060
N	6.12	2,890	6.18	2,970	14.84	14,200	10.19	7,890	7.03	3,990	6.24	3,040
2	5.08	1,760	5.00	1,680	16.25	16,100	9.76	7,340	6.94	3,880	6.20	2,990
4	4.96	1,640	5.00	1,680	17.50	17,900	9.21	6,650	6.79	3,700	5.09	1,770
6	4.96	1,640	5.01	1,690	20.00	21,400	8.81	6,150	6.71	3,600	5.05	1,730
8	4.95	1,630	6.18	2,970	19.30	20,400	8.52	5,790	6.63	3,510	5.00	1,680
10	3.30	280	3.25	252	18.49	19,300	8.26	5,460	6.58	3,450	5.06	1,740
12	3.15	200	6.05	2,810	17.50	17,900	7.99	5,140	6.53	3,390	4.97	1,650
	April 2		April 3		April 4		April 5		April 6		April 7	
6 N 6 12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6 N 6 12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6 N 6 12												

Supplemental record.--Mar. 29, 5:30 p.m., 20.22 ft, 21,700 cfs.

South Chickamauga Creek near Chickamauga, Tenn.

Location.--Lat 35°00'50", long. 85°12'27", a third of a mile upstream from bridge on U. S. Highway 11, 1½ miles south of Chickamauga, Hamilton County, 6 miles east of Chattanooga, and 12 miles upstream from mouth. Datum of gage is 651.12 ft above mean sea level, datum of 1929.

Drainage area.--428 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 27,600 cfs Mar. 30 (gage height, 20.73 ft).
1928 to February 1951: Discharge, 24,900 cfs Nov. 29, 1948 (gage height, 19.83 ft).

Remarks.--Flood runoff affected by backwater from Tennessee River at times.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	517	3,440	9	2,550	3,350	17	809	680	25	585	1,340
2	478	1,720	10	1,210	1,700	18	777	604	26	528	1,020
3	447	1,520	11	917	1,180	19	949	1,070	27	489	1,160
4	454	1,180	12	1,040	1,260	20	1,330	1,970	28	1,990	1,180
5	977	974	13	1,480	1,040	21	1,020	1,320	29	15,900	861
6	841	861	14	1,500	869	22	845	3,650	30	22,100	756
7	1,830	1,100	15	1,120	768	23	733	4,230	31	8,190	
8	3,200	4,080	16	925	735	24	661	2,960			
Monthly mean discharge, in cfs										2,464	1,619
Runoff, in inches										6.64	4.22

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.28	503	2.22	482	12.84	7,230	20.53	27,000	16.74	12,800	10.97	4,600
4	2.27	500	2.23	486	13.68	8,850	20.69	27,500	16.10	11,500	10.63	4,350
6	2.26	496	2.42	553	14.45	10,500	20.73	27,600	15.50	10,400	10.26	4,130
8	2.25	492	3.05	805	15.17	12,100	20.67	26,900	14.93	9,270	9.86	3,880
10	2.24	489	4.23	1,290	15.85	13,800	20.50	25,100	14.38	8,330	9.48	3,680
N	2.23	486	5.55	1,890	16.58	15,800	20.21	22,800	13.85	7,540	9.07	3,480
2	2.23	486	6.33	2,240	17.30	17,900	19.79	20,700	13.35	6,890	8.64	3,280
4	2.22	482	6.77	2,440	18.00	19,700	19.42	19,200	12.88	6,370	8.13	3,050
6	2.21	478	7.62	2,820	18.66	21,600	18.97	17,800	12.45	5,920	7.55	2,790
8	2.21	478	9.15	3,520	19.15	22,900	18.48	16,500	12.03	5,500	6.94	2,510
10	2.21	478	10.85	4,500	19.76	24,700	17.98	15,400	11.65	5,160	6.44	2,290
12	2.22	482	11.94	5,730	20.22	26,100	17.36	14,100	11.28	4,840	5.98	2,080
	April 2		April 3		April 4		April 5		April 6		April 7	
6	5.20	1,750	4.75	1,580	3.99	1,240	3.43	1,010	3.12	877	2.97	814
N	5.04	1,680	4.74	1,560	3.80	1,160	3.33	966	3.07	856	2.92	793
6	5.00	1,670	4.56	1,480	3.66	1,100	3.24	928	3.03	840	3.58	1,070
12	4.77	1,570	4.27	1,360	3.53	1,050	3.17	898	3.02	835	7.95	2,970
	April 8		April 9		April 10		April 11		April 12		April 13	
6	9.89	3,900	9.67	3,780	5.70	1,960	3.94	1,220	4.07	1,280	3.67	1,110
N	10.57	4,310	8.88	3,390	4.80	1,580	3.75	1,140	4.06	1,270	3.47	1,020
6	10.73	4,420	7.47	2,750	4.40	1,420	3.66	1,100	4.04	1,260	3.34	970
12	10.39	4,200	6.92	2,500	4.15	1,310	3.93	1,220	3.90	1,200	3.24	928
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.15	890	2.91	789	2.79	739	2.70	701	2.49	613	2.44	592
N	3.09	865	2.84	760	2.80	743	2.65	680	2.45	596	3.37	982
6	3.04	844	2.79	739	2.77	730	2.59	655	2.43	588	4.58	1,490
12	2.97	814	2.76	726	2.75	722	2.54	634	2.40	575	5.29	1,790

Tennessee River at Hales Bar, near Chattanooga, Tenn.

Location.--Lat 35°01'43", long. 85°32'49", at bridge on U. S. Highways 41, 64, and 72, 1½ miles downstream from Hales Bar Dam, 5½ miles southeast of Jasper, Marion County, 7 miles upstream from Sequatchie River, and 34.5 miles downstream from Chattanooga. Datum of gage is 588.51 ft above mean sea level, datum of 1929, supplementary adjustment of 1936. Auxiliary gage at Widows Bar, 22.0 miles downstream. Datum of auxiliary gage is 581.01 ft above mean sea level, datum of 1929.

Drainage area.--21,800 square miles.

Gage-height record.--Water-stage recorder graphs from base and auxiliary gages.

Discharge record.--Stage-fall-discharge relations defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 155,000 cfs 12 m.-1 p.m. Mar 30 (gage height, 23.89 ft).
1930 to February 1951: Discharge, 264,000 cfs Dec. 31, 1932, Jan. 1, 1933; gage-height, 31.2 ft Dec. 31, 1932, Jan. 1, 1933, Mar. 30, 1936.
Stage known, 44.6 ft, present site and datum, in March 1867. A stage of 37.4 ft, present site and datum occurred Mar. 8, 1917 (discharge, 345,000 cfs, from rating curve extended above 261,000 cfs).

Remarks.--Flow regulated by many reservoirs above station.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	39,200	93,500	9	58,500	40,500	17	46,900	33,400	25	33,900	30,000
2	37,100	63,200	10	55,700	36,100	18	37,200	31,100	26	34,800	32,900
3	36,700	53,600	11	45,600	35,300	19	38,200	31,600	27	33,800	32,400
4	35,100	49,300	12	48,900	35,300	20	38,600	31,200	28	47,700	34,800
5	37,100	48,800	13	60,600	34,500	21	38,300	23,900	29	122,000	33,500
6	42,500	43,800	14	68,200	33,700	22	34,200	32,200	30	153,000	33,500
7	49,500	33,900	15	65,100	34,500	23	34,500	32,400	31	134,000	
8	61,800	41,300	16	58,800	35,200	24	35,800	27,900			
Monthly mean discharge, in cfs										53,650	38,440
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Short Creek near Albertville, Ala.

Location.--Lat 34°18'05", long. 86°10'53", in NE¼ sec. 35, T. 8 S., R. 4 E., 325 ft downstream from county highway bridge, 800 ft downstream from Turkey Creek, 3 miles northeast of Albertville, and 4.4 miles upstream from Scarham Creek. Datum of gage is 865.80 ft above mean sea level, datum of 1929, supplementary adjustment of 1936.

Drainage area.--91.6 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 14,500 cfs and extended to peak stage.

Maxima.--March-April 1951: Discharge, 13,200 cfs Mar. 29 (gage height, 15.55 ft). 1945 to February 1951: Discharge, 14,800 cfs Jan. 5, 1949 (gage height, 16.37 ft). The flood of December 1942 reached a stage of 21.2 ft, from floodmark.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	150	576	9	348	333	17	180	152	25	202	319
2	136	930	10	288	270	18	531	130	26	172	261
3	124	594	11	243	246	19	548	1,010	27	156	231
4	204	444	12	246	294	20	432	589	28	2,990	234
5	444	356	13	291	213	21	348	441	29	8,280	200
6	308	305	14	240	185	22	288	1,570	30	1,520	160
7	540	443	15	208	160	23	249	548	31	782	
8	460	524	16	190	172	24	246	400			
Monthly mean discharge, in cfs										689	410
Runoff, in inches										8.67	4.99

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.90	160	3.00	185	15.20	12,500	7.40	2,460	4.83	915	4.24	643
4	2.89	158	3.29	267	15.55	13,200	7.00	2,160	4.76	877	4.21	630
6	2.89	158	3.86	484	15.32	12,800	6.65	1,920	4.69	846	4.18	616
8	2.88	156	4.70	850	14.66	11,500	6.27	1,690	4.63	818	4.15	602
10	2.88	156	5.30	1,150	13.93	10,100	5.96	1,510	4.58	796	4.12	589
N	2.87	154	5.93	1,490	13.13	8,720	5.70	1,350	4.53	774	4.10	580
2	2.87	154	6.60	1,890	12.21	7,240	5.49	1,240	4.48	751	4.07	568
4	2.88	156	8.15	3,030	11.28	6,040	5.35	1,180	4.43	728	4.04	556
6	2.88	156	11.15	5,880	10.44	5,100	5.23	1,120	4.39	710	4.01	544
8	2.88	156	12.39	7,500	9.25	3,960	5.11	1,060	4.35	692	3.98	532
10	2.89	158	12.79	8,140	8.42	3,250	5.01	1,000	4.32	679	3.96	524
12	2.91	162	14.15	10,500	7.80	2,760	4.96	980	4.27	656	3.93	512
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.88	492	4.24	643	3.82	468	3.58	372	3.43	316	3.30	270
N	5.20	1,100	4.08	572	3.75	440	3.54	356	3.40	305	3.54	358
6	5.94	1,490	3.97	528	3.69	416	3.50	340	3.37	294	4.02	548
12	4.70	850	3.88	492	3.63	392	3.46	326	3.33	280	4.73	864
	April 8		April 9		April 10		April 11		April 12		April 13	
6	4.17	612	3.53	352	3.34	284	3.21	243	3.50	340	3.14	222
N	3.85	480	3.48	333	3.30	270	3.18	234	3.42	312	3.10	210
6	3.70	420	3.43	316	3.27	261	3.21	243	3.28	264	3.07	202
12	3.60	380	3.38	298	3.23	249	3.32	277	3.20	240	3.05	198
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.02	190	2.92	165	2.93	168	2.90	160	2.78	136	3.28	264
N	3.00	185	2.90	160	2.97	178	2.85	150	2.75	130	5.39	1,200
6	2.97	178	2.88	156	3.02	190	2.82	144	2.73	126	6.50	1,830
12	2.95	172	3.86	152	2.98	180	2.80	140	2.72	124	5.25	1,120

Guntersville Reservoir

Location.--Lat 34°25'17", long. 86°23'34", at Guntersville Dam on Tennessee River in sec. 14, T. 7 S., R. 2 E., 11 miles northwest of Guntersville, Ala., and 82.1 miles downstream from Hales Bar Dam. Datum of gage is mean sea level, datum of 1929.

Drainage area.--24,450 square miles.

Gage-height record.--Water-stage recorder graph.

Maxima.--March-April 1951: Contents, 570,000 cfs-days Mar. 30 (elevation, 593.47 ft). 1939 to February 1951: Elevation, 596.29 ft Mar. 2, 1944.

Remarks.--Contents based on backwater profile. Total level pool capacity is 513,600 cfs-days, of which 82,100 cfs-days is controlled flood storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	593.03	445,000	593.79	497,000
2	593.01	444,000	593.93	484,000
3	593.09	447,000	593.99	483,000
4	593.25	450,000	593.95	479,000
5	593.19	452,000	593.87	477,000
6	593.01	447,000	594.01	475,000
7	593.37	466,000	593.99	474,000
8	593.67	477,000	594.27	486,000
9	593.59	473,000	594.59	494,000
10	593.31	462,000	594.79	500,000
11	593.05	450,000	594.93	504,000
12	592.99	452,000	594.93	504,000
13	592.95	457,000	595.17	512,000
14	593.13	464,000	595.17	512,000
15	593.29	467,000	595.25	515,000
16	593.21	461,000	595.31	516,000
17	593.19	452,000	595.33	516,000
18	593.31	453,000	595.29	515,000
19	593.39	458,000	595.43	520,000
20	593.43	458,000	595.45	520,000
21	593.43	458,000	595.45	518,000
22	593.33	454,000	595.47	522,000
23	593.21	450,000	595.41	519,000
24	593.41	455,000	595.25	512,000
25	593.45	457,000	595.01	505,000
26	593.51	458,000	594.85	501,000
27	593.35	452,000	594.69	496,000
28	594.19	509,000	594.67	494,000
29	593.73	565,000	594.63	494,000
30	593.47	570,000	594.65	493,000
31	593.41	532,000		

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Paint Rock River near Woodville, Ala.

Location.--Lat 34°37'27", long. 86°18'23", in NW¼ sec. 10, T. 5 S., R. 3 E., 20 ft downstream from bridge on U. S. Highway 72, 1,000 ft downstream from Southern Railway bridge, 2 miles west of Woodville, and 4 miles upstream from Little Paint Creek. Datum of gage is 570.95 ft above mean sea level, datum of 1929.

Drainage area.--320 square miles.

Gage-height record.--Water-stage recorder graph. Gage heights used to hundredths.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 27,000 cfs and extended to peak stage.

Maxima.--March-April 1951: Discharge, 27,500 cfs Mar. 29; gage height, 20.32 ft Mar. 29. 1935 to February 1951: Discharge, 31,300 cfs Dec. 28, 1942; gage height, 20.84 ft Jan. 5, 1949.

Remarks.--Flood runoff not affected by artificial storage. Stage-discharge relation affected by rate of change of stage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	426	k3,730	9	1,240	1,660	17	835	810	25	542	k1,850
2	384	k2,360	10	820	1,060	18	1,030	666	26	464	1,050
3	352	1,890	11	656	860	19	1,790	k1,450	27	412	785
4	347	1,310	12	574	1,400	20	1,610	k3,660	28	k2,720	735
5	520	958	13	572	1,680	21	1,250	k4,170	29	k21,000	670
6	760	782	14	614	1,070	22	952	3,630	30	k13,300	644
7	k1,770	742	15	638	832	23	762	k4,250	31	k5,640	
8	k2,020	1,700	16	698	732	24	642	k3,350			
Monthly mean discharge, in cfs										2,108	1,684
Runoff, in inches										7.59	5.87

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	4.19	429	4.18	428	16.66	k7,010	19.67	k20,500	17.29	k7,040	15.48	k4,400
4	4.18	428	5.40	668	17.56	k10,100	19.47	k19,500	17.14	k6,680	15.31	k4,270
6	4.15	422	7.30	1,150	18.68	k16,900	19.24	k17,200	16.99	k6,320	15.14	k4,150
8	4.13	419	9.15	1,710	19.45	k22,800	19.00	k15,500	16.84	k6,020	14.94	k4,020
10	4.11	416	10.50	k2,700	19.88	k25,600	18.81	k14,100	16.68	k5,750	14.76	k3,890
N	4.08	411	11.45	k2,960	20.17	k27,500	18.59	k12,600	16.54	k5,500	14.56	k3,750
2	4.06	407	12.18	k3,310	20.27	k27,400	18.38	k11,400	16.41	k5,320	14.36	k3,620
4	4.05	406	12.89	k3,650	20.32	k27,400	18.18	k10,300	16.26	k5,150	14.14	k3,460
6	4.04	404	13.68	k4,010	20.26	k26,300	17.99	k9,450	16.12	k5,010	13.88	k3,320
8	4.03	402	14.29	k4,310	20.17	k25,200	17.80	k8,680	15.97	k4,840	13.62	k3,180
10	4.03	402	14.93	k4,790	20.00	k23,500	17.63	k8,070	15.81	k4,680	13.34	k3,050
12	4.03	402	15.82	k5,790	19.88	k22,200	17.47	k7,550	15.64	k4,520	13.03	k2,910
	April 2		April 3		April 4		April 5		April 6		April 7	
6	12.07	k2,580	9.93	1,990	8.28	1,440	6.76	1,000	6.02	820	5.52	695
N	11.20	k2,310	9.70	1,900	7.75	1,280	6.54	950	5.87	782	5.45	679
6	10.60	k2,130	9.38	1,790	7.34	1,160	6.35	902	5.73	748	5.87	782
12	10.22	k2,040	8.88	1,620	7.03	1,070	6.18	860	5.61	718	6.67	982
	April 8		April 9		April 10		April 11		April 12		April 13	
6	8.42	1,490	9.73	1,920	7.21	1,120	6.25	878	6.87	1,030	9.76	1,930
N	9.49	1,830	9.04	1,670	6.89	1,040	6.10	840	8.26	1,440	9.22	1,740
6	10.00	2,010	9.28	1,440	6.65	978	6.02	820	9.28	1,760	8.48	1,500
12	10.07	k2,020	7.65	1,260	6.48	935	6.16	855	9.80	1,940	7.79	1,300
	April 14		April 15		April 16		April 17		April 18		April 19	
6	7.32	1,160	6.24	875	5.70	740	5.92	795	5.63	722	5.38	644
N	6.98	1,060	6.05	828	5.65	728	6.12	845	5.46	681	7.42	1,190
6	6.69	988	5.88	785	5.63	722	6.07	832	5.32	652	10.00	2,010
12	6.44	925	5.75	752	5.69	738	5.85	778	5.21	630	11.77	k2,920

k Computed by using rate of change of stage as a factor.

Flint River near Chase, Ala.

Location.--Lat 34°49'08", long. 86°28'52", in SW¼ sec. 36, T. 2 S., R. 1 E., 250 ft downstream from Nashville, Chattanooga & St. Louis Railway bridge, a third of a mile downstream from Brier Fork, 0.4 mile downstream from county highway bridge, and 5 miles northeast of Chase. Datum of gage is 640.37 ft above mean sea level, datum of 1929.

Drainage area.--342 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 24,700 cfs Mar. 29 (gage height, 19.30 ft).
1930 to February 1951: Discharge, 37,700 cfs Jan. 5, 1949 (gage height, 23.61 ft).
Flood of September 1929 reached a stage of 26.0 ft, from flood marks (discharge, 46,000 cfs, from rating curve extended above 27,000 cfs).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	560	1,330	9	625	820	17	680	835	25	520	745
2	515	1,420	10	545	725	18	945	655	26	475	685
3	490	1,280	11	500	810	19	1,160	2,020	27	455	775
4	510	1,010	12	485	1,560	20	1,060	1,440	28	5,510	715
5	715	855	13	600	980	21	825	960	29	18,300	680
6	635	775	14	695	770	22	700	2,050	30	4,460	560
7	820	810	15	685	660	23	630	1,270	31	1,880	
8	800	1,100	16	700	910	24	580	890			
Monthly mean discharge, in cfs										1,550	1,003
Runoff, in inches										5.23	3.27

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.05	460	2.30	585	18.38	21,900	11.50	7,520	5.53	2,300	4.06	1,480
4	2.05	460	2.90	885	19.12	24,200	10.58	6,580	5.34	2,190	3.99	1,440
6	2.04	455	4.00	1,450	19.30	24,700	9.77	5,780	5.17	2,090	3.92	1,410
8	2.03	450	5.48	2,270	19.20	24,400	9.04	5,090	4.96	1,980	3.86	1,370
10	2.03	450	7.00	3,300	18.85	23,400	8.40	4,480	4.83	1,910	3.80	1,340
N	2.03	450	8.05	4,170	18.28	21,600	7.80	3,960	4.71	1,840	3.75	1,310
2	2.03	450	9.25	5,290	17.50	19,300	7.32	3,560	4.60	1,780	3.71	1,290
4	2.03	450	10.78	6,780	16.53	16,400	6.92	3,240	4.50	1,720	3.67	1,270
6	2.03	450	12.50	8,600	15.50	13,600	6.56	2,970	4.40	1,670	3.63	1,250
8	2.04	455	14.02	10,500	14.40	11,200	6.24	2,750	4.30	1,620	3.58	1,220
10	2.06	465	15.55	13,700	13.35	9,600	5.98	2,570	4.21	1,570	3.55	1,210
12	2.12	495	17.10	18,100	12.42	8,510	5.74	2,420	4.14	1,530	3.51	1,190
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.56	1,220	3.91	1,400	3.22	1,040	2.90	885	2.71	790	2.60	735
N	4.05	1,480	3.76	1,270	3.13	1,000	2.84	855	2.69	780	2.59	730
6	4.26	1,590	3.47	1,170	3.05	960	2.79	830	2.65	760	2.84	855
12	4.24	1,580	3.33	1,100	2.98	925	2.74	805	2.63	750	3.27	1,070
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.50	1,180	2.87	870	2.58	725	2.50	685	4.64	1,800	3.22	1,040
N	3.45	1,160	2.74	805	2.57	720	2.47	670	4.31	1,620	3.04	955
6	3.22	1,040	2.66	765	2.57	720	2.83	850	3.96	1,370	2.91	890
12	3.02	945	2.62	745	2.55	710	4.02	1,460	3.50	1,180	2.82	845
	April 14		April 15		April 16		April 17		April 18		April 19	
6	2.73	800	2.49	680	2.52	695	2.94	905	2.48	675	2.45	660
N	2.67	770	2.45	660	3.08	975	2.76	815	2.43	650	6.73	3,090
6	2.61	740	2.41	640	3.36	1,120	2.64	755	2.38	625	6.90	3,220
12	2.55	710	2.39	630	3.16	1,020	2.56	715	2.36	615	5.15	2,080

Tennessee River at Whitesburg, Ala.

Location.--Lat 34°34'27", long. 86°32'42", in NE¼ sec. 30, T. 5 S., R. 1 E., at Whitesburg, a quarter of a mile upstream from Aldridge Creek, a third of a mile upstream from Clement C. Clay Bridge on State Highway 38, 5½ miles downstream from Flint River, 11 miles south of Huntsville, 15½ miles downstream from Guntersville Dam, and 58½ miles upstream from Wheeler Dam. Datum of gage is 549.00 ft above mean sea level, datum of 1929. Auxiliary gage at bridge on U. S. Highway 31 at Decatur, 28½ miles downstream. Datum of auxiliary gage is 534.30 ft above mean sea level, datum of 1929.

Drainage area.--25,610 square miles.

Gage-height record.--Water-stage recorder graphs from base and auxiliary gages.

Discharge record.--Stage-fall-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 249,000 cfs 4 p.m. Mar. 30; gage height, 21.49 ft 9-10 p.m. Mar. 30.
1924-36, 1937 to February 1951: Discharge, 283,000 cfs Jan. 1, 1927 (gage height, 23.2 ft, site and datum then in use).
Stage known, 31.4 ft, present site and datum, in March 1867, from high-water profile by Corps of Engineers.

Remarks.--Flow regulated by many reservoirs above station.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	45,700	203,000	9	77,900	50,100	17	68,000	44,500	25	39,100	57,900
2	43,600	142,000	10	79,700	43,900	18	50,600	40,600	26	40,700	56,400
3	41,400	101,000	11	71,100	42,700	19	52,600	53,100	27	46,700	52,800
4	39,200	74,200	12	58,100	47,600	20	52,300	63,000	28	72,200	48,000
5	44,400	68,900	13	66,200	47,600	21	52,500	52,200	29	177,000	46,000
6	55,400	61,300	14	74,100	43,800	22	51,800	75,900	30	246,000	44,100
7	62,100	51,300	15	74,400	43,600	23	49,300	72,800	31	240,000	
8	75,000	52,600	16	74,100	47,000	24	43,000	60,700			
Monthly mean discharge, in cfs										73,040	62,950
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Elk River near Prospect, Tenn.

Location.--Lat 35°01'39", long. 86°56'52", at highway bridge 1.1 miles downstream from Richland Creek, 3.2 miles east of Prospect, Giles County, 5.2 miles upstream from Ford Creek, and 7.7 miles upstream from Tennessee-Alabama State line. Datum of gage is 563.29 ft above mean sea level, datum of 1929.

Drainage area.--1,784 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 28,600 cfs 12 m. to 4 p.m. Mar. 30 (gage height, 27.52 ft).
1904-8, 1919 to February 1951: Discharge, 100,000 cfs Feb. 14, 1948 (gage height, 38.17 ft), from rating curve extended above 60,000 cfs.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	3,820	20,000	9	6,040	5,070	17	3,280	4,000	25	3,390	6,210
2	3,520	13,100	10	5,180	4,720	18	5,850	3,600	26	2,970	4,720
3	3,210	7,360	11	4,170	4,700	19	7,620	3,320	27	2,650	4,160
4	3,360	6,120	12	3,610	8,020	20	7,880	3,200	28	11,400	3,610
5	4,680	5,210	13	3,510	6,930	21	7,040	4,410	29	25,900	3,580
6	4,560	4,450	14	3,550	5,920	22	5,620	12,900	30	28,300	3,840
7	5,520	4,440	15	3,470	4,790	23	4,750	11,900	31	24,800	
8	5,770	6,220	16	3,340	4,770	24	3,990	8,320			
Monthly mean discharge, in cfs										6,869	6,320
Runoff, in inches										4.44	3.95

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Big Nance Creek at Courtland, Ala.

Location.--Lat 34°40'12", long. 87°19'02", in SW¼ sec. 30, T. 4 S., R. 7 W., at bridge on State Highway 20, at Courtland, 12¾ miles upstream from mouth. Datum of gage is 537.60 ft above mean sea level, datum of 1929.

Drainage area.--166 square miles.

Gage-height record.--Water-stage recorder graph except for period 9 a.m. to 12m. Mar. 29, for which graph was reconstructed on basis of normal pattern.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 10,500 cfs Mar. 29 (gage height, 22.06 ft). 1935-40, 1945 to February 1951: Discharge, 12,300 cfs Jan. 7, 1950 (gage height, 22.60 ft).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	214	814	9	1,000	268	17	220	689	25	213	332
2	192	548	10	369	218	18	646	316	26	184	266
3	173	641	11	271	200	19	1,440	435	27	171	232
4	174	442	12	258	282	20	1,090	985	28	2,480	277
5	332	340	13	355	284	21	554	582	29	9,260	855
6	371	295	14	417	201	22	366	1,160	30	7,090	583
7	632	268	15	314	173	23	293	1,450	31	3,340	
8	1,760	276	16	254	520	24	252	546			
Monthly mean discharge, in cfs										1,119	483
Runoff, in inches										7.77	3.24

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.94	173	4.27	381	20.11	6,620	21.45	9,200	18.15	4,940	8.46	1,330
4	2.93	171	5.85	687	20.65	7,600	21.28	8,860	17.53	4,660	7.70	1,120
6	2.92	170	7.34	1,040	21.09	8,480	21.07	8,440	16.81	4,340	7.09	972
8	2.91	168	9.10	1,510	21.48	9,260	20.88	8,060	16.00	4,000	6.58	853
10	2.90	167	10.62	1,990	21.77	9,860	20.66	7,620	15.19	3,680	6.22	771
N	2.90	167	11.78	2,380	21.95	10,200	20.48	7,280	14.34	3,340	5.96	711
2	2.90	167	12.88	2,760	22.04	10,400	20.26	6,880	13.52	3,010	5.74	663
4	2.91	168	13.95	3,180	22.05	10,400	20.02	6,470	12.76	2,720	5.57	625
6	2.90	167	15.49	3,800	22.00	10,300	19.72	6,050	11.96	2,440	5.42	594
8	2.90	167	16.90	4,380	21.91	10,200	19.44	5,730	11.13	2,150	5.32	574
10	2.96	175	18.15	4,940	21.77	9,860	19.10	5,440	10.25	1,870	5.22	554
12	3.27	220	10.24	5,550	21.62	9,540	18.67	5,180	9.32	1,580	5.13	536
	April 2		April 3		April 4		April 5		April 6		April 7	
6	5.07	524	5.80	676	4.81	476	4.12	355	3.80	303	3.60	271
N	5.12	534	5.82	680	4.56	431	4.03	340	3.74	293	3.58	268
6	5.26	562	5.58	528	4.38	400	3.94	325	3.68	284	3.56	265
12	5.52	614	5.25	560	4.22	372	3.86	313	3.63	276	3.56	265
	April 8		April 9		April 10		April 11		April 12		April 13	
6	3.57	266	3.67	282	3.30	225	3.10	195	3.42	243	3.87	314
N	3.61	273	3.58	268	3.24	216	3.07	191	3.63	276	3.67	282
6	3.69	285	3.48	252	3.20	210	3.13	200	2.92	322	3.47	250
12	3.72	290	3.39	238	3.14	201	3.30	225	4.01	337	3.32	228
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.20	210	2.94	173	4.30	386	6.48	830	4.10	352	3.40	240
N	3.12	198	2.90	167	5.00	510	6.06	734	3.81	306	4.36	396
6	3.06	189	2.88	164	5.81	678	5.35	580	3.59	269	5.49	623
12	2.98	178	3.11	196	6.42	817	4.62	442	3.45	248	6.33	796

Supplemental record.--Mar. 29, 3 p.m., 22.06 ft, 10,500 cfs.

Wheeler Reservoir

Location.--Lat 34°47'52", long. 87°22'51", at Wheeler Dam on Tennessee River, in SW¼ sec. 9, T. 3 S., R. 8 W., 0.9 mile upstream from Big Nance Creek, 29.5 miles downstream from Decatur, Ala., and 74.1 miles downstream from Guntersville Dam. Datum of gage is mean sea level, datum of 1929.

Drainage area.--29,590 square miles.

Gage-height record.--Water-stage recorder graph.

Maxima.--March-April 1951: Contents, 707,000 cfs-days Mar. 31 (elevation, 555.70 ft). 1936 to February 1951: Elevation, 557.32 ft, Mar. 1, 1944.

Remarks.--Contents based on backwater profile. Total level pool capacity is 580,000 cfs-days of which 175,200 cfs-days is controlled flood storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	550.05	417,000	555.95	649,000
2	550.52	425,000	554.85	583,000
3	550.37	421,000	554.77	552,000
4	550.32	420,000	555.12	555,000
5	550.40	427,000	555.42	563,000
6	550.50	430,000	555.28	554,000
7	550.60	439,000	554.67	535,000
8	550.90	449,000	555.15	549,000
9	551.20	457,000	555.50	560,000
10	551.80	471,000	555.63	562,000
11	551.85	463,000	555.53	560,000
12	551.05	445,000	555.10	547,000
13	550.85	445,000	555.12	547,000
14	550.75	446,000	555.35	555,000
15	550.90	448,000	556.05	577,000
16	551.10	453,000	556.08	578,000
17	551.26	448,000	556.10	578,000
18	551.60	453,000	556.02	575,000
19	551.94	462,000	556.05	580,000
20	552.20	468,000	556.36	590,000
21	552.34	472,000	556.03	578,000
22	552.50	475,000	556.04	586,000
23	552.18	466,000	556.15	587,000
24	552.10	462,000	556.18	584,000
25	552.50	472,000	556.07	580,000
26	552.67	476,000	555.82	572,000
27	552.61	477,000	555.60	563,000
28	553.63	529,000	555.60	562,000
29	552.78	616,000	555.90	572,000
30	554.20	693,000	556.00	574,000
31	555.70	707,000		

Shoal Creek at Iron City, Tenn.

Location.--Lat 35°01'20", long. 87°34'44", at Iron City, Lawrence County, 600 ft upstream from Louisville & Nashville Railroad bridge, 700 ft downstream from highway bridge, and 0.2 mile downstream from Holly Creek. Datum of gage is 534.91 ft above mean sea level, datum of 1929.

Drainage area.--348 square miles.

Gage-height record.--Water-stage recorder graph except Apr. 19, 20, for which gage heights were interpolated.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 12,400 cfs Mar. 29 (gage height, 13.38 ft).
1925 to February 1951: Discharge, 65,000 cfs Mar. 13, 1927 (gage height, 23.4 ft, present site and datum), from rating curve extended above 20,000 cfs by contracted-opening method.

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	964	1,530	9	996	1,050	17	740	895	25	885	1,190
2	890	1,530	10	915	991	18	1,480	815	26	800	1,020
3	850	1,580	11	855	1,210	19	2,140	765	27	755	930
4	900	1,300	12	840	2,300	20	2,320	715	28	3,220	910
5	1,060	1,130	13	855	1,720	21	1,810	855	29	9,850	820
6	1,070	1,040	14	825	1,370	22	1,400	3,740	30	3,530	755
7	1,130	1,010	15	780	1,140	23	1,170	2,130	31	2,030	
8	1,100	1,160	16	750	1,010	24	1,010	1,490			
Monthly mean discharge, in cfs										1,546	1,270
Runoff, in inches										5.12	4.07

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	2.16	755	2.40	875	12.10	9,900	8.30	4,920	4.93	2,380	3.80	1,680
4	2.15	750	2.52	936	12.58	10,800	7.78	4,470	4.78	2,290	3.74	1,640
6	2.15	750	2.78	1,080	13.04	11,700	7.37	4,150	4.66	2,210	3.68	1,610
8	2.14	745	3.07	1,240	13.33	12,300	6.98	3,840	4.54	2,130	3.63	1,580
10	2.14	745	3.32	1,390	13.35	12,300	6.66	3,600	4.43	2,060	3.58	1,550
N	2.14	745	3.98	1,790	13.14	11,900	6.37	3,380	4.33	2,000	3.53	1,520
2	2.14	745	5.45	2,720	12.70	11,000	6.12	3,190	4.23	1,940	3.48	1,490
4	2.15	750	7.40	4,170	12.14	9,970	5.88	3,020	4.15	1,890	3.44	1,460
6	2.16	755	9.00	5,580	11.42	8,720	5.66	2,870	4.07	1,840	3.42	1,450
8	2.17	760	10.00	6,700	10.65	7,530	5.46	2,730	3.99	1,790	3.36	1,420
10	2.18	765	10.95	7,980	9.75	6,400	5.27	2,610	3.93	1,760	3.33	1,400
12	2.24	795	11.58	8,990	8.92	5,500	5.09	2,490	3.86	1,720	3.28	1,370
	April 2		April 3		April 4		April 5		April 6		April 7	
6	3.28	1,370	3.84	1,700	3.23	1,340	2.94	1,170	2.73	1,050	2.58	969
N	3.54	1,520	3.58	1,550	3.15	1,290	2.88	1,130	2.70	1,040	2.59	975
6	3.83	1,700	3.42	1,450	3.08	1,250	2.83	1,110	2.65	1,010	2.72	1,050
12	4.01	1,810	3.31	1,390	3.01	1,210	2.78	1,080	2.62	991	2.84	1,110
	April 8		April 9		April 10		April 11		April 12		April 13	
6	2.99	1,190	2.76	1,070	2.65	1,010	2.51	930	5.12	2,510	4.04	1,820
N	2.96	1,180	2.72	1,050	2.63	996	2.62	991	5.10	2,500	3.94	1,700
6	2.93	1,160	2.67	1,020	2.58	969	3.50	1,500	4.58	2,160	3.68	1,610
12	2.83	1,110	2.65	1,010	2.55	952	4.28	1,970	4.28	1,970	3.53	1,520
	April 14		April 15		April 16		April 17		April 18		April 19	
6	3.38	1,430	2.97	1,180	2.73	1,050	2.48	915	2.31	830	2.20	775
N	3.26	1,360	2.89	1,140	2.67	1,020	2.43	890	2.28	815	2.18	765
6	3.15	1,290	2.82	1,100	2.59	975	2.38	865	2.25	800	2.15	750
12	3.05	1,230	2.77	1,070	2.53	942	2.34	845	2.22	785	2.13	740

Supplemental record.--Mar. 29, 9:30 a.m., 13.38 ft, 12,400 cfs.

Wilson Reservoir

Location.--Lat 34°47'46", long. 87°37'27", in SE¼ sec. 18, T. 3 S., R. 10 W., at cooling water intake at Wilson Dam on Tennessee River, 2.9 miles southeast of Florence, Ala., 4.1 miles upstream from Cypress Creek, and 15.5 miles downstream from Wheeler Dam. Datum of gage is mean sea level, datum of 1929.

Drainage area.--30,750 square miles.

Gage-height record.--Water-stage recorder graph.

Maxima.--March-April 1951: Contents, 282,700 cfs-days Apr. 19 (elevation, 507.77 ft). 1935 to February 1951: Contents, 287,400 cfs-days, Feb. 11, 1948 (elevation, 508.35 ft).
Maximum contents and elevations for water years prior to 1936 are not available.

Remarks.--Total capacity is 283,600 cfs-days of which 26,500 cfs-days is controlled flood storage. Records furnished by Tennessee Valley Authority.

Elevation and contents at 12 p.m. of indicated day, 1951

Day	March		April	
	Elevation (feet)	Contents (cfs-days)	Elevation (feet)	Contents (cfs-days)
1	505.20	262,500	505.66	266,100
2	505.50	264,800	505.30	263,300
3	506.08	269,400	505.69	266,300
4	506.05	269,100	505.69	266,300
5	505.99	268,600	505.67	266,200
6	506.12	269,700	506.20	270,300
7	506.22	270,400	506.18	270,100
8	505.80	267,200	506.25	270,700
9	505.81	267,200	506.64	273,800
10	505.88	267,800	506.71	274,300
11	505.96	268,400	506.19	270,200
12	506.70	274,200	506.55	273,000
13	506.25	270,700	506.58	273,300
14	506.52	272,800	506.70	274,200
15	507.28	278,800	506.36	271,600
16	507.23	278,400	506.93	276,000
17	507.07	277,100	507.30	279,000
18	506.74	270,600	507.06	277,100
19	506.29	271,000	507.77	282,700
20	506.51	272,700	507.54	280,900
21	506.52	272,800	507.72	282,300
22	506.36	271,600	507.35	279,400
23	506.62	273,600	507.39	279,700
24	506.16	270,000	507.36	279,400
25	505.88	267,800	507.31	279,100
26	506.47	272,400	506.97	276,400
27	507.15	277,800	507.25	278,600
28	507.48	280,400	507.53	280,800
29	507.40	279,800	507.33	279,200
30	507.00	276,600	507.35	279,400
31	505.95	268,300		

Tennessee River at Florence, Ala.

Location.--Lat 34°47'12", long, 87°40'08", in SW¼ sec. 14, T. 3 S., R. 11 W., at lock and dam 1 at lower end of Patton Island, 700 ft upstream from Southern Railway bridge, 1,000 ft upstream from O'Neal Bridge on U. S. Highway 72, 1 mile south of Florence, 1.7 miles upstream from Cypress Creek, and 2.7 miles downstream from Wilson Dam. Datum of gage is 401.12 ft above mean sea level, datum of 1929. Auxiliary gage at Smithsonia, 13.5 miles downstream from Cypress Creek and 15.2 miles downstream from base gage. Datum of auxiliary gage is 399.97 ft above mean sea level, datum of 1929.

Drainage area.--30,810 square miles.

Gage-height record.--Water-stage recorder graph at base gage except periods Mar. 1-5, 9, 11, 12, for which graph was reconstructed on basis of bi-hourly readings from dial indicator in lockmaster's office and normal daily pattern. Water-stage recorder graph at auxiliary gage.

Discharge record.--Stage-fall-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 303,000 cfs 8 a.m. Mar. 29 (gage height, 24.10 ft). 1871 to February 1951: Discharge, 444,000 cfs Mar. 19, 1897 (gage height, 32.5 ft), from rating curve extended above 320,000 cfs.

Remarks.--Flow regulated by many reservoirs above station.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	60,400	244,000	9	88,200	51,400	17	78,600	54,900	25	40,300	74,600
2	43,700	209,000	10	84,900	50,700	18	68,500	55,200	26	40,800	74,400
3	47,100	141,000	11	77,900	61,200	19	66,700	57,600	27	54,800	65,700
4	52,000	79,900	12	79,900	68,000	20	67,500	64,900	28	122,000	54,700
5	51,700	75,900	13	82,900	65,100	21	66,600	72,600	29	280,000	50,700
6	65,100	77,600	14	84,000	51,500	22	66,100	102,000	30	278,000	52,600
7	70,700	80,300	15	77,600	38,800	23	62,100	96,500	31	265,000	
8	92,300	53,200	16	80,200	52,000	24	59,400	79,900			
Monthly mean discharge, in cfs										88,870	78,530
Runoff, in inches										-	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	April 2		April 3		April 4		April 5		April 6		April 7	
6												
N												
6												
12												
	April 8		April 9		April 10		April 11		April 12		April 13	
6												
N												
6												
12												
	April 14		April 15		April 16		April 17		April 18		April 19	
6												
N												
6												
12												

Cypress Creek near Florence, Ala.

Location.--Lat 34°48'27", long. 87°42'02", in NE¼ sec. 9, T. 3 S., R. 11 W., 100 ft downstream from bridge on State Highway 2, 2 miles west of Florence, 4 miles downstream from Cox Creek, and 4 miles upstream from mouth. Datum of gage is 423.78 ft above mean sea level, datum of 1929.

Drainage area.--209 square miles.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 16,000 cfs and extended to peak stage. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 25,100 cfs Mar. 29 (gage height, 19.20 ft). 1934 to February 1951: Discharge, 20,600 cfs Mar 4, 1937; gage height, 17.40 ft Feb. 13, 1948 (backwater from Tennessee River).

Remarks.--Floof runoff affected by backwater from Tennessee River at times.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	640	936	9	584	704	17	504	592	25	608	608
2	600	1,100	10	544	640	18	1,690	560	26	568	560
3	568	936	11	536	952	19	1,440	624	27	576	520
4	632	792	12	560	1,090	20	1,140	576	28	7,290	592
5	776	720	13	608	792	21	880	776	29	11,600	488
6	656	672	14	560	704	22	784	2,460	30	1,950	442
7	696	744	15	528	648	23	720	888	31	1,140	
8	640	864	16	504	640	24	648	680			
Monthly mean discharge, in cfs										1,328	777
Runoff, in inches										7.33	4.15

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	1.40	560	1.67	776	18.40	23,500	4.38	3,010	2.30	1,280	1.95	1,000
4	1.39	552	2.38	1,340	17.06	20,800	3.94	2,620	2.24	1,230	1.94	992
6	1.39	552	3.40	2,160	15.36	17,400	3.52	2,260	2.20	1,200	1.91	968
8	1.39	552	3.93	2,610	13.86	14,700	3.22	2,020	2.17	1,180	1.89	952
10	1.40	560	4.60	3,210	12.26	12,000	3.08	1,900	2.14	1,150	1.88	944
N	1.40	560	5.60	4,110	10.72	9,710	2.94	1,790	2.10	1,120	1.87	936
2	1.40	560	6.52	4,940	9.32	7,820	2.78	1,660	2.08	1,110	1.86	928
4	1.40	560	8.30	6,680	8.00	6,370	2.68	1,580	2.06	1,090	1.84	912
6	1.42	576	10.66	9,620	7.07	5,470	2.60	1,520	2.02	1,060	1.84	912
8	1.43	584	15.06	16,900	6.30	4,740	2.52	1,460	2.01	1,050	1.82	896
10	1.46	608	18.16	23,000	5.55	4,060	2.45	1,400	2.00	1,040	1.80	880
12	1.51	648	19.20	25,100	4.92	3,500	2.37	1,340	1.98	1,020	1.80	880
	April 2		April 3		April 4		April 5		April 6		April 7	
6	1.80	880	1.93	984	1.72	816	1.62	736	1.56	688	1.53	664
N	2.24	1,230	1.84	912	1.69	792	1.59	712	1.55	680	1.57	696
6	2.34	1,310	1.79	872	1.67	776	1.58	704	1.54	672	1.74	832
12	2.07	1,100	1.76	848	1.64	752	1.57	696	1.53	664	1.88	944
	April 8		April 9		April 10		April 11		April 12		April 13	
6	1.93	984	1.59	712	1.54	672	1.47	616	2.20	1,200	1.73	824
N	1.76	848	1.56	688	1.50	640	1.52	656	1.95	1,000	1.69	792
6	1.67	776	1.54	672	1.49	632	2.63	1,540	1.84	912	1.66	768
12	1.63	744	1.54	672	1.48	624	2.77	1,660	1.77	856	1.63	744
	April 14		April 15		April 16		April 17		April 18		April 19	
6	1.60	720	1.54	672	1.54	672	1.44	592	1.40	560	1.37	536
N	1.58	704	1.50	640	1.51	648	1.43	584	1.39	552	1.50	640
6	1.57	696	1.50	640	1.48	624	1.41	568	1.37	536	1.59	712
12	1.56	688	1.50	640	1.47	616	1.40	560	1.37	536	1.52	656

Supplemental record.--Mar. 28, 12 p.m., 19.20 ft, 25,100 cfs.

Bear Creek at Bishop, Ala.

Location.--Lat 34°39'21", long. 88°07'21", in SE¼ sec. 5, T. 5 S., R. 15 W., at highway bridge half a mile downstream from Little Bear Creek and three-quarters of a mile southwest of Bishop. Datum of gage is 419.91 ft above mean sea level, datum of 1929.

Drainage area.--667 square miles.

Gage-height record.--Water-stage recorder graph except for period 4 p.m. Mar. 18 to 6 a.m. Mar. 19, 3 p.m. Mar. 25 to 6 a.m. Mar. 26, 4 p.m. Mar. 26 to 6 a.m. Mar. 27, and 12 p.m. Apr. 10 to 6 a.m. Apr. 11, for which graph was reconstructed on basis of recorded range in stage and normal daily pattern.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Gage heights used to hundredths.

Maxima.--March-April 1951: Discharge, 27,200 cfs Mar. 29 (gage-height, 19.73 ft). 1926 to February 1951: Discharge, 32,000 cfs Dec. 26, 1926 (gage height, 22.0 ft, present datum, from flood marks).

Remarks.--Flood runoff not affected by artificial storage.

Mean discharge, in cubic feet per second, 1951

Day	March	April	Day	March	April	Day	March	April	Day	March	April
1	1,310	8,630	9	2,000	1,540	17	1,320	1,940	25	1,540	3,730
2	1,200	5,120	10	1,720	1,370	18	2,230	1,770	26	1,350	2,440
3	1,120	3,640	11	1,520	1,420	19	3,470	2,210	27	1,250	1,840
4	1,180	2,680	12	1,700	1,910	20	3,640	2,600	28	8,490	1,720
5	1,590	2,160	13	1,610	1,580	21	3,210	2,850	29	25,600	1,520
6	1,420	1,800	14	1,530	1,420	22	2,780	6,000	30	25,800	1,300
7	2,240	1,700	15	1,430	1,270	23	2,190	5,230	31	17,200	
8	3,010	1,740	16	1,320	1,670	24	1,800	4,260			
Monthly mean discharge, in cfs										4,122	2,635
Runoff, in inches										7.12	4.41

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	March 27		March 28		March 29		March 30		March 31		April 1	
2	5.27	1,250	7.00	2,030	18.74	22,200	19.71	27,000	18.62	21,600	16.11	11,900
4	5.24	1,240	8.21	2,600	19.00	23,500	19.70	27,000	19.41	20,600	15.84	11,200
6	5.23	1,240	9.45	3,220	19.22	24,600	19.69	27,000	18.22	19,700	15.55	10,500
8	5.22	1,230	10.77	3,960	19.37	25,400	19.68	26,900	18.02	18,800	15.28	9,880
10	5.20	1,220	12.00	5,000	19.48	25,900	19.65	26,800	17.85	18,000	14.97	9,240
N	5.19	1,220	13.18	6,320	19.56	26,300	19.60	26,500	17.66	17,200	14.66	8,630
2	5.19	1,220	14.31	8,000	19.61	26,600	19.56	26,300	17.48	16,500	14.37	8,110
4	5.20	1,220	15.36	10,000	19.70	27,000	19.47	25,800	17.29	15,800	14.07	7,610
6	5.21	1,230	16.28	12,400	19.73	27,200	19.34	25,200	17.08	15,000	13.76	7,120
8	5.22	1,230	17.13	15,200	19.73	27,200	19.21	24,600	16.87	14,300	13.47	6,700
10	5.24	1,240	17.79	17,800	19.73	27,200	19.02	23,600	16.62	13,400	13.19	6,330
12	5.76	1,470	18.45	20,800	19.71	27,000	18.82	22,600	16.38	12,700	12.90	5,980
	April 2		April 3		April 4		April 5		April 6		April 7	
6	12.38	5,390	10.89	4,030	8.73	2,780	7.70	2,260	6.92	1,870	6.48	1,660
N	12.03	5,030	10.17	3,600	8.51	2,660	7.47	2,140	6.79	1,800	6.52	1,670
6	11.91	4,910	9.59	3,250	8.28	2,550	7.27	2,040	6.67	1,740	6.61	1,720
12	11.58	4,590	9.17	3,000	7.99	2,400	7.08	1,950	6.55	1,690	6.75	1,780
	April 8		April 9		April 10		April 11		April 12		April 13	
6	6.76	1,790	6.33	1,590	5.94	1,410	5.59	1,260	7.32	2,070	6.36	1,600
N	6.69	1,760	6.22	1,540	5.82	1,360	5.74	1,320	7.07	1,940	6.27	1,560
6	6.59	1,710	6.16	1,510	5.74	1,320	6.29	1,570	6.81	1,820	6.21	1,530
12	6.44	1,640	6.06	1,470	5.66	1,290	6.75	1,780	6.55	1,690	6.15	1,510
	April 14		April 15		April 16		April 17		April 18		April 19	
6	6.04	1,460	5.65	1,280	6.19	1,530	7.30	2,060	6.82	1,820	6.34	1,590
N	5.95	1,420	5.59	1,260	6.57	1,700	7.00	1,910	6.76	1,790	8.16	2,490
6	5.84	1,370	5.56	1,240	6.75	1,780	6.87	1,840	6.64	1,730	8.45	2,640
12	5.75	1,330	5.84	1,370	7.27	2,040	6.84	1,830	6.47	1,650	8.56	2,690

SUMMARY OF FLOOD STAGES AND DISCHARGES

The results of the determinations of maximum flood flows at existing stream-gaging stations and at other places on streams in the area covered by this report are summarized and presented in table 1, "Summary of flood discharges." The map reference number in this table is applicable to plate 1, a map showing the location of all points at which maximum discharge during the present flood was determined.

The maximum discharge during the present flood was obtained from a stage-discharge relation unless otherwise indicated in the table by a letter symbol. The special methods were contracted-opening determination (C), computed flow over dam (D), computed from records of powerplant operation (P), and slope-area determination (S).

Figure 10 shows the flood discharges, in cubic feet per second per square mile, which are listed in table 1, plotted against the corresponding drainage areas.

Table 1.--Summary of flood discharges in Alabama and adjacent States for the floods of March-April 1951

[Maximum discharges for the floods of March-April 1951 were obtained from gaging-station records, except as otherwise indicated by the following symbols: C, Contracted-opening measurement; D, Computed flow over dam; P, Computed from records of powerplant operation; S, Slope-area measurement]

No. on Pl. 1	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (ft)	Discharge		Date	Gage height (ft)	Discharge	
						cfs	cfs per sq mi			cfs	cfs per sq mi
	MOBILE RIVER BASIN										
	Coosa-Alabama River stem										
1	Cartecay River near Ellijay, Ga.	135	1937-51	Apr. 8, 1938	13.0	20,000	148	Mar. 29	10.36	12,000S	88.9
2	Coosawatte River at Pine Chapel, Ga.	856	1938-51	Feb. 11, 1946	29.6	29,100	34.0	Mar. 30	30.75	40,200	47.0
3	Conasauga River at Tilton, Ga.	682	1937-51	Jan. 21, 1947	27.7	26,000	38.1	Mar. 30	30.22	29,000	42.5
4	Oostanaula River at Resaca, Ga.	1,610	1896-1951	Jan. 21, 1947	33.5	49,600	30.8	Mar. 31	34.56	54,800	34.0
5	Oostanaula River near Rome, Ga.	2,120	1940-51	Apr. 1, 1886	a40.3	(b)	-	Apr. 2	35.40	44,700	21.1
				Jan. 23, 1947	c34.1	48,000	22.6				
6	Etowah River at Rome, Ga.	1,810	1904-21 1939-51	Dec. 11, 1919	over 28	55,000	30.4	Mar. 29	d31.07	e14,800	-
7	Coosa River near Rome, Ga.	4,040	1897-1903 1928-31 1937-51	Jan. 22, 1947	37.0	65,000	16.1	Mar. 30	33.6	e49,400	-
8	Cedar Creek near Cedartown, Ga.	109	1942-51	Nov. 28, 1948	16.4	12,500	115	Mar. 29	14.54	9,390	86.1
9	Chattooga River at Summerville, Ga.	193	1937-51	Nov. 28, 1948	20.6	22,700	118	Mar. 29	21.00	24,500	127
10	Chattooga River at Gaylesville, Ala.	377	1937-51	Nov. 29, 1948	24.6	32,000	84.9	Mar. 29,30	25.24	33,700	89.4
11	Little River near Jamestown, Ala.	121	1928-32 1935-49	Nov. 28, 1948	12.9	21,800	180	Mar. 29	12.25	19,700	163
12	Coosa River at Leesburg, Ala.	5,270	1937-51	Feb. 14, 1946	35.1	73,200	13.9	Mar.30,31	34.1	66,900	12.7
				Jan. 24, 1947	35.1	-	-				
13	Terrapin Creek near Piedmont, Ala.	115	1945-51	Nov. 28, 1948	13.3	21,000	183	Mar. 29	12.72	17,800	155
14	Coosa River at Gadsden, Ala.	5,800	1926-51	Apr. 6, 1886	f37.9	(b)	-	Mar. 31 } Apr. 1 }	28.9	64,500	11.1
				Apr. 11, 1936	31.13	76,900	13.3				
15	Big Wills Creek near Crudup, Ala.	189	1943-51	Jan. 5, 1949	14.2	11,800	62.4	Mar. 29	14.50	14,800	78.3

16	Big Canoe Creek near Gadsden, Ala.	238	1938-51	Dec. 29, 1942	29.1	37,900	159	Mar. 30	21.35	15,800	66.4
17	Choccolocco Creek near Jenifer, Ala.	275	1903-8 1929-32 1935-51	Feb. 4, 1936	17.2	21,900	79.6	Mar. 29	16.63	20,400	74.2
18	Choccolocco Creek near Lincoln, Ala.	491	1938-51	1886	g27.5	(b)	-	Mar. 29	25.46	49,300	100
				Jan. 7, 1946	21.9	27,700	56.4				
19	Coosa River near Cropwell, Ala.	7,690	1942-51	Nov. 30, 1948	22.8	117,000	15.2	Mar. 30	23.7	126,000	16.4
20	Talladega Creek at Alpine, Ala.	158	1900-1904 1939-51	Mar. 21, 1942	15.2	14,300	90.5	Mar. 29	16.6	39,000	247
21	Coosa River at Childersburg, Ala.	8,390	1914-15	Apr. 9, 1938	30.0	136,000	16.2	Mar. 30,31	30.1	146,000	17.4
				Nov. 30, 1948	28.3						
22	Yellowleaf Creek near Wilsonville, Ala.	97	1950-51	-	-	-	-	Mar. 29	23.85	19,300	199
23	Coosa River at Lay Dam, Ala.	-	-	-	-	-	-	Mar. 30	h383.1	154,000P	-
24	Hatchet Creek near Rockford, Ala.	225	1944-51	Jan. 6, 1946	24.9	22,800	101	Mar. 29	21.66	18,600	82.7
25	Weogufka Creek near Weogufka, Ala.	74	1950-51	-	-	-	-	Mar. 29	16.83	i24,000	324
26	Coosa River at Mitchell Dam, Ala.	-	-	-	-	-	-	Mar. 29	h313.0	194,000P	-
27	Coosa River at Jordan Dam, near Wetumpka, Ala.	10,200	1912-14 1925-51	Apr. 8, 1938	46.4	298,000	29.2	Mar. 29	38.2	217,000	21.3
28	Tallapoosa River below Tallassee, Ala.	3,320	1928-51	Mar. 15, 1929	51.35	115,000	34.6	Apr. 24	8.3	e9,920	2.99
29	Alabama River near Montgomery, Ala.	15,100	1927-51	Mar. 17, 1929	59.6	256,000	17.0	Apr. 1	46.2	j137,000	9.07
30	Autauga Creek at Prattville, Ala.	119	1939-51	Aug. 16,17, 1938	k18.35	21,800	183	Mar. 30	4.05	2,160	18.2
31	Big Swamp Creek near Lowndesboro, Ala.	242	1938 1940-51	Nov. 27, 1948	21.3	37,000	153	Apr. 22	15.00	2,130	8.80
32	Mulberry River at Jones, Ala.	205	1938-51	April 1938	m33.6	(b)	-	Mar. 29	23.84	18,200	88.8
				Aug. 16, 1939	30.4	32,800	160				
33	Alabama River at Selma, Ala.	17,100	1899-1913	Apr. 8, 1886	f57.0	221,000	-	Apr. 2, 3	48.0	139,000	8.13
			1928-51	Dec. 3, 1948	56.0	-	-				
				Mar. 19, 1929	55.5	204,000	11.9				
34	Cahaba River near Acton, Ala.	229	1938-51	Dec. 28, 1942	44.23	25,500	111	Mar. 29	36.80	18,100	79.0
35	Cahaba River at Centerville, Ala.	1,030	1901-8 1929-32 1935-51	Apr. 8, 1938	36.63	82,800	80.4	Mar. 29	34.80	83,600	81.2

Table 1.--Summary of flood discharges in Alabama and adjacent States for the floods of March-April 1951--Continued

No. on Pl. 1	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (ft)	Discharge		Date	Gage height (ft)	Discharge	
						cfs	cfs per sq mi			cfs	cfs per sq mi
36	Cahaba River at Sprott, Ala.	1,380	1938-51	Apr. 9, 1938	f28.55	95,000	-	Mar. 30	27.2	80,000	58.0
				Aug. 16, 1939	27.5	85,200	61.7				
37	Cahaba River near Marion Junction, Ala.	1,780	1939-51	Aug. 16, 1939	42.95	83,400	46.9	Mar. 31	41.76	80,400	45.2
38	Boguechitto Creek near Browns, Ala.	93	1944-51	Dec. 28, 1942	f20.7	(b)	-	Mar. 29	18.97	14,200	153
				Mar. 26, 1945	17.16	9,440	102				
39	Alabama River near Millers Ferry, Ala.	20,700	1937-51	March, 1929	fn56.8	(b)	-	Apr. 4, 5	49.9	155,000	7.49
				Apr. 14, 1938	56.6	237,000	11.4				
40	Alabama River at Claiborne, Ala.	22,000	1920-51	Apr. 16,17,1938	52.25	227,000	10.3	Apr. 7, 8	45.7	148,000	6.73
	Tombigbee River stem										
41	Mackys Creek near Dennis, Miss.	66	1938-51	Feb. 13, 1948	22.08	3,520	53.3				
42	East Fork Tombigbee River near Marietta, Miss.	305	1938-47 1948-51	Jan. 4, 1949	10.90	13,300	43.6	Mar. 29	11.45	20,500	67.2
43	East Fork Tombigbee River near Fulton, Miss.	605	1928-51	Feb. 14, 1948	22.24	47,700	78.8	Mar. 29	20.70	34,500	57.0
44	Bull Mountain Creek near Smithville, Miss.	335	1940-51	Feb. 13, 1948	15.25	24,800	74.0	Mar. 29	15.48	26,700	79.7
45	West Fork Tombigbee River near Nettleton, Miss.	617	1939-51	Dec. 24, 1926	32.5	(b)	-	Mar. 29	29.31	49,200	79.7
				Mar. 28, 1944	31.18	-					
				Feb. 14, 1948	30.74	56,300	91.2				
46	Tombigbee River near Amory, Miss.	1,941	1938-51	Feb. 14, 1948	32.55	89,100	45.9	Mar. 30	30.85	64,700	33.3
47	Tombigbee River at Aberdeen, Miss.	2,210	1928-51	Apr. 20, 1892	44.8	(b)	-	Mar. 31	40.60	64,300	29.1
				Feb. 15, 1948	42.04	97,000	43.9				
48	Buttahatchee River below Hamilton, Ala.	276	1950-51	Feb. 1, 1951	26.10	23,800	86.2	Mar. 29	26.31	24,200	87.7
49	Buttahatchee River near Sulligent, Ala.	460	1939-51	Jan. 7, 1950	16.4	-	-	Mar. 29	15.67	29,700	64.6
				Jan. 8, 1946	15.5	33,000	71.7				
50	Buttahatchee River near Caledonia, Miss.	823	1928-32	July, 1916	22.6	(b)		Mar. 30	18.36	29,400	35.7
			1939-51	Jan. 6, 1949	18.65	30,800	37.4				

51	Chookatonchee Creek near West Point, Miss.	514	1943-46 1947-51	Jan. 5, 1949 Mar. 29, 1944	22.32 21.7	- 38,300	- 74.5	Mar. 29	23.55	45,800	89.1
52	Tibbee River near Tibbee, Miss.	928	1928-30 1939-51	Jan. 5, 1949	30.15	67,300	72.5	Mar. 29	30.82	75,200	81.0
53	Tombigbee River at Columbus, Miss.	4,490	1900-1912 1928-51	Apr. 8, 1892 Jan. 7, 1949	42.6 39.32	- 148,000	- 33.0	Apr. 1	p37.85	118,000	26.3
54	Luxapalila Creek near Fayette, Ala.	127	1945-51	Jan. 5, 1949	13.8	9,910	78.0	Mar. 29	13.16	8,150	64.2
55	Luxapalila Creek at Steens, Miss.	309	1943-47 1949-51	Jan. 6, 1949 Jan. 7,8, 1950	19.2 18.34	16,000 11,500	 37.2	Mar. 30	18.55	12,700	41.1
56	Tombigbee River near Cochrane, Ala.	5,990	1939-51	April, 1892 Jan. 9, 1949	q50.2 46.9	(b) 163,000	- 27.2	Apr. 2	45.0	124,000	20.7
57	Lubbub Creek near Reform, Ala.	80	-	-	-	-	-	Mar. 29	9.27	9,600	120
58	New River near Winfield, Ala.	58	-	-	-	-	-	Mar. 29	23.15	6,900	119
59	Sipsey River at Fayette, Ala.	275	1939-51	Jan. 8, 1946 Jan. 7, 1950	21.75 21.2	- 20,500	- 74.5	Mar. 29	21.20	20,500	74.5
60	Sipsey Creek at Moores Bridge, Ala.	406	1939-51	Jan. 10, 1946	16.78	23,600	58.1	Mar. 30	16.47	21,700	53.4
61	Sipsey River near Elrod, Ala.	515	1928-32 1939-51	Jan. 9, 1950	18.1	21,000	40.8	Mar. 31	18.09	21,000	40.8
62	Sipsey River near Pleasant Ridge, Ala.	766	1939-51	Jan. 10, 1949 Jan. 11, 1950	25.8 24.1	- 19,100	 24.8	Apr. 2	25.5	21,900	28.6
63	Noxubee River near Brooksville, Miss.	440	1940-42 1944-51	Jan. 6, 1949	23.26	46,600	106	Mar. 29	23.88	55,000	125
64	Noxubee River at Macon, Miss.	812	1928-32 1938-51	Jan. 6, 1949	32.73	50,000	61.6	Mar. 30	32.97	52,000	64.0
65	Noxubee River near Geiger, Ala.	1,080	1939-40 1944-51	Jan. 8, 1949	41.6	27,900	25.8	Mar. 31	42.69	37,600	34.8
66	Tombigbee River at Gainesville, Ala.	8,700	1938-51	Jan. 11, 1949	53.9	168,000	19.3	Apr. 3	r52.9	141,000	16.2
67	Mulberry Fork near Garden City, Ala.	365	1928-51	Feb. 4, 1936	24.0	46,600	128	Mar. 29	20.62	35,200	96.4
68	Sipsey Fork near Falls City, Ala.	375	1943-51	Jan. 8, 1946	29.6	48,400	129	Mar. 29	25.80	39,000	104
69	Clear Creek near Falls City, Ala.	151	1939-51	Jan. 8, 1946	10.97	13,000	86.1	Mar. 29	10.28	11,700	77.5
70	Blackwater Creek near Manchester, Ala.	177	1938-51	Jan. 9, 1946	11.49	8,050	45.5	Mar. 30	10.95	7,350	41.5
71	Lost Creek near Jasper, Ala.	116	-	-	-	-	-	Mar. 29	24.85	11,600	100
72	Locust Fork near Cleveland, Ala.	300	1936-51	Dec. 28, 1942	19.2	47,000	157	Mar. 29	14.54	26,700	89.0
73	Locust Fork at Trafford, Ala.	622	1930-51	Jan. 6, 1949	59.1	60,700	97.6	Mar. 29	53.40	51,100	82.2

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Table 1.--Summary of flood discharges in Alabama and adjacent States for the floods of March-April 1951--Continued.

No. on Pl. 1	Stream and place of determination	Drainage area (sq mi)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (ft)	Discharge		Date	Gage height (ft)	Discharge	
						cfs	cfs per sq mi			cfs	cfs per sq mi
74	Turkey Creek at Morris, Ala.	81	1944-51	Nov. 28, 1948	23.1	11,600	143	Mar. 29	20.12	9,500	117
75	Locust Fork at Sayre, Ala.	885	1928-32 1942-51	Jan. 7, 1949	47.9	55,300	62.5	Mar. 30	43.87	47,200	53.3
76	Yellow Creek near Tuscaloosa, Ala.	24	1951	-	-	-	-	Mar. 29	9.35	-	-
77	North River near Samantha, Ala.	220	1938-51	Mar. 13, 1950	26.0	14,000	63.6	Mar. 29	30.68	18,000	81.8
78	Black Warrior River at Tuscaloosa, Ala.	4,830	1889-1905 1928-51	Apr. 18, 1900	67.7	215,000	44.5	Mar. 29	66.0	223,000	46.2
79	Black Warrior River near Eutaw, Ala.	5,820	1932-51	Jan. 9, 1949	56.8	158,000	27.1	Apr. 1	59.1	183,000	31.4
80	Prairie Creek near Gallion, Ala.	170	1940-51	Dec. 28, 1942	s19.3	39,000	229	Mar. 29	18.6	32,400	191
81	Tombigbee River near Coatopa, Ala.	15,500	1928-51	Mar. 29, 1929	51.4	-	-	Apr. 5, 6	t52.4	217,000	14.0
				Jan. 14, 1949	51.1	199,000	12.8				
82	Sucarnoochee River at Livingston, Ala.	635	1938-51	Nov. 30, 1948	26.9	17,600	27.7	Mar. 30	27.64	21,500	33.9
83	Tombigbee River near Leroy, Ala.	19,100	1928-51	Apr. 2, 1929	46.0	-	-	Apr. 10, 11	45.8	201,000	10.5
				Apr. 10, 1938	45.96	192,000	10.1				
	TENNESSEE RIVER BASIN										
84	Toccoa River near Dial, Ga.	177	1913-51	July 9, 1916	10.0	9,200	52.0	Mar. 29	9.04	7,410	41.9
85	Toccoa River near Blue Ridge, Ga.	233	1913-51	July 9, 1916	a13.0	13,900	59.7	Apr. 28	5.10	e1,870	8.03
86	Ocoee River at Copperhill, Ga.	352	1903-13 1918-25 1942-51	Nov. 19, 1906	a18.5	(b)	-	Mar. 29	9.83	10,500S	29.8
87	Fightingtown Creek at McCaysville, Ga.	70.9	1942-51	Jan. 20, 1947	11.32	5,280	74.5	Mar. 29	11.92	5,420	76.4
88	Ocoee River at Emf, Tenn.	724	1913-51	July 10, 1916	13.7	29,400	56.1	Mar. 29	11.30	19,800	37.8
89	Ocoee River at Parksville, Tenn.	595	1911-16 1921-51	Apr. 6, 1936	18.32	19,000	31.9	Mar. 29	20.22	21,700	36.5
90	South Chickamauga Creek near Ringgold, Tenn.	159	-	-	-	-	-	Mar. 29	25.1	10,000	62.9P
91	South Chickamauga Creek near Chickamauga, Tenn.	428	1928-51	Nov. 29, 1948	19.83	24,900	58.2	Mar. 30	20.73	27,600	64.5
92	Tennessee River at Hales Bar, near Chattanooga, Tenn.	21,800	1930-51	March 1867	44.6	(b)	-	Mar. 30	23.89	155,000	7.11
				Mar. 8, 1917	37.4	u345,000	-				
				Dec. 31, 1932	31.2	264,000	-				
				Jan. 1, 1933	31.2	-	-				
				Mar. 30, 1936	31.2	264,000	12.1				

93	Short Creek near Albertville, Ala.	91.6	1945-51	December 1942	21.2	(b)	-	Mar. 29	15.55	13,200	144
				Jan. 5, 1949	16.37	14,800	162				
94	Paint Rock River near Woodville, Ala.	320	1935-51	Jan. 5, 1949	20.84	-		Mar. 29	20.32	27,500	85.9
				Dec. 28, 1942	20.46	31,300	97.8				
95	Flint River near Chase, Ala.	342	1930-51	September 1929	26.0	v46,000		Mar. 29	19.30	24,700	72.2
				Jan. 5, 1949	23.61	37,700	110				
96	Tennessee River at Whitesburg, Ala.	25,610	1924-36	March 1867	w31.4	(b)	-	Mar. 30	21.49	249,000	9.72
			1937-51	Jan. 1, 1927	a23.2	283,000	11.1				
97	Richland Creek near Pulaski, Tenn.	366	1934-51	Feb. 13, 1948	24.58	62,400	170	Mar. 29	16.32	8,910	24.3
98	Elk River near Prospect, Tenn.	1,784	1904-8	Feb. 14, 1948	38.17	100,000	56.1	Mar. 30	27.52	28,600	16.0
			1919-51								
99	Big Nance Creek at Courtland, Ala.	166	1935-40	Jan. 7, 1950	22.60	12,300	74.1	Mar. 29	22.06	10,500	63.3
			1945-51								
100	Shoal Creek at Iron City, Tenn.	348	1925-51	Mar. 13, 1927	23.4	65,000	187	Mar. 29	13.38	12,400	35.6
101	Tennessee River at Florence, Ala	30,810	1871-1951	Mar. 19, 1897	32.5	444,000	14.4	Mar. 29	24.10	303,000	9.83
102	Cypress Creek near Florence, Ala.	209	1034-51	Feb. 13, 1948	x17.4	-		Mar. 28	19.20	25,100	120
				May 4, 1937	16.60	20,600	98.6				
103	Bear Creek above Quarter Creek, Ala.	47.7	-	-	-	-	-	-	-	6,830S	143
104	Little Bear Creek 1.69 miles above mouth	39.5	-	-	-	-	-	-	-	4,020S	102
105	Bear Creek at Scott Bridge, Ala.	201	-	-	-	-	-	-	-	26,500C	132
106	Little Bear Creek above Steel Branch, Ala.	19.3	-	-	-	-	-	-	-	3,260S	169
107	Little Bear Creek at Jordans Mill, Ala.	67.0	-	-	-	-	-	-	-	5,870D	87.6
108	Cedar Creek ¼ mile above Mud Creek, Ala.	30.4	-	-	-	-	-	-	-	3,800S	125
109	Cedar Creek 1.4 miles above Little Bear Creek, Ala.	198	-	-	-	-	-	-	-	16,400S	82.8
110	Bear Creek at Bishop, Ala.	667	1926-51	Dec. 26, 1926	22.0	32,000	48.0	Mar. 29	19.73	27,200	40.8

a Site and datum then in use.
b Not determined.
c At site and datum of present auxiliary gage.
d Maximum gage height occurred Mar. 30.
e Affected by regulation.
f From floodmarks.
g From floodmarks at former site, 1,000 ft upstream.
h Forebay elevation in feet above mean sea level.
i Partly estimated.
j Occurred on rising stage between 45.4 and 45.6 ft.
k Prior to major channel improvement.
m From information by local residents.
n Flood of April 1886 reached a stage 1 to 5 ft higher.
p Occurred March 31.
q From reports of U. S. Weather Bureau present datum.
r Occurred April 4.
s Gage height in sell; 20.1 ft from outside gage.
t Occurred April 6, and 7.
u From rating curve extended above 261,000 cfs.
v From rating curve extended above 27,000 cfs.
w From highwater profile by Corps of Engineers.
x Backwater from Tennessee River.

FLOOD-CREST STAGES

Tables 2 and 3 present data on flood crest stages that were collected in the flood area by various agencies, and furnished to the Geological Survey for inclusion in this report.

Data in table 2 were furnished as follows: Stages in Calhoun and Talladega Counties, by county engineers, except those at Geological Survey gaging stations; stages at numbered highways--mainly in Tennessee River basin--by the Alabama State Highway Department; by the Corps of Engineers, Alabama Power Co., and the U. S. Weather Bureau, as indicated by footnotes. The points are identified by land-line location.

Data in table 3 were furnished by the Corps of Engineers, except those at Geological Survey gaging stations. The points are identified by river-mileage distances above Mobile.

Table 2. --Flood-crest stages at miscellaneous locations

Stream and location	Elevation (feet)
MOBILE RIVER BASIN	
Coosa-Alabama River stem	
Coosa River:	
St. Clair County, sec. 1, T. 14 S, R. 5 E., at Greensport Ferry gage.	a496.4
Ohatchee Creek:	
Calhoun County, sec. 27, T. 13 S., R. 7 E., 55 ft downstream from Reads Mill Bridge.	541.38
Calhoun County, sec. 23, T. 14 S., R. 6 E., at Patterson Bridge.	497.09
Calhoun County, sec. 27, T. 14 S., R. 6 E., at Winn Bridge.	495.74
Calhoun County, sec. 27, T. 14 S., R. 6 E., at Planing Mill Bridge near Ohatchee School.	494.92
Calhoun County, sec. 34, T. 14 S., R. 6 E., at county bridge 1000 ft east of Ohatchee.	494.26
Tallahatchee Creek:	
Calhoun County, sec. 13, T. 14 S., R. 7 E., at Broughton Bridge.	549.88
Calhoun County, sec. 14, T. 14 S., R. 7 E., at Prickett Bridge.	542.87
Calhoun County, sec. 22, T. 14 S., R. 7 E., at Lacy Bridge.	537.75
Calhoun County, sec. 20, T. 14 S., R. 7 E., at Curvin Bridge.	513.79
Calhoun County, sec. 30, T. 14 S., R. 7 E., at Goode Bridge.	506.65
Calhoun County, sec. 24, T. 14 S., R. 6 E., 90 ft upstream from Grayton Bridge.	498.74

Table 2. --Flood-crest stages at miscellaneous locations--Con.

Stream and location	Elevation (feet)
Coosa-Alabama River stem--Continued	
Cane Creek:	
Calhoun County, sec. 18, T. 15 S., R. 6 E., at Francis Mill Bridge:	
Upstream side of bridge	495.09
Downstream side of bridge	492.95
Calhoun County, sec. 14, T. 15 S., R. 5 E., at Slayton Acker Bridge.	482.78
Aker Creek:	
Calhoun County, sec. 22, T. 15 S., R. 5 E., 20 ft downstream from county bridge.	481.14
Blue Eye Creek:	
Talladega County, sec. 13, T. 16 S., R. 5 E., at county bridge.	531.58
Talladega County, sec. 28, T. 16 S., R. 5 E., at Lincoln Bridge.	484.48
Talladega County, sec. 31, T. 16 S., R. 5 E., at county bridge.	463.67
Choccolocco Creek:	
Calhoun County, sec. 10, T. 15 S., R. 9 E., at Morgan Bridge.	686.89
Calhoun County, sec. 25, T. 16 S., R. 8 E., at Mellon Bridge.	629.05
Calhoun County, sec. 32, T. 16 S., R. 8 E., at Friendship Bridge.	605.65
Talladega County, sec. 3, T. 17 S., R. 7 E., at Silver Run Bridge.	577.90
Talladega County, sec. 5/8, T. 17 S., R. 7 E., at Jenifer, Geological Survey gage.	570.78
Talladega County, sec. 8, T. 17 S., R. 7 E., at county bridge.	564.00
Talladega County, sec. 15, T. 17 S., R. 6 E., at county bridge.	517.84

Table 2.--Flood-crest stages at miscellaneous locations--Con.

Stream and location	Elevation (feet)
Coosa-Alabama River stem--Continued	
Cheaha Creek:	
Talladega County, sec. 1, T. 18 S., R. 6 E., at McElderry Bridge.	563.34
Talladega County, sec. 28, T. 17 S., R. 6 E., at Jemison Mill Bridge.	525.68
Choccolocco Creek:	
Talladega County, sec. 9, T. 17 S., R. 5 E., at Lincoln, Geological Survey gage.	473.96
Talladega County, sec. 12, T. 17 S., R. 4 E., at Eureka Bridge.	466.73
Poorhouse Creek:	
Talladega County, sec. 30, T. 17 S., R. 5 E., at county bridge.	489.43
Talladega County, sec. 26, T. 17 S., R. 4 E., at county bridge.	450.03
Coosa River:	
St. Clair County, sec. 1, T. 18 S., R. 3 E., at Easonville gage.	a432.76
Branch:	
Talladega County, sec. 16, T. 19 S., R. 3 E., at Laniers Bridge.	421.45
Talladega Creek:	
Talladega County, sec. 27, T. 19 S., R. 4 E., at Reynolds Mill Bridge.	456.57
Talladega County, sec. 21, T. 19 S., R. 4 E., at Alpine, Geological Survey gage.	447.84
Talladega County, sec. 35, T. 19 S., R. 3 E., at Kymulga Bridge.	427.10
Tallasseehatchee Creek:	
Talladega County, sec. 11, T. 21 S., R. 4 E., at county bridge.	480.30

Table 2. --Flood-crest stages at miscellaneous locations--Con.

Stream and location	Elevation (feet)
Coosa-Alabama River stem--Continued	
Emauhee Creek:	
Talladega County, sec. 2, T. 21 S., R. 4 E., at county bridge.	477.16
Shirtee Creek:	
Talladega County, sec. 18, T. 21 S., R. 4 E., at Odena Bridge.	460.03
Tallasseehatchee Creek:	
Talladega County, sec. 19, T. 20 S., R. 4 E., at county bridge.	430.39
Weewoka Creek:	
Talladega County, sec. 1, T. 20 S., R. 4 E., at county bridge.	522.97
Talladega County, sec. 17, T. 20 S., R. 4 E., at county bridge.	455.77
Tallasseehatchee Creek:	
Talladega County, sec. 23, T. 20 S., R. 3 E., at Coleman Bridge.	420.08
Coosa River:	
Chilton County, sec. 24, T. 23 N., R. 15 E., at Lay Dam.	b383.1 above dam b323.2 below dam
Chilton County, sec. 15, T. 21 N., R. 16 E., at Mitchell Dam.	b313.0 above dam - below dam
Elmore County, sec. 22, T. 19 N., R. 18 E., at Jordan Dam.	b253.3 above dam b179.5 below dam
Elmore County, sec. 22, T. 19 N., R. 18 E., at Jordan Dam, Geological Survey gage.	179.8
Elmore County, sec. 13, T. 18 N., R. 18 E., at Wetumpka gage.	c162.0
Alabama River:	
Montgomery County, sec. 12, T. 16 N., R. 17 E., at Montgomery gage.	c147.8

Table 2.--Flood-crest stages at miscellaneous locations--Con.

Stream and location	Elevation (feet)
Tombigbee River stem	
Sipsey Fork:	
Cullman County, sec. 17, T. 13 S., R. 5 W., at bridge on State Highway 69.	320.59
TENNESSEE RIVER BASIN	
Point Rock River:	
Madison County, sec. 14, T. 6 S., R. 2 E., at bridge on U. S. Highway 241.	579.75
Flint River:	
Madison County, sec. 29, T. 3 S., R. 2 E., at bridge on U. S. Highway 72.	626.06
Hurricane Creek:	
Madison County, sec. 10, T. 4 S., R 2 E., at bridge on U. S. Highway 72.	615.30
Flint River:	
Madison County, sec. 13, T. 4 S., R. 2 E., at bridge on U. S. Highway 241.	600.23
Cotaco Creek:	
Morgan County, sec. 2, T. 7 S., R. 2 W., at bridge on Alabama Highway 33.	573.10
Limestone Creek:	
Limestone County, sec. 26, T. 3 S., R. 3 W., at bridge on U. S. Highway 72.	443.20
Flint Creek:	
Morgan County, sec. 24, T. 8 S., R. 4 W., at bridge on U. S. Highway 31.	415.00
Cedar Creek:	
Morgan County, sec. 25, T. 7 S., R. 4 W., at bridge on U. S. Highway 31.	402.20

a Furnished by Corps of Engineers.
b Furnished by Alabama Power Co.
c Furnished by U. S. Weather Bureau.

Table 3. --Flood-crest stages on Black Warrior and Tombigbee Rivers

Stream and location	Miles above Mobile	Date 1951	Elevation (feet)
Mulberry Fork:			
Cordova gage	426	**Mar. 30**	283.4
Locust Fork:			
Port Birmingham gage	406	Mar. 29-30	266.3
Black Warrior River:			
Lock 17	375.3	Mar. 30	254.1 pool 202.6 tailwater
Lock 16	374.0	Mar. 29	193.4 pool 182.1 tailwater
Lock 15	367.6	Mar. 29	176.7 pool 171.0 tailwater
Lock 14	360.6	Mar. 29	165.0 pool 162.8 tailwater
Lock 13	357.3	Mar. 29	158.1 pool 157.3 tailwater
Tuscaloosa Lock	347.8	Mar. 29	148.1 pool 147.8 tailwater
Floodmark	347.6	-	147.2
Floodmark	346.0	-	145.2
Floodmark	344.7	-	145.0
Floodmark	344.0	-	144.9
Floodmark	341.0	-	142.6
Floodmark	339.0	-	141.7
Floodmark	336.2	-	141.2
Floodmark	332.0	-	137.2
Floodmark, Foster Ferry Bridge.	330.7	-	136.0

Table 3. --Flood-crest stages on Black Warrior and Tombigbee Rivers--Continued.

Stream and location	Miles above Mobile	Date 1951	Elevation (feet)
Black Warrior River--Con.			
Floodmark	326.0	-	133.0
Floodmark	321.1	-	130.8
Floodmark	319.5	-	129.1
Floodmark	317.0	-	128.6
Floodmark	313.2	-	126.5
Floodmark	307.5	-	123.1
Floodmark	304.5	-	122.8
Lock 9 gage	303.0	Mar. 31	122.1
Floodmark	301.0	-	121.8
Floodmark	299.8	-	121.4
Floodmark	294.5	-	119.4
Floodmark	291.8	-	118.9
Lock 8 gage	287.7	Apr. 1	118.4 pool 117.8 tailwater
Floodmark	284.0	-	116.8
Floodmark	281.0	-	116.1
Floodmark	277.6	-	115.3
Eutaw, Geological Survey gage.	275.0	Apr. 1	112.4
Lock 7 gage	272.0	Apr. 2	110.2
Floodmark	269.6	-	109.5
Floodmark	268.7	-	109.4

Table 3. --Flood-crest stages on Black Warrior and Tombigbee Rivers--Continued.

Stream and location	Miles above Mobile	Date 1951	Elevation (feet)
Black Warrior River--Con.			
Floodmark	262.2	-	107.6
Lock 6 gage	257.0	Apr. 2	104.5
Floodmark	253.1	-	101.1
Floodmark	242.6	-	96.4
Floodmark	241.4	-	96.0
Floodmark	240.6	-	95.5
Lock 5 gage	236.6	Apr. 4	93.0
Floodmark	233.9	-	92.4
Floodmark	231.0	-	91.6
Floodmark	227.4	-	91.1
Floodmark	226.6	-	90.9
Floodmark	223.7	-	90.9
Tombigbee River:			
Lock 4 gage	221.3	Apr. 5	90.4
Coatopa, Geological Survey gage.	207	Apr. 5, 6	81.7
Lock 3 gage	194.6	Apr. 7	76.5
Lock 2 gage	172.6	Apr. 8	67.8
Lock 1, Leroy, Geological Survey gage	101.6	Apr. 11	38.5

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Floods of May 1951 in Western Oklahoma and Northwestern Texas

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch*

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1227-B

Data on floods in Oklahoma and Texas, collected in cooperation with State, Federal, and municipal agencies

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PREFACE

This report on the floods of May 1951 in western Oklahoma and northwestern Texas was prepared in the Water Resources Division, C. G. Paulsen, chief, under the general direction of J. V. B. Wells, chief, Surface Water Branch.

Records of discharge are collected by the U. S. Geological Survey in cooperation with the following agencies: the Oklahoma Planning and Resources Board, Division of Water Resources, Ira C. Husky, director; Corps of Engineers, Tulsa district; Texas Board of Water Engineers, H. A. Beckwith, chairman; the Upper Red River Flood Control and Irrigation District, R. E. Barr, president; and the U. S. Bureau of Reclamation.

Acknowledgment is made to the Corps of Engineers for assistance in providing an isohyetal map of the storm. The map was based on records from Weather Bureau gages, supplemented by data obtained through "bucket" surveys in the field by employees of the Bureau of Reclamation, the Corps of Engineers, the Weather Bureau, the Soil Conservation Service, and the Geological Survey.

The compilation and preparation of the data presented in this report was accomplished by technical personnel of the district office of the Geological Survey at Oklahoma City, Okla., and Austin, Tex., under the supervision of S. K. Jackson, and C. E. Ellsworth, district engineers, Surface Water Branch.

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FLOODS OF 1951

FLOODS OF MAY 1951 IN WESTERN OKLAHOMA AND NORTHWESTERN TEXAS

ABSTRACT

Floods of unusual magnitude over an area in western Oklahoma, northwestern Texas, southwestern Kansas, and southeastern Colorado resulted from heavy rains during the period May 13-19. Near Custer City, Okla., a total of 18 inches of rain fell within a 12-hour period, according to information furnished by a local resident.

Five lives are known to have been lost. Although no comprehensive estimate of property damage was made, it is known to exceed 2 million dollars.

This report contains records of stage and discharge for 43 gaging stations, records of contents in 7 reservoirs (including 3 major flood-control reservoirs), an isohyetal map showing total precipitation during the period May 13-19, and other data related to the floods.

INTRODUCTION

The series of storms that caused the floods described in this report began with an initial storm in the eastern part of the Oklahoma Panhandle during the night of May 13, and the storm spread south and southeast over the Texas Panhandle and western Oklahoma during the next three days. Because official rainfall stations were unable to record the wide variation in amount and areal distribution of rainfall, field parties were sent into the area shortly after the storms to obtain information from local residents. Data obtained in this manner indicated that total precipitation exceeded 10 inches at a number of storm centers in scattered localities.

The area covered by this report is outlined on figure 14. The isohyetal map, plate 2, was prepared by the Corps of Engineers on the basis of all available records of rainfall for the period May 13-19.

This report presents records of discharge at 43 gaging stations in the Arkansas and Red River basins in Oklahoma and Texas. Daily discharge is shown for the month of May, with additional detail of stages and discharges for the period of highest flows, May 13-24. The report also contains a brief discussion of the general features of the flood and related data.

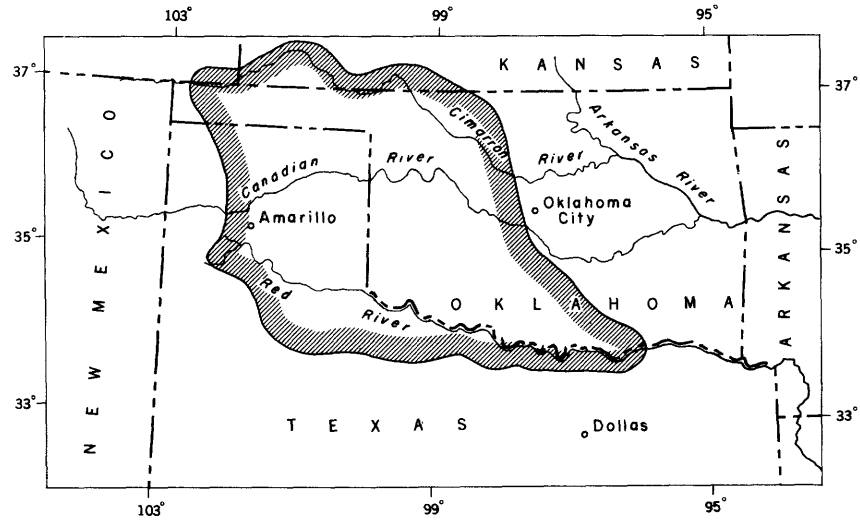

Figure 14. --Map showing area covered by this report.

GENERAL FEATURES OF THE FLOODS

Recurrent heavy thunderstorms during the period May 13-19 resulted in floods of unusual magnitude over a wide area in western Oklahoma, northwestern Texas, southwestern Kansas, and southeastern Colorado. Although flood discharges in the major streams generally did not exceed previous floods of record, discharges on some of the smaller streams draining areas of heavy storm centers were the highest known.

The area of heaviest rainfall was north of Custer City, about 15 miles northeast of Clinton, Okla., in the Deer Creek basin (a tributary of the Canadian River), where 18 inches of rain, as measured in an oil drum, was reported to have fallen during the afternoon and night of May 16. Other storm centers, with approximate total rainfall, were: Washita River basin, immediately west of Clinton, Okla., 15.5 inches; Wolf Creek basin, a tributary of the North Canadian River, in the vicinity of Shattuck, Okla., 11.2 inches; Cache Creek basin, in the vicinity of Apache, Okla., 10.7 inches; Palo Duro Creek basin, a tributary of Prairie Dog Town Fork Red River, northwest of Hereford, Tex., 11.0 inches; and a large area east of Amarillo, Tex., with a maximum of 15.0 inches reported at Conway, Tex. There were only a few recording rain gages near these storm centers; hourly figures of recorded precipitation for three such stations are shown in table 1.

Table 1. --Hourly precipitation for selected periods during storm of May 13-19, 1951; at representative Weather Bureau stations.

Hour	Hourly precipitation, in inches					
	Shattuck, Okla.		Wichita Mountain Wild Life Refuge, Okla.		Amarillo, Tex.	
	May 15	May 16	May 16	May 17	May 15	May 16
1	0	0.49	0	0.24	0	0
2	0	.01	.01	.10	0	0
3	0	.02	.03	.41	0	0
4	0	.01	.01	.49	0	0
5	0	.16	.01	.08	0	0
6	0	.42	0	.06	0	.11
7	0	.16	0	.01	.01	1.34
8	0	.24	0	0	0	.33
9	0	.07	0	.05	0	.23
10	0	.39	0	0	.03	.29
11	0	.12	.01	.19	.22	.14
12	0	.01	0	.34	.09	.51
1	.06	.03	0	.02	.02	.22
2	.02	.02	0	.08	.22	.05
3	.18	.04	0	.20	.71	.07
4	.40	.08	0	.10	.31	.03
5	.43	.10	0	.19	.09	.11
6	.44	.10	0	0	.42	.07
7	1.52	.08	.02	0	.22	.04
8	1.29	.33	.01	0	.35	.13
9	.02	.29	0	0	.96	0
10	.05	.20	.79	0	.15	0
11	.02	0	1.38	0	.14	0
12	.13	0	.66	0	.01	.03
Total for day	**4.56**	**3.37**	**2.93**	**2.56**	3.95	**3.70**

The period of heavy rainfall was preceded by a period of relatively dry weather, and streamflow was generally very low at the beginning of the storm period. In view of this dry antecedent period, initial infiltration rates were undoubtedly quite high, thereby lessening the resulting flood runoff. Daily precipitation for May 1951 for selected rainfall stations in the area is shown by bar graph in figure 15. Precipitation data at these and many other rainfall stations may be found in "Climatological Data" reports, published monthly by the U. S. Weather Bureau.

A large portion of the high plains area of the Oklahoma and Texas "panhandles" does not contribute any surface runoff to the stream systems, and a very large amount of water was stored in the many "wet-weather" lakes scattered throughout the area.

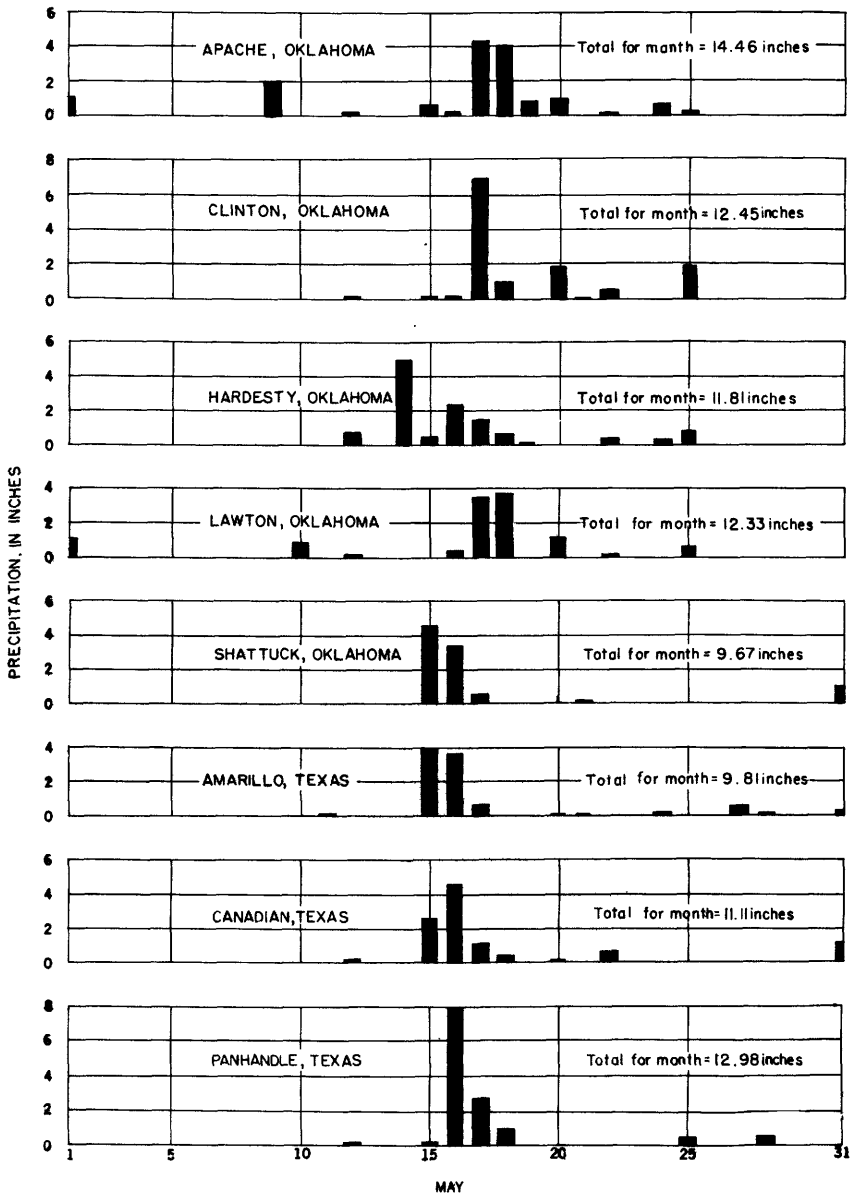

Figure 15.--Daily precipitation at selected Weather Bureau Stations in western Oklahoma and northwestern Texas during May 1951.

There are three major flood-control reservoirs in the area--Denison Reservoir on the Red River, Canton Reservoir on the North Canadian River, and Fort Supply Reservoir on Wolf Creek (a tributary of the North Canadian). These reservoirs effectively controlled flood flows originating from upstream areas.

Five persons lost their lives in flood waters, and a number of dramatic rescues of marooned persons were reported. No comprehensive estimate of property damage resulting from these floods has been made, but it is known to be in excess of 2 million dollars. Probably the highest monetary damage was suffered by transportation systems; the Oklahoma Highway Department estimated that damage to highways and bridges alone amounted to nearly a million dollars. Figure 16 shows the damage to a highway bridge near Sayre, Okla. Large intangible losses caused by personal inconvenience and delayed schedules resulted from flood-blocked highways and railroads. Damage to farm lands was considerable; crops were washed out, and many fields were covered with sand. No large urban areas were flooded, but several smaller cities suffered heavy damage; the City of Waurika, Okla. (population, 2,360), suffered the worst flood in its history--at least 250 families had to be evacuated from their homes because of the overflow from Beaver Creek.

STAGES AND DISCHARGES AT STREAM-GAGING STATIONS

Explanation of Data

The data given for each gaging station are as follows: a station description, a tabulation of daily discharge for the month of May, and a tabulation of stage and discharge at selected times of day for the period May 13-24.

The station description gives information about the type and location of gage, size of drainage area, length of record, nature of gage-height record obtained during the flood period, definition of the stage-discharge relation, maximum stage and discharge during the present flood and the previous maxima of record, and other pertinent information.

Daily mean discharge is tabulated for the month of May. A summary gives the monthly mean discharge in cubic feet per second and the runoff in acre-feet--the summary gives runoff in inches for gaging stations where the discharge records are not affected by regulation.

The table showing stage and discharge at indicated time for the period May 13-24 is in sufficient detail to permit delineation of the instantaneous stage and discharge during the flood period.

Figure 16.--Flood damage to bridge on U. S. Highway 66 near Sayre, Okla., caused by North Fork Red River. Washed-out span temporarily replaced by Bailey bridge. Photo by Oklahoma Highway Commission.

A record of the flood was obtained on a water-stage recorder graph at most gaging stations. At three gaging stations, the flood destroyed the bridge to which the recorder was attached. For this and other reasons the gage-height record at some stations is based on floodmarks or on gage readings made by a local observer.

The stage-discharge relation at most stations is sufficiently well defined in the upper range by current-meter measurements, made during this flood or during recent floods, to permit the **rating curve** to be extended to the peak stage, if necessary. At gaging stations where the rating curve could not be reliably extended, and at sites other than gaging stations where determinations of peak discharge were made, the peak discharge was obtained by indirect methods, such as the contracted-opening method, the slope-area method, or the weir formula for flow over a dam or over a highway embankment.

Figures 17 and 18 are hydrographs of discharge at selected gaging stations.

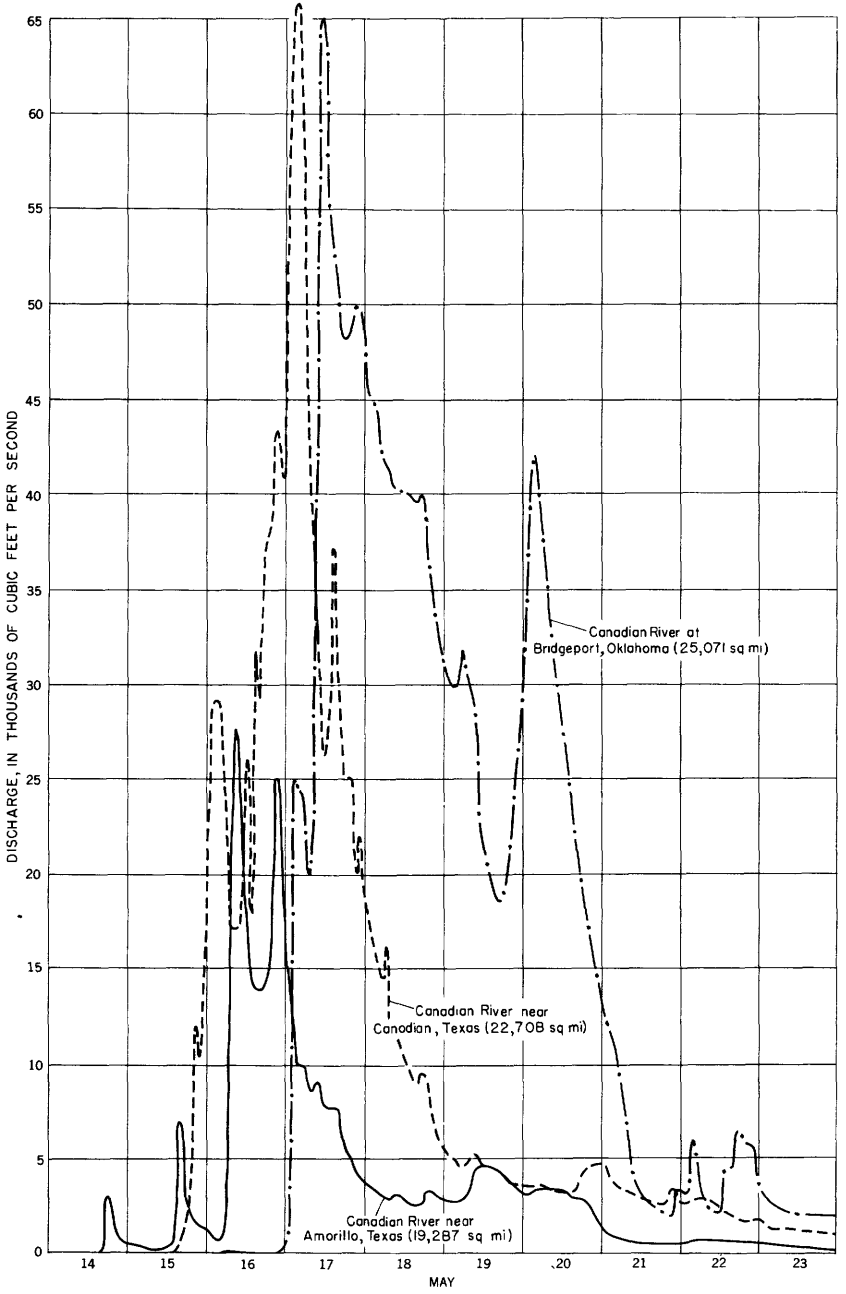

Figure 17.--Hydrographs of discharge at gaging stations on Canadian River, May 14-23, 1951.

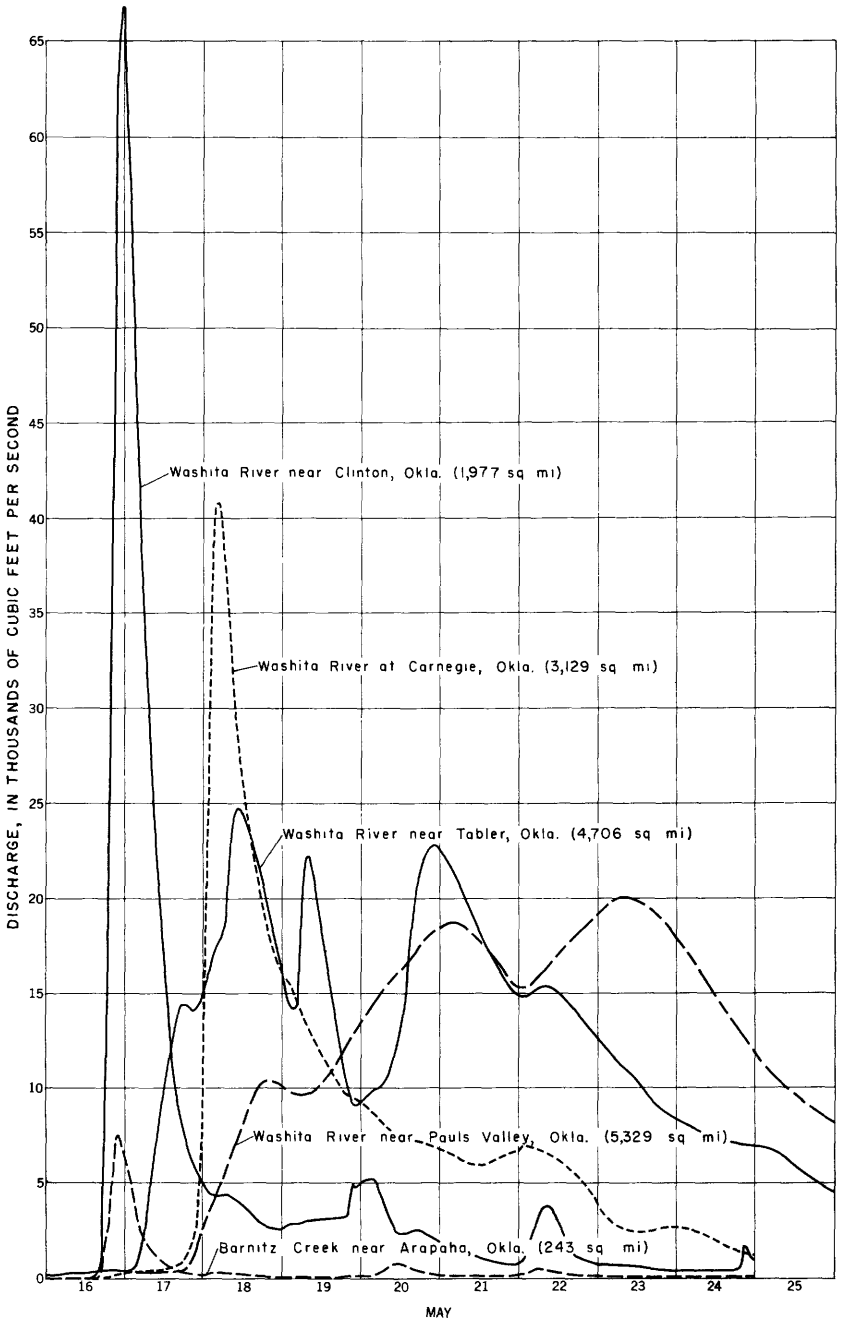

Figure 18. --Hydrographs of discharge at selected gaging stations in Washita River basin, May 16-25, 1951.

Arkansas River basin

Cimarron River above Ute Creek, near Boise City, Okla.

Location.--Lat 36°55', long. 102°36', in SE¼ sec. 10, T. 5 N., R. 4 E., on right bank 1,000 ft downstream from Kohler's dam, 1 mile upstream from Cold Springs Creek, 5.5 miles upstream from Ute Creek, 14 miles northwest of Boise City, and at mile 560.0. Datum of gage 3,932.85 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.--1,955 sq mi.

Gage-height record.--Water-stage recorder graph except for May 23, when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 4,200 cfs and extended above on basis of computation of peak flow over Kohler's dam. Shifting-control method used May 3, 16-31. Discharge estimated May 23.

Maxima.--May 1951: Discharge, 17,200 cfs 2 p.m. May 15 (gage height, 10.22 ft).
1905-7, 1942 to April 1951: Discharge recorded, 15,000 cfs July 28, 1950 (gage height, 9.66 ft).
Flood of Apr. 20, 1942, reached a stage of 20.1 ft, from floodmarks (discharge, 80,000 cfs, mean of slope-area determination of peak flow at present site and discharge at site 8.5 miles downstream determined from rating curve extended above 41,000 cfs on basis of logarithmic plotting).

Remarks.--Diversion for irrigation of about 8,600 acres above station. Records include water diverted at dam 1,000 ft upstream for irrigation of about 650 acres below station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0	6	0	11	0	16	1,060	21	400	26	74
2	0	7	0	12	0	17	238	22	494	27	58
3	.1	8	0	13	0	18	141	23	131	28	103
4	0	9	0	14	0	19	95	24	108	29	180
5	0	10	0	15	4,850	20	69	25	88	30	98
										31	106

Monthly mean discharge, in cfs	268
Runoff, in acre-feet	16,450
Runoff, in inches	

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												

Cimarron River near Mocane, Okla.

Location.--Lat 36°59', long. 100°19', 1,000 ft south of northwest corner sec. 24, T. 6 N., R. 25 E., near right bank on downstream side of county highway bridge, 6½ miles northeast of Mocane, 14.7 miles upstream from Crooked Creek, and at mile 364.1. Datum of gage is 2,206.12 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.--8,653 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period May 17-31, for which graph was drawn based on wire-weight gage readings made twice daily or oftener.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 6,300 cfs and extended above on basis of slope-area determination of peak discharge. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 53,400 cfs 4:45 a.m. May 17 (gage height, 9.94 ft from floodmark).
1942 to April 1951: Discharge, 10,500 cfs June 7, 1949 (gage height, 5.50 ft), from rating curve extended above 6,300 cfs as described above.
Stage known, about 13 ft in 1914, from information by local residents.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	49	6	63	11	76	16	1,840	21	198	26	191
2	56	7	63	12	63	17	17,900	22	1,830	27	144
3	56	8	67	13	58	18	2,120	23	1,780	28	152
4	56	9	72	14	2,100	19	462	24	756	29	152
5	60	10	76	15	942	20	207	25	360	30	152
										31	128

Monthly mean discharge, in cfs	1,040
Runoff, in acre-feet	63,930
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			3.20	72					3.78	1,740		
4			3.38	224			4.13	3,120	8.60	38,200	2.42	2,590
6			3.62	680	3.08	564			9.35	49,100		
8			4.13	2,200			3.97	2,340	7.95	38,500	2.36	2,450
10			5.05	7,600					6.65	28,700		
N	3.17	56	4.68	5,880	3.03	510	3.65	1,380	5.40	20,500	2.24	2,100
2			3.99	2,800					4.43	13,200		
4			3.47	1,300			3.48	960	3.92	9,830	2.17	1,950
6			3.38	1,080	3.17	700			3.53	7,480		
8			3.71	1,860	3.49	1,380	3.52	1,050	3.23	5,880	2.04	1,620
10			3.36	1,480	3.81	2,200			2.92	4,450		
12	3.19	63	3.33	960	4.13	3,320	3.51	1,020	3.60	3,200	1.70	880
	May 19		May 20		May 21		May 22		May 23		May 24	
2							1.78	960				
4							1.92	1,250	2.61	3,160	1.97	1,320
6	1.43	474	1.15	235	1.05	136	1.86	1,100				
8							1.66	800	2.25	1,950	1.86	1,100
10							1.56	640				
N	1.45	510	1.10	224	1.08	160	1.57	660	1.87	1,120	1.60	640
2							1.97	1,380				
4							2.53	3,000	1.77	940	1.40	360
6	1.27	300	1.04	160	1.10	181	2.58	3,120				
8							2.67	3,400	1.92	1,200	1.42	390
10							2.74	3,640				
12	1.18	247	1.05	170	1.42	456	2.75	3,640	1.83	1,020	1.47	438

Supplemental record.--May 14, 10:50 a.m., 5.07 ft, 7,720 cfs 8:30 p.m., 3.73 ft, 1,920 cfs; May 17, 3 a.m., 4.14 ft, 2,960 cfs 4:45 a.m., 9.94 ft, 53,400 cfs; May 22, 11 a.m., 1.53 ft, 582 cfs; May 23, 3 p.m., 1.73 ft, 860 cfs 6 p.m., 2.03 ft, 1,420 cfs 11 p.m., 1.79 ft, 940 cfs.

Crooked Creek near Nye, Kans.

Location.--Lat 37°02', long. 100°12', at southeast corner sec. 1, T. 35 S., R. 27 W., on right bank at upstream side of bridge on county road, 6½ miles east of Nye and 14 miles upstream from mouth. Datum of gage is 2,163.79 ft above mean sea level (unadjusted).

Drainage area.--1,157 sq mi, of which about 800 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except for period May 1-6, when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 2,400 cfs and extended above on basis of slope-area determination of peak discharge at gage and discharge measurement at site 10 miles upstream. Shifting-control method used May 7-31. Discharge for May 1-6 estimated on basis of range in stage and weather records.

Maxima.--May 1951: Discharge, 10,000 cfs 9 p.m. May 23 (gage height, 7.59 ft).
1942 to April 1951: Discharge, 6,360 cfs July 27, 1950 (gage height, 7.15 ft), from rating curve extended above 2,400 cfs as described above.
Stage known, that of May 23, 1951, exceeding flood of 1913 at site 1 mile above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	40	6	40	11	16	16	2,060	21	1,030	26	817
2		7	30	12	14	17	3,450	22	2,210	27	498
3		8	22	13	26	18	6,000	23	6,720	28	390
4		9	17	14	811	19	2,780	24	6,040	29	329
5		10	16	15	608	20	1,040	25	1,840	30	311
										31	202

Monthly mean discharge, in cfs	1,210
Runoff, in acre-feet	74,410
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			3.35	49	3.50	162	6.16	3,390	4.81	1,300	7.21	6,300
4			3.35	49	3.48	151	5.94	2,990	4.85	1,350	7.36	7,150
6			3.55	67	3.43	135	5.71	2,600	5.01	1,560	7.40	7,400
8			3.89	265	3.41	120	5.47	2,220	5.88	2,890	7.34	7,150
10			5.80	2,640	3.45	140	5.24	1,880	6.23	3,530	7.26	6,770
N			6.18	3,400	3.47	149	5.06	1,620	6.42	3,890	7.18	6,440
2			4.91	1,420	3.53	178	4.94	1,470	6.53	4,120	7.11	6,120
4			4.32	760	3.98	465	4.82	1,320	6.61	4,260	7.01	5,740
6			3.91	420	4.10	560	4.86	1,360	6.67	4,400	6.90	5,360
8			3.68	265	4.61	1,060	4.93	1,450	6.89	4,960	6.80	5,060
10			3.62	230	5.36	2,050	5.07	1,630	7.00	5,330	6.60	4,560
12			3.54	180	6.34	3,740	4.96	1,490	7.14	5,950	6.53	4,420
	May 19		May 20		May 21		May 22		May 23		May 24	
2	6.46	4,270	4.60	1,340	4.26	985	5.94	3,400	4.18	1,040	7.41	8,820
4	6.34	4,040	4.50	1,230	4.24	970	6.16	3,750	5.05	2,040	7.29	8,080
6	6.17	3,730	4.42	1,150	4.18	915	6.30	3,990	6.68	4,890	7.18	7,480
8	5.98	3,400	4.38	1,110	4.16	895	5.94	3,400	6.94	5,760	7.02	6,700
10	5.76	3,020	4.26	985	4.10	835	5.28	2,390	7.12	6,680	6.92	6,240
N	5.57	2,720	4.22	950	4.06	805	4.70	1,590	7.26	7,580	6.72	5,480
2	5.34	2,340	4.20	930	4.02	775	4.47	1,330	7.40	8,520	6.65	5,270
4	5.09	1,980	4.18	915	3.99	745	4.36	1,210	7.55	9,660	6.56	5,020
6	4.92	1,740	4.18	915	3.95	715	4.26	1,110	7.58	9,940	6.41	4,680
8	4.76	1,530	4.24	970	3.96	720	4.18	1,040	7.57	9,840	6.21	4,300
10	4.77	1,550	4.18	915	4.75	1,520	4.11	970	7.47	9,220	6.06	4,050
12	4.62	1,370	4.17	905	6.43	4,220	4.04	915	7.52	9,550	5.74	3,520

Supplemental record.--May 14, 11 a.m., 6.72 ft, 4,370 cfs; May 17, 3 a.m., 4.76 ft, 1,230 cfs; May 21, 5 p.m., 3.93 ft, 700 cfs; May 23, 9 p.m., 7.59 ft, 10,000 cfs.

Cimarron River near Waynoka, Okla.

Location.--Lat 36°30'55", long. 98°52'45", near center of sec. 35, T. 24 N., R. 16 W., near center of span on downstream side of bridge on U. S. Highway 281, three-quarters of a mile downstream from Ewers (Maine) Creek, 5 miles south of Waynoka, and at mile 247.0. Datum of gage is 1,367.50 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--13,307 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period May 27-30, when no record was obtained.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge for period of no gage-height record estimated on basis of weather records.

Maxima.--May 1951: Discharge, 37,700 cfs 10:45 a.m. May 18 (gage height, 9.54 ft). 1938 to April 1951: Discharge, 70,000 cfs July 28, 1950 (gage height, 11.40 ft), from rating curve extended above 38,000 cfs.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	352	6	58	11	36	16	15,100	21	4,690	26	4,310
2	167	7	55	12	34	17	17,800	22	8,750	27	2,350
3	121	8	53	13	29	18	27,500	23	14,900	28	1,650
4	87	9	47	14	25	19	16,400	24	14,400	29	1,080
5	71	10	41	15	1,440	20	6,150	25	10,400	30	930
										31	832

Monthly mean discharge, in cfs	4,834
Runoff, in acre-feet	287,200
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
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Canadian River near Amarillo, Tex.

Location.--Lat 35°28'10", long. 101°52'45", on left bank at downstream side of bridge on U. S. Highways 87 and 287, 2,000 ft downstream from Pitcher Creek, 2.0 miles downstream from Panhandle & Santa Fe Railway bridge, and 19 miles north of Amarillo, Potter County. Datum of gage is 2,989.16 ft above mean sea level, datum of 1929.

Drainage area.--19,287 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period May 1-14 for which a graph was drawn based on once-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used.

Maxima.--May 1951: Discharge, 27,700 cfs 9 a.m. May 16 (gage height, 9.56 ft).
1924-25, 1938 to April 1951: Discharge, 135,000 cfs July 25, 1941 (gage height, 15.7 ft), from rating curve extended above 100,000 cfs.
Flood of May 1914 reached a stage of about 24.0 ft; a higher stage probably occurred during the flood of October 1904.

Remarks.--Some regulation by Conchas Reservoir in New Mexico (capacity, 370,200 acre-ft). Extremely low flow is maintained by sewage effluent from the City of Amarillo. No large diversions above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	10	6	8.9	11	7.6	16	13,800	21	642	26	114
2	8.9	7	8.3	12	12	17	8,330	22	556	27	79
3	8.3	8	7.0	13	9.6	18	3,070	23	326	28	271
4	8.3	9	7.0	14	450	19	3,740	24	155	29	88
5	8.3	10	7.0	15	1,370	20	3,030	25	134	30	60
										31	54
Monthly mean discharge, in cfs											1,174
Runoff, in acre-feet											72,160
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			3.57	6.4	4.66	378	5.10	840	7.08	13,400	5.02	3,690
4			3.55	5.8	4.60	326	4.98	687	6.40	10,100	4.97	3,320
6	3.60	7.6	3.55	5.2	4.50	262	5.95	2,900	6.39	10,100	4.92	3,000
8			3.62	9.6	4.43	224	9.15	24,100	6.05	8,600	4.88	2,830
10			3.67	14	4.47	240	9.25	26,100	6.10	9,200	4.96	3,210
N	3.69	14	3.66	13	4.70	393	8.30	18,600	5.85	7,780	4.87	3,040
2			3.64	12	4.80	470	7.34	14,500	5.86	7,780	4.72	2,600
4			3.62	11	6.93	7,000	7.15	13,800	5.85	7,780	4.70	2,600
6	3.64	10	6.00	3,070	6.00	2,870	7.20	14,200	5.46	5,810	4.83	2,670
8			5.40	1,360	5.67	1,870	7.75	16,100	5.30	5,060	5.02	3,380
10			4.95	653	5.50	1,500	9.10	25,100	5.13	4,330	4.96	3,070
12	3.59	7.0	4.78	478	5.40	1,320	7.85	16,100	5.04	3,960	4.88	2,930
	May 19		May 20		May 21		May 22		May 23		May 24	
2			4.94	3,070								
4			4.95	3,320	4.60	840						
6	4.84	2,870	4.97	3,380			4.58	710				
8			4.99	3,460	4.58	687						
10			4.98	3,420								
N	5.30	4,710	4.97	3,380	4.47	470	4.45	546	4.28	300	4.08	144
2			4.92	3,280								
4			4.80	2,930	4.42	452						
6	5.23	4,330	4.76	2,870			4.42	516				
8			4.69	2,590	4.42	443						
10			4.66	2,290								
12	5.04	3,210	4.62	1,520	4.38	400	4.40	506	4.12	195	4.03	138

Supplemental record.--May 16, 9 a.m., 9.56 ft, 27,700 cfs, 9:30 p.m., 9.17 ft, 25,100 cfs.

Canadian River near Canadian, Tex.

Location.--Lat 35°55', long. 100°22', near left bank on downstream side of pier of bridge on U. S. Highways 60 and 83, 220 ft downstream from Panhandle & Santa Fe Railway bridge, 1.2 miles downstream from Red Deer Creek, and 1.6 miles northeast of Canadian, Hemphill County. Datum of gage is 2,301.50 ft above mean sea level, datum of 1929.

Drainage area.--22,708 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period May 1-13 for which a graph was drawn based on once-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 30,000 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 65,900 cfs 3-4 a.m. May 17 (gage height, 8.82 ft).
1924-25, 1938 to April 1951: Discharge, 122,000 cfs Sept. 23, 1941 (gage height, 9.8 ft, from graph based on wire-weight gage readings), from rating curves for two channels extended above 8,000 and 38,000 cfs.
Stage known, about 20.0 ft Oct. 2, 1904.

Remarks.--Some regulation by Conchas Reservoir in New Mexico (capacity, 370,200 acre-ft). No large diversions above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0.9	6	0.9	11	0.9	16	28,100	21	3,150	26	299
2	.9	7	.9	12	.9	17	37,200	22	2,250	27	151
3	.9	8	.9	13	1.7	18	11,400	23	1,160	28	112
4	.9	9	.9	14	2.4	19	4,540	24	839	29	320
5	.9	10	.9	15	2,300	20	3,680	25	637	30	213
										31	316
Monthly mean discharge, in cfs											3,119
Runoff, in acre-feet											191,800
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2					5.61	3.1	7.80	27,600	8.77	62,900	7.40	16,900
4					5.62	4.2	7.87	29,300	8.82	65,900	7.32	15,300
6					5.60	3.1	7.70	25,300	8.65	57,400	7.28	14,400
8					5.60	3.1	7.30	17,100	8.18	39,300	7.15	12,200
10					5.59	3.1	7.30	17,100	7.93	31,800	7.11	11,400
N	5.44	1.5	5.54	2.2	5.58	3.1	7.62	23,500	7.72	26,200	7.05	10,500
2					5.61	3.1	7.35	18,000	7.94	31,000	6.98	9,660
4					5.89	486	7.92	30,800	7.97	31,800	6.93	8,970
6					6.16	1,600	8.14	36,900	7.72	24,900	6.97	9,520
8					6.69	6,020	8.18	38,400	7.75	25,100	6.83	7,800
10					6.99	10,400	8.33	43,500	7.53	20,000	6.71	6,650
12	5.47	2.2	5.61	3.1	7.41	18,200	8.24	40,900	7.56	20,200	6.59	5,700
	May 19		May 20		May 21		May 22		May 23		May 24	
2	6.48	5,060	6.10	3,550	6.22	4,420						
4	6.45	4,970	6.10	3,550	6.15	3,690	6.04	2,780	5.76	1,240	5.63	724
6	6.35	4,460	6.11	3,620	6.11	3,410						
8	6.37	4,970	6.07	3,340	6.09	3,270	6.04	2,780	5.77	1,280	5.70	936
10	6.35	5,240	6.06	3,270	6.06	3,080						
N	6.27	4,700	6.06	3,270	6.02	2,840	5.94	2,220	5.73	1,130	5.72	1,000
2	6.24	4,620	6.06	3,270	6.01	2,780						
4	6.20	4,460	6.06	3,270	5.97	2,540	5.89	1,950	5.71	1,060	5.67	840
6	6.15	4,060	6.15	3,900	5.96	2,490						
8	6.11	3,760	6.22	4,460	5.94	2,380	5.82	1,600	5.67	936	5.64	753
10	6.08	3,550	6.24	4,620	6.09	3,270						
12	6.08	3,550	6.24	4,620	5.98	2,600	5.85	1,750	5.64	840	5.63	724

Supplemental record.--May 15, 9 p.m., 7.17 ft, 12,800 cfs; May 16, 1 p.m., 7.74 ft, 26,200 cfs, 3:30 p.m., 7.97 ft, 31,800 cfs, 4:30 p.m., 7.86 ft, 29,300 cfs; May 17, 3 a.m., 8.82 ft, 65,900 cfs, 2:30 p.m., 8.17 ft, 37,200 cfs, 11 p.m., 7.64 ft, 22,000 cfs; May 18, 7 a.m., 7.39 ft, 16,200 cfs.

Canadian River at Bridgeport, Okla.

Location.--Lat 35°34'00", long. 98°22'45", in SE¼SW¼ sec. 28, T. 13 N., R. 11 W., on downstream side of left abutment of Chicago, Rock Island & Pacific Railway bridge, 1 mile north of Bridgeport, 2 3/4 miles upstream from Lumpmouth Creek, and at mile 267.1. Datum of gage is 1,384.25 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--25,071 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for May 24, when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting control method used May 1-31. Discharge for May 24 estimated on basis of weather records.

Maxima.--May 1951: Discharge, 65,000 cfs 11:45 a.m. May 17 (gage height, 11.74 ft). 1944 to April 1951: Discharge, about 150,000 cfs June 23, 1948 (gage height, 14.60 ft, from floodmark), from rating curve extended above 50,000 cfs by logarithmic plotting and on basis of records for nearby stations.

Remarks.--Occasional slight regulation by Conchas Reservoir in New Mexico (capacity, 370,200 acre-ft).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	46	6	16	11	16	16	58	21	5,300	26	1,470
2	26	7	17	12	16	17	39,400	22	4,100	27	930
3	19	8	18	13	16	18	40,400	23	2,230	28	608
4	17	9	18	14	16	19	25,400	24	1,940	29	470
5	17	10	17	15	18	20	28,100	25	2,320	30	350
										31	320

Monthly mean discharge, in cfs	4,958
Runoff, in acre-feet	304,800
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							5.98	20	7.73	2,050	10.27	45,200
4							5.98	20	9.90	24,900	10.30	44,600
6							6.62	89	9.81	23,900	10.21	41,900
8							6.46	54	9.49	20,600	10.34	41,100
10							6.43	50	10.90	47,000	10.47	40,200
N							6.36	44	11.68	64,400	10.45	40,100
2							6.24	35	10.85	55,200	10.59	40,000
4							6.17	30	10.54	51,600	10.60	39,600
6							6.15	29	10.25	48,200	10.64	39,900
8							6.13	29	10.30	48,600	10.35	36,300
10							6.12	28	10.52	50,000	10.10	33,500
12							7.25	665	10.44	48,400	9.90	31,800
	May 19		May 20		May 21		May 22		May 23		May 24	
2	9.66	30,300	9.96	37,800	7.42	12,100	6.38	3,000				
4	9.50	29,800	10.25	42,000	7.31	11,100	7.05	6,000	6.51	2,620		
6	9.60	31,800	10.08	39,600	7.05	8,700	6.73	3,750				
8	9.43	30,000	9.80	35,700	6.74	6,100	6.52	2,650	6.43	2,240		
10	9.27	28,300	9.50	31,700	6.41	3,900	6.43	2,240				
N	8.79	22,800	9.30	29,000	6.28	3,200	6.39	2,050	6.39	2,050	6.36	1,950
2	8.55	20,100	8.71	25,600	6.22	2,800	6.84	4,400				
4	8.43	18,800	8.40	22,200	6.15	2,550	6.85	4,500	6.38	2,010		
6	8.40	18,500	8.18	19,800	6.07	2,300	7.12	6,500				
8	8.60	20,700	7.93	17,200	6.04	2,050	7.02	5,800	6.37	1,970		
10	8.91	24,200	7.75	15,300	6.00	1,900	7.01	5,700				
12	9.28	28,800	7.53	13,200	6.42	3,200	6.70	3,550	6.37	1,970	6.35	1,910

Supplemental record.--May 17, 3 a.m., 9.92 ft, 25,000 cfs, 7:45 a.m., 9.45 ft, 20,000 cfs, 11:45 a.m., 11.74 ft, 65,000 cfs; May 21, 11 p.m., 6.49 ft, 3,400 cfs.

North Canadian River near Guymon, Okla.

Location.--Lat 36°43'20", long. 101°29'30", in NW¼SW¼ sec. 18, T. 3 N., R. 15 E., near center of span on downstream side of pier of bridge on U. S. Highway 64 at Dry Sand Draw, 1½ miles upstream from Gulf Creek, 2½ miles north of Guymon, and at mile 650.7. Datum of gage is 2,970.93 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--2,139 sq mi, includes that of Dry Sand Draw and an undetermined amount of noncontributing area.

Gage-height record.--Water-stage recorder graph except for period May 18-21, for which graph was drawn based on daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 9,970 cfs 1:45 a.m. May 17 (gage height, 7.56 ft).
1938 to April 1951: Discharge, 44,000 cfs Sept. 23, 1941 (gage height, 13.82 ft, from floodmark), from rating curve extended above 26,000 cfs by logarithmic plotting.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	4.0	6	6.7	11	5.4	16	1,500	21	69	26	19
2	4.9	7	7.6	12	5.4	17	2,400	22	28	27	20
3	6.0	8	6.0	13	6.0	18	111	23	20	28	22
4	6.7	9	4.9	14	767	19	89	24	20	29	23
5	6.7	10	4.9	15	44	20	84	25	22	30	19
										31	19

Monthly mean discharge, in cfs	173
Runoff, in acre-feet	10,610
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												

Coldwater Creek near Hardesty, Okla.

Location.--Lat 36°39', long. 101°13', in NW¼NE¼ sec. 15, T. 2 N., R. 17 E., near center of span on downstream side of bridge on State Highway 3, 2 miles northwest of Hardesty and 5.7 miles upstream from mouth. Datum of gage is 2,751.32 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--2,124 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 7,250 cfs 9:15 p.m. May 16 (gage height, 7.68 ft).
1939 to April 1951: Discharge not determined (probably occurred on June 25, 1947); gage height, 9.12 ft July 18, 1950.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	3.1	6	4.6	11	4.1	16	2,770	21	52	26	37
2	3.1	7	4.6	12	4.1	17	4,280	22	41	27	31
3	3.6	8	4.1	13	3.6	18	555	23	36	28	26
4	4.1	9	3.1	14	1,740	19	110	24	36	29	25
5	4.6	10	2.7	15	483	20	54	25	39	30	25
										31	25

Monthly mean discharge, in cfs	336
Runoff, in acre-feet	20,660
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			3.05	7	4.10	410	5.41	1,640	7.40	6,200		
4			3.20	21	3.85	263	5.11	1,270	7.38	6,110	4.80	891
6			4.60	650	3.65	169	4.78	927	7.35	5,990		
8			5.90	2,150	4.84	981	4.52	706	7.20	5,460	4.42	587
10			5.85	2,070	4.37	594	4.42	629	6.85	4,380		
N			5.95	2,240	4.15	442	4.47	666	6.72	4,020	4.12	384
2			6.67	3,600	4.10	410	4.85	990	6.94	4,630		
4			6.81	3,950	4.02	360	6.15	2,790	6.75	4,100	4.06	348
6			6.48	3,170	3.92	302	7.28	5,670	6.30	3,040		
8			5.70	1,840	3.95	318	7.60	6,910	5.74	2,010	4.00	312
10			4.82	873	4.35	580	7.66	7,160	5.45	1,590		
12			4.45	615	5.15	1,310	7.48	6,420	5.25	1,330	3.95	285
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4	3.73	165										
6			3.37	52	3.38	54					3.31	31
8	3.61	121										
10												
N	3.48	83	3.36	50	3.38	54	3.30	39	3.31	36	3.34	36
2												
4	3.41	65										
6			3.40	59	3.32	43					3.35	37
8	3.36	54										
10												
12	3.37	57	3.40	59	3.36	50	3.27	34	3.31	36	3.40	46

Supplemental record.--May 14, 9:15 a.m., 6.66 ft, 3,690 cfs, 3:30 p.m., 6.84 ft, 4,020 cfs; May 15, 6:45 a.m., 4.83 ft, 972 cfs; May 16, 9:15 p.m., 7.68 ft, 7,250 cfs.

Palo Duro Creek near Spearman, Tex.

Location.--Lat 36°12', long. 101°19', at bridge on State Highway 282, at abandoned town of Hansford, 6 miles west of Spearman, Hansford County, and about 18 miles upstream from Horse Creek. Datum of gage is 2,961.6 ft above mean sea level, datum of 1929.

Drainage area.--977 sq mi, of which 515 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 4,930 cfs 4 a.m. May 17 (gage height, 15.32 ft). 1945 to April 1951: Discharge, 21,200 cfs Oct. 7, 1946 (gage height, 19.87 ft). Stage known, about 22.5 ft Sept. 4, 1938, from floodmark (discharge, about 34,000 cfs). Flood of June 4, 1936 reached a stage of about 21 ft, from floodmarks (discharge, 26,100 cfs). Discharge for the two floods determined from rating curve extended above 20,000 cfs by logarithmic plotting.

Remarks.--Diversion by pumping plant in stream bed above station affects low flow.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	2.0	6	2.0	11	2.5	16	1,670	21	53	26	18
2	1.8	7	3.2	12	2.8	17	4,440	22	51	27	14
3	2.1	8	2.9	13	2.7	18	2,560	23	32	28	13
4	2.3	9	3.1	14	756	19	511	24	22	29	12
5	2.5	10	2.6	15	467	20	114	25	20	30	11
										31	11
Monthly mean discharge, in cfs											349
Runoff, in acre-feet											21,440
Runoff, in inches											0.87

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			1.07	2.4	12.06	995	10.18	500				
4			10.20	515	11.35	760	10.72	610	15.32	4,930	14.62	3,880
6			11.67	860	9.85	470	11.92	945				
8			11.78	900	7.40	240	12.23	1,110	14.98	4,630	13.84	2,740
10			9.80	455	8.75	337	12.16	1,050				
N	0.94	2.0	5.93	167	9.32	402	12.50	1,320	14.99	4,630	13.52	2,350
2			8.40	308	8.77	347	13.01	1,770				
4			10.60	570	8.39	308	13.24	1,980	14.88	4,330	13.33	2,220
6			12.25	1,110	7.62	254	13.55	2,350				
8			12.91	1,670	7.08	221	14.12	3,000	14.88	4,330	12.85	1,580
10			13.02	1,770	8.35	308	14.36	3,430				
12	1.06	3.8	12.70	1,490	9.59	426	14.46	3,580	14.73	4,030	12.17	1,110
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4							2.33	38				
6												
8	10.85	610					2.33	38				
10												
N			4.28	104	2.68	50	2.27	37	1.99	28	1.76	22
2												
4	8.12	283					3.54	81				
6												
8							3.15	67				
10												
12	6.23	177	3.31	72	2.41	41	2.62	49	1.89	25	1.68	20

Supplemental record.--May 14, 7 a.m., 12.05 ft, 995 cfs, 9:30 p.m., 13.03 ft, 1,770 cfs; May 15, 11:30 a.m., 9.50 ft, 414 cfs.

North Canadian River at Beaver, Okla.

Location.--Lat 36°49'20", long. 100°31'05", in SW¼ sec. 7, T. 4 N., R. 24 E., near right bank on downstream side of pier of bridge on U. S. Highway 270 at Beaver, 1½ miles downstream from Home Creek, 5 miles upstream from Clear Creek, and at mile 576.0. Datum of gage is 2,368.16 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--8,112 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period 6 p.m. May 16 to 6 a.m. May 17, for which graph was completed on basis of range line and adjacent graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-10, 14-31.

Maxima.--May 1951: Discharge, 32,200 cfs 3 p.m. May 17 (gage height, 11.57 ft). 1938 to April 1951: Discharge, 70,000 cfs Oct. 8, 1946, by slope-area determination of overflow and extension of rating curve for main channel above 42,000 cfs; gage height, 14.55 ft Oct. 8, 1946.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	22	6	4.0	11	1.6	16	20,100	21	842	26	325
2	10	7	4.8	12	1.6	17	26,200	22	1,200	27	277
3	6.0	8	4.0	13	15	18	11,800	23	513	28	217
4	4.8	9	2.0	14	12,100	19	3,210	24	358	29	231
5	4.8	10	1.8	15	11,300	20	1,070	25	379	30	217
										31	238
Monthly mean discharge, in cfs											2,924
Runoff, in acre-feet											179,800
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2			4.18	12	9.80	16,700	10.40	20,800	10.10	19,000	10.15	20,500
4			4.48	57	9.47	14,900	10.85	24,500	10.21	19,500	9.77	17,700
6			5.60	660	9.16	12,900	10.82	24,200	10.60	22,100	9.47	15,600
8			9.00	9,600	8.91	11,500	10.69	22,900	10.89	24,900	9.07	13,200
10			10.46	20,800	8.65	9,900	10.65	22,600	11.20	28,100	8.67	11,200
N			10.52	21,400	8.27	8,200	10.46	20,800	11.37	30,000	8.30	9,450
2			9.95	18,000	7.95	7,000	10.24	19,800	11.50	31,400	7.92	8,080
4			9.57	15,300	7.85	6,600	10.04	18,400	11.54	31,800	7.81	7,640
6			9.55	15,100	8.13	7,750	9.78	16,500	11.50	31,400	7.81	7,640
8			9.78	16,500	8.62	9,720	9.75	16,300	11.20	29,200	7.90	8,000
10			10.01	18,600	9.27	13,300	9.80	16,700	10.83	25,800	7.86	7,840
12			10.05	18,500	9.82	16,900	9.92	17,800	10.55	23,500	7.84	7,020
	May 19		May 20		May 21		May 22		May 23		May 24	
2					4.25	860	4.95	1,600				
4	6.78	4,720	4.66	1,250	4.21	872	5.62	2,540	4.23	548	4.04	361
6					4.13	776	5.39	1,950				
8	6.19	3,480	4.42	1,010	4.11	812	5.07	1,480	4.18	495	4.07	388
10					4.14	788	4.85	1,180				
N	5.80	2,800	4.35	980	4.11	812	4.68	956	4.24	559	4.03	352
2					4.07	764	4.58	836				
4	5.40	2,140	4.41	993	4.04	728	4.50	740	4.20	515	4.00	325
6					4.00	682	4.43	717				
8	5.16	1,840	4.38	1,020	4.04	728	4.40	682	4.15	465	4.02	345
10					4.45	1,040	4.36	636				
12	4.88	1,490	4.28	896	4.95	1,600	4.32	592	4.08	397	4.04	361

Supplemental records.--May 14, 11 a.m., 10.60 ft, 22,100 cfs, 11 p.m., 10.08 ft, 18,800 cfs; May 15, 3:30 p.m., 7.82 ft, 6,480 cfs; May 16, 4:45 a.m., 10.91 ft, 25,100 cfs; May 17, 3 p.m., 11.57 ft, 32,200 cfs; May 22, 1 a.m., 4.90 ft, 1,520 cfs, 3:30 a.m., 5.66 ft, 2,620 cfs.

Wolf Creek near Fargo, Okla.

Location.--Lat 36°24'00", long. 99°37'25", in SE¼NE¼ sec. 11, T. 22 N., R. 23 W., on downstream side of right pier of county highway bridge, 800 ft downstream from Boggy Creek, 1½ miles downstream from Sixteen Mile Creek, 1½ miles north of Fargo and 16.0 miles upstream from mouth. Datum of gage is 2,054.35 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--1,624 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder destroyed by flood May 16, and except for May 1 no recorder graph was available. Graphs were drawn for periods 5 p.m. May 18 to May 24, May 30, 31, based on at least once-daily staff-gage readings. No gage-height record May 2 to 4 p.m. May 18, May 25-29.

Discharge record.--Stage-discharge relation defined by current-meter measurements except for May 16-18 when stage-discharge relation was indefinite and for which discharge hydrograph was computed on basis of weather records, 3 discharge measurements, and computations of inflow to Fort Supply Reservoir. Discharge for periods of no gage-height record estimated on basis of weather records.

Maxima.--May 1951: Discharge, 23,500 cfs May 16 (time unknown); gage height, 8.19 ft May 16, from floodmark (time unknown).
1943 to April 1951: Discharge, 10,800 cfs Oct. 2, 1944 (gage height, 7.65 ft). Flood of 1951 reported as maximum known at town of Gage, 12 miles above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	88	6		11		16	16,400	21	520	26	260
2		7		12	50	17	10,100	22	468	27	240
3	50	8	50	13		18	4,250	23	499	28	220
4		9		14		19	1,200	24	333	29	210
5		10		15	400	20	652	25	290	30	276
										31	458
Monthly mean discharge, in cfs											1,210
Runoff, in acre-feet											74,410
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2						40		3,900		14,300		2,900
4								6,700		13,800		3,000
6								9,400		13,900		4,200
8								14,800		13,700		5,100
10								20,500		12,000		6,200
N						40		22,300		10,400		7,800
2								23,500		8,900		6,000
4						80		22,400		7,300		4,800
6						400		21,000		5,900	3.88	3,390
8						1,100		21,600		5,800	3.56	2,610
10						1,800		20,100		5,400	3.32	2,110
12						2,500		16,800		4,000	3.19	1,950
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4	2.96	1,540										
6			2.42	701	2.28	540	2.18	440	2.28	540	2.10	366
8	2.80	1,240										
10												
N	2.75	1,150	2.36	629	2.26	520	2.20	458	2.26	520	2.05	325
2												
4	2.66	1,010										
6			2.32	584	2.23	489	2.22	479	2.22	479	2.00	284
8	2.58	888										
10												
12	2.52	803	2.29	551	2.21	468	2.24	499	2.17	430	1.97	262

Fort Supply Reservoir near Fort Supply, Okla.

Location.--Lat 36°33', long. 99°34', in NE¼SE¼ sec. 17, T. 24 N., R. 22 W., in control tower at left end of Fort Supply Dam on Wolf Creek, 2 miles southeast of Fort Supply and 5.5 miles upstream from mouth. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--1,735 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph.

Maxima.--May 1951: Contents, 83,790 acre-ft 5:30 p.m. May 28 (elevation, 2,023.80 ft).
1942 to April 1951: Contents, 89,130 acre-ft Aug. 7, 1950 (elevation, 2,024.86 ft).

Remarks.--Reservoir is formed by an earth dam. Regulated storage began May 4, 1942; conservation pool stage first reached June 11, 1942. Capacity, 106,100 acre-ft at elevation 2,028.0 ft (crest of spillway) and 10,070 acre-ft at elevation 2,000.0 ft (conservation pool). No storage below elevation 1,984.0 ft. Reservoir is used for flood control and conservation. Figures given herein represent total contents. Records furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet, at 12 p.m., May 1951

Day	Elevation	Contents	Day	Elevation	Contents
1	2,002.07	13,530	16	2,014.45	45,500
2	2,001.98	13,360	17	2,020.34	67,830
3	2,001.94	13,290	18	2,022.17	75,970
4	2,001.93	13,270	19	2,022.58	77,900
5	2,001.92	13,250	20	2,022.82	79,030
6	2,001.90	13,220	21	2,023.02	79,990
7	2,001.92	13,250	22	2,023.20	80,850
8	2,001.98	13,360	23	2,023.39	81,780
9	2,001.87	13,160	24	2,023.50	82,320
10	2,001.89	13,200	25	2,023.61	82,860
11	2,001.92	13,250	26	2,023.70	83,300
12	2,001.97	13,340	27	2,023.78	83,690
13	2,002.00	13,400	28	2,023.75	83,540
14	2,002.04	13,470	29	2,023.54	82,520
15	2,002.42	14,170	30	2,023.37	81,680
			31	2,023.32	81,440
Change in contents during month					+67,860

Note.--Contents at 12 p.m. Apr. 30, 13,580 acre-ft (elevation, 2,002.10 ft).

Wolf Creek near Fort Supply, Okla.

Location.--Lat 36°34'00", long. 99°33'05", in SE¼SE¼ sec. 9, T. 24 N., R. 22 W., on left bank on downstream side of bridge on U. S. Highway 270, 1 mile southeast of Fort Supply, 1.6 miles downstream from Fort Supply Dam, and 3.9 miles upstream from mouth. Datum of gage is 1,962.38 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--1,739 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 1,160 cfs 11 p.m. May 28 (gage height, 5.90 ft).
1937 to April 1951: Discharge, 14,200 cfs June 24, 1939 (gage height, 11.60 ft, present datum), from rating curve extended above 8,000 cfs.
Stage known, 15.6 ft, present datum, date unknown, from information by State Highway Commission.

Remarks.--Flow completely regulated by Fort Supply Reservoir (see above)

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	85	6	32	11	8.0	16	19	21	12	26	11
2	84	7	32	12	8.0	17	18	22	13	27	11
3	70	8	32	13	8.0	18	14	23	13	28	279
4	32	9	28	14	8.0	19	14	24	12	29	801
5	31	10	8.0	15	11	20	13	25	11	30	564
										31	641
Monthly mean discharge, in cfs											94.3
Runoff, in acre-feet											5,800
Runoff, in inches											

North Canadian River at Woodward, Okla.

Location.--Lat 36°26'55", long. 99°23'55", on line between secs. 24 and 25, T. 23 N., R. 21 W., near right bank on downstream side of pier of bridge on State Highway 15 just north of Woodward, 15 miles upstream from Indian Creek, 19.7 miles downstream from Wolf Creek, and at mile 468.0. Datum of gage is 1,867.44 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--11,687 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for period 10 p.m. May 18 to May 31, for which graph was drawn based on at least once-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 26,000 cfs and extended to peak stage. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 43,000 cfs 12 p.m. May 18 (gage height, 8.70 ft). 1938 to April 1951: Discharge, 42,000 cfs Oct. 10, 1946 (gage height, 9.80 ft). Stage known, 11.0 ft Oct. 12, 1923, from reports of U. S. Weather Bureau.

Remarks.--Some regulation by Fort Supply Reservoir on Wolf Creek (see p.156).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	146	6	78	11	41	16	15,300	21	3,490	26	870
2	158	7	78	12	38	17	23,800	22	2,200	27	650
3	140	8	68	13	33	18	30,500	23	3,340	28	436
4	112	9	70	14	32	19	24,200	24	1,560	29	1,380
5	83	10	62	15	2,650	20	6,510	25	1,220	30	1,100
										31	944
Monthly mean discharge, in cfs											3,913
Runoff, in acre-feet											240,600
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2					0.78	32	5.35	7,610	7.78	19,000	8.15	29,500
4					.78	32	5.62	8,480	7.71	18,000	8.05	27,700
6					.79	33	5.90	9,600	7.65	16,800	7.97	26,200
8					.79	33	6.15	10,800	7.67	16,600	7.92	25,500
10					.79	33	6.45	12,600	7.70	17,600	7.88	25,000
N					3.55	3,320	6.72	14,300	7.92	22,200	7.94	25,800
2					3.92	4,110	7.05	16,700	8.05	25,300	7.97	26,200
4					4.17	4,600	7.32	18,800	8.20	29,200	8.14	29,200
6					4.38	5,010	7.80	21,300	8.26	30,800	8.35	33,700
8					4.50	5,190	8.00	25,500	8.29	31,500	8.55	39,200
10					4.78	5,930	7.97	24,200	8.30	32,000	8.65	41,800
12					5.10	6,850	7.88	21,700	8.20	30,500	8.70	43,000
	May 19		May 20		May 21		May 22		May 23		May 24	
2	8.67	42,200							3.26	2,680		
4	8.57	39,500	5.77	8,800					3.86	4,080		
6	8.48	37,000			3.77	3,870			4.06	4,580	2.74	1,670
8	8.32	33,000	5.33	7,710					4.07	4,600		
10	8.07	27,000							3.90	4,180		
N	7.79	21,200	4.67	5,910	3.58	3,410	3.01	2,160	3.73	3,770	2.58	1,410
2	7.48	17,300										
4	7.09	14,100	4.35	5,060					3.45	3,120		
6	6.68	12,000			3.45	3,120					2.53	1,340
8	6.42	11,000	4.13	4,630					3.21	2,570		
10	6.21	10,200										
12	6.03	9,700	3.95	4,180	3.31	2,790	2.75	1,680	3.00	2,140	2.61	1,460

Supplemental record.--May 15, 11 a.m., 0.80 ft, 34 cfs; May 16, 9 p.m., 8.02 ft, 25,700 cfs; May 17, 9 p.m., 8.31 ft, 32,500 cfs.

North Canadian River near Seiling, Okla.

Location.--Lat 36°11', long. 98°55', in NW¼ sec. 28, T. 20 N., R. 16 W., on downstream side of left abutment of bridge on U. S. Highway 60, 2 miles upstream from Seiling Creek, 2¼ miles north of Seiling, 2 3/4 miles downstream from Deep Creek, and at mile 422.6. Datum of gage is 1,680.42 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--12,419 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 30,000 cfs and extended to peak stage. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 40,100 cfs 10:30 p.m. May 19 (gage height, 10.61 ft).
1946 to April 1951: Discharge, 29,300 cfs Oct. 11, 1946 (gage height, 11.00 ft).

Remarks.--Some regulation by Fort Supply Reservoir on Wolf Creek (see p. 156).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	166	6	104	11	81	16	5,550	21	6,550	26	1,150
2	151	7	97	12	70	17	11,800	22	4,080	27	1,030
3	169	8	92	13	53	18	24,800	23	3,390	28	1,050
4	157	9	97	14	44	19	29,100	24	2,310	29	960
5	139	10	90	15	112	20	18,000	25	1,400	30	1,540
										31	1,110
Monthly mean discharge, in cfs											3,724
Runoff, in acre-feet											229,000
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							5.17	4,040	7.16	8,880	9.72	20,800
4							5.30	4,300	7.31	9,330	9.77	21,500
6							5.40	4,500	7.50	9,900	9.75	21,200
8							5.48	4,660	7.67	10,400	9.68	20,400
10							5.55	4,800	7.77	10,700	9.75	21,200
N					1.58	42	5.64	5,000	7.83	10,900	9.94	23,800
2							5.75	5,280	7.97	11,300	10.10	26,600
4							5.98	5,850	8.12	11,800	10.24	29,200
6							6.25	6,520	8.47	13,000	10.33	31,000
8							6.62	7,450	8.87	14,600	10.28	30,000
10					1.58	42	6.95	8,280	9.30	17,000	10.18	28,600
12					4.84	3,380	7.05	8,550	9.64	19,900	10.08	27,200
	May 19		May 20		May 21		May 22		May 23		May 24	
2	9.95	25,200	10.24	32,700			5.68	5,190	4.23	2,400	4.87	3,600
4	9.86	23,900	9.88	26,200	6.80	8,250	5.80	5,460	4.09	2,190	4.67	3,210
6	9.80	23,200	9.59	22,000			5.80	5,460	4.21	2,360	4.40	2,740
8	9.81	23,400	9.27	18,800	6.46	7,230	5.67	5,160	4.39	2,640	4.27	2,530
10	9.85	24,400	8.96	16,800			5.40	4,580	4.65	3,080	4.08	2,240
N	9.91	26,000	8.68	15,300	6.15	6,320	5.11	3,980	4.93	3,620	3.94	2,050
2	10.00	28,200	8.40	14,000			4.88	3,520	5.13	4,020	3.80	1,860
4	10.11	30,400	8.10	12,800	5.79	5,440	4.77	3,300	5.27	4,310	3.72	1,750
6	10.29	33,600	7.85	11,900			4.67	3,120	5.32	4,410	3.69	1,710
8	10.50	38,200	7.64	11,100	5.50	4,790	4.58	2,960	5.29	4,350	3.62	1,620
10	10.60	40,000	7.45	10,400			4.36	2,600	5.18	4,120	3.67	1,690
12	10.51	38,400	7.23	9,700	5.50	4,790	4.32	2,530	5.07	3,900	3.55	1,540

Supplemental records.--May 15, 11:10 p.m., 1.58 ft, 42 cfs; May 16, 11 p.m., 7.04 ft, 8,520 cfs; May 19, 10:30 p.m., 10.61 ft, 40,100 cfs; May 21, 10 p.m., 5.45 ft, 4,680 cfs; May 22, 5 a.m., 5.81 ft, 5,480 cfs; May 23, 3 a.m., 4.04 ft, 2,120 cfs; 6:30 p.m., 5.33 ft, 4,420 cfs.

Canton Reservoir near Canton, Okla.

Location.--Lat 36°05', long. 98°36', in SE¼NE¼ sec. 32, T. 19 N., R. 13 W., near right end of Canton Dam on North Canadian River, 2 miles northwest of Canton and at mile 394.3. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--12,641 sq mi(includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph.

Maxima.--May 1951: Contents, 258,600 acre-ft, 10 a.m. May 25 (elevation, 1,628.05 ft). 1948 to April 1951: Contents, 211,300 acre-ft Aug. 5, 1950 (elevation, 1,623.84 ft).

Remarks.--Reservoir is formed by an earth dam. Regulated storage began April 15, 1948; conservation pool stage first reached July 4, 1948. Capacity, 390,000 acre-ft at elevation 1,638.0 ft (flood-control pool), 112,000 acre-ft at elevation 1,613.0 ft (crest of spillway), and 23,400 acre-ft at elevation 1,596.5 ft (conservation pool). Dead storage, 400 acre-ft below elevation 1,582.0 ft (invert of bypass gates). Reservoir was designed for flood-control, irrigation, and conservation, but owing to lack of facilities, is not being used for irrigation at this time. Figures given herein represent total contents. Records furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet, at 12 p.m., May 1951

Day	Elevation	Contents	Day	Elevation	Contents
1	1,603.23	52,650	16	1,604.75	60,620
2	1,603.22	52,600	17	1,607.50	76,000
3	1,603.25	52,750	18	1,612.75	110,200
4	1,603.28	52,900	19	1,619.70	169,200
5	1,603.31	53,050	20	1,625.20	226,200
6	1,603.31	53,050	21	1,626.75	243,600
7	1,603.29	52,950	22	1,627.35	250,500
8	1,603.24	52,700	23	1,627.72	254,800
9	1,603.36	53,300	24	1,628.02	258,200
10	1,603.33	53,150	25	1,627.99	257,900
11	1,603.32	53,100	26	1,627.80	255,700
12	1,603.29	52,950	27	1,627.53	252,600
13	1,603.23	52,650	28	1,627.24	249,300
14	1,603.23	52,650	29	1,626.90	245,400
15	1,603.30	53,000	30	1,626.58	241,700
			31	1,626.28	238,200
Change in contents during month.....					+185,500

Note.--Contents at 12 p.m. Apr. 30, 52,700 acre-ft (elevation, 1,603.24 ft).

North Canadian River at Canton, Okla.

Location.--Lat 36°03'30", long. 98°34'55", in NW¼ sec. 10, T. 18 N., R. 13 W., near left bank on downstream side of pier of bridge on State Highway 58, a quarter of a mile northeast of Canton, 2¼ miles upstream from Minnehaha Creek, 3.0 miles downstream from Canton Dam, and at mile 391.3. Datum of gage is 1,555.59 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--12,646 sq mi (includes an undetermined amount of noncontributing area).

Gage-height record.--Water-stage recorder graph except for May 15, for which a graph was drawn based on daily wire-weight gage reading.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-16, 25-31.

Maxima.--May 1951: Daily discharge, 3,200 cfs May 30, 31.
1938 to April 1951: Discharge, 24,800 cfs Oct. 12, 1946 (gage height, 17.83 ft, present datum).
Stage known, 21.8 ft Oct. 13, 1923, at site 300 ft upstream, present datum from reports of U. S. Weather Bureau.

Remarks.--Some regulation by Fort Supply Reservoir (see p.156) for the period May 1942 to April 1948 and complete regulation thereafter by Canton Reservoir (see preceding page).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	71	6	64	11	66	16	28	21	366	26	2,880
2	67	7	64	12	67	17	89	22	850	27	2,740
3	66	8	64	13	67	18	27	23	1,300	28	2,810
4	65	9	64	14	52	19	181	24	2,180	29	2,880
5	64	10	65	15	6.6	20	42	25	2,420	30	3,200
										31	3,200
Monthly mean discharge, in cfs											842
Runoff, in acre-feet											51,780
Runoff, in inches											

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												

Red River basin

Tierra Blanca Creek at reservoir, near Umbarger, Tex.

Location.--Lat 34°55', long. 102°06', at conduit gate tower, 200 ft upstream from dam, 200 ft streamward from left bank, 2 miles south of Umbarger, Randall County, and 20 miles upstream from Palo Duro Creek. Datum of gage is 3,515.6 ft above mean sea level, datum of 1929. Auxiliary gage at weir 9 miles upstream from dam.

Drainage area.--About 2,075 sq mi, of which 1,500 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graphs at reservoir and auxiliary gages.

Discharge record at auxiliary water-stage recorder.--Stage-discharge relation defined by current-meter measurements below 150 cfs and extended to peak stage on basis of rate of change of storage in the reservoir and slope-area measurement.

Maxima.--May 1951: Discharge at auxiliary gage, 9,760 cfs 5:50 a.m. May 17 (gage height, 8.50 ft); reservoir gage height, 127.64 ft 9 a.m. May 19.
1938 to April 1951: Discharge, 11,300 cfs June 6, 1941; reservoir gage height, 130.43 ft June 6, 1941.

Remarks.--Dam completed June 15, 1938. Reservoir capacity, 18,150 acre-ft at spillway crest (gage height, 127.0 ft). Reservoir used for recreational purposes. Reservoir and weir gage-height records and reservoir capacity curve furnished by U. S. Soil Conservation Service.

Gage height, in feet, and contents, in acre-feet, at 12 p.m., May 1951

Day	Gage height	Contents	Day	Gage height	Contents
1	120.5	7,740	16	122.1	9,990
2	120.4	7,600	17	126.1	17,600
3	120.4	7,600	18	127.6	19,300
4	120.4	7,600	19	127.6	19,300
5	120.4	7,600	20	127.5	19,100
6	120.4	7,600	21	127.3	18,720
7	120.4	7,600	22	127.3	18,720
8	120.4	7,600	23	127.2	18,530
9	120.3	7,460	24	127.2	18,530
10	120.3	7,460	25	127.1	18,340
11	120.3	7,460	26	127.1	18,340
12	120.3	7,460	27	127.0	18,150
13	120.3	7,460	28	127.0	18,150
14	120.3	7,460	29	127.0	18,150
15	120.8	8,160	30	127.0	18,150
			31	127.0	18,150

Palo Duro Creek near Canyon, Tex.

Location.--Lat 35°02', long. 102°02', at conduit tower in Amarillo City Lake, 200 ft upstream from dam, 0.4 miles upstream from Nigger Arroyo Creek, and 6 miles northwest of Canyon, Randall County. Datum of gage is 3,584.4 ft above mean sea level, datum of 1929.

Drainage area.--982 sq mi, of which about 920 sq mi is probably noncontributing.

Gage-height record.--Twice-daily staff-gage readings.

Maxima.--May 1951: Gage height observed, 53.6 ft May 17.
1942 to April 1951: Gage height observed, 43.5 ft July 22, 23, 1950.
Highest stage known occurred June 5-7, 1937, when lake reached a stage of about 54.5 ft (spillway crest at that time, 52.5 ft, gage height) according to the City of Amarillo Water Department.

Remarks.--Lake is formed by earth-fill dam 39 ft high and 1,600 ft long with 500-foot earthen spillway crest at 50.3 ft gage height. Dam completed February 1927. Capacity at spillway crest about 3,200 acre-ft (estimate by city engineer of Amarillo). No water is diverted from the lake. The lower part of the lake is surrounded by ten water wells which are used to partly supply the city of Amarillo. The lake provides recharge to the sands and gravels of the underlying High Plains deposits (Ogallala formation) from which the wells draw water; additional replenishment is afforded by infiltration from rainfall on the surrounding area. Records of daily gage heights furnished by City of Amarillo.

Gage height, in feet, at approximately 8:30 a.m., May 1951

Day	Gage height	Day	Gage height	Day	Gage height
1	20.5	11	19.4	21	51.0
2	20.4	12	19.4	22	50.9
3	20.3	13	19.3	23	50.6
4	20.1	14	19.2	24	50.5
5	20.0	15	19.1	25	50.3
6	19.9	16	22.4	26	50.2
7	19.8	17	53.6	27	50.1
8	19.7	18	52.6	28	50.0
9	19.6	19	51.5	29	49.9
10	19.5	20	51.3	30	49.7
				31	49.6

North Tule Draw at reservoir, near Tulia, Tex.
(Formerly published as North Tule Creek at reservoir, near Tulia, Tex.

Location.--Lat 34°33', long. 101°42', at walkway to conduit valve 250 ft to left of concrete spillway, 1 mile upstream from mouth, and 3.2 miles northeast of Tulia, Swisher County. Altitude of gage is about 3,310 ft (by barometer).

Drainage area.--About 189 sq mi, of which 124 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Discharge below gage height 91.9 ft (spillway crest) determined from daily change in contents of reservoir; that above gage height 91.9 ft determined by algebraic summation of flow over spillway (computed from spillway rating curve), computed flow through conduit, and change in contents of reservoir (computed from capacity curve and reduced to equivalent cubic feet per second).

Maxima.--May 1951: Discharge, 5,430 cfs 8 p.m. May 15, on basis of slope area determination of peak discharge; reservoir gage height, 96.76 ft 8:30 p.m. May 16.
1939 to April 1951: Discharge, 3,110 cfs Oct. 4, 1941; reservoir gage height, 95.48 ft Oct. 4, 1941.

Remarks.--Dam completed Jan. 15, 1939. Reservoir capacity, 654 acre-ft. Gage-height record and capacity curve furnished by U. S. Soil Conservation Service.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0	6	0	11	0	16	1,450	21	18	26	0
2	0	7	0	12	0	17	1,370	22	5	27	0
3	0	8	0	13	0	18	470	23	1	28	0
4	0	9	0	14	0	19	99	24	1.5	29	0
5	0	10	0	15	919	20	39	25	.5	30	3.0
										31	0
Monthly mean discharge, in cfs											141
Runoff, in acre-feet											8,680
Runoff, in inches											2.50

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2					86.18		94.53		95.20		93.54	
4					86.18		93.87		94.67		93.64	
6					86.18		93.35		94.40		93.58	
8					86.18		92.98		94.35		93.42	
10					86.21		92.73		94.49		93.26	
N	86.23		86.20		86.27		92.58		94.56		93.10	
2					86.29		92.52		94.51		92.94	
4					86.48		92.92		94.32		92.83	
6					87.03		94.75		94.13		92.73	
8					95.35		96.75		93.93		92.64	
10					96.52		96.57		93.70		92.58	
12	86.22		86.18		95.45		95.92		93.56		92.51	
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10	92.28		91.98		91.57		91.59		91.65		91.68	
N												
2												
4												
6												
8												
10												
12	92.11		91.82		91.53		91.65		91.68		91.71	

Supplemental record.--May 15, 9:30 p.m., 96.62 ft.

Prairie Dog Town Fork Red River near Brice, Tex.

Location.--Lat 34°37'45", long. 100°58'30", at upstream side of highway bridge in Briscoe County, 1 mile upstream from Byrnes (Battle) Creek, 3.4 miles upstream from Mulberry Creek, and 7½ miles southwest of Brice, Hall County. Datum of gage is 2,070.08 ft above mean sea level, datum of 1929.

Drainage area.--5,972 sq mi, of which 4,479 sq mi is probably noncontributing.

Gage-height record.--From graph based on twice-daily or oftener staff-gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 5,000 cfs and extended above on basis of slope-area determination at peak stage. Shifting-control method used throughout.

Maxima.--May 1951: Discharge, 41,700 cfs 2 a.m. May 16 (gage height, 10.32 ft, from floodmarks). 1938-44, 1949 to April 1951: Discharge, 42,100 cfs Oct. 4, 1941 (gage height, 5.18 ft, site and datum then in use), from rating curve extended above 5,000 cfs on basis of slope-area determinations at gage heights 3.7 and 4.8 ft.

Stage known since 1906, 14.8 ft, present site and datum, in summer of 1933. Flood of May 1937 reached a stage of 14.3 ft, present site and datum. Information on floods from local residents.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0	6	0	11	0	16	14,100	21	721	26	229
2	0	7	0	12	0	17	14,300	22	358	27	168
3	0	8	0	13	0	18	7,690	23	344	28	165
4	0	9	0	14	0	19	1,480	24	288	29	102
5	0	10	0	15	0	20	658	25	440	30	75
										31	72

Monthly mean discharge, in cfs	1,329
Runoff, in acre-feet	81,700
Runoff, in inches	1.03

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							10.32	41,700				
4							8.38	16,900				
6							7.00	6,340	8.50	17,800	7.58	9,920
8							7.03	6,500				
10							6.98	6,240				
N		0		0		0	6.55	4,160	8.07	14,200	6.92	5,990
2							6.37	3,430				
4							7.07	6,720				
6							7.97	13,000	7.63	10,300	6.47	3,860
8							9.00	23,300				
10							9.10	24,500				
12		0		0		0	8.92	22,100	8.63	19,300	6.14	2,680
	May 19		May 20		May 21		May 22		May 23		May 24	
2					5.22	635						
4					5.21	622						
6	5.82	1,780			5.21	622						
8					5.58	1,240						
10					5.44	969						
N	5.65	1,370	5.21	609	5.34	805	4.97	340	4.99	340	4.93	286
2					5.31	760						
4					5.25	674						
6	5.48	1,020			5.17	570						
8					5.12	510						
10					5.08	462						
12	5.34	790	5.22	622	5.06	439	4.95	313	5.03	384	4.88	194

Supplemental record.--May 16, 1 a.m., 9.70 ft, 32,100 cfs; May 17, 11:59 p.m., 7.25 ft, 7,800 cfs; May 21, 7 a.m., 5.67 ft, 1,440 cfs.

Mulberry Creek near Brice, Tex.

Location.--Lat 34°40'30", long. 100°55'00", at upstream side of bridge on State Highway 70, 1.5 miles upstream from Bitter Creek, 2.3 miles southwest of Brice, Hall County, and 3.3 miles upstream from mouth. Datum of gage is 2,090.27 ft above mean sea level, datum of 1929.

Drainage area.--About 534 sq mi, of which 238 sq mi is probably noncontributing.

Gage-height record.--From graph based on once-daily or oftener wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 4,000 cfs, and extended to peak stage on basis of logarithmic plotting and contracted-opening determination at gage height 15.24 ft. Shifting-control method used.

Maxima.--May 1951: Discharge, 6,730 cfs 1 p.m. May 17 (gage height, 12.02 ft).
1949 to April 1951: Discharge, 50,700 cfs July 16, 1950 (gage height, 15.24 ft, from floodmarks), by contracted-opening determination.
Stage known, 16.5 ft in 1941, from information by local resident.

Remarks.--No diversions above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0	6	0	11	0	16	562	21	80	26	2.1
2	0	7	0	12	0	17	1,530	22	37	27	.6
3	0	8	0	13	0	18	662	23	40	28	32
4	0	9	0	14	0	19	103	24	16	29	1.8
5	0	10	0	15	0	20	97	25	22	30	.1
										31	0

Monthly mean discharge, in cfs	103
Runoff, in acre-feet	6,320
Runoff, in inches	0.40

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2								0	10.82	805	10.90	730
4								0	10.82	805	10.88	683
6								0	10.82	805	10.87	661
8							11.00	1,220	10.82	805	10.87	661
10							10.74	672	11.02	1,260	11.12	1,350
N		0		0		0	10.62	477	11.64	3,720	11.00	986
2							10.63	486	11.58	3,250	10.89	705
4							10.74	672	11.20	1,610	10.87	661
6							10.79	755	11.04	1,100	10.82	555
8							10.82	805	10.98	928	10.71	333
10							10.82	805	10.95	858	10.65	170
12		0		0		0	10.82	805	10.92	780	10.61	109

Hour	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4	10.56	93			10.44	93						
6									10.65	63		
8	10.56	90			10.41	90						
10												
N	10.64	113	10.48	96	10.36	78	10.48	36	10.59	40	10.62	17
2												
4	10.62	113			10.57	96						
6									10.59	31		
8	10.55	105			10.57	53						
10												
12	10.51	99	10.47	96	10.53	45	10.46	32	10.58	21	10.56	11

Supplemental record.--May 16, 7 a.m., 11.10 ft, 1,510 cfs; May 17, 1 p.m., 12.02 ft, 6,730 cfs.

Salt Fork Red River at Mangum, Okla.

Location.--Lat 34°52', long. 99°31', in SW¼SE¼ sec. 34, T. 5 N., R. 22 W., near left bank on downstream side of pier of bridge on State Highway 34, half a mile south of Mangum, 13 miles downstream from Fish Creek, and at mile 35.5. Datum of gage is 1,490.87 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.--1,566 sq mi (revised), of which 209 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except for period May 28-31, for which no record was obtained.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-11, 16, 22-27. Discharge for May 28-31 estimated on basis of normal recession.

Maxima.--May 1951: Discharge, 13,200 cfs 2 a.m. May 17 (gage height, 10.79 ft).
1905-6, 1937 to April 1951: Gage height observed, 14.7 ft June 16, 1938 (discharge not determined).
Stage known, that of June 16, 1938, from information by local residents.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	72	6	4.0	11	0.2	16	874	21	171	26	73
2	32	7	2.4	12	0	17	5,560	22	354	27	107
3	22	8	1.6	13	0	18	2,200	23	164	28	64
4	13	9	.8	14	0	19	446	24	81	29	51
5	8.0	10	.4	15	0	20	150	25	69	30	44
										31	40

Monthly mean discharge, in cfs	342
Runoff, in acre-feet	21,030
Runoff, in inches	0.29

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2								0	10.79	13,200	8.83	3,590
4								0	10.15	9,100	9.03	4,190
6								0	9.35	5,300	8.76	3,400
8								0	8.86	3,680	8.45	2,610
10								0	8.66	3,140	8.24	2,130
N								0	8.63	3,060	8.01	1,660
2								0	9.00	4,090	8.08	1,800
4								0	9.34	5,260	7.93	1,510
6								0	9.28	5,040	7.82	1,320
8							6.60	23	9.08	4,350	7.75	1,200
10							9.30	5,110	8.76	3,400	7.64	1,020
12							10.50	11,200	8.53	2,800	7.49	802
	May 19		May 20		May 21		May 22		May 23		May 24	
2	7.41	694	6.89	192	6.66	105	7.46	761	6.84	134		
4	7.33	592	6.85	174	6.64	100	7.24	430	6.81	126	6.71	92
6	7.19	430	6.83	165	6.64	100	7.07	274	6.77	113		
8	7.19	430	6.83	165	6.63	97	6.92	183	6.76	111	6.68	85
10	7.21	452	6.84	169	6.62	94	6.95	197	7.15	315		
N	7.20	440	6.80	151	6.61	92	7.06	266	7.11	274	6.66	81
2	7.20	440	6.76	137	6.59	87	7.15	339	7.04	228		
4	7.18	420	6.75	134	6.58	85	7.25	430	6.94	169	6.63	74
6	7.15	390	6.73	126	6.67	108	7.20	369	6.87	140		
8	7.06	307	6.70	116	6.90	197	7.12	298	6.81	120	6.61	70
10	6.97	240	6.68	111	6.92	209	7.01	221	6.76	105		
12	6.94	221	6.66	105	7.48	788	6.90	165	6.74	100	6.60	68

Supplemental record.--May 16, 6:30 p.m., no flow, 7 p.m., 6.56 ft, 21 cfs; May 17, 11:30 a.m., 8.60 ft, 2,980 cfs; 4:45 p.m., 5,300 cfs; May 21, 10:30 p.m., 7.88 ft, 1,420 cfs.

North Fork Red River near Carter, Okla.

Location.--Lat 35°10', long. 99°30', in NW¼SE¼ sec. 15, T. 8 N., R. 22 W., near left bank on downstream side of pier of bridge on State Highway 34, 3 miles south of Carter, 10.8 miles downstream from Timber Creek, and at mile 110.5. Datum of gage is 1,673.71 ft above mean sea level, datum of 1929.

Drainage area.--2,337 sq mi, of which 399 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting control method used May 1-31.

Maxima.--May 1951: Discharge, 18,300 cfs 9 a.m. May 18; gage height, 10.22 ft 3 a.m. May 17.
1944 to April 1951: Discharge, 16,400 cfs May 18, 1950; gage height, 10.37 ft May 12, 1947.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	147	6	24	11	12	16	2,110	21	3,000	26	450
2	97	7	20	12	12	17	11,600	22	2,240	27	242
3	65	8	19	13	11	18	14,700	23	1,560	28	209
4	48	9	18	14	7.4	19	7,260	24	1,020	29	193
5	32	10	12	15	7.4	20	4,500	25	728	30	231
										31	231

Monthly mean discharge, in cfs	1,639
Runoff, in acre-feet	100,800
Runoff, in inches	0.98

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									10.16	15,100	8.71	11,800
4									10.17	15,200	9.00	13,100
6							4.91	25	9.72	13,000	9.31	15,400
8									9.04	11,200	9.50	18,000
10									8.67	10,600	9.35	18,100
N							4.93	28	8.36	10,200	9.12	17,400
2							5.39	165	8.26	10,200	8.84	16,500
4							5.39	165	8.20	10,100	8.52	15,300
6							5.42	180	8.17	10,100	8.20	14,200
8							8.27	6,340	8.26	10,400	7.92	13,100
10							9.27	10,000	8.36	10,700	7.68	12,200
12							9.96	13,600	8.50	11,100	7.45	11,300
	May 19		May 20		May 21		May 22		May 23		May 24	
2	7.17	10,100	6.50	7,350	5.57	1,750	6.27	2,870			5.45	1,460
4	6.94	9,150	6.52	7,400	5.58	1,800	6.26	2,850			5.38	1,360
6	6.70	8,200	6.38	6,800	5.58	1,800	6.10	2,630	5.62	1,710	5.28	1,230
8	6.44	7,100	6.16	5,800	5.53	1,650	6.06	2,460			5.19	1,130
10	6.26	6,350	5.96	4,700	5.49	1,550	5.88	2,130			5.10	1,030
N	6.15	5,900	5.84	4,000	5.52	1,600	5.80	1,990	5.49	1,510	5.02	950
2	6.05	5,500	5.77	3,450	5.45	1,450	5.87	2,110			4.96	893
4	5.98	5,200	5.71	2,950	5.56	1,600	5.86	2,090			4.90	837
6	5.93	5,000	5.66	2,400	8.80	9,430	5.77	1,940	5.39	1,370	4.84	784
8	5.90	4,850	5.62	2,000	7.65	6,150	5.70	1,820			4.80	750
10	7.10	9,700	5.59	1,850	7.05	4,630	5.65	1,740			4.79	742
12	6.85	8,800	5.57	1,750	6.52	3,400	5.65	1,740	5.41	1,400	4.77	725

Supplemental record.--May 17, 3 a.m., 10.22 ft, 15,500 cfs; May 18, 9 a.m., 9.45 ft, 18,300 cfs; May 19, 9 p.m., 5.90 ft, 4,850 cfs; 11 p.m., 7.35 ft, 10,900 cfs; May 21, 5:45 p.m., 8.96 ft, 9,930 cfs.

Lake Altus at Lugert, Okla.

Location.--Lat 34°54', long. 99°18', in SW¼SE¼ sec. 22, T. 5 N., R. 20 W., on upstream face of Altus Dam on North Fork Red River, 1 mile west of Lugert, 2.6 miles upstream from Elm Fork of North Fork, and at mile 73.5. Datum of gage is at mean sea level (levels by Bureau of Reclamation).

Drainage area.--2,515 sq mi, of which 399 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Maxima.--May 1951: Contents, 167,000 acre-ft 1 a.m. May 19 (elevation, 1,562.10 ft).
1944 to April 1951: Contents, 154,700 acre-ft July 6, 1950 (elevation, 1,560.39 ft).

Remarks.--Reservoir is formed by concrete and coursed masonry dam. Storage began December 1943. Capacity, 145,000 acre-ft at elevation 1,559.0 ft (crest of uncontrolled spillway), 77,500 acre-ft at elevation 1,547.0 ft (crest of controlled spillway), and no contents at elevation 1,517.5 ft (sill of head gate at irrigation canal). Figures given herein represent total contents. Reservoir is used for flood control, municipal water supply, and irrigation of about 48,000 acres. Records furnished by Bureau of Reclamation.

Elevation, in feet, and contents, in acre-feet, at 12 p.m., May 1951

Day	Elevation	Contents	Day	Elevation	Contents
1	57.49	135,000	16	57.13	132,700
2	57.48	135,000	17	60.61	156,200
3	57.46	134,800	18	62.09	166,900
4	57.41	134,500	19	61.92	165,700
5	57.36	134,200	20	61.43	162,100
6	57.30	133,800	21	61.12	159,900
7	57.22	133,300	22	61.33	161,400
8	57.14	132,800	23	61.11	159,800
9	57.16	132,900	24	60.74	157,100
10	57.07	132,300	25	60.29	154,000
11	57.00	131,900	26	59.75	150,200
12	56.89	131,200	27	59.35	147,400
13	56.83	130,800	28	59.19	146,300
14	56.78	130,500	29	59.19	146,300
15	56.79	130,500	30	59.11	145,800
			31	59.05	145,400
Change in contents during month.....					+10,500

North Fork Red River below Altus Dam, near Lugert, Okla.

Location.--Lat 34°53'26", long. 99°18'22", in SW¼ sec. 22, T. 15 N., R. 20 W., on right bank, 3,500 ft downstream from Altus Dam, 1.9 miles upstream from Elm Fork of North Fork, 2 miles west of Lugert, and at mile 72.8. Datum of gage is 1,471.81 ft above mean sea level, datum of 1929.

Drainage area.--2,515 sq mi, of which 399 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements.

Maxima.--May 1951: Discharge, 16,100 cfs 12 p.m. May 18 (gage height, 12.70 ft).
October 1950 to April 1951: Maximum daily discharge, 340 cfs Oct. 1.

Remarks.--Flow completely regulated by Lake Altus (see preceding page).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0	6	1.2	11	0	16	0.4	21	3,370	26	2,260
2	.1	7	.1	12	0	17	473	22	3,270	27	2,160
3	0	8	0	13	0	18	7,440	23	2,160	28	906
4	0	9	0	14	0	19	10,600	24	2,240	29	156
5	0	10	0	15	.1	20	8,000	25	2,210	30	243
										31	217
Monthly mean discharge, in cfs											1,474
Runoff, in acre-feet											90,660
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									1.39	2.5	8.18	2,890
4									1.35	1.8	8.29	3,050
6									1.33	1.4	8.38	3,180
8									1.30	1.0	9.46	5,230
10									1.27	.7	9.64	5,660
N									1.25	.4	9.63	5,640
2									1.24	.3	9.71	5,840
4									2.20	53	11.29	10,500
6									3.25	146	11.33	10,600
8									6.90	1,600	11.37	10,800
10									7.94	2,590	12.06	13,500
12									8.08	2,760	12.70	16,100
	May 19		May 20		May 21		May 22		May 23		May 24	
2	12.69	16,100	11.03	9,690			8.55	3,440	7.44	2,060	7.60	2,210
4	12.66	15,900	11.06	9,780			8.60	3,520	7.44	2,060	7.59	2,200
6	12.63	15,800	11.06	9,780	8.56	3,460	8.63	3,570	7.43	2,050	7.58	2,190
8	12.00	13,300	11.35	10,700			8.64	3,590	7.42	2,040	7.73	2,340
10	11.33	10,600	11.30	10,500			8.64	3,590	7.60	2,210	7.71	2,320
N	11.30	10,500	11.25	10,400	8.48	3,330	8.64	3,590	7.58	2,190	7.68	2,290
2	10.35	7,650	11.18	10,100			8.63	3,570	7.56	2,170	7.66	2,270
4	9.78	6,020	9.67	5,740			8.62	3,550	7.54	2,150	7.65	2,260
6	9.78	6,020	9.63	5,640	8.42	3,240	8.60	3,520	7.70	2,310	7.62	2,230
8	9.78	6,020	8.70	3,690			7.49	2,100	7.68	2,290	7.60	2,210
10	9.85	6,200	8.65	3,600			7.46	2,070	7.65	2,260	7.58	2,190
12	11.01	9,630	8.64	3,590	8.49	3,340	7.45	2,060	7.63	2,240	7.56	2,170

Supplemental record.--May 18, 7 a.m., 9.42 ft, 5,140 cfs, 2:30 p.m., 9.73 ft, 5,890 cfs, 3 p.m., 11.21 ft, 10,200 cfs, 8:30 p.m., 11.37 ft, 10,800 cfs, 9 p.m., 12.00 ft, 13,300 cfs, 10:30 p.m., 12.06 ft, 13,500 cfs, 11 p.m., 12.66 ft, 15,900 cfs; May 19, 6:30 a.m., 12.63 ft, 15,800 cfs, 7 a.m., 12.00 ft, 13,300 cfs, 9 a.m., 11.34 ft, 10,700 cfs, 1 p.m., 11.28 ft, 10,400 cfs, 2:45 p.m., 10.32 ft, 7,560 cfs, 3 p.m., 9.81 ft, 6,100 cfs, 8:45 p.m., 9.76 ft, 5,940 cfs, 11 p.m., 11.00 ft, 9,600 cfs; May 20, 6:30 a.m., 11.34 ft, 10,700 cfs, 3 p.m., 9.68 ft; 5,760 cfs, 7:30 p.m., 9.60 ft, 5,560 cfs; May 22, 7 p.m., 8.59 ft, 3,500 cfs; May 23, 9 a.m., 7.41 ft, 2,030 cfs; May 24, 7 a.m., 7.57 ft, 2,180 cfs.

Elk Creek near Hobart, Okla.

Location.--Lat 34° 55', long. 99°07', in NE¼ sec. 17, T. 5 N., R. 18 W., near right bank on downstream side of pier of county bridge, 7 miles downstream from Little Elk Creek, 7½ miles south of Hobart, and 10.9 miles upstream from mouth. Datum of gage is 1,429.4 ft above mean sea level, datum of 1929.

Drainage area.--549 sq mi(revised).

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-17, 22.31.

Maxima.--May 1951: Discharge, 6,090 cfs 10 a.m. May 18 (gage height, 27.89 ft).
1904-8, 1949 to April 1951: Discharge not determined; gage height observed, 28.9 ft June 9, 1907, datum then in use.
Flood of May 1949 reached a stage of 28.63 ft, from floodmark.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	11	6	8.7	11	6.5	16	15	21	2,200	26	236
2	12	7	7.0	12	6.1	17	1,370	22	1,640	27	186
3	13	8	6.5	13	5.5	18	5,670	23	3,500	28	144
4	12	9	6.6	14	5.2	19	3,530	24	693	29	122
5	9.8	10	6.8	15	4.8	20	2,130	25	316	30	104
										31	92
Monthly mean discharge, in cfs											712
Runoff, in acre-feet											43,770
Runoff, in inches											1.50

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							3.44	4.8	5.75	135	25.40	4,950
4							3.45	5.0	6.12	167	26.70	5,530
6							3.45	5.0	6.42	192	27.53	5,920
8							3.45	5.0	7.60	322	27.85	6,070
10							3.46	5.1	8.42	429	27.89	6,090
N							3.47	5.2	10.60	778	27.85	6,070
2							3.47	5.2	13.50	1,360	27.72	6,010
4							3.46	5.1	16.10	1,950	27.51	5,910
6							3.45	5.0	18.40	2,520	27.22	5,770
8							3.45	5.0	20.10	2,990	26.83	5,590
10							5.08	80	21.70	3,490	26.46	5,420
12							5.15	86	23.30	4,080	26.06	5,240
	May 19		May 20		May 21		May 22		May 23		May 24	
2	25.63	5,050	13.53	1,370	17.44	2,280	9.60	606	21.15	3,230	16.42	1,740
4	25.22	4,870	16.00	1,930	17.88	2,390	9.68	619	21.95	3,430	13.33	1,080
6	24.75	4,670	17.15	2,210	18.37	2,520	10.90	832	22.54	3,570	11.40	688
8	24.20	4,440	17.00	2,170	18.71	2,600	12.30	1,110	23.06	3,680	10.65	550
10	23.54	4,180	16.86	2,140	18.89	2,650	13.60	1,380	23.47	3,760	10.24	488
N	22.68	3,840	17.15	2,210	18.80	2,630	14.85	1,660	23.72	3,820	10.00	454
2	21.45	3,410	17.56	2,310	18.44	2,530	15.85	1,890	23.80	3,840	9.80	419
4	19.85	2,920	17.82	2,380	17.77	2,360	16.72	2,100	23.80	3,830	9.86	399
6	17.80	2,370	17.88	2,390	16.55	2,060	17.50	2,300	23.47	3,690	9.52	380
8	15.70	1,860	17.68	2,340	14.80	1,650	18.40	2,520	22.78	3,450	9.39	363
10	13.92	1,450	17.37	2,260	12.80	1,210	19.35	2,780	21.42	3,030	9.48	374
12	13.78	1,420	17.21	2,220	10.85	823	20.35	3,040	19.20	2,420	9.28	350

Supplemental records.--May 16, 8:30 p.m., 3.45 ft, 5.0 cfs; May 17, 3:30 a.m., 6.15 ft, 170 cfs; 4:45 a.m., 6.00 ft, 155 cfs; May 19, 10:45 p.m., 14.14 ft, 1,500 cfs; May 22, 3 a.m., 9.45 ft, 582 cfs; May 23, 2:30 p.m., 23.87 ft, 3,860 cfs.

North Fork Red River near Headrick, Okla.

Location.--Lat 34°38', long. 99°06', in center of N½ sec. 21, T. 2 N., R. 18 W., near left bank on downstream side of pier of bridge on U. S. Highway 62, 2½ miles east of Headrick, 13 miles upstream from Otter Creek, and at mile 33.0. Datum of gage is 1,299.83 ft above mean sea level, datum of 1929 (Bureau of Reclamation bench mark).

Drainage area.--4,244 sq mi, of which 399 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except for period May 26-31, when no record was obtained.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting control method used May 1-25. Discharge for period of no gage-height record estimated on basis of weather records and records of outflow from Lake Altus.

Maxima.--May 1951: Discharge, 24,900 cfs 1 p.m. May 19 (gage height, 9.96 ft).
1938 to April 1951: Discharge, 27,400 cfs June 10, 1941 (gage height, 10.85 ft).
Stage known, 16.1 ft sometime prior to 1927, from information by State Highway Department.

Remarks.--Flow regulated by Lake Altus, 40 miles above station (see p.168).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	97	6	52	11	28	16	26	21	12,700	26	3,150
2	96	7	45	12	26	17	7,620	22	9,050	27	2,800
3	126	8	38	13	26	18	21,100	23	10,600	28	2,650
4	77	9	35	14	24	19	24,000	24	8,590	29	1,000
5	61	10	30	15	24	20	20,600	25	5,780	30	420
										31	330

Monthly mean discharge, in cfs	4,232
Runoff, in acre-feet	260,200
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									1.99	45	9.04	19,700
4									2.10	60	9.30	21,100
6									2.17	71	9.54	22,500
8									2.25	86	9.48	22,100
10									2.30	97	9.40	21,700
N									6.80	9,160	9.35	21,400
2									7.44	11,900	9.23	20,700
4									7.86	13,800	9.20	20,600
6									8.11	15,000	9.20	20,600
8									8.42	16,500	9.29	21,100
10									8.62	17,500	9.40	21,700
12									8.78	18,300	9.49	22,200
	May 19		May 20		May 21		May 22		May 23		May 24	
2	9.58	22,700	9.73	23,000	9.10	19,500	7.12	10,200	7.60	12,200	7.14	10,300
4	9.67	23,200	9.59	22,200	8.79	17,900	7.00	9,730	7.62	12,300	7.21	10,600
6	9.75	23,700	9.42	21,200	8.36	15,700	6.86	9,200	7.62	12,300	7.24	10,700
8	9.84	24,200	9.26	20,400	7.75	12,800	6.68	8,550	7.52	11,800	7.30	10,900
10	9.90	24,600	9.13	19,600	7.32	11,000	6.49	7,900	7.29	10,900	7.29	10,900
N	9.93	24,700	9.02	19,100	7.14	10,300	6.33	7,360	7.05	9,920	7.19	10,500
2	9.95	24,900	9.04	19,200	7.03	9,850	6.32	7,330	6.89	9,310	6.81	9,020
4	9.92	24,700	9.12	19,600	7.00	9,730	6.43	7,690	6.83	9,090	6.26	7,130
6	9.89	24,500	9.21	20,100	7.01	9,770	6.73	8,730	6.83	9,090	5.78	5,700
8	9.87	24,100	9.30	20,600	7.13	10,200	7.03	9,850	6.90	9,350	5.52	5,000
10	9.86	24,000	9.30	20,600	7.16	10,400	7.32	11,000	6.98	9,650	5.48	4,900
12	9.86	24,000	9.22	20,100	7.15	10,300	7.52	11,800	7.05	9,920	5.50	4,950

Supplemental record.--May 17, 1 p.m., 7.21 ft, 11,000 cfs; May 19, 1 p.m., 9.96 ft, 24,900 cfs.

Otter Creek at Mountain Park, Okla.

Location.--Lat 34°42', long. 98°59', in NW¼NW¼ sec. 34, T. 3 N., R. 17 W., on downstream side of left abutment of county highway bridge, 500 ft upstream from Horse Creek, 1½ miles west of Mountain Park, 3.2 miles downstream from water-supply reservoir of city of Snyder, and at mile 23.0. Datum of gage is 1,329.90 ft above mean sea level, datum of 1929.

Drainage area.--164 sq mi (revised), includes that of Horse Creek.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1, 2, 16, 17, 19, 21-31.

Maxima.--May 1951: Discharge, 4,450 cfs 12:30 p.m. May 18 (gage height, 17.65 ft). 1946 to April 1951: Discharge, 5,110 cfs May 16, 1947; gage height, 18.30 ft June 3, 1949.

Remarks.--Small diversions for water supply and irrigation above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0.2	6	0	11	0	16	0.9	21	112	26	11
2	0	7	0	12	0	17	1,160	22	94	27	8.2
3	0	8	0	13	0	18	3,350	23	17	28	7.0
4	0	9	0	14	0	19	342	24	12	29	5.9
5	0	10	0	15	0	20	1,770	25	16	30	6.3
										31	4.6

Monthly mean discharge, in cfs	223
Runoff, in acre-feet	13,720
Runoff, in inches	1.57

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									2.80	26	16.40	2,640
4									2.70	23	16.84	3,110
6									3.65	62	17.10	3,430
8									4.90	158	17.37	3,860
10									5.80	264	17.56	4,240
N									8.35	586	17.65	4,450
2									12.80	1,170	17.62	4,380
4									15.40	1,910	17.50	4,110
6									16.35	2,600	17.20	3,570
8									16.64	2,880	16.45	2,690
10									16.66	2,910	14.90	1,660
12									16.52	2,760	12.90	1,180
	May 19		May 20		May 21		May 22		May 23		May 24	
2	11.00	930	15.30	1,850	5.04	176	5.45	224				
4	9.15	690	16.55	2,790	4.50	122	5.38	216				
6	7.50	480	16.89	3,170	4.12	93	4.99	170	2.50	19	2.27	13
8	6.35	342	16.84	3,110	3.83	74	4.45	118				
10	5.60	240	16.57	2,810	3.61	62	3.91	79				
N	5.00	169	15.95	2,260	3.45	54	3.49	56	2.45	17	2.25	12
2	4.52	122	14.50	1,500	3.32	48	3.20	43				
4	4.17	95	12.60	1,140	3.21	43	3.02	36				
6	3.90	77	10.75	998	3.13	40	2.88	30	2.36	15	2.19	11
8	3.71	66	8.76	639	5.01	172	2.79	27				
10	3.53	56	7.05	426	5.44	223	2.68	24				
12	9.90	787	5.83	280	5.18	192	2.59	21	2.31	14	2.20	11

Supplemental record.--May 17, 1:30 a.m., 2.85 ft, 27 cfs, 9:30 p.m., 16.67 ft, 2,920 cfs; May 18, 1:15 a.m., 16.28 ft, 2,530 cfs, 12:30 p.m., 17.65 ft, 4,450 cfs; May 19, 10:30 p.m., 3.50 ft, 55 cfs; May 20, 6:30 a.m., 16.90 ft, 3,180 cfs.

Quitaque Creek near Quitaque, Tex.

Location.--Lat 34°14', long. 101°07', on right bank about three-quarters of a mile upstream from W. F. Saul's ranch house, 1 mile downstream from Wilson Creek, 1½ miles upstream from Turkey Creek, and 10 miles southwest of Quitaque, Briscoe County. Datum of gage is 2,633.91 ft above mean sea level, datum of 1929.

Drainage area.--293 sq mi, of which about 258 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except May 18-22 when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 40 cfs and extended to peak stage on basis of slope-area determinations at gage heights 2.70, 3.00, and 5.59 ft. Shifting-control method used. Discharge for period of no gage-height record estimated on the basis of weather records.

Maxima.--May 1951: Discharge, 556 cfs 3 p.m. May 17 (gage height, 3.08 ft).
1945 to April 1951: Discharge, 1,720 cfs May 10, 1947 (gage height, 5.59 ft), from rating curve extended as explained above.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	6.0	6	5.8	11	5.3	16	20	21	9.2	26	6.8
2	6.0	7	5.8	12	5.8	17	221	22	8.9	27	6.8
3	5.8	8	5.3	13	5.2	18	44	23	8.6	28	6.6
4	5.5	9	5.8	14	5.6	19	18	24	8.0	29	6.0
5	5.3	10	5.5	15	8.9	20	11	25	7.5	30	6.0
										31	6.0

Monthly mean discharge, in cfs	15.5
Runoff, in acre-feet	956
Runoff, in inches	0.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									1.63	49		
4							1.24	6.6	1.60	44		
6					1.21	5.8			1.63	49		
8							1.25	6.8	1.60	44		
10									2.30	246		
N	1.20	5.5	1.22	6.0	1.21	5.8	1.24	6.6	2.47	308		
2									3.00	534		
4							1.24	6.6	2.88	476		
6					1.43	18			2.64	380		
8							1.70	64	2.50	324		
10									1.96	137		
12	1.18	5.1	1.18	5.1	1.25	6.8	1.62	48	1.78	89		
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N									1.23	7.8	1.23	7.8
2												
4												
6												
8												
10												
12									1.25	8.6	1.23	7.8

Supplemental record.--May 17, 3 p.m., 3.08 ft, 556 cfs.

Cache Creek near Walters, Okla.

Location.--Lat 34°20', long. 98°17, in SE¼ sec. 19, T. 2 S., R. 10 W., on right bank on downstream side of bridge on State Highway 53, 1 3/4 miles east of Walters, 12.2 miles upstream from West Cache Creek, and 19.7 miles upstream from mouth. Datum of gage is 938.2 ft above mean sea level (Oklahoma State Highway Commission bench mark).

Drainage area.--675 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 4-10, 12-17, 24, 25, 27-31.

Maxima.--May 1951: Discharge, 28,200 cfs 4 p.m. May 18 (gage height, 29.72 ft). 1938 to April 1951: Discharge, 25,600 cfs May 17, 1947 (gage height, 29.62 ft). Stage known, about 30 ft in 1906, from information by local residents.

Remarks.--Some regulation by Lake Lawtonka (capacity, 42,300 acre-ft) on Medicine Bluff Creek and by Lake Thomas (capacity, 8,300 acre-ft) on Little Medicine Bluff Creek.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	238	6	25	11	938	16	13	21	8,280	26	1,490
2	377	7	20	12	110	17	4,610	22	4,600	27	867
3	153	8	15	13	30	18	24,600	23	1,670	28	480
4	54	9	16	14	15	19	15,400	24	942	29	310
5	33	10	473	15	11	20	12,500	25	870	30	347
										31	309

Monthly mean discharge, in cfs	2,577
Runoff, in acre-feet	158,500
Runoff, in inches	4.40

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge	Gage height	Dis-charge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									4.42	29	29.14	20,900
4									4.92	51	29.24	22,100
6									8.60	327	29.31	22,900
8									13.35	938	29.34	23,200
10									17.50	1,620	29.36	23,400
N									20.25	2,110	29.48	24,900
2									22.58	2,700	29.64	27,100
4									24.77	3,590	29.72	28,200
6									26.69	5,660	29.66	27,400
8									28.20	12,800	29.56	26,000
10									28.75	17,000	29.44	24,400
12									29.07	20,100	29.33	23,100
	May 19		May 20		May 21		May 22		May 23		May 24	
2							27.12	6,760	21.06	2,300		
4	28.99	19,200	28.42	14,400	27.65	9,380	26.92	6,160	20.12	2,080	14.34	1,100
6							26.73	5,730	19.22	1,910		
8	28.63	16,000	28.27	13,300	27.54	8,770	26.53	5,400	18.45	1,780	13.62	990
10							26.29	5,040	17.76	1,660		
N	28.36	13,900	28.13	12,300	27.43	8,160	26.02	4,690	17.22	1,570	13.11	915
2							25.68	4,310	16.74	1,490		
4	28.20	12,800	27.98	11,400	27.36	7,800	25.27	3,940	16.39	1,430	12.72	856
6							24.68	3,540	16.07	1,370		
8	28.21	12,900	27.88	10,700	27.34	7,700	23.95	3,150	15.76	1,320	12.41	810
10							23.05	2,840	15.40	1,260		
12	28.40	14,200	27.77	10,000	27.23	7,150	22.00	2,540	15.11	1,220	12.12	769

Deep Red Run near Randlett, Okla.

Location.--Lat 34°13', long. 98°27', in SW¼ sec. 10, T. 4 S., R. 12 W., near right bank on downstream side of pier of bridge on U. S. Highway 277, 2 3/4 miles north of Randlett and 4½ miles upstream from mouth. Datum of gage is 924.49 ft above mean sea level, datum of 1929 (Oklahoma State Highway Commission bench mark).

Drainage area.--617 sq mi.

Gage-height record.--Water-stage recorder graph except for periods, May 1-3, 9-10, 25-27, for which no record was obtained.

Discharge record.--Defined by current-meter measurements below 13,000 cfs and extended to peak stage. Shifting-control method used May 4-8, 11-17. Discharge during periods of no gage-height record interpolated or estimated on basis of weather records.

Maxima.--May 1951: Discharge, 20,300 cfs 9 a.m. May 18 (gage height, 27.10 ft).
1949 to April 1951: Discharge, 9,400 cfs May 11, 1950 (gage height, 24.18 ft).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	90	6	3.0	11	13	16	2.8	21	7,600	26	116
2	140	7	2.0	12	42	17	444	22	3,950	27	92
3	26	8	1.5	13	10	18	17,400	23	1,260	28	69
4	5.1	9	1.3	14	5.4	19	12,100	24	345	29	50
5	4.8	10	1.1	15	3.5	20	10,200	25	144	30	37
										31	26

Monthly mean discharge, in cfs	1,748
Runoff, in acre-feet	107,500
Runoff, in inches	3.27

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Diacharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									3.39	3.3	23.75	9,440
4									3.48	4.5	26.73	19,100
6									4.33	26	27.00	20,000
8									5.28	63	27.10	20,300
10									6.42	117	27.10	20,300
N									7.83	202	27.05	20,200
2									9.32	336	26.92	19,700
4									10.55	457	26.70	19,000
6									13.22	769	26.40	18,000
8									15.45	1,060	26.15	17,200
10									17.45	1,380	25.89	16,400
12									19.25	1,810	25.64	15,600
	May 19		May 20		May 21		May 22		May 23		May 24	
2	25.41	14,800	24.06	10,400	23.12	7,390	22.70	6,020	20.02	2,050	10.66	498
4	25.23	14,200	24.19	10,900	22.97	6,900	22.54	5,500	19.50	1,880	10.24	456
6	25.03	13,600	24.24	11,000	22.88	6,610	22.39	5,020	18.83	1,700	9.77	411
8	24.84	13,000	24.23	11,000	23.00	7,000	22.26	4,630	18.14	1,530	9.43	381
10	24.69	12,500	24.25	11,100	23.30	7,980	22.11	4,180	17.29	1,350	9.09	350
N	24.55	12,000	24.24	11,000	23.47	8,530	21.95	3,700	16.32	1,190	8.80	326
2	24.41	11,600	24.15	10,700	23.48	8,560	21.80	3,290	15.31	1,040	8.52	304
4	24.27	11,100	24.03	10,300	23.41	8,330	21.64	2,980	14.25	905	8.30	286
6	24.13	10,700	23.85	9,760	23.29	7,940	21.45	2,760	13.29	778	8.06	267
8	23.96	10,100	23.69	9,240	23.18	7,580	21.21	2,570	12.41	685	7.84	249
10	23.83	9,700	23.51	8,660	23.02	7,060	20.90	2,400	11.75	612	7.64	233
12	23.66	9,140	23.32	8,040	22.86	6,540	20.53	2,240	11.18	550	7.45	218

Supplemental record.--May 18, 9 a.m., 27.10 ft, 20,300 cfs.

Lake Kemp near Mabelle, Tex.

Location.--Lat 33°45', long. 99°09', in outlet-gate control house at dam on Wichita River, 6.2 miles north of Mabelle, Baylor County, and 10.2 miles northeast of Seymour. Datum of gage is 2.4 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Drainage area.--2,099 sq mi.

Gage-height record.--Float-tape gage read daily at 8 a.m.

Maxima.--May 1951: Contents, 287,500 acre-ft May 24, 25 (gage height, 1,141.2 ft). 1922 to April 1951: Contents, 420,900 acre-ft June 30, 1941 (gage height, 1,149.6 ft).

Remarks.--Reservoir is formed by hydraulic earth-fill dam 7,500 ft long, having an uncontrolled semi-circular concrete service spillway 564 ft long with crest at gage height 1,150.6 ft (capacity, 438,000 acre-ft). Two uncontrolled emergency spillways are located between the left end of dam and the service spillway, one 70 ft long with crest at gage height 1,159.1 ft, and the other 335 ft long with crest varying from gage heights 1,159.6 to 1,162.9 ft. Storage began Oct. 1, 1922; dam completed Aug. 25, 1923. Outlet works consists of 6 conduits, 7 ft in diameter, controlled by lift-type gates. Records of daily gage heights furnished by Wichita County Water Improvement Districts Nos. 1 and 2. Capacity table furnished by Corps of Engineers and based on their survey in 1944.

Gage height, in feet, and contents, in acre-feet, at 8 a.m., May 1951

Day	Gage height	Contents	Day	Gage height	Contents
1	1,138.2	247,800	16	1,137.7	241,400
2	1,138.1	246,500	17	1,137.8	242,700
3	1,138.1	246,500	18	1,139.3	262,100
4	1,138.1	246,500	19	1,140.5	278,000
5	1,138.1	246,500	20	1,140.9	283,400
6	1,138.0	245,200	21	1,141.0	284,700
7	1,138.0	245,200	22	1,141.1	286,100
8	1,138.0	245,200	23	1,141.1	286,100
9	1,138.0	245,200	24	1,141.2	287,500
10	1,138.0	245,200	25	1,141.2	287,500
11	1,138.0	245,200	26	1,141.1	286,100
12	1,138.0	245,200	27	1,141.1	286,100
13	1,137.9	244,000	28	1,141.1	286,100
14	1,137.9	244,000	29	1,141.1	286,100
15	1,137.8	242,700	30	1,141.0	284,700
			31	1,141.0	284,700
Change in contents during month.....					+36,900

Wichita River at Wichita Falls, Tex.

Location.--Lat 33°54'30", long. 98°32'05", near center of stream on upstream side of Tenth Street Bridge in Wichita Falls, Wichita County, 4 miles upstream from Fort Worth & Denver City Railway bridge, and about 7 miles upstream from Holliday Creek. Datum of gage is 924.26 ft above mean sea level, datum of 1929.

Drainage area.--3,140 sq mi, of which 2,099 sq mi is above Lake Kemp Dam.

Gage-height record.--From graph based on twice-daily, or oftener, readings of wire-weight gage.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used.

Maxima.--May 1951: Discharge, 6,670 cfs 5 a.m. May 20 (gage height, 18.98 ft).
1938 to April 1951: Discharge observed, 17,800 cfs Oct. 3, 1941 (gage height, 24.00 ft).
Discharge known, 50,000 cfs June 8, 1915, computed by Vernon L. Sullivan, engineer for Big Wichita River Irrigation Co.

Remarks.--Flow largely regulated by Lake Kemp (see preceding page), and slightly regulated by Lake Diversion (capacity 40,000 acre-ft) about 50 miles upstream.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	220	6	70	11	124	16	82	21	2,960	26	742
2	118	7	70	12	115	17	182	22	1,370	27	504
3	100	8	66	13	91	18	2,980	23	1,290	28	389
4	89	9	64	14	90	19	5,490	24	1,030	29	426
5	62	10	56	15	88	20	6,250	25	838	30	395
										31	335
Monthly mean discharge, in cfs											861
Runoff, in acre-feet											52,930
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4									3.33	118	7.95	1,620
6							3.21	91				
8									3.44	144	10.95	2,800
10												
N	3.17	82	3.20	89	3.21	91	3.18	85	3.51	162	12.32	3,380
2												
4									3.57	177	13.06	3,670
6							3.11	70				
8									3.71	214	13.85	4,010
10												
12	3.21	91	3.22	93	3.14	76	3.20	89	4.62	468	14.68	4,360
	May 19		May 20		May 21		May 22		May 23		May 24	
2					17.09	5,500						
4			18.97	6,660	16.10	5,000						
6	16.03	5,000			14.45	4,270	7.27	1,330				
8			18.88	6,590	12.80	3,550						
10					11.48	3,000						
N	17.22	5,550	18.52	6,320	10.37	2,560	7.33	1,370	7.22	1,290	6.37	998
2					9.27	2,120						
4			18.11	6,060	8.20	1,680						
6	17.97	6,000			7.80	1,530	7.46	1,410				
8			17.71	5,820	7.61	1,450						
10					7.48	1,410						
12	18.67	6,450	17.30	5,600	7.39	1,370	7.42	1,370	6.93	1,220	6.03	902

Supplemental record.--May 20, 5 a.m., 18.98 ft, 6,670 cfs.

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Little Beaver Creek near Duncan, Okla.

Location.--Lat 34°30', long. 98°07', in NE¼ sec. 11, T. 1 S., R. 9 W., on downstream side of right pier of county highway bridge, just downstream from Hell Creek, 8¼ miles west of Duncan, and 11.9 miles upstream from mouth. Datum of gage is 1,003.39 ft above mean sea level, unadjusted (Corps of Engineers bench mark).

Drainage area.--158 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 3,900 cfs and extended above on basis of computations of overflow at gage heights 16.39 and 16.87 ft. Shifting-control method used May 25-31.

Maxima.--May 1951: Discharge, 25,200 cfs 10:15 a.m. May 17 (gage height, 16.87 ft). 1948 to April 1951: Discharge, 12,200 cfs May 11, 1950 (gage height, 16.03 ft), from rating curve extended above 3,300 cfs on basis of contracted-opening determination of peak flow.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	993	6	23	11	22	16	89	21	223	26	111
2	70	7	22	12	19	17	6,920	22	354	27	71
3	39	8	22	13	19	18	3,480	23	136	28	64
4	31	9	26	14	16	19	1,050	24	148	29	61
5	26	10	48	15	64	20	2,470	25	320	30	53
										31	44

Monthly mean discharge, in cfs	549
Runoff, in acre-feet	33,790
Runoff, in inches	4.01

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							3.60	162	1.94	58	15.64	3,970
4							3.57	160	9.75	874	15.82	4,820
6					1.07	17	2.67	100	15.25	2,780	15.83	4,890
8							2.43	86	15.90	5,350	15.76	4,490
10							2.30	78	16.86	25,000	15.87	5,150
N					1.07	17	2.15	69	16.65	19,800	15.87	5,150
2					1.07	17	2.23	74	16.20	9,100	15.65	4,000
4					1.26	25	2.10	66	15.90	5,350	15.28	2,870
6					1.95	58	1.99	60	15.70	4,200	14.40	2,000
8					4.07	199	1.88	55	15.63	3,930	12.40	1,360
10					4.53	238	1.75	48	15.57	3,720	10.15	934
12					4.27	215	1.65	44	15.58	3,750	8.35	674
	May 19		May 20		May 21		May 22		May 23		May 24	
2	9.05	771	15.03	2,350	5.30	312	3.46	153			2.82	109
4	11.40	1,140	15.48	3,430	4.94	276	3.43	150	3.44	151	2.79	107
6	13.15	1,560	15.90	5,350	4.68	251	5.95	384			2.77	106
8	14.77	2,160	15.90	5,350	4.51	236	8.43	885	3.27	139	2.77	106
10	14.68	2,110	15.68	4,120	4.35	222	8.64	714			2.79	107
N	13.25	1,590	15.36	3,090	4.23	211	7.55	570	3.18	133	2.85	111
2	10.40	973	14.50	2,040	4.12	203	6.30	422			2.94	116
4	7.43	556	12.20	1,310	4.02	195	5.42	325	3.15	130	3.19	133
6	6.10	400	9.50	836	3.87	183	4.77	259			3.58	161
8	5.50	334	7.38	550	3.74	172	4.34	221	3.01	121	4.18	207
10	5.08	290	6.38	431	3.61	163	4.03	195			5.18	300
12	10.20	941	5.75	362	3.53	157	3.78	175	2.90	114	5.29	311

Supplemental record.--May 15, 10:30 p.m., 4.58 ft, 242 cfs; May 17, 10:15 a.m., 16.87 ft, 25,200 cfs; May 18, 5 a.m., 15.84 ft, 4,950 cfs, 11 a.m., 15.91 ft, 5,440 cfs; May 19, 1 a.m., 8.10 ft, 642 cfs, 8:45 a.m., 14.85 ft, 2,200 cfs; May 20, 7 a.m., 15.97 ft, 5,990 cfs; May 22, 9:15 a.m., 8.78 ft, 733 cfs.

Lake Kickapoo near Archer City, Tex.

Location.--Lat 33°39'45", long. 98°46'45", at intake tower near left end of dam on North Fork Little Wichita River, 8.2 miles south of Mankins, and 9,2 miles northwest of Archer City, Archer County. Datum of gage is at mean sea level, datum of 1929.

Drainage area.--275 sq mi.

Gage-height record.--Twice-daily staff gage readings.

Maxima.--May 1951: Contents, 92,420 acre-ft May 20-31 (elevation, 1,042.8 ft).
1946 to April 1951: Contents, 134,300 acre-ft Aug. 2, 1950 (elevation, 1,049.2 ft).

Remarks.--Reservoir is formed by a rolled-fill earthen type dam 6,800 ft long, containing a reinforced concrete ogee-type service spillway at right end of dam, 482.7 ft long without gates. Dam completed Dec. 15, 1945, and storage began Feb. 1, 1946. Capacity, 106,000 acre-ft between elevations 1,000.92 (bottom of two 48" x 60" outlet conduits) and 1,045.0 ft (top of service spillway). Maximum capacity 220,000 acre-ft at elevation 1,060 ft with 2-foot freeboard. There is no dead storage. Reservoir contents used as municipal supply for city of Wichita Falls. Capacity curve, records of observed lake elevations and diversions for municipal use, furnished by city of Wichita Falls.

Elevation, in feet, and contents, in acre-feet, at 8 a.m., May 1951

Day	Elevation	Contents	Day	Elevation	Contents
1	1,042.1	88,290	16	1,041.8	86,560
2	1,042.1	88,290	17	1,041.8	86,560
3	1,042.1	88,290	18	1,041.2	88,880
4	1,042.0	87,700	19	1,041.7	91,830
5	1,042.0	87,700	20	1,042.8	92,420
6	1,042.0	87,700	21	1,042.8	92,420
7	1,042.0	87,700	22	1,042.8	92,420
8	1,042.0	87,700	23	1,042.8	92,420
9	1,042.0	87,700	24	1,042.8	92,420
10	1,042.0	87,700	25	1,042.8	92,420
11	1,041.9	87,130	26	1,042.8	92,420
12	1,041.9	87,130	27	1,042.8	92,420
13	1,041.9	87,130	28	1,042.8	92,420
14	1,041.8	86,560	29	1,042.8	92,420
15	1,041.8	86,560	30	1,042.8	92,420
			31	1,042.8	92,420
Change in contents during month					+4,130

Note.--A total of 806 acre-ft was diverted for municipal use during month.

Little Wichita River near Archer City, Tex.

Location.--Lat 33°40', long. 98°36', on left bank at downstream side of pier of bridge on State Highway 79, 1.5 miles downstream from confluence of North and Middle Forks, and 4.8 miles north of Archer City, Archer County. Datum of gage is 934.72 ft above mean sea level, datum of 1929.

Drainage area.--481 sq mi.

Gage-height record.--Water-stage recorder graph except from May 1-19 when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used. Discharge for the period of no gage-height record estimated on the basis of nearby stations.

Maxima.--May 1951: Discharge, 1,330 cfs May 20 (gage height, 18.81 ft).
1932 to April 1951: Discharge, 17,900 cfs Oct. 31, 1941 (gage height, 26.18 ft).
Flood of June 1930 reached a stage of about 28 ft, from information by State Highway Department.

Remarks.--Some regulation by Lake Kickapoo on North Fork (see preceding page). City of Wichita Falls diverts water from Lake Kickapoo for municipal use.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	790	6	1	11	2	16	0.2	21	510	26	4.2
2	510	7	.5	12	1	17	.2	22	71	27	2.7
3	40	8	.2	13	.5	18	.2	23	80	28	2.7
4	4	9	0	14	.4	19	270	24	23	29	1.4
5	2	10	3	15	.3	20	1,240	25	8.8	30	.7
										31	.5

Monthly mean discharge, in cfs	115
Runoff, in acre-feet	7,080
Runoff, in inches	-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2			16.46	1,020	17.20	1,100						
4			17.49	1,150	16.50	1,010						
6			18.17	1,240	15.60	890	5.03	42	6.02	108		
8			18.39	1,270	14.35	770						
10			18.60	1,300	12.70	606						
N			18.76	1,330	10.83	450	5.54	78	5.72	90	4.79	21
2			18.81	1,330	8.80	300						
4			18.79	1,330	6.90	167						
6			18.67	1,310	5.74	93	5.71	90	5.18	55		
8			18.45	1,270	5.37	68						
10			18.15	1,240	5.22	60						
12			17.72	1,170	5.13	51	5.82	96	4.98	37	4.68	14

Red River near Terral, Okla.

Location.--Lat 33°52'50", long. 97°56'15", near center of stream on downstream side of pier of bridge on U. S. Highway 81, a quarter of a mile downstream from Chicago, Rock Island & Pacific Railway bridge, 1.2 miles south of Terral, Jefferson County, and 3.2 miles downstream from Little Wichita River. Datum of gage is 770.31 ft above mean sea level, datum of 1929.

Drainage area.--28,723 sq mi, of which 6,697 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except May 1-17, when record is from graph based on twice-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used.

Maxima.--May 1951: Discharge, 164,000 cfs 12 p.m. May 19 (gage height, 26.68 ft). 1938 to April 1951: Discharge, 197,000 cfs June 8, 1941 (gage height, 28.12 ft). Stage known prior to 1938, 27.2 ft, present site and datum, May 19, 1935; floods of 1891 and May 1, 1908 are reported to have reached about the same stage.

Remarks.--Flow slightly regulated by Lake Kemp on Wichita River in Baylor County, Tex. (see p.176) and Lake Kickapoo on Little Wichita River in Archer County, Tex. (see p.179).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	4,360	6	2,460	11	654	16	554	21	94,800	26	8,980
2	9,150	7	919	12	1,180	17	581	22	52,600	27	8,340
3	7,040	8	620	13	1,280	18	29,400	23	37,200	28	6,380
4	4,030	9	563	14	771	19	128,000	24	22,100	29	5,290
5	2,930	10	557	15	588	20	143,000	25	12,600	30	4,280
										31	3,790
Monthly mean discharge, in cfs											19,190
Runoff, in acre-feet											1,180,000
Runoff, in inches											1.00

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2											10.02	766
4											11.35	2,140
6											14.40	13,000
8	10.78	1,420									15.85	22,600
10											16.45	27,100
N			9.98	745	9.74	575	9.70	551	9.72	563	16.92	31,100
2											17.30	35,300
4	10.54	1,190									17.65	38,300
6											18.15	43,500
8											18.78	50,100
10											19.25	56,100
12	10.25	959	9.82	634	9.73	569	9.69	545	9.86	654	19.88	63,800
	May 19		May 20		May 21		May 22		May 23		May 24	
2	20.70	74,600	26.58	162,000	23.61	117,000	19.87	59,900	18.38	42,400	16.60	25,500
4	21.55	85,000	26.39	158,000	23.32	112,000	19.66	57,300	18.30	41,300	15.40	24,000
6	22.65	101,000	26.19	155,000	23.00	109,000	19.44	54,900	18.23	40,300	16.28	23,300
8	23.65	116,000	26.13	155,000	22.79	107,000	19.31	53,700	18.20	40,300	16.21	22,600
10	24.25	124,000	25.75	148,000	22.50	102,000	19.23	52,500	18.17	39,300	16.15	22,600
N	25.10	138,000	25.60	144,000	22.17	97,400	19.20	52,500	18.13	39,300	16.14	21,900
2	25.70	148,000	25.25	139,000	21.84	91,000	19.16	51,300	18.00	38,300	16.09	21,200
4	26.17	155,000	24.91	134,000	21.50	86,500	19.12	51,300	17.85	35,300	16.02	21,200
6	26.43	158,000	24.65	131,000	21.13	79,000	19.05	50,100	17.62	33,500	15.91	21,200
8	26.58	162,000	24.43	127,000	20.84	74,600	18.89	47,900	17.34	31,100	15.75	19,800
10	26.63	162,000	24.19	124,000	20.51	69,000	18.72	45,700	17.07	29,500	15.56	18,600
12	26.68	164,000	23.89	121,000	20.18	65,100	18.54	43,500	16.82	27,100	15.33	17,400

Red River near Gainesville, Tex.

Location.--Lat 33°44', long. 97°10', in SW¼ sec. 36, T. 9 S., R. 1 E., near center of span on downstream side of bridge on U. S. Highway 77, a quarter of a mile downstream from Gulf, Colorado & Santa Fe Railway bridge, 5 miles downstream from Fish Creek, 7 miles north of Gainesville, and at mile 791.5. Datum of gage is 627.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--30,782 sq mi, of which 6,697 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except for period May 21-31, for which a graph was drawn from at least twice-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 2, 14-21, 23, 24.

Maxima.--May 1951: Discharge, 146,000 cfs 7:30 p.m. May 21 (gage height, 26.53 ft). 1936-37, 1938 to April 1951: Discharge, 168,000 cfs June 9, 1941 (gage height, 24.15 ft).

Remarks.--Flow slightly regulated by Lake Altus on North Fork Red River (see p.168), Lake Kemp on Wichita River (see p.176), and by Lake Kickapoo on Little Wichita River (see p.179). Records collected and computed by Corps of Engineers and reviewed by Geological Survey.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	540	6	5,060	11	870	16	1,340	21	138,000	26	14,900
2	1,180	7	3,580	12	790	17	1,060	22	117,000	27	11,800
3	8,720	8	2,250	13	790	18	1,090	23	64,300	28	11,100
4	10,300	9	1,370	14	1,350	19	35,800	24	34,000	29	8,720
5	8,720	10	1,040	15	1,800	20	84,500	25	22,100	30	7,200
										31	6,200
Monthly mean discharge, in cfs											19,600
Runoff, in acre-feet											1,205,000
Runoff, in inches											0.94

Washita River near Cheyenne, Okla.

Location.--Lat 35°38', long. 99°40', on line between SE¼ and SW¼ sec. 5, T. 13 N., R. 23 W., near left bank on downstream side of pier of bridge on U. S. Highway 283, half a mile downstream from Sergeant Major Creek, 1 mile north of Cheyenne, 5.2 miles upstream from Dead Indian Creek, and at mile 543.9. Datum of gage is 1,905.98 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--794 sq mi.

Gage-height record.--Water-stage recorder graph except for period May 1-7, when there was no gage-height record.

Discharge records.--Stage-discharge relation defined by current-meter measurements below 1,100 cfs and extended to peak stage. Discharge for period of no gage-height record was interpolated or estimated on basis of weather records and records for station near Clinton. Shifting-control method used May 8-17, 21-31.

Maxima.--May 1951: Discharge, 5,040 cfs 3 a.m. May 18 (gage height, 9.16 ft). 1938 to April 1951: Discharge, 40,000 cfs May 23, 1941 (gage height, 13.5 ft), from rating curve extended above 27,000 cfs.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	40	6	24	11	20	16	521	21	409	26	154
2	35	7	22	12	21	17	1,790	22	308	27	140
3	31	8	21	13	19	18	3,840	23	236	28	133
4	28	9	20	14	18	19	1,560	24	209	29	127
5	26	10	21	15	18	20	974	25	184	30	113
										31	98
Monthly mean discharge, in cfs											360
Runoff, in acre-feet											22,140
Runoff, in inches											0.52

Barnitz Creek near Arapaho, Okla.

Location.--Lat 35°35', long. 99°02', in SE¼SE¼ sec. 19, T. 13 N., R. 17 W., on right bank on downstream side of pier of highway bridge, half a mile downstream from confluence of East and West Barnitz Creeks, 4½ miles west of Arpahao, and 6 miles upstream from mouth. Datum of gage is 1,529.12 ft above mean sea level, unadjusted (Bureau of Reclamation bench mark).

Drainage area.--243 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 2,000 cfs and extended to peak stage. Shifting-control method used May 1-13, 16, 27-31.

Maxima.--May 1951: Discharge, 7,700 cfs 10 p.m. May 16 (gage height, 20.67 ft).

1945 to April 1951: Discharge, 6,000 cfs Apr. 8, 1947 (gage height, 20.8 ft, from floodmark).
Flood in April 1934 is greatest known (stage not determined).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	0.5	6	0.1	11	0	16	1,450	21	57	26	39
2	.2	7	.1	12	0	17	1,520	22	201	27	23
3	.2	8	0	13	0	18	162	23	37	28	18
4	.1	9	0	14	0	19	71	24	27	29	15
5	.1	10	0	15	0	20	337	25	257	30	13
										31	12
Monthly mean discharge, in cfs											137
Runoff, in acre-feet											8,410
Runoff, in inches											0.65

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							6.21	0	20.28	4,850	10.20	234
4							6.21	0	19.81	3,000	10.13	228
6							6.22	0	19.18	2,130	9.94	211
8							6.22	0	17.69	1,610	10.10	225
10							6.22	0	16.12	1,170	9.79	199
N							6.23	0	14.59	835	9.24	157
2							6.22	0	12.97	558	8.78	125
4							7.35	16	11.47	363	8.58	112
6							18.10	1,740	10.66	277	8.50	107
8							20.22	4,550	10.21	235	8.43	103
10							20.67	7,700	9.71	193	8.44	103
12							20.55	6,650	9.27	159	8.48	106
	May 19		May 20		May 21		May 22		May 23		May 24	
2	8.43	103	7.24	43	8.11	85	9.60	184				
4	8.29	95	8.30	95	7.91	74	11.55	372	7.31	46	6.76	26
6	8.10	84	11.55	372	7.75	66	12.18	449				
8	7.91	74	12.90	547	7.64	61	11.65	384	7.17	40	6.74	25
10	7.72	64	14.15	753	7.52	55	10.65	276				
N	7.58	58	14.28	776	7.43	51	9.70	208	7.05	36	6.73	25
2	7.46	52	13.10	577	7.34	47	8.95	136				
4	7.36	48	11.17	330	7.27	44	8.50	107	6.93	32	6.69	24
6	7.28	45	9.80	200	7.21	42	8.18	88				
8	7.58	58	9.10	147	7.15	40	7.91	74	6.87	30	6.70	24
10	8.35	98	8.64	117	7.14	39	7.70	64				
12	7.61	59	8.32	96	8.30	95	7.55	57	6.81	27	7.70	64

Supplemental record.--May 16, 5 p.m., 12.65 ft, 506 cfs 11 p.m., 20.61 ft, 7,150 cfs.

Washita River near Clinton, Okla.

Location.--Lat 35°31', long. 98°57', in center of sec. 11, T. 12 N., R. 17 W., near right bank on downstream side of pier of bridge on U. S. Highway 183, half a mile north of Clinton, three-quarters of a mile upstream from Beaver Creek, 4.8 miles downstream from Barnitz Creek, and at mile 447.4. Datum of gage is 1,467.60 ft above mean sea level, datum of 1929.

Drainage area.--1,977 sq mi.

Gage-height record.--Water-stage recorder graph except for periods May 23, 26-28, for which graphs were drawn based on daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 7,900 cfs and extended above on basis of contracted-opening determination of peak flow. Shifting-control method used May 1-20, 23-25, 27-31.

Maxima.--May 1951: Discharge, 66,800 cfs 12 p.m. May 16 (gage height, 31.09 ft).
1935 to April 1951: Discharge observed, 26,900 cfs June 5, 1936 (gage height, 28.50 ft), from rating curve extended above 13,000 cfs.
Stage known, 33.9 ft Apr. 3-4, 1934, from floodmarks.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	61	6	36	11	25	16	10,500	21	1,120	26	348
2	98	7	33	12	26	17	24,800	22	1,960	27	288
3	83	8	31	13	24	18	3,700	23	540	28	224
4	52	9	28	14	22	19	3,300	24	510	29	180
5	42	10	27	15	21	20	3,200	25	1,130	30	164
										31	152
Monthly mean discharge, in cfs											1,701
Runoff, in acre-feet											104,600
Runoff, in inches											0.99

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2							5.29	21	30.20	58,500		
4							5.29	21	28.76	45,500	17.43	4,410
6							5.29	21	27.63	36,200		
8							5.30	22	26.65	30,000	17.48	4,440
10							5.29	21	25.56	23,000		
N							5.29	21	24.48	17,400	16.55	3,930
2							5.29	21	23.50	13,200		
4							5.37	26	22.74	9,650	14.83	3,060
6							20.70	7,340	21.84	7,840		
8							26.30	28,000	20.90	6,620	13.95	2,620
10							30.70	63,300	19.76	5,700		
12							31.09	66,800	18.44	4,910	13.85	2,580
	May 19		May 20		May 21		May 22		May 23		May 24	
2	14.00	2,800	18.25	5,090			9.90	1,000			7.58	377
4	14.17	2,880	18.45	5,210	11.24	1,620	12.45	2,220			7.56	372
6	14.34	2,970	17.20	4,500			14.50	3,250	8.72	670	7.54	368
8	14.43	3,020	14.90	3,300	10.55	1,280	15.44	3,720			7.53	366
10	14.58	3,090	13.36	2,530			15.18	3,590			7.52	363
N	14.60	3,100	12.89	2,300	9.95	1,020	13.78	2,890	8.20	527	7.50	359
2	14.68	3,140	13.04	2,370			12.30	2,150			7.50	359
4	14.74	3,170	13.30	2,500	9.50	860	10.96	1,480			7.50	359
6	14.78	3,190	13.31	2,500			10.16	1,110	7.76	418	7.53	366
8	14.90	3,250	12.94	2,320	9.17	746	9.64	909			8.36	624
10	17.80	4,780	12.40	2,050			9.34	804			9.75	1,110
12	18.28	5,050	11.97	1,840	9.00	693	9.14	737	7.59	379	9.38	958

Supplemental record.--May 16, 5 p.m., 15.00 ft, 3,500 cfs; May 18, 5 a.m., 17.34 ft, 4,360 cfs, 10 p.m., 13.85 ft, 2,580 cfs; May 19, 9 p.m., 17.79 ft, 4,770 cfs, 9:45 p.m., 18.02 ft, 4,900 cfs; May 20, 3:30 a.m., 18.48 ft, 5,230 cfs; May 22, 8:30 a.m., 15.49 ft, 3,740 cfs; May 24, 8:45 p.m., 10.98 ft, 1,690 cfs.

Washita River at Carnegie, Okla.

Location.--Lat 35°07', long. 98°34', near center of north line of sec. 3, T. 7 N., R. 13 W., near right bank on downstream side of pier of bridge on State Highway 9, 1,300 ft upstream from Running Creek, 2.7 miles east of Carnegie, and at mile 353.9. Datum of gage is 1,249.23 ft above mean sea level, datum of 1929.

Drainage area.--3,129 sq mi, includes that of Running Creek.

Gage-height record.--Water-stage recorder graph except for period 1-6 a.m. May 18, for which graph was completed on basis of floodmark in gage well.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-31.

Maxima.--May 1951: Discharge, 40,900 cfs 4:45 a.m. May 18 (gage height, 25.50 ft). 1937 to April 1951: Discharge, 50,000 cfs May 18, 1949 (gage height, 26.21 ft), from rating curve extended above 28,000 cfs on basis of contracted-opening determination of peak flow.

Stage known, about 29 ft May 23, 1903, at former site and datum, from information by local resident (flood of May 18, 1949 reached a stage of 20.9 ft, from floodmark, at that site and datum).

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	86	6	89	11	60	16	64	21	6,210	26	1,410
2	136	7	76	12	59	17	976	22	5,820	27	1,140
3	111	8	70	13	57	18	26,300	23	2,640	28	595
4	93	9	66	14	56	19	12,200	24	1,900	29	480
5	112	10	64	15	57	20	7,670	25	912	30	412
										31	366

Monthly mean discharge, in cfs	2,267
Runoff, in acre-feet	139,400
Runoff, in inches	0.84

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									5.27	230	23.90	23,900
4									5.60	282	25.48	40,600
6									6.26	386	25.44	40,100
8									6.26	386	25.04	35,000
10									6.17	370	24.65	30,600
N							3.86	62	6.20	375	24.24	26,700
2									6.66	450	23.95	24,300
4									7.78	690	23.67	22,300
6									8.88	988	23.35	20,300
8									10.68	1,570	23.05	18,600
10									13.34	2,480	22.77	17,300
12							4.35	108	20.00	7,890	22.55	16,300
	May 19		May 20		May 21		May 22		May 23		May 24	
2	22.33	15,800	20.13	9,120	18.91	6,710	18.94	6,950				
4	22.13	15,000	19.95	8,690	18.78	6,490	18.89	6,850	14.05	2,980	12.81	2,500
6	21.92	14,200	19.77	8,270	18.64	6,270	18.82	6,730				
8	21.70	13,400	19.63	7,960	18.53	6,110	18.74	6,590	12.74	2,480	12.13	2,270
10	21.50	12,600	19.48	7,630	18.43	5,980	18.62	6,390				
N	21.31	12,000	19.39	7,440	18.42	5,970	18.47	6,170	12.49	2,390	11.08	1,920
2	21.15	11,400	19.37	7,400	18.46	6,020	18.33	5,980				
4	20.95	10,800	19.34	7,340	18.56	6,150	18.14	5,750	12.64	2,440	9.98	1,570
6	20.73	10,200	19.30	7,260	18.66	6,300	17.83	5,410				
8	20.50	9,550	19.23	7,120	18.78	6,490	17.33	4,940	12.83	2,510	9.17	1,310
10	20.35	9,420	19.14	6,950	18.86	6,620	16.74	4,480				
12	20.29	9,300	19.07	6,820	18.89	6,670	15.98	3,980	12.93	2,550	8.70	1,170

Supplemental record.--May 16, 9 p.m., 3.81 ft, 59 cfs; May 18, 4:45 a.m., 25.50 ft, 40,900 cfs; May 23, 11:30 a.m., 12.48 ft, 2,390 cfs.

Pond Creek near Fort Cobb, Okla.
(Known locally as Cobb Creek)

Location.--Lat 35°08', long. 98°27', in NW¼SE¼ sec. 26, T.8N., R. 12 W., on left bank 100 ft downstream from bridge on county road, 2.7 miles north of Fort Cobb and 5.0 miles upstream from mouth. Datum of gage is 1,252.57 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.--319 sq mi (revised).

Gage-height record.--Water-stage recorder graph except for periods 3-11 a.m. May 18, 4 a.m. May 19 to May 22, for which graphs were drawn based on fragmentary recorder record, occasional staff-gage readings, and floodmark in gage well, and May 13, 14, 23-30, for which no record was obtained.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-12, 15-17, 30. Discharge for periods of no gage-height record estimated on basis of weather records and records for Washita River at Carnegie.

Maxima.--May 1951: Discharge, 4,540 cfs 12:30 p.m. May 20 (gage height, 15.92 ft, from high-water mark in gage well).
1940 to April 1951: Discharge, 35,000 cfs May 17, 1949 (gage height, 18.72 ft, from high-water mark in gage well), from rating curve extended above 4,300 cfs on basis of contracted-opening determinations at gage heights 16.62, 17.58, and 18.72 ft.
Flood of June 15, 1937 reached a stage of 19.3 ft, from information by local residents.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	66	6	27	11	27	16	36	21	177	26	76
2	46	7	27	12	27	17	693	22	87	27	52
3	34	8	27	13	27	18	1,160	23	56	28	42
4	31	9	28	14	26	19	348	24	64	29	38
5	28	10	29	15	27	20	1,530	25	86	30	35
										31	34

Monthly mean discharge, in cfs	161
Runoff, in acre-feet	9,900
Runoff, in inches	0.58

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									3.08	35	12.84	1,170
4									4.10	74	12.20	970
6									4.80	109	11.20	980
8									7.00	288	10.90	737
10									12.00	922	12.30	1,000
N									13.10	1,270	13.10	1,270
2									13.22	1,320	13.52	1,440
4									12.80	1,160	13.81	1,580
6									11.73	870	13.93	1,640
8									10.95	744	13.53	1,450
10									12.00	922	12.00	922
12									12.77	1,150	10.20	651
	May 19		May 20		May 21		May 22		May 23		May 24	
2	9.12	521	7.04	292	7.27	315	4.59	97				
4	8.60	460	9.00	507	6.74	262	4.53	94				
6	8.09	404	13.20	1,310	6.30	221	4.50	92				
8	7.69	360	14.84	2,210	5.89	186	4.45	89				
10	7.35	323	15.55	3,180	5.57	161	4.40	87				
N	7.09	297	15.89	4,400	5.35	146	4.38	86				
2	6.92	280	15.58	3,250	5.17	133	4.37	85				
4	6.84	272	13.00	1,230	5.01	122	4.35	84				
6	6.79	267	10.55	693	4.90	115	4.31	82				
8	6.76	264	9.46	562	4.81	110	4.30	81				
10	6.77	265	8.56	456	4.72	104	4.29	80				
12	6.84	272	7.89	382	4.63	99	4.27	80				

Supplemental record.--May 17, 1:30 p.m., 13.23 ft, 1,320 cfs; May 18, 7:30 a.m., 10.70 ft, 711 cfs; May 20, 12:30 p.m., 15.92 ft, 4,540 cfs.

Washita River near Tabler, Okla.

Location.--Lat 34°58', long. 97°51', in SW¼SW¼ sec. 21, T. 6 N., R. 6 W., near center of span on downstream side of pier of abandoned highway bridge, 1 mile downstream from Little Washita River, 5 miles south of Tabler, 7½ miles upstream from Winter Creek, and at mile 243.0. Datum of gage is 1,022.38 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--4,706 sq mi.

Gage-height record.--Water-stage recorder graph except for periods May 3, 4, 2 p.m. May 22 to 2 p.m. May 23, May 27-31, for which graphs were drawn from twice-daily staff-gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-17.

Maxima.--May 1951: Discharge, 24,800 cfs 11:30 a.m. May 18 (gage height, 27.14 ft). 1940 to April 1951: Discharge, 50,000 cfs May 20, 1949 (gage height, 29.72 ft). Stage known, 29.9 ft Apr. 7, 1927 (from relation of 1927 and 1949 floodmarks set by observer), partly caused by ponded water released when railroad embankment on Little Washita River failed.

Remarks.--Diurnal fluctuation at low flow caused by power plant at Chickasha, 8 miles above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	1,400	6	285	11	249	16	271	21	18,500	26	3,400
2	700	7	255	12	247	17	8,520	22	14,600	27	2,240
3	528	8	242	13	270	18	20,200	23	10,300	28	2,240
4	386	9	243	14	215	19	15,600	24	7,490	29	2,200
5	269	10	243	15	202	20	15,000	25	5,860	30	1,480
										31	1,290
Monthly mean discharge, in cfs											4,352
Runoff, in acre-feet											267,600
Runoff, in inches											1.05

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2									4.62	350	24.88	16,000
4							3.62	168	7.61	1,100	25.30	17,300
6									10.90	2,540	25.55	18,100
8							3.87	210	15.50	4,940	26.38	21,300
10									20.00	7,540	27.06	24,400
N							3.63	170	22.00	9,690	27.10	24,600
2									23.06	11,500	26.92	23,700
4							4.63	352	23.90	13,400	26.68	22,600
6									24.30	14,400	26.33	21,100
8							5.04	437	24.23	14,200	25.94	19,500
10									24.16	14,000	25.54	18,100
12							4.54	334	24.50	14,900	24.98	16,300
	May 19		May 20		May 21		May 22		May 23		May 24	
2	24.44	14,700	21.94	9,600								
4	24.24	14,200	22.09	9,820			24.55	15,000				
6	25.80	19,000	22.18	9,970	26.28	20,900			23.00	11,400	20.38	7,830
8	26.59	22,200	22.46	10,400			24.70	15,400				
10	26.34	21,100	22.98	11,400								
N	25.76	18,800	23.70	12,900	25.64	18,400	24.53	15,000	22.37	10,300	19.82	7,410
2	25.08	16,600	24.73	15,500								
4	24.20	14,100	25.80	19,000			24.30	14,400				
6	23.14	11,700	26.33	21,100	25.02	16,400			21.60	9,130	19.39	7,120
8	22.11	9,860	26.60	22,200			24.00	13,600				
10	21.57	9,090	26.70	22,700								
12	21.68	9,230	26.68	22,600	24.47	14,800	23.60	12,700	20.97	8,390	19.00	6,870

Supplemental record.--May 18, 11:30 a.m., 27.14 ft, 24,800 cfs; May 20, 10:15 p.m., 26.72 ft, 22,800 cfs.

Washita River near Pauls Valley, Okla.

Location.--Lat 34°45', long. 97°15', in SE¼ sec. 1, T. 3 N., R. 1 W., on downstream side of right pier of bridge on U. S. Highway 77, 2 miles northwest of Pauls Valley, 6 miles downstream from Owl Creek, 7 miles upstream from Washington Creek, and at mile 146.7. Datum of gage is 854.61 ft above mean sea level, datum of 1929.

Drainage area.--5,329 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-17.

Maxima.--May 1951: Discharge, 20,100 cfs 8:30 a.m. May 23 (gage height, 23.00 ft). 1938 to April 1951: Discharge, 30,000 cfs May 11, 1950 (gage height, 29.88 ft). Stage known, that of May 11, 1950.

Remarks.--Some diurnal fluctuation at low flow caused by power plant at Chickasha, 104 miles above station.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	6,970	6	492	11	392	16	341	21	17,500	26	6,960
2	3,630	7	420	12	366	17	547	22	16,900	27	4,970
3	1,410	8	420	13	366	18	7,530	23	19,500	28	3,630
4	831	9	392	14	366	19	10,800	24	14,800	29	2,780
5	660	10	406	15	366	20	16,100	25	9,670	30	2,540
										31	2,040

Monthly mean discharge, in cfs	4,971
Runoff, in acre-feet	305,600
Runoff, in inches	1.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 17		May 18		May 19		May 20		May 21		May 22	
2	5.18	358	10.48	3,550	16.38	9,920	19.13	14,000	22.10	18,700	20.00	15,300
4	5.16	353	11.33	4,320	16.26	9,750	19.50	14,600	22.16	18,800	20.10	15,500
6	5.14	345	12.25	5,240	16.19	9,660	19.80	15,000	22.14	18,700	20.30	15,800
8	5.11	341	13.10	6,150	16.20	9,670	20.10	15,500	22.00	18,500	20.55	16,200
10	5.08	334	13.95	7,100	16.35	9,880	20.35	15,900	21.84	18,200	20.79	16,600
N	5.06	329	14.60	7,880	16.60	10,200	20.56	16,200	21.58	17,800	21.05	17,000
2	5.07	331	15.48	8,940	16.88	10,600	20.83	16,600	21.30	17,400	21.25	17,300
4	5.10	339	16.18	9,780	17.25	11,200	21.04	17,000	21.00	16,900	21.50	17,700
6	5.20	363	16.55	10,200	17.64	11,800	21.30	17,400	20.75	16,500	21.72	18,100
8	6.10	664	16.71	10,400	18.00	12,300	21.58	17,800	20.50	16,100	21.95	18,400
10	7.58	1,410	16.61	10,300	18.45	13,000	21.80	18,200	20.17	15,700	22.15	18,700
12	9.32	2,590	16.49	10,100	18.82	13,500	21.97	18,500	19.95	15,200	22.40	19,100
	May 23		May 24		May 25		May 26		May 27		May 28	
2	22.60	19,500							12.67	5,160	13.05	5,580
4	22.80	19,800	21.05	17,000	17.06	10,900	14.90	7,870	12.47	4,940	12.25	4,700
6	22.95	20,000							12.26	4,710	11.63	4,050
8	22.99	20,100	20.45	16,000	16.50	10,100	14.67	7,570	12.09	4,520	11.20	3,630
10	22.99	20,100							11.95	4,370	11.06	3,500
N	22.88	19,900	19.70	14,800	16.20	9,670	14.37	7,180	11.90	4,320	11.17	3,600
2	22.76	19,700							11.78	4,200	11.17	3,600
4	22.63	19,500	19.00	13,800	15.84	9,170	13.90	6,600	12.30	4,750	11.00	3,450
6	22.44	19,200							12.85	5,360	10.85	3,320
8	22.20	18,800	18.30	12,800	15.41	8,560	13.35	5,940	13.30	5,880	10.75	3,220
10	21.94	18,400							13.70	6,360	10.62	3,120
12	21.65	17,900	17.67	11,800	15.15	8,200	12.88	5,390	13.65	6,300	10.52	3,040

Supplemental record.--May 23, 8:30 a.m., 23.00 ft, 20,100 cfs; May 27, 11 p.m., 13.80 ft, 6,480 cfs.

Washita River near Durwood, Okla.

Location.--Lat 34°14', long. 96°58', in SE¼ sec. 3, T. 4 S., R. 3 E., on right bank 500 ft upstream from bridge on State Highway 18, 1.3 miles downstream from Caddo Creek, 4 miles north of Durwood, and at mile 63.4. Datum of gage is 650.57 ft above mean sea level (levels by Corps of Engineers).

Drainage area.--7,202 sq mi.

Gage-height record.--Graph based on twice-daily wire-weight gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-28.

Maxima.--May 1951: Discharge, 25,900 cfs noon May 21 (gage height, 24.41 ft).
1928 to April 1951: Discharge, 91,300 cfs May 11, 1943; gage height, 44.37 ft Oct. 31, 1941.
Discharge known, that of May 11, 1943.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	3,810	6	1,140	11	678	16	399	21	25,700	26	11,400
2	10,100	7	875	12	547	17	439	22	23,600	27	8,550
3	5,600	8	700	13	480	18	4,500	23	21,800	28	10,800
4	2,480	9	678	14	451	19	14,600	24	22,300	29	5,500
5	1,470	10	825	15	447	20	21,600	25	18,700	30	3,990
										31	3,200
Monthly mean discharge, in cfs											7,334
Runoff, in acre-feet											451,000
Runoff, in inches											1.17

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												

Lake Texoma near Denison, Tex.

Location.--Lat 33°49', long. 96°34', in NE¼ sec. 33, T. 8 S., R. 7 E., in control tower of Denison Dam on Red River, 1¼ miles upstream from Shawnee Creek, 1 3/4 miles upstream from Sand Creek, 4 miles northwest of Denison, and at mile 725.9. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.--39,719 sq mi, of which 6,697 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph.

Maxima.--May 1951: Contents, 3,370,000 acre-ft 11 a.m. May 25 (elevation, 621.38 ft). 1943 to April 1951: Contents, 4,295,000 acre-ft Apr. 19, 1945 (elevation, 629.07 ft), capacity table then in use.

Remarks.--Reservoir is formed by rolled-fill earth dam. Regulated storage began Oct. 31, 1943. Capacity, 5,659,000 acre-ft at elevation 640.0 ft (crest of spillway). Dead and sediment storage, 1,163,000 acre-ft (elevation, 590.0 ft in Denison pool). When contents are below 2,348,000 acre-ft the reservoir is divided into two pools by protective levees around the Cumberland oil field on the Washita River arm, with the bottom of the outlet channel for the upper pool (known as Cumberland pool) at elevation 610 ft. At higher elevations the two pools are considered as being at a common level, contents being computed from the gage in the Denison pool. Reservoir is used principally for flood control and power development. Figures given herein represent total contents of both pools except for 60,000 acre-ft dead and sediment storage in Cumberland pool. Records furnished by Corps of Engineers.

Elevation, in feet, and contents, in thousands of acre-feet, at 12 p.m., May 1951

Day	Elevation	Contents	Day	Elevation	Contents
1	610.68	2,402.4	16	611.62	2,478.4
2	610.67	2,401.6	17	611.58	2,475.2
3	610.85	2,416.0	18	611.60	2,476.8
4	611.10	2,436.0	19	612.20	2,526.0
5	611.35	2,456.3	20	613.93	2,672.0
6	611.59	2,476.0	21	617.07	2,952.0
7	611.65	2,480.9	22	619.85	3,217.1
8	611.70	2,485.0	23	621.04	3,335.7
9	611.74	2,488.3	24	621.32	3,364.2
10	611.77	2,490.7	25	621.35	3,367.3
11	611.74	2,488.3	26	621.11	3,342.8
12	611.73	2,487.5	27	620.90	3,321.6
13	611.75	2,489.1	28	620.57	3,288.6
14	611.70	2,485.0	29	620.20	3,251.6
15	611.68	2,483.4	30	619.63	3,195.5
			31	619.04	3,138.0
Change in contents during month, in thousands of acre-feet.....					+738.8

Note.--Contents at 12 p.m. Apr. 30, 2,399,200 acre-ft.

Red River near Colbert, Okla.

Location.--Lat 33°49', long. 96°31', in E½ sec. 36, T. 8 S., R. 7 E., near center of span on downstream side of pier of highway bridge, 1.3 miles downstream from Sand Creek, 2 miles south of Colbert, 2.9 miles downstream from Denison Dam, and at mile 723.0. Datum of gage is 497.36 ft above mean sea level, datum of 1929.

Drainage area.--39,777 sq mi, of which 6,697 sq mi is probably noncontributing.

Gage-height record.--Water-stage recorder graph except for May 7, when there was no gage-height record.

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used May 1-17, 21-31. Discharge for May 7 estimated on basis of record of outflow from Lake Texoma.

Maxima.--May 1951: Discharge, 48,300 cfs 12:45 p.m. May 26 (gage height, 21.02 ft).
1923 to April 1951: Discharge, 201,000 cfs May 21, 1935; gage height, 32.0 ft Apr. 25, 1942, adjusted to present site and datum.
Stage known, 45.5 ft May 26, 1908, present site and datum, from records of U. S. Weather Bureau.

Remarks.--Flow regulated by Lake Texoma, 2.9 miles above station (see preceding page). Three discharge measurements and records of outflow from Lake Texoma furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, May 1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	3,000	6	411	11	3,060	16	3,820	21	11,300	26	39,600
2	2,660	7	3,020	12	838	17	3,910	22	22,500	27	37,100
3	3,060	8	3,310	13	417	18	3,490	23	32,400	28	38,600
4	3,460	9	3,600	14	3,450	19	3,320	24	38,600	29	38,600
5	1,700	10	3,260	15	3,650	20	5,580	25	38,100	30	37,100
										31	37,600
Monthly mean discharge, in cfs											13,890
Runoff, in acre-feet											853,900
Runoff, in inches											-

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
	May 13		May 14		May 15		May 16		May 17		May 18	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												
	May 19		May 20		May 21		May 22		May 23		May 24	
2												
4												
6												
8												
10												
N												
2												
4												
6												
8												
10												
12												

SUMMARY OF FLOOD STAGES AND DISCHARGES

The results of determinations of maximum flood flows at existing stream-gaging stations, and at other places on streams in the area covered by this report, are summarized in table 2. The plate reference number in column 1 of this table is applicable to plate 2 and will aid in identifying the place where the discharge was determined.

The peak discharge figures for the flood of May 1951, as presented in table 2, were computed either by the special methods discussed in the preceding section "Stages and discharges at stream-gaging stations" (in which case, the discharge figure is followed by a symbol explained in the headnote to the table), or by means of an established stage-discharge relation (in which case, no special reference is made in the table).

Pertinent information relative to stages antedating the period of record is available at many stations. This information is included in table 2. Explanatory footnotes on other features of the table are also included.

Figure 19 shows the flood discharges, in cubic feet per second per square mile (listed in table 2), plotted against the corresponding drainage areas. Discharges known to have been greatly affected by artificial storage, diversion, or similar regulating effects are not plotted in figure 19; peak discharge for these stations, in terms of cubic feet per second per square mile, is not shown in table 2 because it does not represent the true runoff intensity. For the same reason, peak discharges were not plotted for those stations where a portion of the drainage area was noncontributing (for a brief discussion of noncontributing area, see p. 138.)

The basic data and computations for the determinations of discharge are filed in the district offices of the Geological Survey and may be examined in those offices.

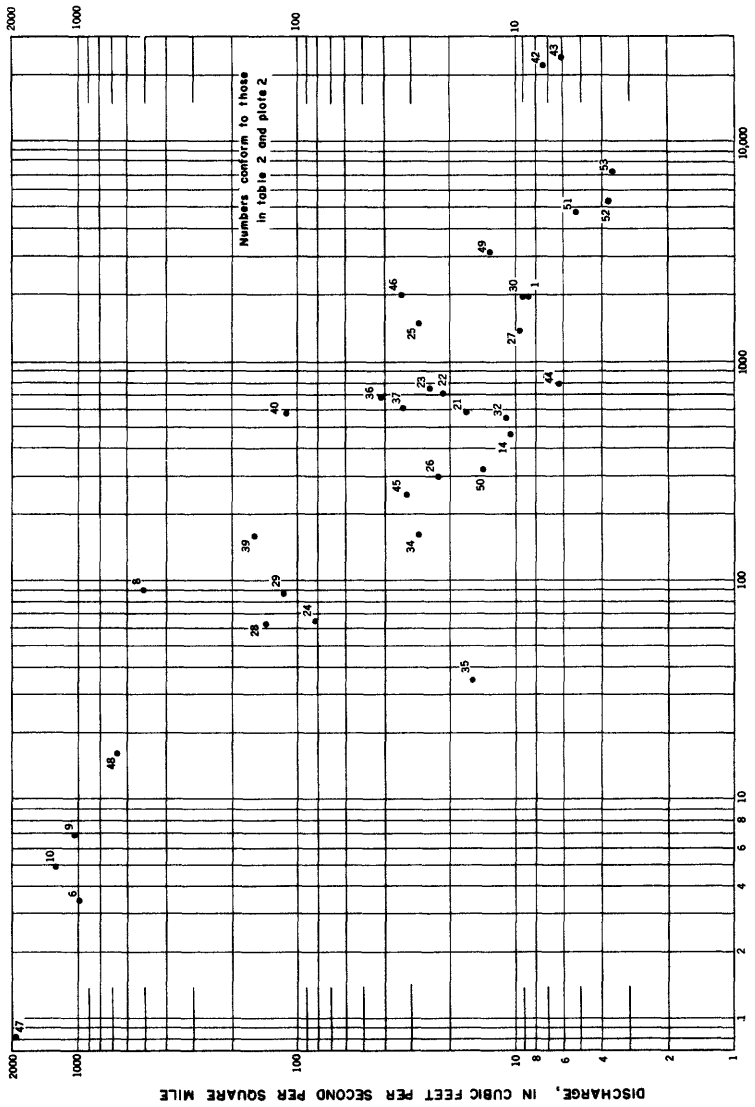

Figure 19.--Relation of unit discharge to size of drainage area.

Table 2. --Summary of flood stages and discharges in western Oklahoma and northwestern Texas for the flood of May 1951

[Maximum discharges for the floods of May 1951 were obtained from gaging-station records, except as otherwise indicated by the following symbols: C, contracted-opening determination; D, computed flow over dam; S, slope-area determination]

No. on pl. 2	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date and hour	Gage height (feet)	Discharge	
						Cfs	Cfs per sq mi			Cfs	Cfs per sq mi
	ARKANSAS RIVER BASIN										
1	Cimarron River above Ute Creek, near Boise City, Okla.	1,955	1905-7, 1942-	Apr. 20, 1942 July 28, 1950	a20.1 9.66	80,000 15,000	40.9 7.67	May 15, 2 p. m.	10.22	17,200D	8.80
2	Cimarron River near Mocane, Okla.	b8,653	1942-	1914 July 7, 1949	c13 5.50	- 10,500	- -	May 17, 4:45 a. m.	a9.94	53,400S	-
3	Crooked Creek near Nye, Kans.	b1,157	1942-	July 27, 1950	7.15	6,360	-	May 23, 9 p. m.	d7.59	10,000S	-
4	Cimarron River near Waynoka, Okla.	b13,307	1938-	July 28, 1950	11.40	70,000	-	May 18, 10:45 a. m.	9.54	37,700	-
5	Canadian River near Amarillo, Tex.	b19,287	1924-25, 1938-	May 1914 July 25, 1941	e24.0 15.7	- 135,000	- -	May 16, 9 a. m.	9.56	27,700	-
6	Red Deer Creek at bridge on State Highway 70, 2½ miles north of Pampa, Tex.	3.43	-	-	-	-	-	May 16	-	3,430S	1,000
7	Canadian River near Canadian, Tex.	b22,708	1924-25, 1938-	Oct. 2, 1904 Sept. 23, 1941	f20.0 9.8	- 122,000	- -	May 17, 3-4 a. m.	8.82	65,900	-
8	Deer Creek near Custer City, Okla.	90.2	-	-	-	-	-	May 16	-	46,600C	514
9	Deer Creek tributary 1 near Custer City, Okla.	6.74	-	-	-	-	-	May 16	-	7,030C	1,040
10	Little Deer Creek near Thomas, Okla.	4.96	-	-	-	-	-	May 16	-	6,230S	1,260
11	Canadian River at Bridgeport, Okla.	b25,071	1944-	June 23, 1948	a14.60	g150,000	-	May 17, 11:45 a. m.	11.74	65,000	-
12	North Canadian River near Guymon, Okla.	b2,139	1938-	Sept. 23, 1941	a13.82	44,000	-	May 17, 1:45 a. m.	7.56	9,970	-
13	Coldwater Creek near Hardesty, Okla.	b2,124	1939-	July 18, 1950	9.12	(h)	-	May 16, 9:15 p. m.	7.68	7,250	-
14	Palo Duro Creek near Spearman, Tex.	i462	1945-	June 4, 1936 Sept. 4, 1938 Oct. 7, 1946	g21 f22.5 19.87	g26,100 g34,000 21,200	56.5 73.6 45.9	May 17, 12 p. m.	15.32	4,930	10.7

15	North Canadian River at Beaver, Okla.	b8,112	1938-	Oct. 8, 1946	j14.55	70,000	-	May 17, 3 p.m.	11.57	32,200	-
16	Wolf Creek near Fargo, Okla.	b1,624	1943-	Oct. 2, 1944	7.65	10,800	-	May 16	a,k8.19	m23,500	-
17	Wolf Creek near Fort Supply, Okla.	b1,739	1937-	June 24, 1939	n11.60	14,200	-	May 28, 11 p.m.	5.90	p1,160	-
18	North Canadian River at Woodward, Okla.	b11,687	1938-	Oct. 12, 1923 Oct. 10, 1946	q11.0 9.80	- 42,000	- -	May 18, 12 p.m.	8.70	43,000	-
19	North Canadian River near Seiling, Okla.	b12,419	1946-	Oct. 11, 1946	11.00	29,300	-	May 19, 10:30 p.m.	10.61	40,100	-
20	North Canadian River at Canton, Okla.	b12,646	1938-	Oct. 13, 1923 Oct. 12, 1946	r21.8 17.83	- 24,800	- -	May 30, 31	-	p3,200	-
	RED RIVER BASIN										
21	Tierra Blanca Creek at reservoir, near Umbarger, Tex.	i575	1938-	June 6, 1941	s130.43	11,300	19.7	May 19, 9 a.m.	s127.64	t9,760S	17.0
22	Prairie Dog Town Fork Red River near Canyon, Tex.	i711	1924-26, 1938-49	Oct. 24, 1941	12.03	6,650	9.35	May 16	20.31	u15,200D	21.4
23	Prairie Dog Town Fork Red River in Palo Duro State Park, 14 miles east of Canyon, Tex.	i743	-	May 10, 1937	-	14,100	19.0	May 16	-	18,500S	24.9
24	North Tule Draw at reservoir, near Tulia, Tex.	i65	1939-	Oct. 4, 1941	s95.48	3,110	47.8	May 15, 8 p.m.	v96.76	5,430S	83.5
25	Prairie Dog Town Fork Red River near Brice, Tex.	i1,493	1938-44, 1949-	1933 May 1937 Oct. 4, 1941	w14.8 14.3 x5.18	- - 42,100	- - 28.2	May 16, 2 a.m.	a10.32	41,700S	27.9
26	Mulberry Creek near Brice, Tex.	i296	1949-	1941 July 16, 1950	y16.5 a15.24	- 50,700	- 171	May 17, 1 p.m.	12.02	6,730C	22.7

a From floodmarks.
b A portion of area is noncontributing.
c About; from information by local residents.
d Exceeded flood of 1913 at site 1 mile upstream.
e About; flood of October 1904 was probably higher.
f About; maximum stage known.
g About.
h Greatest discharge (not determined) probably occurred June 25, 1947.
i Contributing area only.
j Occurred prior to peak discharge, for which stage was affected by dike failure.
k Reported as maximum known at town of Gage, 12 miles upstream.
m Based on computations of inflow to Fort Supply Reservoir.
n Maximum stage known, 15.6 ft (date unknown), from information by State Highway Commission.
p Completely regulated.
q Maximum known, from reports of U. S. Weather Bureau.
r Maximum stage known, at site 300 ft upstream, from reports of U. S. Weather Bureau.
s Reservoir gage height.
t Peak discharge at auxiliary gage 9 miles above station; occurred 5:50 a.m. May 17.
u Peak discharge at Palo Duro Dam, 2 miles below discontinued station. Highest known to residents of past 46 years.
v Reservoir gage height; occurred 8:30 p.m. May 16. Highest known by resident since 1890.
w Occurred during summer of 1933. Highest known since 1906.
x Site and datum then in use.
y Maximum stage known.

Table 2. --Summary of flood stages and discharges in western Oklahoma and northwestern Texas for the flood of May 1951--Continued

No. on pl. 2	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date and hour	Gage height (feet)	Discharge	
						Cfs	Cfs per sq mi			Cfs	Cfs per sq mi
	RED RIVER BASIN--CONTINUED										
27	Salt Fork Red River at Mangum, Okla.	i1,357	1905-6, 1937-	June 16, 1938	14.7	(z)	-	May 17, 2 a.m.	10.79	13,200	9.73
28	McClellan Creek at bridge on State Highway 70, near Jericho, Tex.	i62.4	-	-	-	-	-	May 16	-	8,720C	140
29	McClellan Creek at reservoir, near Alanreed, Tex.	i86	-	-	-	-	-	May 16	101.34	10,100D	117
30	North Fork Red River near Carter, Okla.	i1,938	1944-	May 12, 1947 May 18, 1950	10.37 -	- 16,400	- 8.46	May 17, 3 a.m. May 18, 9 a.m.	10.22 -	- 18,300	- 9.44
31	North Fork Red River below Altus Dam, near Lugert, Okla.	i2,116	1950-	-	-	-	-	May 18, 12 p.m.	12.70	p16,100	-
32	Elk Creek near Hobart, Okla.	549	1904-8, 1949-	June 9, 1907 May 1949	aa28.9 a28.63	(z) -	- -	May 18, 10 a.m.	27.89	6,090	11.1
33	North Fork Red River near Headrick, Okla.	i3,845	1938-	prior to 1927 June 10, 1941	ab16.1 10.85	- 27,400	- 7.13	May 19, 1 p.m.	9.96	24,900	-
34	Otter Creek at Mountain Park, Okla.	160	1946-	May 16, 1947 June 3, 1949	- 18.30	5,110 -	31.9 -	May 18, 12:30 p.m.	17.65	4,450	27.8
35	Quitaque Creek near Quitaque, Tex.	i35	1945-	May 10, 1947	5.59	1,720	49.1	May 17, 3 p.m.	3.08	556	15.9
36	Cache Creek near Walters, Okla.	675	1938-	1906 May 17, 1947	c30 29.62	- 25,600	- 37.9	May 18, 4 p.m.	29.72	28,200	41.8
37	Deep Red Run near Randlett, Okla.	617	1949-	May 11, 1950	24.18	9,400	15.2	May 18, 9 a.m.	27.10	20,300	32.9
38	Wichita River at Wichita Falls, Tex.	3,140	1938-	June 8, 1915 Oct. 3, 1941	- 24.00	ac50,000 17,800	15.9 -	May 20, 5 a.m.	18.98	6,670	-
39	Little Beaver Creek near Duncan, Okla.	158	1948-	May 11, 1950	16.03	12,200	77.2	May 17, 10:15 a.m.	16.87	25,200	159
40	Beaver Creek near Waurika, Okla.	577	-	-	-	-	-	May 18, 4-6 a.m.	-	ad65,300C	113

41	Little Wichita River near Archer City, Tex.	481	1932-	June 1930 Oct. 31, 1941	g28 26.18	- 17,900	- 37.2	May 20	18.81	1,330	-
42	Red River near Terral, Okla.	i22,026	1938-	May 19, 1935 June 8, 1941	ae27.2 28.12	- 197,000	- 8.94	May 19, 12 p.m.	26.68	164,000	7.45
43	Red River near Gainesville, Tex.	i24,085	1936-37, 1938-	June 9, 1941	24.15	168,000	6.98	May 21, 7:30 p.m.	26.53	146,000	6.06
44	Washita River near Cheyenne, Okla.	794	1938-	May 23, 1941	13.5	40,000	50.4	May 18, 3 a.m.	9.16	5,040	6.35
45	Barnitz Creek near Arapaho, Okla.	243	1945-	Apr. 8, 1947	af20.8	6,000	24.7	May 16, 10 p.m.	20.67	7,700	31.6
46	Washita River near Clinton, Okla.	1,977	1935-	Apr. 3, 4, 1934 June 5, 1936	a,y33.9 28.50	- ag26,900	- 13.6	May 16, 12 p.m.	31.09	66,800C	33.8
47	Beaver Creek tributary 1 near Clinton, Okla.	.81	-	-	-	-	-	May 16	-	1,590C	1,960
48	Turtle Creek near Arapaho, Okla.	16.1	-	-	-	-	-	May 16	-	10,900S	677
49	Washita River at Carnegie, Okla.	3,129	1937-	May 23, 1903 May 18, 1949	ah29 26.21	- 50,000	- 16.0	May 18, 4:45 a.m.	25.50	40,900	13.1
50	Pond Creek near Fort Cobb, Okla.	319	1940-	June 15, 1937 May 17, 1949	ai19.3 a18.72	- 35,000	- 110	May 20, 12:30 p.m.	a15.92	4,540	14.2
51	Washita River near Tabler, Okla.	4,706	1940-	Apr. 7, 1927 May 20, 1949	aj29.9 29.72	- 50,000	- 10.6	May 18, 11:30 a.m.	27.14	24,800	5.27
52	Washita River near Pauls Valley, Okla.	5,329	1938-	May 11, 1950	29.88	30,000	5.63	May 23, 8:30 a.m.	23.00	20,100	3.77
53	Washita River near Durwood, Okla.	7,202	1928-	Oct. 31, 1941 May 11, 1943	44.37 -	- 91,300	- 12.7	May 21, 12 m.	24.41	25,900	3.60
54	Red River near Colbert, Okla.	i33,080	1923-	May 21, 1935 Apr. 25, 1942	- 32.0	201,000 -	5.05 -	May 26, 12:45 p.m.	21.02	p48,300	-

a From floodmarks.
c About; from information by local residents.
g About.
i Contributing area only.
p Completely regulated.
y Maximum stage known.
z Discharge not determined.
aa Observed, datum then in use.
ab From information by State Highway Department.
ac Maximum known; computed by Vernon L. Sullivan, engineer for Big Wichita River Irrigation Co.
ad Maximum known but a flood prior to 1889 may have been similar. Flood of 1908 was exceeded by 1.3 ft at site 2 miles upstream.
ae Maximum known prior to 1938; floods of 1891 and 1908 are reported to have reached about the same stage.
af From floodmarks. Maximum flood known occurred April 1934, stage not determined.
ag Observed.
ah About; at former site 6½ miles upstream at different datum, where flood of May 18, 1949 reached a stage of 20.9 ft, from floodmark.
ai From information by local residents.
aj Maximum stage known; partly due to ponded water released when railroad embankment on Little Washita River failed.

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Floods of 1950–51 in the Catskill Mountain Region New York

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch*

FLOODS OF 1951

GEOLOGICAL SURVEY WATER-SUPPLY 1227-C

Prepared in cooperation with the Board of Water Supply, City of New York, the New York State Department of Public Works, the City of Albany, and the Black River Regulating District

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1958

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

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PREFACE

Basic records of high flood discharge in 1950 and 1951 in the Catskill Mountain region of New York were collected for this report in cooperation with the Board of Water Supply, city of New York, the New York State Department of Public Works, the city of Albany, and the Black River Regulating District. The basic discharge data are supplemented by detailed records of the floods.

The data presented were collected under the direction of A. W. Harrington, district engineer. D. B. Bogart supervised the field investigations and computations and wrote the text. Extensive contributions of data were made by G. R. Ayer; Bernard Dunn made the flood-frequency computations.

The Department of Public Works, State of New York, provided financial assistance for the special hydrologic program through which many of the field investigations and computations that are basic to this report were made. The Rockland Light and Power Corporation and the Central Hudson Gas and Electric Corporation furnished assistance in the operation of gaging stations. Rainfall data and the descriptions of several storms were furnished by the Weather Bureau, and flood-damage estimates were furnished by the Corps of Engineers. Residents and area newspapers provided information and photographs pertaining to floods that are known to have occurred in the region.

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ABSTRACT

Two notable floods occurred in the Catskill Mountain region within a period of about 4 months during 1950-51--the first on November 25-26, and the second on March 30-31. It was estimated that about $2 million damage was caused by each flood.

During the November flood record-high discharge occurred at 10 of the 24 gaging stations that were in operation during the high flood that resulted from the hurricane of September 1938. The March flood was even higher at three of the same stations.

The region is subject to heavy rainfall because of the orographic influence of the mountains. Owing to the rather limited absorptive capacity of the thin soil mantle, high runoff usually results from severe storms. The storm that produced the November flood was not local, however; it extended from Florida and Alabama to Maine. In New York the storm, for its size and duration, was one of the most severe on record. The March storm was less severe but the soil mantle was already near the saturation point; most of the rain in the Catskills became flood runoff.

Although the flooding was among the most severe for the State as a whole the Catskills have experienced local floods of greater intensity. Local flooding of Callicoon Creek on August 16-17, 1947, was the greatest in the memory of old inhabitants. The peak discharge of Callicoon Creek during that flood was more than three times the peak discharge during either the floods of November 1950 or of March 1951. Damage in the creek basin was estimated to exceed $1 million.

The Catskill Mountain region has experienced remarkable local floods that predate the collection of streamflow records but which are documented in historical sources. One of the earliest of these was a flood at the village of Catskill in July 1819 in which the rainfall during a half-hour period was estimated to have exceeded 12 inches.

The floods of November 1950 and March 1951 are notable in that two such severe floods occurred within a 4-month period. There was very little difference in the peak discharge of Beaver Kill at Cook Falls during the two floods; yet, the flood-frequency study indicates that floods of that size have an average recurrence-interval of about 50 years in that area.

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INTRODUCTION

Two floods occurring in relatively quick succession in 1950-51 ended a protracted dry period in the Catskill Mountain region of New York. The excessive runoff on November 25-26 and March 30-31 caused great destruction and inconvenience. Meteorological conditions for the two floods were quite different but the results were similar over a large area.

It is interesting from the hydrologic standpoint that two floods of such magnitude occurred within a period of four months, because a frequency study indicates that such floods have occurred in the region on an average of only once in 50 years.

On a streamflow and damage basis it is not practicable to suggest which was the greater flood, even though more streams were higher in the November flood than in the March flood, because some of the streams that were relatively low in November were relatively high in March, and vice versa. Available data on damage during each flood are too meager to form a basis for comparison. It is suggested, however, that damage from the March flood was greater than it might otherwise have been because the November flood left some structures and facilities in a weakened condition. On the other hand, the November flood destroyed structures (especially bridges) that might well have gone out in the March flood.

The Catskill Mountains are a topographic entity that is identified with the early history of the nation. Settlement began in the 1600's and there are voluminous records of the events that occurred in the region since then. The region is subject to floods that develop quickly from the heavy rainfalls. Undoubtedly the historical records contain references to floods, but a thorough search was beyond the scope of this report. However, included in the report is an account of the flood of August 16-17, 1947, near Callicoon on the southwest side of the Catskills, and some excerpts from the account of the storm at the village of Catskill on July 26, 1819, written by Benjamin Dwight 1/. Reference is made to other storms and floods, but specific data for many of them are unfortunately not available.

PHYSICAL FEATURES OF THE CATSKILL MOUNTAIN REGION

The Catskill Mountains stand at the northeastern end of the Allegheny plateau in southeastern New York (fig. 20) and are the

1/ Dwight, Benjamin W., An account of a remarkable storm which occurred at Catskill, July 26, 1819, Am. Jour. Sci. & Arts, v. 4, 1822.

maturely dissected remains of what probably was a delta or alluvial fan that was uplifted above the plateau. The most prominent features are the bold escarpments that tower above the adjoining land. On the northeast and east the great Catskill escarpment rises abruptly, at places more than 3,000 feet; a number of summits are nearly 4,000 feet higher than the nearby tidal estuary of the Hudson River.

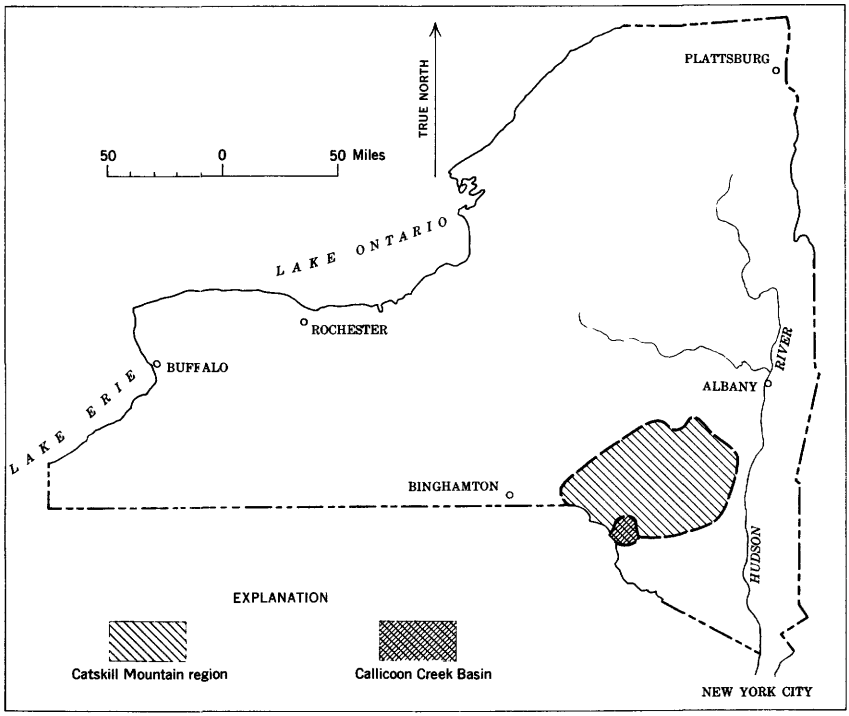

Figure 20.--Map of New York showing location of Catskill Mountain region.

The escarpments mark the edges of former plains (cuestas that sloped gently downward to the west and southwest). The plains are now deeply eroded by streams, all of which drain to the west except that Esopus Creek and its tributaries in the central and most rugged part of the Catskills drain to the east. The summit of Slide Mountain, the highest in the Catskills, is 4,204 feet above sea level and about 3,000 feet above Ashokan Reservoir nearby. Streams radiate from its massif to form the four largest basins of the Catskill region: Esopus Creek, Rondout Creek, Neversink River, and East Branch Delaware River.

The valleys of the Catskill Mountains are typically narrow and the area of bottomland is quite small. Villages built along the valleys are therefore subject to flood damage after severe storms.

The historic Catskill Mountain region has great natural beauty and as a result, it has developed into a recreation area. Operation of summer and winter resorts has become a major occupation, although some of the farm and forest economy of earlier years has endured. Farming is not extensive in the more rugged sections but still is important economically where the mountains give way to more gentle terrain. The mountains are mostly forested, but there are large areas of bare rock or rock with only sparse growth of trees and brush. Except in the valleys the soil mantle of glacial origin is generally shallow. The region is important to New York City because it is the principal source of the city's water supply.

The region receives heavy rainfall because the mountains deflect the moisture-ladened air upwards, thus cooling it and causing rainfall on the windward side. Rains in excess of 5 inches fall almost every year in the high peaks of the eastern and central escarpments 2/. Such heavy rains cannot be absorbed by the thin soil mantle, and large runoff results. When the area of heavy rainfall is large enough, destructive floods occur, as in 1950 and 1951.

FLOOD OF NOVEMBER 1950 IN NEW YORK

The flood of November 25-26, 1950, in the Catskill Mountains region of New York, ranks among the highest known in the region. Mountain creeks became destructive torrents, valley bottoms were filled with floodwaters, and alluvial plains were inundated extensively. Large areas of farmland were ruined for agricultural use, and homes, farm buildings, commercial buildings, and bridges were destroyed. Damage was estimated to be about $2 million.

Meteorology

The storm that brought the flood-producing rains on November 23-25 was one of the most intense in the history of New York. Indeed, the Weather Bureau 3/ suggested that the storm may have been the most destructive yet experienced in the eastern United States. From Florida and Alabama to Maine it took a great toll in death, caused structural damage, smashed communication systems, and snarled transportation lines. Record subfreezing temperatures occurred in the Southern States, record snows hit the Appalachian region, and wind and flood damage was great in the Northeast where wind was the most destructive agent. Insurance claims for wind damage

2/ Statement by Ernest C. Johnson, meteorologist in charge, U. S. Weather Bureau, Albany, N. Y., September 1953.
3/ Aubert, E. J., November 1950, The weather and circulation of November 1950, Monthly Weather Rev., p. 208, 209.

in the Northeast exceeded 1 million in number for a total of about $150 million--claims greater than for the hurricane of 1938. As a result, the insurance rate for wind damage for dwellings in New York was doubled.

In New York, the principal effect of the flood was concentrated along a nearly north-south line, between Schenectady and Monticello. Precipitation, which was greatest in Green and Ulster Counties, totaled more than 8 inches in the northern part of Ulster County during the 3-day period, November 23-25. There were two nodes of heavy precipitation, one centered around Slide Mountain; the other, farther north, centered on the northern front of the Catskills. The isohyetel map (pl. 3) indicates that precipitation exceeded 3 inches in an area of about 2,100 square miles. A total of 8.99 inches was measured at the gage near the peak of Slide Mountain. Precipitation at gages in the Catskill area is listed in table 1.

Generally, the storm area included headwaters of Schoharie, Catskill, Esopus, and Rondout Creeks, and of East Branch Delaware and Neversink Rivers. The storm culminated on November 25 with the greatest daily precipitation and winds of hurricane force. Meteorologic events are described by the U. S. Weather Bureau in Climatological Data, New York, November 1950:

> On the morning of November 24 a very cold mass of air was present in the interior of the country and advancing southeastward over the Gulf states. A low pressure system with warm and moist air appeared over North Carolina and Virginia. The normal eastward drift of the latter system was blocked by a near-stationary high pressure cell over the North Atlantic Ocean. Consequently, the low pressure area advanced northward across Pennsylvania to New York State and then curved westward to Ohio and lower Michigan, before occluding on the 26th. Under the dynamic processes of the contrasting air masses, the low pressure system rapidly increased in intensity and magnitude. Its winds increased to gale force and were accompanied by heavy precipitation. In the warm sector of the storm, precipitation was in the form of rain but on the cold side it fell in the form of snow. Twenty inches or more [of snow] was reported in southwestern New York.
>
> The course of the storm reached New York on the 25th, with winds increasing in velocity in the early morning, and reaching gale velocities later in the day and evening. Some peak gusts that were reported are as follows: New York International Airport, 94 mph; Utica, 91; Syracuse, 90; Albany, 83; New York City, 76; and Binghamton, 70.

Table 1.--Daily rainfall at stations in the Catskill Mountain region, November 23-25, 1950
[Data supplied by Board of Water Supply, City of New York]

Stream basin and station	Rainfall (in inches)		
	Nov. 23	Nov. 24	Nov. 25
Schoharie Creek:			
Windham	0	0.25	5.52
Elka Park	0	.12	3.06
Lexington	.01	.10	6.47
Prattsville	.05	.07	3.58
West Kill	.04	.03	3.55
East Jewett	.02	.11	2.80
North Settlement	.05	.14	7.31
Tannersville	.05	.12	3.33
Catskill Creek:			
Preston Hollow	.03	.08	2.79
Oak Hill	.06	0	1.94
Westerlo	.07	0	1.44
Esopus Creek:			
Phoenicia	.08	.09	4.63
Slide Mountain	.03	1.18	7.78
Highmount	0	0	4.50
Edgewood	.06	.08	3.56
Lake Hill	.02	0	2.58
West Shokan	.11	0	4.87
Coldbrook	.18	.13	3.57
Bushnellsville	.22	.86	2.80
Brown Station	.05	.04	2.28
Glenford	.03	.05	2.82
Rondout Creek:			
Grahamsville	.04	.42	4.36
Sundown	.16	1.02	4.25
Peekamoose	.01	1.20	4.28
Lackawack	.04	.94	3.70
West Branch Delaware River:			
Kortright	.06	.27	2.00
Stamford	.04	.13	2.21
Relay	.07	.27	1.90
East Delhi	.07	.40	1.88
East Branch Delaware River:			
Roxbury	.26	.21	3.67
New Kingston	.14	.95	2.57
Halcott Centre	0	1.53	1.61
Arkville	.04	1.25	2.75
Seager	0	.37	6.03
Arena	.04	.60	2.57
Andes	.18	.86	3.08
Terry Clove	.10	.70	3.00
Mary Smith	.06	.18	2.92
Downsville	.10	.21	1.85
Harvard	0	.25	1.80
Beaver Kill:			
Balsam Lake	.08	.46	4.28
Lewbeach	.18	.71	3.02
Craigie Clair	0	.56	2.29
Butternut Brook	.07	.40	3.05
Parkston	0	.37	4.09
Neversink River:			
Frost Valley	.04	.41	2.84
Claryville	.06	.37	3.63
Neversink	0	.53	3.89

Description of Flood

The principal area of flood damage stretched about 60 miles north and south, between Middleburg and Liberty, and encompassed the main body of the Catskill Mountains. The greatest concentration of urban damage by floodwaters probably was in Margaretville and Arkville, which are about $1\frac{1}{2}$ miles apart on East Branch Delaware River. Floodwaters of Dry Brook and Bush Kill joined just above Arkville to inundate the wide plain on which part of the villages are built. Flow was destructively rapid through the villages and many homes and commercial structures were severely battered and some were destroyed (see fig. 21.) At Margaretville the main street was

Figure 21.--Gasoline tank that floated a quarter of a mile in upright position to lodge against wires on State Route 28 in Arkville.

inundated to a depth of several feet. A bridge across East Branch Delaware River in Margaretville, which was damaged early in the flood, was later lost and numerous smaller bridges also were destroyed. The river reached a stage at Margaretville 2.1 feet higher than the previous maximum in September 1938. Clarke A. Sanford, newspaper editor and resident of Margaretville since 1902, noting that a village playground and picnic center built before 1900 was destroyed in the November 1950 flood, stated it was the worst flood he had seen in Margaretville. Probably the greatest concentration of rural damage during the flood occurred in Rider Hollow where farms, roads, and bridges were badly damaged. Residents of Rider Hollow were deprived of ordinary means of communication for several days.

At Pine Hill in the Esopus Creek basin three small dams burst, including a 30-foot section of a concrete-and-earth dam that had held the waters of a small hotel pond. This flood wave augmented the already high flow of Esopus Creek, and the valley from Pine Hill to Mount Tremper experienced the greatest flood in the memory of local residents. The bed of the Ulster and Delaware Branch of the New York Central Railroad was washed out at many places, leaving the rails and ties draped along the hillsides. Between Pine Hill and Fleischmanns, State Route 28 was put out of service for a week because of destroyed bridges. A survey showed direct damage of $513,000 4/ to property between Pine Hill and Mount Tremper.

At the Coldbrook gaging station, Esopus Creek reached a stage less than a foot lower than the maximum for the 36 years of record (through 1950) which was established in August 1933. No flooding occurred below Ashokan Reservoir because the reservoir was not full before the flood and was able to store the floodwaters from the upper part of Esopus Creek basin. The flood below Ashokan Reservoir was relatively minor.

New peaks were recorded at all five gaging stations along Neversink River, which rises on the southern slopes of Slide Mountain. The Claryville gaging station (established 1949) was destroyed, except for the concrete well, by floodwaters that surged down the valley. Total damage was relatively light, however, because the area along the upper Neversink River is less developed than elsewhere. Martin Cuddeback, age 62, of Cuddebackville (where Basher Kill empties into Neversink River at a point 8 miles northeast of Port Jervis) stated that the November 1950 flood was the highest since the flood of October 9, 1903, and between 1 and 2 feet higher than the 1936 flood. He reported that his grandfather (1816-1910) said that the 1903 flood was the worst he had seen in the area.

New peaks were established at 2 of the 3 gaging stations on Beaver Kill, which rises west of Slide Mountain and is a principal tributary of East Branch Delaware River. At the Cooks Falls gaging station, which had 37 years of record, the peak discharge was 38 percent greater than the previous maximum, which was recorded in March 1936.

North of the Catskills, the peak flood stage at Oak Hill gaging station on Catskill Creek in Catskill basin was 1.25 feet higher than any other during 21 years of record, and Manor Kill and its tributaries inflicted considerable damage upon farmlands in Schoharie Creek basin. At Conesville a house and a highway equipment garage were destroyed. The flood on Keyser Kill, tributary of Schoharie Creek, was the highest in the memory of older inhabitants. At

4/ Furnished by the Albany area office of the Corps of Engineers.

Breakabeen the mill dam, a saw mill, and part of a grist mill were destroyed; some fields were scoured and others were covered with material that made them unfit for farming (see fig. 22). The greatest damage to farmlands probably occurred in the low-lying areas

Figure 22. --View west along path of November 1950 flood to fields ruined by Keyser Kill at Breakabeen. State route 30 is in foreground.

of Catskill and Schoharie Creek basins from erosion by floodwaters, particularly at places where tributaries debouch onto flood plains from narrow valleys.

Rondout Creek basin was affected less by the flood. However, a new peak was recorded at the 12-year-old Grahamsville station on Chestnut Creek, which is a tributary of Rondout Creek. Along the main stem of Rondout Creek below Rondout Reservoir, flood flows were much less than those of previous floods.

Flood Discharge

Peak discharge measurements at 12 miscellaneous sites were made by indirect methods (table 2) in small drainage basins, mostly in the Margaretville area, and they supplement the discharge data for the 40 stream-gaging stations (table 3) in the Catskill region. Indirect measurements of peak discharge are made after a flood has subsided. Using data obtained by surveys of high-water marks

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Table 2.--Peak discharge on November 25 at miscellaneous sites on streams in the Catskill Mountain region, New York, flood of November 25 and 26,1950

Site	Stream and place of determination	Drainage area (square miles)	Momentary peak discharge	
			Cubic feet per second	Cfs per square mile
	Schoharie Creek Basin:			
A	Bear Kill Tributary near Conesville--	4.57	3,470	759
B	Keyser Kill at Breakabeen----------	16.3	5,760	354
	Esopus Creek Basin:			
C	Bushnellsville Creek near Shandaken--	11.4	1,350	118
D	Bush Kill at Phoenicia----------	33.3	6,560	197
	Rondout Creek Basin:			
E	Red Brook at Grahamsville----------	7.44	736	98.9
	East Branch Delaware River Basin:			
F	Batavia Kill at Kelly Corners--------	19.9	1,610	80.9
G	Red Kill at Covesville----------	8.41	810	96.3
H	Bush Kill at Arkville----------	46.4	7,370	159
I	Dry Brook near Arkville----------	31.2	13,300	426
J	Bull Run at Margaretville----------	2.32	722	312
K	Platte Kill near Dunraven----------	25.5	2,730	107
L	Bryants Brook near Dunraven----------	6.99	1,120	160

and of the channel, it is possible to compute the maximum discharge at selected sites. The discharge thus obtained was compared with that of previous maximum floods at the 40 gaging stations in the region (table 3). New peak discharges were recorded at 10 of the 24 gaging stations that were in service during the flood of September 1938. The locations of the gaging stations and the sites of indirect measurements are shown on plate 3.

At the gaging station in Margaretville, which was in the area of severe flood destruction, the discharge at the peak of the flood was 96 cfs (cubic feet per second) per square mile from 163 square miles. Peak discharge at other stations with equivalent drainage areas (100 to 200 square miles) was much greater. The Neversink River at Woodbourne attained a peak flow of 195 cfs per square mile from a drainage area of 113 square miles. Farther upstream, at Claryville, the same stream had an indicated rate of 360 cfs per square mile from 61.1 square miles. Esopus Creek at Coldbrook, a station with 36 years of record, reached a peak flow of 262 cfs per square mile. This was only 10 percent less than the previous maximum established in August 1933, but the flow during the flood of November 1950 was increased somewhat by stored water released when dams failed. Among stations with long periods of record, Beaver Kill at Cooks Falls, with a drainage area of 241 square miles, had the greatest discharge. The new maximum flow of 122 cfs per square mile recorded at this station exceeded the high of record by 39 percent.

Among streams with small drainage areas, whose peak flow was determined by indirect methods, Dry Brook near Arkville had a

Table 3.--Summary of discharges at gaging stations in the Catskill Mountain region, New York, flood of November 25 and 26, 2001

Stream and place of determination	Drainage area (square miles)	Period of record from year shown to 1950	Maximum flood previously known				Maximum during present flood			
			Date	Gage height (feet)	Discharge		Date and hour	Gage height (feet)	Discharge	
					Cfs	Cfs per square mile			Cfs	Cfs per square mile
Schoharie Creek at Prattsville----	236	1907	Sept. 21, 1938	15.6	45,000	191	Nov. 25, 10 p.m.----	15.50	49,500	210
Schoharie Creek at Burtonsville---	883	1939	Mar. 31, 1940	6.77	25,200	28.5	Nov. 26, 7:30 a.m.--	6.04	19,500	22.1
Catskill Creek at Oak Hill--------	98	1929	Mar. 18, 1936	12.83	8,880	90.6	Nov. 25, 11 p.m.----	14.08	12,500	128
Esopus Creek at Coldbrook---------	192	1914	Aug. 24, 1933	20.40	55,000	286	Nov. 25,11:30 p.m.--	19.45	50,200	261
Rondout Creek near Lowes Corners--	39.4	1937	July 22, 1938	a8.2	7,600	193	Nov. 25, 9 p.m.-----	7.41	5,400	137
Chestnut Creek at Grahamsville----	20.9	1938	July 19, 1945	4.07	2,200	105	Nov. 25, 9 p.m.-----	4.27	bc3,800	182
Rondout Creek near Lackawack------	100	1906	Aug. 26, 1928	-----	26,700	267	Nov. 26, 9:15 a.m.--	5.72	2,900	29.0
Rondout Creek at Rosendale--------	386	1926	Aug. 27, 1928	21.9	27,300	70.7	Nov. 26, 8 a.m.-----	10.40	9,190	23.8
East Branch Delaware River at Margaretville.	163	1937	Sept. 21, 1938	12.74	13,200	81.0	Nov. 25, 10 p.m.----	13.84	15,700	96.3
Platte Kill at Dunraven-----------	34.7	1941	Mar. 22, 1948	7.49	3,240	93.4	Nov. 25, 9:15 p.m.--	8.01	3,810	110
Mill Brook at Arena---------------	25.0	1937	Sept. 21, 1938	a7.6	4,500	180	Nov. 25, 9:30 p.m.--	9.92	3,820	153
Tremper Kill near Shavertown------	33.0	1937	Sept. 21, 1938	7.12	4,250	129	Nov. 25, 12 p.m.----	4.74	1,590	48.2
Coles Clove Kill near Pepacton----	28.0	1944	Mar. 22, 1948	6.41	2,400	85.7	Nov. 25, 11 p.m.----	5.07	1,200	42.9
Terry Clove Kill near Pepacton----	14.1	1937	May 23, 1942	5.49	4,010	284	Nov. 25, 10:30 p.m.-	2.98	487	34.5
East Branch Delaware River at Downsville.	373	1941	Mar. 22, 1948	14.11	22,000	59.0	Nov. 26, 7:45 a.m.--	14.52	23,900	64.1
East Branch Delaware River at Harvard.	443	1934	Sept. 22, 1938	16.93	31,400	70.9	Nov. 26, 11 a.m.----	15.69	26,800	60.5
Beaver Kill at Turnwood-----------	40.8	1948	July 11, 1950	6.71	3,220	78.9	Nov. 25, 10 p.m.----	9.16	7,400	181
Beaver Kill at Craigie Clair------	82	1937	Sept. 27, 1942	10.74	10,300	126	Nov. 25, 10:30 p.m.-	10.77	10,100	123
Willowemoc Creek at Debruce-------	40.9	1948	Dec. 30, 1948	4.72	3,150	77.0	Nov. 25, 10:30 p.m.-	6.25	7,780	190
Willowemoc Creek near Livingston Manor.	63	1937	Aug. 11, 1938	7.87	6,200	98.4	Nov. 26, 12:15 a.m.-	8.38	8,130	129

able 3.--Summary of discharges at gaging stations in the Catskill Mountain region, New York, flood of November 25 and 26, 1950--Continued

Stream and place of determination	Drainage area (square miles)	Period of record from year shown to 1950	Maximum flood previously known				Maximum during present flood			
			Date	Gage height (feet)	Discharge		Date and hour	Gage height (feet)	Discharge	
					Cfs	Cfs per square mile			Cfs	Cfs per square mile
Little Beaver Kill near Livingston Manor.	19.8	1924	Aug. 26, 1928	a 8.7	2,500	126	Nov. 25, 9 p.m.------	6.87	2,510	127
Beaver Kill at Cooks Falls -------	241	1913	Mar. 18, 1936	15.02	21,300	88.4	Nov. 26, 1 a.m.------	15.52	29,400	122
East Branch Delaware River at Fishes Eddy.	783	1912	Aug. 24, 1933	20.60	53,300	68.1	Nov. 26, 4:30 a.m.---	17.15	35,800	45.7
West Branch Delaware River at Delhi.	142	1937	Sept. 21, 1938	8.81	8,940	63.0	Nov. 26, 4:30 a.m.---	8.08	6,700	47.2
Little Delaware River near Delhi--	49.8	1937	Sept. 21, 1938	8.5	3,280	65.9	Nov. 25, 12 p.m.-----	7.13	2,750	55.2
West Branch Delaware River at Walton.	331	1950	----------	-----	-------	----	Nov. 26, unknown-----	11.55	10,800	32.6
Trout Creek at Cannonsville ------	49.5	1940	Mar. 22, 1948	9.95	4,600	92.9	Nov. 26, 2:30 a.m.---	7.22	1,880	38.0
Cold Spring Brook at China -------	1.51	1934	Oct. 30, 1935	4.5	335	222	Nov. 25, 9:30 p.m.---	3.33	72.0	47.7
Oquaga Creek at Deposit ----------	66	1940	Mar. 22, 1948	9.21	4,400	66.7	Nov. 25, 11 p.m.-----	7.25	2,860	43.3
West Branch Delaware River at Hale Eddy.	593	1912	Mar. 22, 1948	15.69	28,900	48.7	Nov. 26, 6:30 p.m.---	11.04	12,600	21.2
Callicoon Creek at Callicoon -----	111	1940	Aug. 17, 1947	9.68	16,000	144	Nov. 26, 4 a.m.------	5.86	4,690	42.2
Tenmile River at Tusten ----------	45.0	1946	Apr. 5, 1947	5.83	1,440	32.02	Nov. 26, 2:15 a.m.---	6.05	1,870	41.6
Delaware River near Barryville ---	2,023	1940	May 23, 1942	23.19	105,000	51.9	Nov. 26, 1 p.m.------	16.52	60,900	30.1
Mongaup River near Mongaup -------	202	1939	Apr. 9, 1940	------	d 4,240	21.0	Nov. 25, 12 p.m.-----	3.31	e 1,160	5.74
Delaware River at Port Jervis ----	3,076	1904	May 23, 1942	f 17.76	140,000	45.5	Nov. 26, 2 p.m.------	13.48	81,200	26.4
Neversink River at Claryville ----	61.1	1949	Apr. 4, 1950	5.50	2,450	40.1	Nov. 25, unknown-----	12.22	22,000	360
Neversink River at Neversink-------	93	1941	Dec. 24, 1941	8.54	14,000	151	Nov. 25, 11:30 p.m.--	11.23	22,300	240

Neversink River at Woodbourne----	113	1937	July 22, 1938	11.2	12,300	109	Nov. 26, 2 a.m.------	11.19	22,000	195
Neversink River at Oakland Valley	222	1928	Aug. 24, 1933	12.61	20,000	90.1	Nov. 26, 6:30 a.m.---	12.62	23,300	105
Neversink River at Godeffroy-----	302	1937	July 22, 1938	10.73	16,100	53.3	Nov. 26, 8 a.m.------	11.79	20,000	66.2

[a] Site and datum then in use.
[b] Flow of Red Brook bypassed station.
[c] Computed on basis of peak flow of Chestnut Creek above Red Brook and slope-area determination of peak flow of Red Brook.
[d] Maximum daily discharge.
[e] Combined flows of Rio tailrace and natural channel.
[f] Maximum stage known, 23.1 feet October 10, 1903, discharge about 205,000 cfs.

discharge of 426 cfs per square mile from a drainage area of 31.2 square miles. A tributary of Bear Kill near Conesville, in Schoharie Creek basin, had the highest unit rate determined for the flood--759 cfs per square mile from a drainage area of 4.57 square miles.

A broader picture of the comparative size of peak discharge during the flood is shown in figures 23 and 24. In these graphs the unit discharge (cubic feet per second per square mile) is plotted against drainage area (square miles). Because size of drainage basin is a major factor influencing the magnitude of flood discharge, the graph indicates (1) the limiting parameter of the plotted discharges and (2) the extent to which peak discharges are correlative by location or by topographic and geologic characteristics.

Flood Frequency

The flood-frequency study of the Catskill Mountain region presented in the final section of this report furnishes a basis for determining the relative severity of the flood of November 25-26, 1950. One of the best ways to make this difficult determination is by comparing floods on a frequency basis--that is, how often on the average has a flood of comparable magnitude occurred?

Lines have been drawn on the graphs in figures 23 and 24 (based on data derived from figures 36 and 37) that show the magnitude of floods that have occurred in topographic areas A and B on an average of once in 2.33, 10, 25, and 50 years. Four intervals have been used to show that frequency relations do not vary on a linear basis. Many of the 50 or so points plotted on the graphs indicate a relatively high probability of recurrence, but 6 of them fall in the 25- to 50-year band, and 11 indicate a recurrence interval of more than 50 years.

The flood peaks plotted in figure 23 show recurrence intervals of less than 10 years. The flood in the West Branch Delaware River basin, therefore, was considered relatively moderate.

Figure 24 shows the alinement of points 36-40 at successively-downstream stations on the Neversink River. The 3 upper stations experienced a particularly severe flood, one having a recurrence interval greater than 50 years, but the severity decreased downstream to such an extent that at Godeffroy (point 40) the flood had an indicated frequency of once in less than 10 years. Thus it would be incorrect to assume that if structures were designed on the basis of the November 1950 flood, they would survive a 50-year flood at all places along the Neversink River. If the design criterion

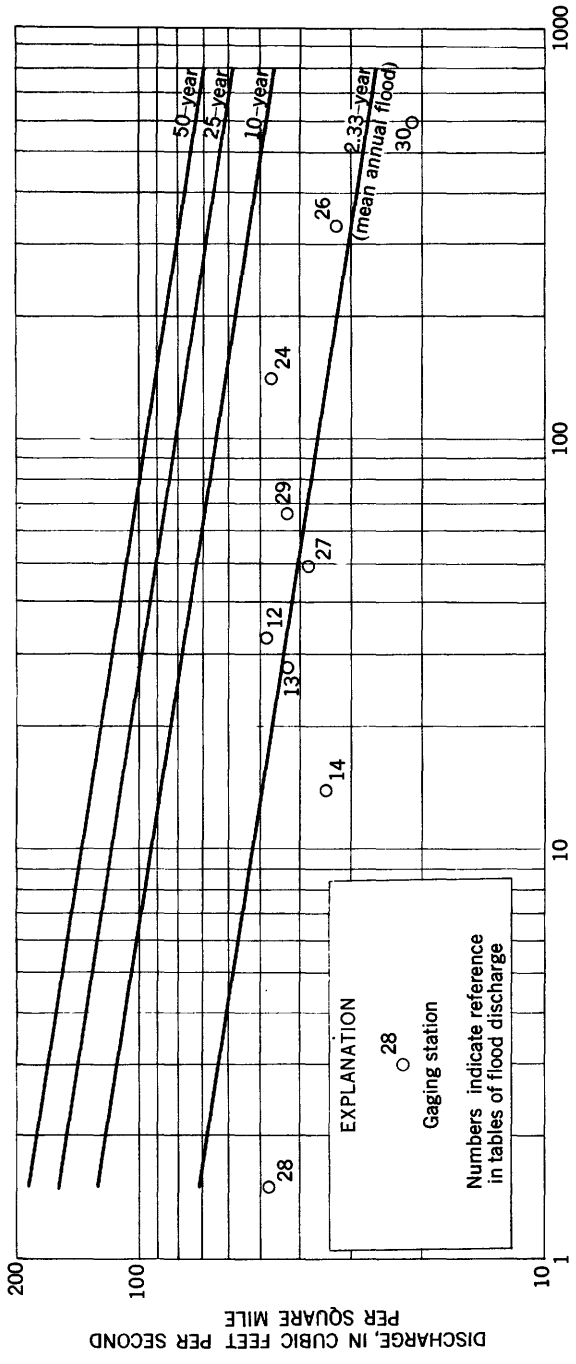

Figure 23.--Relation of unit discharge, size of drainage area, and recurrence-interval for streams in topographic area A in the Catskill Mountain region, flood of November 25 and 26, 1950.

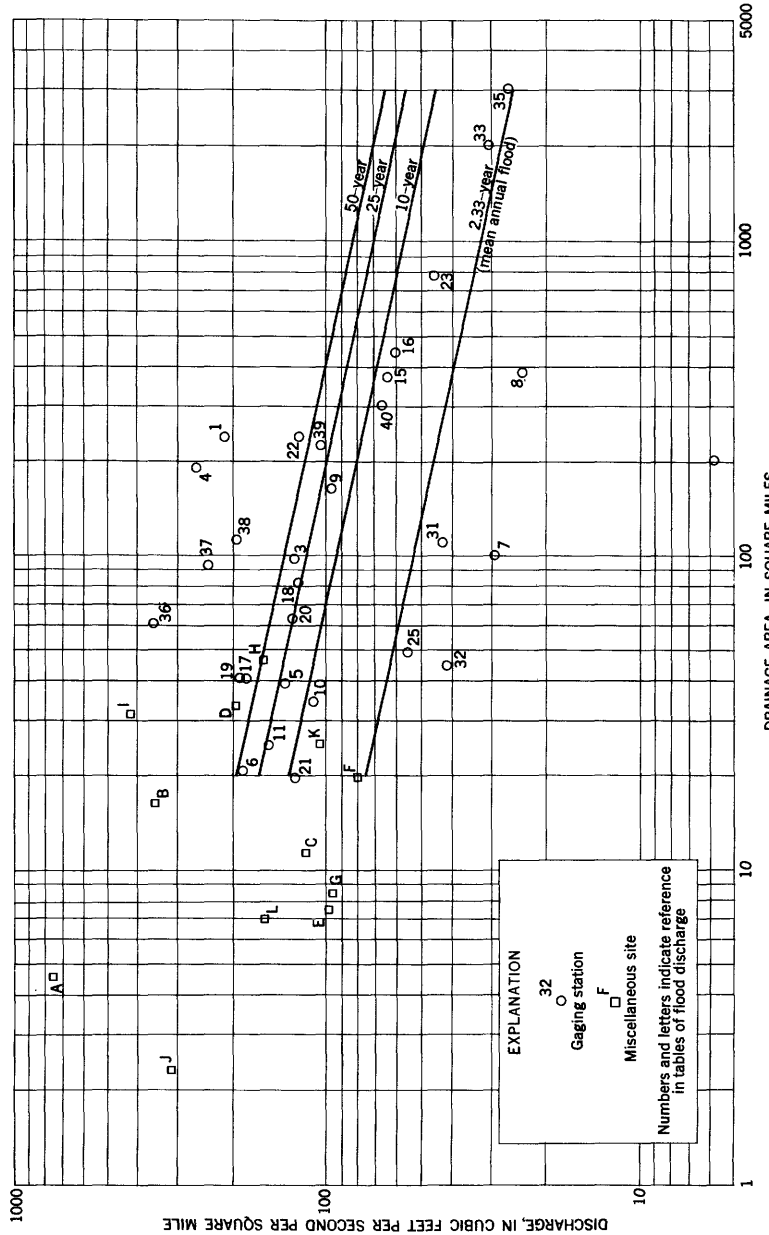

Figure 24.--Relation of unit discharge, size of drainage area, and recurrence-interval for streams in topographic area B in the Catskill Mountain region, flood of November 25 and 26, 1950.

were 50 years, the experience of the November 1950 flood, coupled with the flood-frequency information that was derived in part from the flood, however, would be of great value to the designer.

In figure 24, points 15, 16, 23, 33, and 35 along the East Branch and the main stem of the Delaware River show that the flood there had an indicated frequency of once in less than 10 years.

Stages and Discharges at Gaging Stations

Records only of peak discharge and daily mean discharge generally are inadequate for making detailed studies of a flood. For certain hydraulic and hydrologic purposes, it is necessary to know the stage and discharge not only at the peak of a flood, but also during the rise and fall. The flow characteristics of a stream during floods may have considerable bearing on structural design. The graph of stage or of discharge at a gaging station integrates the effects of physiographic, geologic, and other features of the basin above the station on the distribution of runoff. Stages and discharges are presented in the tabulations in sufficient detail to permit accurate reconstruction of the gage height graph or delineation of the discharge graph.

Data on stages and discharges for the flood of November 1950 are presented in this report for 17 stream-gaging stations in the Catskill Mountain region. The data presented for each station comprise, in general, a description of the station; a table showing daily discharge, mean discharge in cubic feet per second, and runoff in inches for the period November 23 to December 10; and a table showing stages and discharges at selected times during the day. The station description gives the location of the gage, and information about the drainage area, the character of the gage-height and discharge records, and the maximum stage and discharge during the flood of November 1950 and during the greatest known prior flood.

Graphs of discharge for selected gaging stations (fig. 25) illustrate the flow characteristics of the streams during floods. Esopus Creek at Coldbrook is subject to flash floods because of the steep mountain slopes in the basin above that point and the small amount of temporary storage in the channel and adjacent overflow area. The border graph for the East Branch Delaware River at Margaretville reflects the much greater temporary storage in the extensive overflow area above the station. An approximate measure of the quickness of a stream to flood is the ratio of peak discharge to mean discharge for the maximum 24-hour period that includes the flood peak. At the Esopus Creek station this ratio was 2.9 to 1, while at the East Branch Delaware River station it was only 1.8 to 1.

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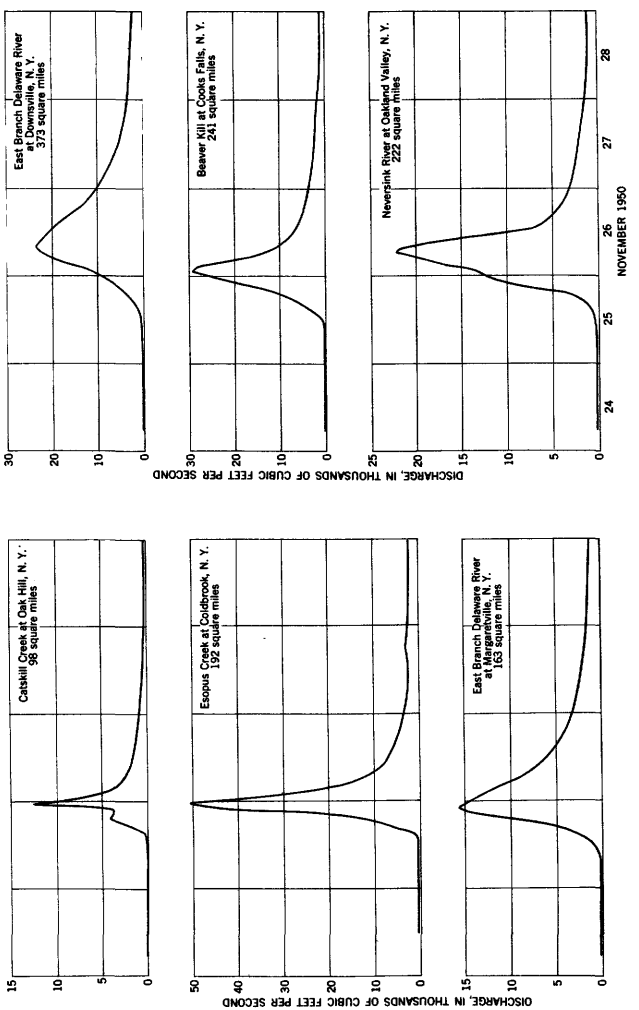

Figure 25.--Graphs of discharge for selected gaging stations, flood of November 25 and 26, 1950.

Catskill Creek at Oak Hill, N. Y.

Location.--Lat 42°24'20", long 74°09'05", just downstream from highway bridge in southernmost part of Oak Hill, Greene County, and 100 ft downstream from unnamed tributary. Datum of gage is 612.65 ft above mean sea level, datum of 1929, New York-Pennsylvania supplementary adjustment of 1943.

Drainage area.--98 sq mi.

Gage-height record.--Water-stage recorder graph, except for period 4 a.m. to 2 p.m. Dec. 8, for which graph was reconstructed on basis of partial record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,600 cfs and extended on basis of slope-area determination at peak stage.

Maxima.--November-December 1950: Discharge, 12,500 cfs 11 p.m. Nov. 25 (gage height, 14.08 ft), from floodmarks in gage house.
1929 to October 1950: Discharge, 8,880 cfs Mar. 18, 1936 (gage height, 12.83 ft, from floodmarks).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	36	27	626	1	144	5	1,090	9	629
24	34	28	366	2	107	6	509	10	373
25	1,770	29	266	3	124	7	362		
26	2,290	30	200	4	1,680	8	1,590		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	678
Runoff, in inches	4.63

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		9	6.88	1,950	12	3.92	172	8	4.82	523
6	3.33	38	10	6.71	1,800		Dec. 1		N	4.72	479
N	3.30	34	11	6.63	1,730	8	3.84	150	4	4.71	474
6	3.30	34	N	6.49	1,620	4	3.78	135	8	4.64	445
12	3.31	36	1	6.40	1,550	12	3.72	121	12	4.55	410
	Nov. 24		2	6.30	1,470		Dec. 2			Dec. 7	
6	3.30	34	3	6.21	1,400	8	3.66	107	2	4.52	398
N	3.29	33	4	6.12	1,330	4	3.63	101	4	4.47	379
6	3.29	33	5	6.03	1,260	12	3.65	105	6	4.43	364
12	3.31	36	6	5.94	1,200		Dec. 3		8	4.40	353
	Nov. 25		7	5.83	1,120	4	3.64	103	10	4.38	346
1	3.33	38	8	5.76	1,070	8	3.67	109	N	4.35	336
2	3.34	39	9	5.70	1,030	N	3.76	130	2	4.34	332
3	3.35	40	10	5.63	984	4	3.81	143	4	4.33	328
4	3.36	41	11	5.57	944	8	3.81	143	6	4.34	332
5	3.39	45	12	5.52	912	12	3.77	133	8	4.36	339
6	3.42	48		Nov. 27			Dec. 4		10	4.48	383
7	3.44	51	2	5.39	830	2	3.76	130	12	4.74	488
8	3.47	55	4	5.30	775	4	3.74	126		Dec. 8	
9	3.50	59	6	5.22	728	6	3.73	123	2	5.31	785
10	3.55	67	8	5.13	676	8	3.73	123	4	6.15	1,350
11	3.65	83	10	5.06	637	10	3.84	150	6	6.81	1,890
N	3.76	103	N	4.99	599	N	6.08	1,300	8	7.74	2,760
1	3.79	109	2	4.93	567	2	8.80	3,880	9	8.09	3,110
2	3.85	122	4	4.88	541	3:15	9.77	5,040	10	7.74	2,760
3	4.27	239	6	4.83	515	4	9.52	4,720	N	7.01	2,070
4	6.13	1,250	8	4.79	495	6	8.44	3,480	2	6.63	1,730
5	7.20	2,170	10	4.74	471	8	7.60	2,620	4	6.30	1,470
6	8.20	3,140	12	4.70	452	10	7.18	2,220	6	6.03	1,260
7	8.99	4,030		Nov. 28		12	6.78	1,860	8	5.80	1,100
7:45	8.68	3,670	4	4.61	412		Dec. 5		10	5.64	994
8	8.75	3,740	8	4.53	378	2	6.52	1,650	12	5.49	897
9	8.73	3,720	N	4.48	357	4	6.30	1,470		Dec. 9	
10	10.52	6,040	4	4.45	346	6	6.12	1,330	4	5.28	767
11	14.08	12,500	8	4.40	326	8	5.93	1,190	8	5.12	675
12	12.71	9,780	12	4.35	308	10	5.76	1,070	N	4.96	591
	Nov. 26			Nov. 29		N	5.65	1,000	4	4.88	552
1	11.23	7,130	6	4.27	280	2	5.56	942	8	4.79	510
2	9.67	4,870	N	4.21	259	4	5.50	903	12	4.67	458
3	8.87	3,960	6	4.19	253	6	5.38	828		Dec. 10	
4	8.35	3,380	12	4.14	237	8	5.28	767	4	4.58	421
5	7.97	2,990		Nov. 30		10	5.20	720	8	4.47	379
6	7.56	2,580	6	4.07	215	12	5.11	670	N	4.38	346
7	7.22	2,260	N	4.00	194		Dec. 6		4	4.40	353
8	7.05	2,100	6	3.97	186	4	4.96	591	8	4.38	346
									12	4.34	332

Esopus Creek at Coldbrook, N. Y.

Location.--Lat 42°00'45", long 74°16'10", at highway bridge at Coldbrook, Ulster County, 1½ miles upstream from Ashokan Reservoir. Datum of gage is 621.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--192 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 12,700 cfs and extended on basis of slope-area determinations at gage heights, 12.39, 15.15, and 20.70 ft.

Maxima.--November-December 1950: Discharge, 50,200 cfs 11:30 p.m. Nov. 25 (gage height, 19.45 ft).
1914 to october 1950: Discharge, 55,000 cfs Aug. 24, 1933 (gage height, 20.40 ft), determined by New York City Board of Water Supply.

Remarks.--Water diverted through Shandaken Tunnel from Schoharie Creek enters Esopus Creek about 6 miles above this station and is included in records of discharge. Mean discharge adjusted for diversion into the basin. Records of diversion collected by New York City Department of Water Supply, Gas, and Electricity and furnished by that organization and New York City Board of Water Supply. No diversion 9 p.m. Nov. 25 to 11 a.m. Nov. 27, and 8 a.m. Dec. 8 through Dec. 10.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	707	27	2,810	1	1,670	5	4,480	9	2,900
24	660	28	2,460	2	1,570	6	2,940	10	1,830
25	8,580	29	2,070	3	1,580	7	2,390		
26	11,900	30	1,840	4	5,730	8	5,680		

Mean discharge (observed), in cubic feet per second, for period Nov. 23 to Dec. 10	3,433
Mean discharge (adjusted), in cubic feet per second, for period	2,857
Runoff (adjusted), in inches	9.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	10.75	8,830	4	6.65	1,800	8	8.32	3,790
N	5.27	704	11	10.45	8,050	12	6.59	1,750	10	8.21	3,620
12	5.24	687	N	10.20	7,440		Dec. 1		12	8.11	3,480
	Nov. 24		1	9.95	6,850	8	6.53	1,690		Dec. 6	
N	5.19	658	2	9.75	6,410	4	6.48	1,640	6	7.87	3,140
12	5.15	636	3	9.55	5,980	12	6.44	1,610	N	7.67	2,880
	Nov. 25		4	9.35	5,580		Dec. 2		6	7.53	2,720
1	5.18	653	5	9.20	5,290	6	6.42	1,590	12	7.39	2,560
2	5.20	664	6	9.00	4,920	N	6.39	1,560		Dec. 7	
3	5.21	670	7	8.85	4,660	6	6.38	1,550	4	7.31	2,470
4	5.21	670	8	8.70	4,400	12	6.40	1,570	8	7.25	2,410
5	5.21	670	9	8.57	4,180		Dec. 3		N	7.19	2,340
6	5.21	670	10	8.45	3,990	6	6.40	1,570	4	7.15	2,300
7	5.20	664	11	8.34	3,820	N	6.39	1,560	8	7.17	2,320
8	5.21	670	12	8.22	3,640	6	6.42	1,590	12	7.33	2,490
9	5.22	675		Nov. 27		12	6.42	1,590		Dec. 8	
10	5.23	681	2	8.01	3,330		Dec. 4		2	7.75	2,980
11	5.25	692	4	7.85	3,120	2	6.41	1,580	4	8.53	4,120
N	5.30	721	6	7.70	2,920	4	6.41	1,580	6	9.12	5,140
1	5.38	769	8	7.57	2,760	6	6.40	1,570	8	9.72	6,340
2	5.58	899	10	7.44	2,610	8	6.43	1,600	10	10.44	8,020
3	6.50	1,660	N	7.32	2,480	10	6.68	1,830	N	10.72	8,750
4	9.00	4,920	2	7.21	2,370	N	7.33	2,490	2	10.35	7,800
5	10.00	6,960	4	7.10	2,250	2	9.24	5,370	4	9.87	6,670
6	11.00	9,480	6	7.70	2,920	4	12.10	12,800	6	9.40	5,680
7	12.20	13,200	8	7.68	2,900	5:15	12.69	14,900	8	9.02	4,960
8	13.40	17,600	10	7.62	2,820	6	12.60	14,600	10	8.73	4,450
9	15.60	27,000	12	7.55	2,740	8	11.76	11,700	12	8.49	4,050
10	18.00	40,500		Nov. 28		10	11.00	9,480		Dec. 9	
11	19.35	49,400	4	7.45	2,620	12	10.38	7,870	4	8.11	3,480
11:30	19.45	50,200	8	7.36	2,530		Dec. 5		8	7.82	3,080
12	19.42	49,900	N	7.29	2,450	2	9.85	6,630	N	7.59	2,790
	Nov. 26		4	7.24	2,400	4	9.43	5,740	4	7.39	2,560
1	17.50	37,500	8	7.15	2,300	6	9.08	5,060	8	7.21	2,370
2	16.35	30,900	12	7.07	2,220	8	8.78	4,540	12	7.05	2,200
3	15.24	25,000		Nov. 29		10	8.53	4,120		Dec. 10	
4	14.10	20,400	8	6.97	2,120	N	8.30	3,760	6	6.83	1,980
5	13.15	16,600	4	6.88	2,020	2	8.11	3,480	N	6.64	1,790
6	12.50	14,200	12	6.80	1,940	4	8.01	3,330	6	6.50	1,660
7	12.00	12,500		Nov. 30		5:30	8.42	3,940	12	6.39	1,560
8	11.50	10,900	8	6.72	1,870	6	8.40	3,910			
9	11.15	9,900									

Rondout Creek near Lowes Corners, N. Y.

Location.--Lat 41°51'50", long 74°29'55", 0.3 mile upstream from Sugarloaf Brook, 0.5 mile east of Lowes Corners, Sullivan County, 1.5 miles northeast of Eureka, and 2.0 miles upstream from Chestnut Creek. Datum of gage is 846.00 ft above mean sea level, datum of New York City Board of Water Supply.

Drainage area.--39.4 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,200 cfs and extended on basis of logarithmic plotting.

Maxima.--November-December 1950: Discharge, 5,400 cfs 9 p.m. Nov. 25 (gage height, 7.41 ft).
1937 to October 1950: Discharge observed, 7,600 cfs July 22, 1938 (gage height, 8.2 ft, site and datum then in use), from rating curve extended above 2,000 cfs by logarithmic plotting.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	44	27	404	1	140	5	619	9	451
24	43	28	264	2	125	6	340	10	308
25	1,260	29	204	3	142	7	262		
26	1,160	30	167	4	797	8	770		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									417
Runoff, in inches									7.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		8	4.09	1,210		Nov. 30		10	2.72	438
N	1.38	44	9	3.97	1,120	8	1.85	170	12	2.66	415
12	1.38	44	10	3.86	1,050	4	1.81	161		Dec. 6	
	Nov. 24		11	3.75	976	12	1.77	153	4	2.57	381
6	1.38	44	N	3.66	919		Dec. 1		8	2.49	353
N	1.37	43	1	3.58	870	8	1.73	144	N	2.43	332
6	1.36	42	2	3.51	828	4	1.69	136	4	2.39	319
12	1.37	43	3	3.42	776	12	1.66	130	8	2.34	303
	Nov. 25		4	3.37	748		Dec. 2		12	2.29	287
1	1.37	43	5	3.32	720	8	1.63	125		Dec. 7	
2	1.38	44	6	3.26	688	4	1.62	123	4	2.24	272
3	1.39	45	7	3.20	656	12	1.63	125	8	2.21	263
4	1.39	45	8	3.15	631		Dec. 3		N	2.17	252
5	1.40	46	9	3.10	606	6	1.66	130	4	2.15	246
6	1.42	48	10	3.06	587	N	1.74	146	8	2.16	249
7	1.45	52	11	3.01	563	6	1.79	157	12	2.29	287
8	1.48	56	12	2.97	544	12	1.75	148		Dec. 8	
9	1.54	64		Nov. 27			Dec. 4		2	2.54	370
10	1.63	77	2	2.90	513	2	1.74	146	4	2.92	522
11	1.86	118	4	2.83	483	4	1.73	144	6	3.27	693
N	2.28	220	6	2.76	454	6	1.72	142	8	3.59	876
1	2.70	358	8	2.71	434	8	1.76	151	10	4.00	1,140
2	3.13	537	10	2.65	411	10	2.06	222	11	4.11	1,220
3	3.73	877	N	2.60	392	N	2.89	509	N	4.08	1,200
4	4.32	1,320	2	2.55	374	2	4.46	1,510	2	3.84	1,030
5	4.81	1,170	4	2.51	360	3:30	4.94	1,950	4	3.58	870
6	5.36	2,360	6	2.46	342	4	4.89	1,900	6	3.40	764
7	5.72	2,810	8	2.43	332	6	4.55	1,580	8	3.26	688
8	6.24	3,520	10	2.40	322	8	4.28	1,350	10	3.15	631
9	7.41	5,400	12	2.36	309	10	4.14	1,240	12	3.06	587
10	6.89	4,520		Nov. 28		12	3.86	1,050		Dec. 9	
11	6.69	4,200	4	2.29	287		Dec. 5		4	2.92	522
12	6.02	3,220	8	2.24	272	2	3.64	907	8	2.81	474
	Nov. 26		N	2.22	266	4	3.48	810	N	2.72	438
1	5.58	2,660	4	2.18	254	6	3.32	720	4	2.65	411
2	5.21	2,230	8	2.13	240	8	3.20	656	8	2.58	385
3	4.92	1,930	12	2.08	227	10	3.11	611	12	2.51	360
4	4.72	1,740		Nov. 29		N	3.02	568		Dec. 10	
5	4.52	1,560	6	2.02	211	2	2.96	540	6	2.42	329
6	4.40	1,460	N	1.98	201	4	2.89	509	N	2.34	303
7	4.22	1,310	6	1.96	196	6	2.83	483	6	2.28	284
			12	1.92	187	8	2.76	454	12	2.25	275

Chestnut Creek at Grahamsville, N. Y.

Location.--Lat 41°50'45", long 74°32'25", just downstream from steel and timber bridge in Grahamsville, Sullivan County, 600 ft downstream from Red Brook, and 2.1 miles upstream from mouth. Datum of gage is 880.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--20.9 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,300 cfs and extended by logarithmic plotting. Disharge for period noon Nov. 25 to 5 p.m. Nov. 28, when flow at Red Brook bypassed gage, was estimated from curve of relationship between Red Brook and Chestnut Creek above Red Brook, based on slope-area determination of peak discharge of Red Brook, flow of Chestnut Creek above Red Brook as determined by water-stage recorder graph, and discharge measurements made on Red Brook and Chestnut Creek above Red Brook. During this period records are approximate and include flow of Red Brook.

Maxima.--November-December 1950: Discharge, 3,800 cfs about 9 p.m. Nov. 25; maximum gage height recorded, 4.27 ft Nov. 25 (flow of Red Brook bypassing station).
1938 to October 1950: Discharge, 2,200 cfs July 19, 1945 (gage height, 4.07 ft), by slope-area method.

Remarks.--Flood flow possibly slightly affected by storage in Beaverdam Pond on Red Brook.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	9.5	27	118	1	39	5	230	9	156
24	9.2	28	79	2	34	6	102	10	97
25	808	29	57	3	38	7	74		
26	379	30	47	4	291	8	307		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									160
Runoff, in inches									5.12

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		8		400	12	1.72	44	6	2.00	89
N	1.20	9.5	10		340		Dec. 1		12	1.97	83
12	1.19	9.0	N		290	N	1.67	38		Dec. 7	
	Nov. 24		2		250	12	1.65	36	4	1.94	78
N	1.20	9.5	4		225		Dec. 2		8	1.92	74
12	1.19	9.0	6		205	N	1.62	33	N	1.91	72
	Nov. 25		8		190	12	1.63	34	4	1.90	70
1	1.19	9.0	10		175		Dec. 3		8	1.90	70
2	1.19	9.0	12		165	6	1.64	35	12	1.97	83
3	1.19	9.0		Nov. 27		N	1.67	38		Dec. 8	
4	1.19	9.0	2		150	6	1.70	41	2	2.11	115
5	1.20	9.5	4		140	12	1.69	40	4	2.40	225
6	1.20	9.5	6		130		Dec. 4		6	2.52	297
7	1.22	10	8		125	2	1.69	40	8	2.62	368
8	1.29	14	10		116	4	1.69	40	10	2.76	484
9	1.36	18	N		110	6	1.69	40	11	2.77	493
10	1.61	40	2		110	8	1.70	41	N	2.75	476
11	2.05	122	4		107	10	1.86	64	2	2.67	407
N	2.30	199	6		103	N	2.30	178	4	2.59	345
1		280	8		100	2	2.94	664	6	2.52	297
1:30		320	10		98	3:45	3.09	838	8	2.47	266
2		360	12		94	4	3.05	790	10	2.43	242
3		520		Nov. 28		6	2.79	511	12	2.41	231
4		840	4	2.00	89	8	2.67	407		Dec. 9	
5		1,300	8	1.97	83	10	2.73	458	4	2.33	192
6		1,450	N	1.95	80	12	2.67	407	8	2.27	167
7		2,600	4	1.92	74		Dec. 5		N	2.22	148
7:30		2,050	8	1.90	70	4	2.55	318	4	2.18	135
8		2,700	12	1.87	65	8	2.43	242	8	2.14	124
9		3,800		Nov. 29		N	2.38	216	12	2.11	115
10		3,200	6	1.84	60	4	2.30	178		Dec. 10	
11		1,550	N	1.81	56	8	2.24	156	6	2.06	103
12		1,080	6	1.80	54	12	2.17	132	N	2.02	94
	Nov. 26		12	1.79	53		Dec. 6		6	2.01	91
12:45		930		Nov. 30		6	2.10	112	12	1.98	85
2		860	8	1.75	48	N	2.04	98			
4		580	4	1.73	45						
6		440									

East Branch Delaware River at Margaretville, N. Y.

Location.--Lat 42°08'40", long 74°39'15", at bridge to fairgrounds at southwest end of Margaretville, Delaware County, 1¾ miles downstream from Bush Kill. Datum of gage is 1,302.48 ft above mean sea level, adjustment of 1912.

Drainage area.--163 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 8,600 cfs and extended to peak stage. Backwater from bridge 6 p.m. Dec. 4 to noon Dec. 9.

Maxima.--November-December 1950: Discharge, 15,700 cfs 10 p.m. Nov. 25 (gage height, 13.84 ft).
1937 to October 1950: Discharge, 13,200 cfs Sept. 21, 1938 (gage height, 12.74 ft, present datum), from rating curve extended above 5,000 cfs by logarithmic plotting.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	204	27	2,210	1	625	5	2,900	9	1,060
24	204	28	1,320	2	536	6	1,650	10	848
25	4,540	29	958	3	693	7	1,200		
26	6,980	30	763	4	3,100	8	1,400		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									1,733
Runoff, in inches									7.12

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	9.50	6,660		Dec. 1		4	6.41	2,460
6	2.10	206	11	9.21	6,200	8	3.26	638	6	6.27	2,340
N	2.08	201	N	8.95	5,820	4	3.19	608	8	6.15	2,240
6	2.08	201	1	8.70	5,460	12	3.10	569	10	6.01	2,140
12	2.08	201	2	8.45	5,120		Dec. 2		12	5.88	2,030
	Nov. 24		3	8.23	4,830	4	3.05	548		Dec. 6	
6	2.08	201	4	8.04	4,590	8	3.00	527	4	5.64	1,860
N	2.07	198	5	7.87	4,380	N	2.96	511	8	5.45	1,720
6	2.08	201	6	7.69	4,170	4	2.95	506	N	5.28	1,590
12	2.18	229	7	7.52	3,970	8	3.02	535	4	5.18	1,530
	Nov. 25		8	7.35	3,780	12	3.20	612	8	5.08	1,460
1	2.19	232	9	7.19	3,610		Dec. 3		12	4.94	1,370
2	2.21	238	10	6.99	3,400	2	3.23	625		Dec. 7	
3	2.23	244	11	6.85	3,260	4	3.23	625	4	4.82	1,310
4	2.24	247	12	6.73	3,140	6	3.24	630	8	4.69	1,230
5	2.26	253		Nov. 27		8	3.27	643	N	4.60	1,170
6	2.28	259	2	6.49	2,910	10	3.30	656	4	4.52	1,130
7	2.32	271	4	6.29	2,730	N	3.35	678	8	4.22	1,100
8	2.37	287	6	6.09	2,550	2	3.44	719	12	4.24	1,110
9	2.47	318	8	5.93	2,420	4	3.55	771		Dec. 8	
10	2.72	407	10	5.78	2,290	6	3.60	795	2	4.34	1,170
11	3.20	621	N	5.59	2,130	8	3.54	766	4	4.51	1,280
N	4.20	1,180	2	5.45	2,020	10	3.49	742	6	4.81	1,470
1	5.31	1,930	4	5.31	1,910	12	3.43	715	8	4.89	1,530
2	6.29	2,730	6	5.21	1,830		Dec. 4		10	4.87	1,520
3	7.17	3,590	8	5.10	1,740	2	3.39	696	N	4.88	1,530
4	8.00	4,540	10	5.00	1,670	4	3.37	688	2	4.94	1,570
5	9.05	5,960	12	4.90	1,600	6	3.38	692	4	4.89	1,540
6	10.06	7,590		Nov. 28		8	3.45	724	6	4.76	1,430
7	11.71	10,700	4	4.72	1,470	10	3.76	876	8	4.62	1,350
8	13.05	13,800	8	4.59	1,380	N	5.00	1,670	10	4.52	1,280
9	13.55	15,000	N	4.47	1,300	2	7.11	3,520	12	4.44	1,230
10	13.84	15,700	4	4.39	1,250	4	9.24	6,250		Dec. 9	
11	13.71	15,400	8	4.27	1,170	6	10.61	7,470	4	4.31	1,150
12	13.36	14,500	12	4.15	1,100	8	9.94	6,420	8	4.21	1,090
	Nov. 26			Nov. 29		10	9.21	5,360	N	4.13	1,040
1	13.08	13,800	6	4.00	1,010	12	8.63	4,650	4	3.98	998
2	12.70	12,900	N	3.88	941		Dec. 5		8	3.93	969
3	12.30	12,000	6	3.81	902	2	8.13	4,100	12	3.87	936
4	11.94	11,200	12	3.72	855	4	7.74	3,660		Dec. 10	
5	11.56	10,400		Nov. 30		6	7.46	3,390	4	3.80	897
6	11.10	9,510	8	3.58	785	8	7.20	3,130	8	3.73	861
7	10.62	8,600	4	3.47	733	10	6.92	2,890	N	3.68	835
8	10.22	7,880	12	3.37	688	N	6.73	2,720	4	3.65	820
9	9.83	7,200				2	6.55	2,560	8	3.63	810
									12	3.60	795

Platte Kill at Dunraven, N. Y.

Location.--Concrete control, lat 42°08'00", long 74°41'40", at highway bridge in Dunraven, Delaware County, 0.6 mile upstream from mouth. Datum of gage is 1,296.23 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--34.7 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge record defined by current-meter measurements below 940 cfs and extended on basis of slope-area determination at gage height 7.49 ft.

Maxima.--November-December 1950: Discharge, 3,810 cfs 9:15 p.m. Nov. 25 (gage height, 8.01 ft).
1941 to October 1950: Discharge, 3,240 cfs Mar. 22, 1948 (gage height, 7.49 ft), from rating curve extended above 940 cfs on basis of slope-area determination of peak flow.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	56	27	408	1	117	5	577	9	178
24	62	28	243	2	107	6	310	10	150
25	957	29	183	3	151	7	221		
26	1,050	30	146	4	788	8	254		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	331
Runoff, in inches	6.39

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		8	5.19	1,100		Nov. 30			Dec. 5	
N	3.09	55	9	5.12	1,040	8	3.55	151	4	4.72	727
12	3.10	56	10	5.05	984	4	3.51	140	8	4.56	617
	Nov. 24		11	5.07	1,000	12	3.47	130	N	4.46	554
4	3.10	56	N	5.05	984		Dec. 1		4	4.37	500
8	3.10	56	1	5.03	967	8	3.43	120	8	4.29	455
N	3.10	56	2	4.97	918	4	3.41	114	12	4.18	396
4	3.12	59	3	4.90	862	12	3.37	105		Dec. 6	
8	3.22	75	4	4.84	816		Dec. 2		4	4.10	356
12	3.28	86	5	4.78	770	4	3.35	101	8	4.02	319
	Nov. 25		6	4.73	734	8	3.34	99	N	3.97	297
1	3.28	86	7	4.68	698	N	3.33	97	4	3.96	293
2	3.28	86	8	4.64	671	4	3.33	97	8	3.91	272
3	3.28	86	9	4.60	643	8	3.45	124	12	3.86	253
4	3.28	86	10	4.56	617	12	3.51	140		Dec. 7	
5	3.28	86	11	4.52	591		Dec. 3		4	3.81	234
6	3.28	86	12	4.48	566	2	3.50	137	8	3.77	220
7	3.29	88		Nov. 27		4	3.48	132	N	3.75	213
8	3.34	99	2	4.43	535	6	3.48	132	4	3.74	210
9	3.47	130	4	4.38	506	8	3.48	132	8	3.74	210
10	3.76	216	6	4.32	471	10	3.48	132	12	3.79	227
11	4.14	376	8	4.27	444	N	3.53	145		Dec. 8	
N	4.43	535	10	4.22	417	2	3.68	190	2	3.87	257
1	4.59	636	N	4.18	396	4	3.71	199	4	3.92	276
2	4.67	691	2	4.14	376	6	3.62	171	6	3.91	272
3	4.71	719	4	4.11	361	8	3.57	157	8	3.89	264
4	4.79	778	6	4.07	342	10	3.54	148	10	3.87	257
5	5.02	959	8	4.02	319	12	3.53	145	N	3.93	281
6	5.40	1,290	10	3.99	306		Dec. 4		2	3.99	306
7	5.96	1,790	12	3.95	289	2	3.53	145	4	3.88	260
8	6.88	2,630		Nov. 28		4	3.56	154	6	3.81	234
9	7.66	3,430	4	3.90	268	6	3.60	165	8	3.77	220
9:15	8.01	3,810	8	3.86	253	8	3.70	196	10	3.74	210
10	7.64	3,400	N	3.83	241	10	4.44	541	12	3.71	199
11	7.41	3,160	4	3.81	234	N	5.40	1,290		Dec. 9	
12	6.82	2,570	8	3.76	216	2	5.89	1,730	6	3.66	184
	Nov. 26		12	3.72	203	3	5.92	1,760	N	3.63	174
1	6.14	1,960		Nov. 29		4	5.79	1,640	6	3.63	174
2	5.78	1,630	6	3.69	193	6	5.32	1,220	12	3.60	165
3	5.65	1,520	N	3.65	180	8	4.97	918		Dec. 10	
4	5.54	1,420	6	3.63	174	9	5.02	959	6	3.55	151
5	5.44	1,330	12	3.60	165	10	4.96	910	N	3.53	145
6	5.35	1,240				12	4.85	824	6	3.55	151
7	5.24	1,150							12	3.53	145

Mill Brook at Arena, N. Y.

Location.--Lat 42°06'25", long 74°43'45", 0.4 mile upstream from highway bridge, three-quarters of a mile southeast of Arena, Delaware County, and 1¼ miles upstream from mouth. Datum of gage is 1,298.54 ft above mean sea level, datum of New York City Board of Water Supply.

Drainage area.--25.0 sq mi.

Gage-height record.--Water-stage recorder graph except for period Dec. 5-10 when intake was partially obstructed.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 830 cfs and extended on basis of slope-area determinations at gage heights 8.36, 9.13, and 9.92 ft. Partially obstructed intake Dec. 5-10; discharge computed on basis of normal recession and records for other stations in the East Branch Delaware River basin.

Maxima.--November-December 1950: Discharge, 3,820 cfs 9:30 p.m. Nov. 25 (gage height, 9.92 ft).
1937 to October 1950: Discharge, 4,500 cfs Sept. 21, 1938, from rating curve extended above 1,000 cfs by logarithmic plotting on basis of velocity-area study; maximum gage height, 8.68 ft Jan. 1, 1945 (ice jam).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	51	27	304	1	84	5	540	9	150
24	50	28	184	2	91	6	260	10	130
25	1,290	29	135	3	135	7	175		
26	1,000	30	104	4	906	8	240		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	324
Runoff, in inches	8.67

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	9.91	3,820	4	4.95	368		Dec. 2	
N	3.82	51	11	9.81	3,730	6	4.91	351	2	3.99	74
12	3.80	49	12	9.21	3,220	8	4.85	326	4	3.98	72
	Nov. 24			Nov. 26		10	4.82	314	6	3.97	71
6	3.79	48	1	8.64	2,760	N	4.77	294	8	3.97	71
N	3.80	49	2	8.00	2,250	2	4.73	279	10	3.96	70
6	3.82	51	3	7.39	1,820	4	4.70	267	N	3.96	70
12	3.82	51	4	6.91	1,490	6	4.67	256	2	3.98	72
	Nov. 25		5	6.52	1,230	8	4.63	241	4	4.16	103
1	3.82	51	5:30	6.45	1,190	10	4.60	230	6	4.26	125
2	3.83	52	6	6.67	1,330	12	4.58	223	8	4.28	130
3	3.84	53	7	6.33	1,110		Nov. 28		10	4.28	130
4	3.85	54	7:30	6.37	1,140	4	4.53	206	12	4.26	125
5	3.91	60	8	6.28	1,080	8	4.49	192		Dec. 3	
6	4.06	77	9	5.98	903	N	4.46	182	4	4.29	133
7	4.35	126	10	5.78	789	4	4.43	173	8	4.30	135
8	4.66	213	11	5.71	750	8	4.40	163	N	4.31	138
9	4.99	333	N	5.65	716	12	4.36	152	4	4.31	138
10	5.20	422	1	5.62	700		Nov. 29		8	4.30	135
11	5.42	526	2	5.62	700	6	4.33	143	12	4.30	135
N	5.50	565	3	5.49	630	N	4.29	133		Dec. 4	
1	5.58	605	4	5.41	587	6	4.27	128	2	4.30	135
2	5.92	782	5	5.37	567	12	4.23	118	4	4.34	146
3	6.41	1,060	6	5.29	526		Nov. 30		6	4.36	152
4	7.15	1,520	7	5.21	487	8	4.18	107	8	4.54	209
5	7.99	2,110	8	5.21	487	4	4.15	101	10	5.18	473
6	8.72	2,710	9	5.14	454	12	4.10	91	N	6.20	1,030
7	9.30	3,230	10	5.10	435		Dec. 1		2	7.17	1,670
8	9.64	3,540	11	5.09	430	8	4.07	86	4	8.26	2,460
8:45	9.66	3,560	12	5.07	422	4	4.04	81	6	7.39	1,820
9	9.75	3,650		Nov. 27		12	4.00	75	8	6.50	1,220
9:30	9.92	3,820	2	5.02	399				10	6.28	1,080
									12	5.82	811

East Branch Delaware River at Downsville, N. Y.

Location.--Lat 42°04'35", long 74°59'25", at highway bridge, 200 ft upstream from Downs Brook and 0.1 mile southeast of highway junction at Downsville, Delaware County. Datum of gage is 1,087.89 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--373 sq mi.

Gage-height record.--Water-stage recorder graph except for period noon to 12 p.m. Dec. 8, when graph was reconstructed on basis of partial record.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 12,000 cfs and extended to peak stage. Shifting-control method used Nov. 26 to Dec. 4.

Maxima.--November-December 1950: Discharge, 23,900 cfs 7:45 a.m. Nov. 26 (gage height, 14.52 ft).
1941 to October 1950: Discharge, 22,000 cfs Mar. 22, 1948 (gage height, 14.11 ft), from rating curve extended above 7,600 cfs by logarithmic plotting.
Stage known, about 16 ft Oct. 9, 1903.

Remarks.--Flood flow possibly slightly affected by temporary storage above Pepacton Dam.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	610	27	6,270	1	1,400	5	9,290	9	2,390
24	582	28	3,020	2	1,200	6	3,930	10	1,900
25	2,160	29	2,140	3	1,490	7	2,640		
26	17,300	30	1,700	4	6,570	8	2,730		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									3,740
Runoff, in inches									6.71

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		6	14.39	23,100		Nov. 29			Dec. 5	
N	7.07	601	7	14.47	23,600	6	8.51	2,270	1	12.63	12,600
12	7.04	583	7:45	14.52	23,900	N	8.39	2,110	2	12.61	12,500
	Nov. 24		8	14.44	23,400	6	8.30	1,990	4	12.50	12,100
6	7.02	571	9	14.39	23,100	12	8.22	1,890	6	12.34	11,500
N	7.02	571	10	14.27	22,200		Nov. 30		8	12.14	10,700
6	7.04	583	11	14.14	21,400	8	8.12	1,760	10	11.98	10,000
12	7.11	625	N	13.98	20,400	4	8.01	1,630	N	11.77	9,240
	Nov. 25		1	13.81	19,400	12	7.92	1,530	2	11.57	8,540
1	7.12	632	2	13.63	18,300		Dec. 1		4	11.37	7,910
2	7.14	645	3	13.44	17,300	8	7.83	1,430	6	11.12	7,180
3	7.15	651	4	13.25	16,400	4	7.75	1,350	8	10.91	6,590
4	7.16	657	5	13.06	15,400	12	7.68	1,280	10	10.69	6,010
5	7.17	664	6	12.87	14,500		Dec. 2		12	10.51	5,560
6	7.18	670	7	12.68	13,600	6	7.62	1,220		Dec. 6	
7	7.20	683	8	12.49	12,800	N	7.56	1,160	4	10.19	4,800
8	7.22	697	9	12.35	12,200	6	7.54	1,140	8	9.90	4,160
9	7.26	724	10	12.22	11,700	12	7.69	1,290	N	9.69	3,740
10	7.31	758	11	12.10	11,200		Dec. 3		4	9.50	3,400
11	7.39	815	12	11.93	10,500	4	7.78	1,380	8	9.37	3,190
N	7.47	873		Nov. 27		8	7.81	1,410	12	9.26	3,020
1	7.59	962	2	11.68	9,590	N	7.83	1,430		Dec. 7	
2	7.76	1,100	4	11.41	8,650	4	7.91	1,520	6	9.09	2,780
3	8.00	1,310	6	11.14	7,800	8	8.04	1,670	N	8.94	2,570
4	8.39	1,720	8	10.88	7,040	12	8.13	1,780	6	8.86	2,460
5	8.77	2,200	10	10.59	6,280		Dec. 4		12	8.86	2,460
6	9.09	2,680	N	10.35	5,700	2	8.14	1,790		Dec. 8	
7	9.54	3,450	2	10.15	5,250	4	8.15	1,800	6	8.90	2,510
8	9.93	4,180	4	10.00	4,920	6	8.17	1,820	N	9.13	2,830
9	10.46	5,340	6	9.82	4,540	7	8.21	1,870	6	9.21	2,940
10	11.03	6,910	8	9.70	4,300	8	8.38	2,090	12	9.13	2,830
11	11.52	8,450	10	9.56	4,020	10	9.83	4,560		Dec. 9	
12	11.89	9,740	12	9.46	3,830	N	10.50	6,060	6	8.92	2,540
	Nov. 26			Nov. 28		2	11.18	7,920	N	8.78	2,350
1	12.26	11,200	4	9.28	3,500	4	11.74	9,800	6	8.67	2,210
2	12.84	13,800	8	9.12	3,220	6	12.05	11,000	12	8.59	2,110
3	13.54	17,600	N	8.95	2,940	8	12.29	12,000		Dec. 10	
4	13.98	20,400	4	8.82	2,730	10	12.45	12,600	8	8.45	1,950
5	14.19	21,700	8	8.73	2,600	12	12.59	13,200	4	8.34	1,820
			12	8.64	2,460				12	8.28	1,760

Beaver Kill near Turnwood, N. Y.

Location.--Lat 42°02'05", long 74°43'55", 75 ft downstream from highway bridge, 300 ft downstream from Big Pond outlet, and 1.3 miles northwest of Turnwood, Ulster County. Datum of gage is 1,751.90 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--40.8 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge record defined by current-meter measurements below 1,100 cfs and extended on basis of contracted-opening determination at peak stage.

Maxima.--November-December 1950: Discharge, 7,400 cfs 10 p.m. Nov. 25 (gage height, 9.16 ft).
1948 to October 1950: Discharge, 3,220 cfs July 11, 1950 (gage height, 6.71 ft).

Remarks.--Flood flow possibly slightly affected by storage in Alder, Beech, and Balsam Lakes.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	98	27	434	1	144	5	747	9	380
24	93	28	288	2	127	6	404	10	296
25	1,770	29	238	3	176	7	305		
26	1,370	30	183	4	1,120	8	489		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									481
Runoff, in inches									7.90

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	4.47	1,090		Nov. 30		2	3.59	650
N	2.01	98	11	4.35	1,010	6	2.42	194	4	3.51	614
12	1.98	93	N	4.30	930	N	2.36	180	6	3.44	583
	Nov. 24		1	4.22	930	6	2.32	171	8	3.37	552
6	1.97	92	2	4.15	888	12	2.27	161	10	3.31	526
N	1.97	92	3	4.09	852		Dec. 1		12	3.25	501
6	1.98	93	4	4.02	812	8	2.20	147		Dec. 6	
12	2.01	98	5	3.97	783	4	2.16	139	4	3.15	460
	Nov. 25		6	3.89	739	12	2.11	130	8	3.06	423
1	2.02	99	7	3.84	712		Dec. 2		N	2.99	396
2	2.02	99	8	3.78	680	4	2.09	126	4	2.93	374
3	2.03	101	9	3.73	654	8	2.07	123	8	2.87	352
4	2.04	103	10	3.68	629	N	2.05	119	12	2.82	335
5	2.04	103	11	3.63	605	4	2.04	117		Dec. 7	
6	2.05	104	12	3.59	586	8	2.14	136	4	2.78	321
7	2.08	110		Nov. 27		12	2.20	147	8	2.74	308
8	2.15	122	2	3.51	550		Dec. 3		N	2.71	298
9	2.39	171	4	3.44	521	4	2.21	149	4	2.69	292
10	2.80	273	6	3.36	488	8	2.22	151	8	2.68	289
11	3.28	435	8	3.30	464	N	2.29	165	12	2.74	308
N	3.83	678	10	3.24	441	4	2.43	196		Dec. 8	
1	4.30	948	N	3.19	422	8	2.49	211	2	2.81	332
2	4.81	1,310	2	3.14	404	12	2.51	216	4	2.91	367
3	5.17	1,600	4	3.09	387		Dec. 4		6	3.06	423
4	5.67	2,050	6	3.05	373	2	2.53	221	8	3.19	476
5	6.11	2,500	8	3.01	359	4	2.59	236	10	3.34	539
6	6.44	2,880	10	2.96	343	6	2.64	250	N	3.49	605
7	6.54	3,000	12	2.93	334	8	2.92	330	1	3.52	618
8	7.28	4,040		Nov. 28		10	3.64	610	2	3.51	614
9	8.08	5,340	4	2.86	312	N	4.38	1,030	4	3.44	583
10	9.16	7,400	8	2.81	297	2	5.33	1,740	6	3.35	544
11	8.34	5,790	N	2.78	288	4	6.01	2,400	8	3.28	514
11:15	8.93	6,920	4	2.74	277	4:45	6.48	2,930	10	3.21	484
12	8.03	5,250	8	2.69	263	6	5.94	2,450	12	3.15	460
	Nov. 26		12	2.64	250	8	5.15	1,690		Dec. 9	
1	7.09	3,760	m		Nov. 29	10	4.86	1,460	4	3.06	423
2	6.54	3,000	4	2.60	239	12	4.56	1,240	8	2.99	396
3	6.19	2,590	8	2.57	231		Dec. 5		N	2.93	374
4	5.65	2,030	11	2.55	226	2	4.32	1,070	4	2.88	356
5	5.22	1,650	11:30	2.70	266	4	4.17	969	8	2.83	338
6	5.18	1,610	N	2.69	263	6	4.03	883	12	2.79	325
7	4.96	1,440	4	2.62	244	8	3.90	808		Dec. 10	
8	4.77	1,300	8	2.56	229	10	3.78	744	8	2.72	302
9	4.60	1,180	12	2.50	213	N	3.68	693	4	2.67	286
									12	2.63	273

Beaver Kill at Craigie Clair, N. Y.

Location.--Lat 41°57'45", long 74°52'00", 100 ft downstream from highway bridge at Craigie Clair, Sullivan County, and 2¼ miles upstream from Spring Brook. Datum of gage is 1,399.69 ft above mean sea level, adjustment of 1912.

Drainage area.--82 sq mi, approximately.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 3,000 cfs and extended on basis of slope-area determinations at gage heights 10.74 and 10.77 ft.

Maxima.--November-December 1950: Discharge, 10,100 cfs 10:30 p.m. Nov. 25 (gage height, 10.77 ft).
1937 to October 1950: Discharge, 10,300 cfs Sept. 27, 1942 (gage height, 10.74 ft), from rating curve extended above 4,000 cfs on basis of slope-area determination of peak flow.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	172	27	1,030	1	294	5	1,470	9	660
24	164	28	640	2	252	6	733	10	512
25	2,450	29	485	3	325	7	528		
26	3,320	30	377	4	2,130	8	818		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									909
Runoff, in inches									7.42

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	7.22	2,860	12	4.31	328	4	5.67	1,170
N	3.69	171	11	7.07	2,660		Dec. 1		6	5.57	1,100
12	3.67	164	N	6.92	2,470	N	4.22	291	8	5.48	1,030
	Nov. 24		1	6.80	2,320	12	4.15	264	10	5.41	982
6	3.66	161	2	6.69	2,190		Dec. 2		12	5.34	933
N	3.65	158	3	6.60	2,080	6	4.12	253		Dec. 6	
6	3.68	167	4	6.49	1,960	N	4.09	242	4	5.22	851
12	3.72	181	5	6.42	1,880	6	4.10	245	8	5.10	774
	Nov. 25		6	6.33	1,780	12	4.17	272	N	5.00	713
1	3.73	184	7	6.27	1,720		Dec. 3		4	4.92	667
2	3.74	188	8	6.20	1,650	2	4.20	283	8	4.85	630
3	3.74	188	9	6.13	1,580	4	4.21	287	12	4.78	593
4	3.75	192	10	6.07	1,520	6	4.21	287		Dec. 7	
5	3.75	192	11	6.02	1,470	8	4.21	287	4	4.71	559
6	3.77	198	12	5.96	1,410	10	4.21	287	8	4.66	536
7	3.80	209		Nov. 27		N	4.22	291	N	4.61	513
8	3.85	228	2	5.86	1,320	2	4.25	304	4	4.59	504
9	3.96	269	4	5.78	1,250	4	4.34	342	8	4.58	499
10	4.16	353	6	5.68	1,170	6	4.45	392	12	4.64	526
11	4.54	549	8	5.60	1,110	8	4.46	396		Dec. 8	
N	5.15	970	10	5.52	1,050	10	4.47	401	2	4.71	559
1	5.62	1,370	N	5.45	998	12	4.49	410	4	4.85	630
2	6.11	1,840	2	5.39	953		Dec. 4		6	4.97	696
3	6.49	2,270	4	5.33	910	2	4.51	420	8	5.10	774
4	6.92	2,810	6	5.26	860	4	4.52	425	10	5.26	878
5	7.37	3,440	8	5.21	826	6	4.57	450	N	5.37	954
6	7.69	3,920	10	5.16	793	8	4.67	502	2	5.45	1,010
7	7.96	4,350	12	5.12	766	10	5.20	819	4	5.44	1,000
8	8.19	4,720		Nov. 28		N	6.49	1,960	6	5.35	940
9	9.43	7,060	4	5.03	709	2	7.56	3,320	8	5.26	878
10	10.25	8,890	8	4.97	672	4	8.28	4,450	10	5.19	832
10:30	10.77	10,100	N	4.91	636	5:30	8.45	4,740	12	5.14	800
11	10.34	9,110	4	4.86	607	6	8.39	4,630		Dec. 9	
12	10.43	9,320	8	4.79	568	8	7.94	3,890	4	5.04	737
	Nov. 26		12	4.73	534	10	7.41	3,110	8	4.94	679
1	10.10	8,260		Nov. 29		12	7.04	2,620	N	4.88	645
2	9.72	7,330	6	4.66	497		Dec. 5		4	4.83	619
3	9.22	6,210	N	4.60	465	2	6.76	2,270	8	4.78	593
4	8.77	5,310	2	4.67	502	4	6.50	1,970	12	4.73	569
5	8.42	4,680	6	4.62	476	6	6.31	1,760		Dec. 10	
6	8.13	4,200	12	4.55	440	8	6.12	1,570	6	4.65	531
7	7.85	3,760		Nov. 30		10	5.98	1,430	N	4.60	508
8	7.58	3,350	8	4.45	392	N	5.87	1,330	6	4.56	491
9	7.38	3,070	4	4.37	355	2	5.77	1,250	12	4.51	469

Willowemoc Creek near Livingston Manor, N. Y.

Location.--Lat 41°54'15", long 74°48'50", three-quarters of a mile upstream from highway bridge in Livingston Manor, Sullivan County, and 1½ miles upstream from Little Beaver Kill. Datum of gage is 1,435.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--63 sq mi, approximately.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 3,200 cfs and extended by logarithmic plotting on basis of slope-area determination at gage height 9.01 ft.

Maxima.--November-December 1950: Discharge, 8,130 cfs 12:15 a.m. Nov. 26 (gage height, 8.38 ft).
1937 to October 1950: Discharge, 6,200 cfs Aug. 11, 1938 (gage height, 7.87 ft).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	109	27	681	1	211	5	1,030	9	565
24	98	28	400	2	185	6	496	10	376
25	1,880	29	301	3	196	7	358		
26	2,620	30	249	4	1,310	8	726		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	655
Runoff, in inches	6.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		8	4.81	2,500		Nov. 30		8	2.51	728
N	1.22	107	9	4.57	2,280	8	1.50	255	10	2.42	676
12	1.20	102	10	4.35	2,080	4	1.46	241	12	2.34	632
	Nov. 24		11	4.16	1,920	12	1.42	228		Dec. 6	
6	1.19	100	N	3.98	1,760		Dec. 1		4	2.23	573
N	1.18	98	1	3.83	1,640	8	1.38	215	8	2.13	521
6	1.17	95	2	3.70	1,530	4	1.35	205	N	2.05	482
12	1.19	100	3	3.59	1,440	12	1.33	199	4	1.98	449
	Nov. 25		4	3.49	1,370		Dec. 2		8	1.94	431
1	1.19	100	5	3.40	1,300	8	1.29	186	12	1.88	404
2	1.20	102	6	3.30	1,230	4	1.27	180		Dec. 7	
3	1.21	104	7	3.22	1,170	12	1.27	180	4	1.84	387
4	1.21	104	8	3.15	1,120		Dec. 3		8	1.80	370
5	1.22	107	9	3.08	1,080	4	1.27	180	N	1.77	358
6	1.23	110	10	3.01	1,030	8	1.26	177	4	1.74	345
7	1.25	114	11	2.94	987	N	1.27	180	6	1.73	341
8	1.28	122	12	2.88	949	4	1.33	199	8	1.67	318
9	1.36	144		Nov. 27		8	1.42	228	12	1.69	325
10	1.52	192	2	2.79	893	12	1.47	245		Dec. 8	
11	1.82	301	4	2.69	833		Dec. 4		2	1.76	354
N	2.23	487	6	2.60	780	2	1.49	252	4	1.89	409
1	2.81	808	8	2.53	739	4	1.52	262	6	2.11	511
2	3.23	1,090	10	2.45	694	6	1.55	273	8	2.38	654
3	3.70	1,450	N	2.39	660	8	1.63	302	10	2.64	804
4	4.24	1,910	2	2.34	632	10	2.00	458	N	2.87	942
5	4.80	2,410	4	2.29	605	N	2.84	924	2	2.96	999
6	5.44	3,050	6	2.23	573	2	3.77	1,590	4	2.91	967
7	6.14	3,880	8	2.17	542	4	4.93	2,620	6	2.81	905
8	6.70	4,660	10	2.09	501	6	5.28	2,970	8	2.71	845
9	7.35	5,700	12	2.05	482	8	5.01	2,700	10	2.62	792
10	7.82	6,700		Nov. 28		10	4.54	2,260	12	2.54	745
11	8.13	7,430	4	1.97	444	12	4.16	1,920		Dec. 9	
11:15	8.34	8,010	8	1.91	418		Dec. 5		4	2.40	665
12	8.20	7,610	N	1.85	392	2	3.80	1,610	8	2.29	605
	Nov. 26		4	1.82	379	4	3.52	1,390	N	2.19	552
12:15	8.38	8,130	8	1.77	358	6	3.27	1,210	4	2.10	506
1	8.11	7,380	12	1.72	337	8	3.08	1,080	8	2.02	468
2	7.82	6,720		Nov. 29		10	2.93	980	12	1.96	440
3	7.19	5,520	6	1.66	314	N	2.79	893		Dec. 10	
4	6.52	4,490	N	1.62	299	2	2.69	833	6	1.88	404
5	5.95	3,730	6	1.59	287	4	2.61	786	N	1.80	370
6	5.52	3,230	12	1.55	273	4:30	2.71	845	6	1.74	345
7	5.11	2,800				6	2.66	815	12	1.70	329

Little Beaver Kill near Livingston Manor, N. Y.

Location.--Concrete control, lat 41°52'20", long 74°47'55", 2½ miles southeast of Livingston Manor, Sullivan County, and 3 miles upstream from Cattail Brook. Datum of gage is 1,496.69 ft above mean sea level, adjustment of 1912.

Drainage area.--19.8 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,700 cfs and extended to peak stage. Shifting-control method used Dec. 4-10.

Maxima.--November-December 1950: Discharge, 2,510 cfs 9 p.m. Nov. 25 (gage height, 6.87 ft).
1924 to October 1950: Discharge observed, 2,500 cfs Aug. 26, 1928 (gage height, 8.7 ft, from floodmarks), from rating curve extended above 470 cfs by logarithmic plotting on basis of slope-area determination at gage height 8.5 ft.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	23	27	160	1	56	5	259	9	174
24	20	28	107	2	48	6	134	10	110
25	891	29	82	3	56	7	102		
26	488	30	66	4	428	8	300		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	195
Runoff, in inches	6.58

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		1:30	4.83	1,200		Nov. 29		4	2.59	208
N	1.76	23	2	4.40	971	N	2.15	82	8	2.52	186
12	1.75	22	3	4.12	829	12	2.11	74	12	2.47	170
	Nov. 24		4	3.93	736		Nov. 30			Dec. 6	
6	1.74	20	5	3.79	672	N	2.06	65	6	2.38	142
N	1.73	19	6	3.67	618	12	2.03	60	N	2.35	134
6	1.74	20	7	3.52	553		Dec. 1		6	2.30	122
12	1.76	23	8	3.40	502	N	2.00	55	12	2.25	110
	Nov. 25		9	3.34	477	12	1.98	52		Dec. 7	
1	1.77	24	10	3.26	445		Dec. 2		6	2.22	103
2	1.78	25	11	3.17	409	N	1.95	48	N	2.19	96
3	1.78	25	N	3.09	378	12	1.94	46	6	2.18	94
4	1.80	27	1	3.02	351		Dec. 3		12	2.28	116
5	1.81	28	2	2.97	332	4	1.93	44		Dec. 8	
6	1.83	31	3	2.92	313	8	1.93	44	2	2.42	156
7	1.86	35	4	2.88	298	N	1.95	48	4	2.62	218
8	1.93	45	5	2.85	286	4	2.06	65	6	2.84	298
9	2.10	75	6	2.82	275	8	2.10	72	8	2.99	359
10	2.38	142	7	2.79	264	12	2.12	76	10	3.22	449
11	2.70	237	8	2.76	254		Dec. 4		10:30	3.24	457
N	3.06	367	9	2.74	246	2	2.13	78	N	3.16	425
1	3.95	746	10	2.71	236	4	2.15	82	2	3.04	378
2	4.50	1,020	11	2.68	225	6	2.15	82	4	2.92	332
3	5.15	1,380	12	2.66	218	8	2.25	105	6	2.84	298
4	5.50	1,580		Nov. 27		10	2.68	232	8	2.75	264
5	6.05	1,940	4	2.59	195	N	3.36	502	10	2.70	246
6	6.29	2,100	8	2.51	170	2	4.00	809	12	2.66	232
7	6.45	2,220	N	2.45	153	4	4.12	884		Dec. 9	
7:30	6.08	1,960	4	2.41	142	6	4.00	824	6	2.55	195
8	6.35	2,10 0	8	2.37	132	8	3.74	694	N	2.47	170
9	6.87	2,510	12	2.34	124	10	3.49	574	6	2.40	150
10	6.50	2,250		Nov. 28		12	3.26	477	12	2.34	134
11	5.85	1,800	8	2.29	112		Dec. 5			Dec. 10	
12	5.30	1,460	4	2.24	101	4	2.91	332	8	2.26	112
	Nov. 26		12	2.19	90	8	2.75	268	4	2.22	103
1	4.68	1,120				N	2.67	236	12	2.19	96

Beaver Kill at Cooks Falls, N. Y.

Location.--Lat 41°56'50", long 74°58'45", 125 ft downstream from highway bridge in Cooks Falls, Delaware County, and 5½ miles downstream from Willowemoc Creek. Datum of gage is 1,151.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--241 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 13,000 cfs and extended on basis of slope-area determinations at gage heights 11.73 and 15.52 ft.

Maxima.--November-December 1950: Discharge, 29,400 cfs 1 a.m. Nov. 26 (gage height, 15.52 ft).
1913 to October 1950: Discharge, 21,300 cfs Mar. 18, 1936 (gage height, 15.02 ft), from rating curve extended above 9,500 cfs on basis of slope-area determination at peak stage.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	420	27	2,710	1	790	5	4,240	9	2,080
24	388	28	1,300	2	675	6	2,070	10	1,410
25	5,290	29	1,190	3	742	7	1,440		
26	10,700	30	970	4	5,230	8	2,540		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									2,471
Runoff, in inches									6.86

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		9	9.58	8,960	12	4.12	1,090	6	6.31	3,130
8	2.70	421	10	9.20	8,120		Nov. 30		8	6.21	3,010
4	2.67	411	11	8.87	7,430	8	3.96	998	10	6.04	2,810
12	2.63	399	N	8.64	6,960	4	3.84	932	12	5.94	2,690
	Nov. 24		1	8.39	6,460	12	3.72	867		Dec. 6	
6	2.60	389	2	8.17	6,040		Dec. 1		4	5.72	2,430
N	2.58	383	3	7.95	5,640	8	3.62	814	8	5.51	2,200
6	2.57	380	4	7.80	5,370	4	3.52	761	N	5.31	1,990
12	2.63	399	5	7.64	5,100	12	3.44	721	4	5.19	1,870
	Nov. 25		6	7.51	4,880		Dec. 2		8	5.06	1,750
1	2.65	405	7	7.38	4,670	8	3.35	677	12	4.95	1,660
2	2.67	411	8	7.25	4,460	4	3.30	653		Dec. 7	
3	2.68	415	9	7.13	4,280	12	3.33	667	6	4.76	1,510
4	2.70	421	10	7.01	4,100		Dec. 3		N	4.61	1,400
5	2.72	428	11	6.92	3,960	4	3.35	677	6	4.53	1,350
6	2.74	434	12	6.81	3,800	8	3.35	677	12	4.48	1,310
7	2.77	444		Nov. 27		N	3.35	677		Dec. 8	
8	2.83	464	2	6.60	3,510	4	3.46	731	2	4.55	1,360
9	2.90	489	4	6.45	3,320	8	3.75	883	4	4.69	1,460
10	3.03	538	6	6.29	3,110	12	3.87	948	6	5.05	1,740
11	3.30	653	8	6.15	2,940		Dec. 4		8	5.47	2,160
N	3.87	948	10	6.01	2,770	2	3.95	992	10	5.93	2,680
1	4.66	1,440	N	5.89	2,630	4	4.01	1,030	N	6.28	3,100
2	5.83	2,560	2	5.78	2,500	6	4.10	1,080	2	6.48	3,350
3	6.74	3,710	4	5.67	2,380	8	4.38	1,250	3	6.53	3,420
4	7.55	4,940	6	5.58	2,280	10	5.41	2,090	4	6.49	3,370
5	8.38	6,440	8	5.48	2,170	N	7.11	4,240	6	6.40	3,250
6	9.20	8,120	10	5.38	2,060	2	8.78	7,240	8	6.24	3,050
7	9.95	9,880	12	5.27	1,950	4	9.80	9,500	10	6.08	2,860
8	10.90	12,600		Nov. 28		6	10.39	11,100	12	5.96	2,710
9	12.05	16,000	4	5.10	1,790	7	10.45	11,200		Dec. 9	
10	13.00	19,300	8	4.97	1,680	8	10.27	10,700	4	5.72	2,430
11	13.80	22,200	N	4.85	1,580	10	9.63	9,080	8	5.52	2,210
12	15.00	27,000	4	4.74	1,500	12	8.98	7,660	N	5.34	2,020
	Nov. 26		8	4.63	1,420		Dec. 5		4	5.20	1,880
1	15.52	29,400	12	4.52	1,340	2	8.45	6,580	8	5.06	1,750
2	15.30	28,400		Nov. 29		4	7.97	5,680	12	4.94	1,650
3	14.65	25,600	4	4.42	1,270	6	7.60	5,030		Dec. 10	
4	13.05	19,500	8	4.34	1,220	8	7.31	4,560	6	4.75	1,500
5	12.15	16,400	N	4.26	1,170	10	7.07	4,180	N	4.58	1,380
6	11.25	13,600	4	4.20	1,140	N	6.83	3,830	6	4.49	1,320
7	10.57	11,600	5	4.25	1,160	2	6.64	3,570	12	4.40	1,260
8	10.00	10,000	8	4.20	1,140	4	6.46	3,330			

Neversink River at Neversink, N. Y.

Location.--Lat 41°49'05", long 74°38'05", 1,100 ft upstream from bridge on State Highway 55, 2,300 ft downstream from Neversink Dam (under construction), and 1 mile downstream from Neversink, Sullivan County. Datum of gage is 1,255.04 ft above mean sea level, datum of New York City Board of Water Supply.

Drainage area.--93 sq mi, approximately.

Gage-height record.--Water-stage recorder graph except for Nov. 29 to 8 a.m. Dec. 4, Dec. 7. Gage-height graph for Nov. 29, Dec. 7 was constructed on basis of twice-daily outside-gage readings on Dec. 7 and record for station at Woodbourne.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 2,600 cfs and extended by logarithmic plotting on basis of contracted-opening determination at peak stage. Discharge for Nov. 30 to 8 a.m. Dec. 4 estimated on basis of records for station at Woodbourne and based partly on an estimated gage-height graph. Shifting-control method used Dec. 4.

Maxima.--November-December 1950: Discharge, 22,300 cfs 11:30 p.m. Nov. 25 (gage height, 11.23 ft).
1941 to October 1950: Discharge, 14,000 cfs Dec. 24, 1941, by slope-area method; gage height, 11.65 ft Sept. 27, 1942.

Remarks.--Flood flow possibly slightly affected by temporary storage above Neversink Dam.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	171	27	876	1	310	5	1,700	9	939
24	154	28	540	2	280	6	735	10	606
25	4,650	29	436	3	320	7	507		
26	4,830	30	360	4	2,250	8	1,400		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	1,170
Runoff, in inches	8.42

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		2	9.78	17,000		Nov. 28			Dec. 6	
N	1.34	168	3	8.14	12,100	4	1.06	595	4	1.25	846
12	1.33	165	4	6.22	7,120	8	.98	557	8	1.13	768
	Nov. 24		5	5.50	5,660	N	.92	530	N	1.04	711
6	1.29	152	6	4.77	4,400	4	.88	513	4	1.01	692
N	1.29	152	7	4.37	3,780	8	.83	492	8	.91	633
6	1.29	152	8	4.06	3,340	12	.77	467	12	.83	588
12	1.29	152	9	3.88	3,100		Nov. 29			Dec. 7	
	Nov. 25		10	3.71	2,880	6	.72	448	6	.72	531
1	1.30	155	11	3.55	2,690	N	.68	433	N	.65	498
2	1.30	155	N	3.35	2,460	6	.65	422	6	.60	474
3	1.31	158	1	3.19	2,280	12	.63	414	12	.57	461
4	1.32	161	2	3.05	2,130		Dec. 4			Dec. 8	
5	1.32	161	3	2.93	2,010	10	.83	492	2	.65	498
6	1.33	165	4	2.82	1,900	N	1.18	656	4	.91	633
7	1.34	168	5	2.72	1,800	2	1.80	1,040	6	1.12	761
8	1.38	181	6	2.62	1,710	4	3.55	2,690	8	1.49	1,020
9	1.43	197	7	2.54	1,640	5	4.18	3,510	10	1.88	1,330
10	1.46	207	8	2.46	1,560	6	4.10	3,400	N	2.34	1,780
11	1.55	239	9	2.34	1,460	7:30	4.85	6,000	2	2.79	2,280
N	1.70	296	10	2.26	1,390	8	4.75	5,140	3	2.82	2,310
1	2.20	546	11	2.18	1,320	10	4.18	4,190	4	2.79	2,280
2	2.67	873	12	2.11	1,260	12	3.77	3,560	6	2.57	2,030
3	4.11	2,300		Nov. 27			Dec. 5		8	2.30	1,740
4	5.28	4,150	2	1.98	1,170	2	3.34	2,960	10	2.09	1,520
5	6.03	5,710	4	1.85	1,070	4	2.96	2,480	12	1.90	1,340
6	6.64	7,240	6	1.77	1,020	6	2.69	2,160		Dec. 9	
7	7.04	8,360	8	1.68	957	8	2.40	1,840	4	1.65	1,140
8	8.21	11,900	10	1.59	898	10	2.19	1,620	8	1.47	1,000
9	9.44	15,800	10:50	1.51	846	N	2.01	1,440	N	1.33	901
10	10.54	19,500	11:15	1.60	904	2	1.85	1,300	4	1.20	813
11	11.08	21,600	N	1.53	859	4	1.74	1,210	8	1.11	754
11:30	11.23	22,300	2	1.41	785	6	1.63	1,120	12	1.04	711
11:45	11.15	21,800	4	1.35	750	8	1.54	1,060		Dec. 10	
12	11.23	22,300	6	1.29	716	10	1.46	995	6	.93	645
	Nov. 26		8	1.25	694	12	1.38	936	N	.84	594
1	10.79	20,500	10	1.19	661				6	.78	562
			12	1.14	635				12	.72	531

Neversink River at Woodbourne, N. Y.

Location.--Lat 41°45'25", long 74°35'55", a quarter of a mile downstream from highway bridge at Woodbourne, Sullivan County. Altitude of gage is 1,180 ft (from topographic map).

Drainage area.--113 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 9,100 cfs and extended by logarithmic plotting on basis of slope-area determination at peak stage.

Maxima.--November-December 1950: Discharge, 22,000 cfs 2 a.m. Nov. 26 (gage height, 11.19 ft).
1937 to October 1950: Discharge, 12,300 cfs July 22, 1938 (gage height, 11.2 ft, from floodmarks and graph based on gage readings).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	185	27	1,190	1	405	5	2,020	9	1,070
24	168	28	736	2	364	6	835	10	683
25	3,170	29	572	3	398	7	602		
26	7,090	30	476	4	2,600	8	1,610		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	1,343
Runoff, in inches	7.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		1	6.25	3,180		Dec. 1		6	4.53	1,340
N	1.71	182	2	6.06	2,940	2	3.19	432	8	4.41	1,230
12	1.68	174	3	5.88	2,730	4	3.18	427	10	4.32	1,150
	Nov. 24		4	5.74	2,570	6	3.17	422	12	4.33	1,080
6	1.67	171	5	5.61	2,430	8	3.16	418		Dec. 6	
N	1.65	166	6	5.49	2,300	10	3.15	414	4	4.09	970
6	1.65	166	7	5.38	2,190	N	3.13	404	8	3.95	870
12	1.64	163	8	5.27	2,070	2	3.05	370	N	3.86	809
	Nov. 25		9	5.19	1,990	4	3.11	396	4	3.79	763
1	1.64	163	10	5.10	1,900	6	3.10	391	8	3.72	719
2	1.64	163	11	5.01	1,810	8	3.10	391	12	3.65	676
3	1.64	163	12	4.93	1,730	10	3.09	387		Dec. 7	
4	1.65	166		Nov. 27		12	3.08	383	4	3.60	646
5	1.65	166	2	4.79	1,590		Dec. 2		8	3.54	612
6	1.66	168	4	4.67	1,470	8	3.04	366	N	3.50	589
7	1.67	171	6	4.56	1,370	4	3.02	357	4	3.46	567
8	1.70	179	8	4.45	1,260	12	3.02	357	8	3.45	562
9	1.74	191	10	4.37	1,190		Dec. 3		12	3.51	595
10	1.78	202	N	4.28	1,120	4	3.02	357		Dec. 8	
11	1.84	220	1	4.33	1,160	8	3.05	370	2	3.63	664
N	1.96	259	2	4.24	1,090	N	3.07	378	4	3.84	795
1	2.16	331	4	4.16	1,020	4	3.15	414	6	4.07	955
2	2.52	490	6	4.11	985	8	3.22	446	8	4.35	1,180
3	3.27	912	8	4.05	940	12	3.32	494	10	4.79	1,590
4	4.52	1,940	10	4.00	904		Dec. 4		N	5.19	1,990
5	6.37	4,060	12	3.95	870	2	3.35	510	2	5.57	2,390
6	7.52	5,730		Nov. 28		4	3.36	515	3:30	5.71	2,540
7	8.38	7,140	4	3.86	809	6	3.37	520	4	5.70	2,530
8	8.98	8,450	8	3.79	763	8	3.42	546	6	5.51	2,330
9	9.46	9,860	N	3.72	719	10	3.53	606	8	5.23	2,030
10	9.94	11,700	4	3.68	694	N	3.88	822	10	4.99	1,790
11	10.40	14,300	8	3.65	676	2	4.67	1,470	12	4.79	1,590
12	10.84	17,900	12	3.59	640	4	6.55	3,520		Dec. 9	
	Nov. 26			Nov. 29		6	8.14	6,170	4	4.50	1,310
1	11.07	20,400	4	3.53	606	8	8.78	7,470	8	4.31	1,140
2	11.19	22,000	8	3.49	584	10	8.33	6,530	N	4.15	1,020
3	10.98	19,300	N	3.44	557	12	7.18	4,500	4	4.03	926
4	10.78	17,100	4	3.42	546		Dec. 5		8	3.93	856
5	10.30	13,100	5	3.47	573	2	6.47	3,460	12	3.85	802
6	9.87	10,800	8	3.41	540	4	6.00	2,870		Dec. 10	
7	9.27	8,660	12	3.38	525	6	5.65	2,480	6	3.73	725
8	8.36	6,590		Nov. 30		8	5.35	2,160	N	3.64	670
9	7.44	4,920	6	3.33	499	10	5.13	1,930	6	3.58	635
10	7.00	4,220	N	3.27	470	N	4.95	1,750	12	3.52	600
11	6.70	3,780	6	3.24	455	2	4.78	1,580			
N	6.46	3,450	12	3.20	436	4	4.65	1,450			

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Neversink River at Oakland Valley, N. Y.

Location.--Lat 41°29'45", long. 74°38'45", 250 ft downstream from highway bridge known as Paradise Bridge, Orange County, and three-quarters of a mile downstream from Oakland Valley, Sullivan County, and Bushkill Creek. Datum of gage is 632.00 ft above mean sea level, adjustment of 1912.

Drainage area.--222 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 7,800 cfs and extended on basis of slope-area determination at peak stage.

Maxima.--November-December 1950: Discharge, 23,300 cfs 6:30 a.m. Nov. 26 (gage height, 12.62 ft).
1928 to October 1950: Discharge, 20,000 cfs Aug. 24, 1933 (gage height, 12.61 ft) from rating curve extended above 4,100 cfs by logarithmic plotting.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	233	27	2,190	1	648	5	4,290	9	2,280
24	208	28	1,290	2	558	6	1,700	10	1,390
25	2,250	29	960	3	543	7	1,190		
26	11,100	30	777	4	2,030	8	2,580		

Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10	2,012
Runoff, in inches	6.07

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	10.30	14,800		Dec. 1		8	4.44	1,800
N	2.16	228	11	9.32	11,400	8	3.05	664	N	4.28	1,640
12	2.12	215	N	8.33	8,570	4	3.00	633	4	4.15	1,520
	Nov. 24		1	7.54	6,660	12	2.93	591	8	4.05	1,420
6	2.10	208	2	7.13	5,790		Dec. 2		12	3.98	1,360
N	2.09	205	3	6.87	5,280	8	2.89	567		Dec. 7	
6	2.10	208	4	6.66	4,900	4	2.85	544	4	3.89	1,280
12	2.09	205	5	6.49	4,600	12	2.83	533	8	3.81	1,220
	Nov. 25		6	6.32	4,310		Dec. 3		N	3.75	1,170
1	2.09	205	7	6.17	4,070	4	2.82	527	4	3.70	1,130
2	2.09	205	8	6.04	3,860	8	2.82	527	8	3.67	1,110
3	2.09	205	9	5.92	3,680	N	2.82	527	12	3.71	1,140
4	2.09	205	10	5.81	3,520	4	2.86	550		Dec. 8	
5	2.09	205	11	5.70	3,350	8	2.88	562	2	3.81	1,220
6	2.10	208	12	5.60	3,210	12	2.94	597	4	4.01	1,390
7	2.12	215		Nov. 27			Dec. 4		6	4.26	1,620
8	2.15	225	2	5.40	2,930	2	2.97	615	8	4.53	1,890
9	2.21	246	4	5.23	2,710	4	3.00	633	10	4.87	2,270
10	2.35	299	6	5.08	2,520	6	3.04	658	N	5.15	2,600
11	2.53	377	8	4.95	2,360	8	3.10	695	2	5.44	2,990
N	2.73	478	10	4.82	2,210	10	3.18	747	4	5.71	3,360
1	2.89	567	N	4.71	2,090	N	3.31	835	6	5.93	3,700
2	3.09	689	2	4.61	1,980	2	3.72	1,150	8	6.06	3,900
3	3.49	966	4	4.51	1,870	4	4.14	1,510	10	5.94	3,710
4	3.86	1,260	6	4.47	1,830	6	4.89	2,290	12	5.73	3,400
5	4.26	1,620	8	4.35	1,710	8	6.05	3,880		Dec. 9	
6	4.71	2,090	10	4.27	1,630	10	7.62	6,840	2	5.51	3,080
7	5.35	2,860	12	4.20	1,560	12	8.29	8,460	4	5.31	2,810
8	6.72	5,010		Nov. 28			Dec. 5		6	5.17	2,630
9	8.09	7,960	4	4.07	1,440	12:45	8.34	8,590	8	5.04	2,470
10	8.83	9,960	8	3.96	1,340		8.16	8,130	10	4.90	2,300
11	9.36	11,600	N	3.86	1,260	4	7.42	6,390	N	4.79	2,180
12	9.66	12,500	4	3.79	1,200	6	6.85	5,240	2	4.68	2,060
	Nov. 26		8	3.72	1,150	8	6.46	4,550	4	4.59	1,960
1	9.98	13,600	12	3.66	1,100	10	6.13	4,010	6	4.50	1,860
2	10.56	15,700		Nov. 29		N	5.87	3,600	8	4.43	1,790
3	11.16	17,900	6	3.56	1,020	2	5.66	3,290	10	4.36	1,720
4	11.60	19,400	N	3.47	951	4	5.44	2,990	12	4.30	1,660
5	12.04	21,100	6	3.38	885	6	5.27	2,760		Dec. 10	
6	12.50	22,900	12	3.35	864	8	5.12	2,570	4	4.19	1,550
6:15	12.37	22,400		Nov. 30		10	4.99	2,410	8	4.08	1,450
6:30	12.62	23,300	8	3.26	801	12	4.86	2,260	N	3.99	1,370
7	12.47	22,700	4	3.18	747		Dec. 6		4	3.91	1,300
8	12.05	21,200	12	3.11	702	4	4.64	2,010	8	3.84	1,240
9	11.33	18,500							12	3.79	1,200

Neversink River at Godeffroy, N. Y.

Location.--Lat 41°26'30", long 74°36'10", at highway bridge half a mile downstream from Basher Kill, three-quarters of a mile southeast of Godeffroy, Orange County, and 8½ miles upstream from mouth. Altitude of gage is 460 ft (from topographic map).

Drainage area.--302 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 10,500 cfs and extended to peak stage.

Maxima.--November-December 1950: Discharge, 20,000 cfs 8 a.m. Nov. 26 (gage height, 11.79 ft).
1903, 1909-14, 1937 to October 1950: Discharge, 16,100 cfs July 22, 1938 (gage height, 10.73 ft).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1950

Day	November	Day	November	Day	December	Day	December	Day	December
23	294	27	2,820	1	891	5	4,960	9	2,960
24	257	28	1,750	2	765	6	2,210	10	2,010
25	1,530	29	1,320	3	716	7	1,620		
26	11,600	30	1,060	4	1,900	8	2,920		
Mean discharge, in cubic feet per second, for period Nov. 23 to Dec. 10									2,310
Runoff, in inches									5.12

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1950

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Nov. 23		10	11.50	18,800	12	4.70	968	N	5.67	2,160
N	3.48	289	11	11.05	17,000		Dec. 1		4	5.57	2,010
12	3.44	269	N	10.25	14,100	8	4.64	916	8	5.49	1,900
	Nov. 24		1	9.45	11,400	4	4.58	865	12	5.43	1,810
6	3.43	264	2	8.70	8,960	12	4.52	815		Dec. 7	
N	3.41	254	3	8.25	7,570		Dec. 2		4	5.37	1,730
6	3.40	249	4	8.00	6,840	8	4.48	783	8	5.32	1,670
12	3.41	254	5	7.81	6,310	4	4.43	744	N	5.27	1,600
	Nov. 25		6	7.64	5,860	12	4.40	721	4	5.23	1,550
1	3.41	254	7	7.47	5,450		Dec. 3		8	5.20	1,510
2	3.41	254	8	7.32	5,100	6	4.39	714	12	5.21	1,520
3	3.41	254	9	7.14	4,720	N	4.37	699		Dec. 8	
4	3.42	259	10	7.06	4,560	6	4.40	721	2	5.27	1,600
5	3.42	259	11	6.95	4,340	12	4.42	737	4	5.38	1,740
6	3.42	259	12	6.85	4,160		Dec. 4		6	5.55	1,980
7	3.43	264		Nov. 27		2	4.44	752	8	5.72	2,230
8	3.45	274	2	6.65	3,780	4	4.47	776	10	5.93	2,550
9	3.47	284	4	6.48	3,470	6	4.49	791	N	6.15	2,900
10	3.50	299	6	6.34	3,230	8	4.52	815	2	6.33	3,210
11	3.55	326	8	6.22	3,020	10	4.59	873	4	6.54	3,580
N	3.66	390	10	6.11	2,840	N	4.68	951	6	6.71	3,890
1	3.82	493	N	6.01	2,680	2	4.94	1,200	8	6.87	4,190
2	4.01	632	2	5.92	2,530	4	5.28	1,610	9	6.95	4,340
3	4.19	780	4	5.85	2,420	6	5.66	2,140	10	6.94	4,330
4	4.40	974	6	5.77	2,300	8	6.20	2,990	12	6.80	4,060
5	4.66	1,240	8	5.74	2,260	10	7.55	5,640		Dec. 9	
6	5.00	1,640	10	5.67	2,160	12	8.34	7,840	2	6.65	3,780
7	5.28	1,990	12	5.62	2,080		Dec. 5		4	6.51	3,530
8	5.72	2,630		Nov. 28		2	8.67	8,860	6	6.39	3,310
9	6.35	3,730	4	5.52	1,940	4	8.31	7,750	8	6.30	3,160
10	7.67	6,510	8	5.44	1,830	6	7.78	6,230	10	6.21	3,010
11	8.05	7,440	N	5.37	1,730	8	7.42	5,330	N	6.12	2,850
12	9.15	10,400	4	5.30	1,640	10	7.13	4,700	2	6.05	2,740
	Nov. 26		8	5.24	1,560	N	6.92	4,290	4	5.99	2,640
1	9.55	11,700	12	5.19	1,500	2	6.72	3,910	6	5.92	2,530
2	9.95	13,000		Nov. 29		4	6.55	3,600	8	5.87	2,460
3	10.30	14,200	6	5.12	1,410	6	6.42	3,370	10	5.82	2,380
4	10.73	15,800	N	5.04	1,320	8	6.30	3,160	12	5.78	2,320
5	11.15	17,400	6	4.97	1,240	10	6.19	2,970		Dec. 10	
6	11.48	18,700	12	4.90	1,160	12	6.10	2,820	6	5.66	2,140
7	11.66	19,400		Nov. 30			Dec. 6		N	5.56	1,990
8	11.79	20,000	8	4.84	1,100	4	5.93	2,550	6	5.47	1,870
9	11.68	19,500	4	4.76	1,020	8	5.79	2,340	12	5.40	1,770

FLOODS OF MARCH 1951 IN NEW YORK

On March 30 and 31, 1951, floods occurred generally in southern New York, but they were particularly severe in the Catskill Mountain region. In addition to the usual damage to property and facilities, four deaths occurred, one directly and three indirectly attributed to the floods.

Of the principal streams in the Catskill Mountain region, those most affected were Schoharie Creek, Esopus Creek, upper Rondout Creek, the lower reaches of Beaver Kill, East and West Branches of the Delaware River, and the Neversink River. Many small streams had severe floods, especially in the triangular area formed by Hunter, Kingston, and Slide Mountain.

Meteorology

The severe storm that caused the flood deposited moderate to large amounts of rain on most of the State. Antecedent conditions were such that high rates of runoff were inevitable. As reported by the U. S. Weather Bureau 5/ :

> There was some rain or snow on practically every day from the 14th to 26th [of March]. Under the influence of a strong atmospheric circulation, southerly winds brought moist air and rising temperatures on the 27th. By the 29th, a low pressure system began to invade the State accompanied by rain. On the following day, a wave development along the Atlantic Coast, assisted in feeding moist air to the circulation ***.
>
> Damages from the storm for the State as a whole have been estimated as high as 2,000,000 dollars, with the greatest losses in the Esopus and Schoharie Creeks and the upper reaches of the Delaware River ***. An estimate of the loss [in Esopus Creek basin] has been placed at 245,350 dollars.

The heaviest rainfall fell in the area that extends from the northeastern escarpment of the Catskills to the southern escarpments (Slide Mountain group). The isohyetal map (pl. 3) shows a sizable area enclosed by the 5-inch line. Another area of heavy rainfall was in the Highlands area, but no exceptional discharges were reported from there. Rainfall data at 51 gages in the Catskill Mountain region are listed in table 4.

5/ Climatological data, U. S. Weather Bur., March 1951.

Table 4.- Daily rainfall at stations in the Catskill Mountain region, March 28-30, 1951
[Data supplied by Board of Water Supply, City of New York]

Stream basin and station	Rainfall, in inches		
	Mar. 28	Mar. 29	Mar. 30
Schoharie Creek:			
Windham	0	0.13	2.05
Elka Park	.06	1.33	4.69
Lexington	0	.23	2.14
Prattsville	0	.18	1.05
West Kill	0	.22	1.92
East Jewett	0	.48	3.75
North Settlement	0	.06	1.23
Tannersville	.01	1.12	4.64
Catskill Creek:			
Preston Hollow	0	.22	1.46
Oak Hill	0	.30	1.20
Westerlo	0	.42	2.20
Manorkill	0	.14	1.04
Esopus Creek:			
Phoenicia	.15	1.58	4.61
Slide Mountain	.17	2.61	3.80
Highmount	0	.83	1.56
Edgewood	.01	1.75	4.19
Lake Hill	0	2.22	4.60
West Shokan	0	1.50	5.15
Coldbrook	.06	2.71	3.96
Bushnellsville	.02	1.10	2.05
Brown Station	.07	2.35	2.99
Glenford	.02	2.33	3.08
Rondout Creek:			
Grahamsville	.08	2.08	2.29
Sundown	.53	.13	4.12
Peekamoose	0	.34	6.71
Lackawack	0	1.20	2.15
West Branch Delaware River:			
Kortright	0	.55	.11
Stamford	0	.18	.85
Relay	0	.98	1.21
East Delhi	0	.80	1.10
Bovina	0	.53	1.49
Lake Delaware	0	.47	1.31
East Branch Delaware River:			
Roxbury	0	.89	1.14
New Kingston	0	.35	1.27
Halcott Centre	0	.44	1.71
Arkville	0	.10	1.56
Seager	0	.63	1.41
Arena	0	.40	.96
Andes	.56	.61	.93
Terry Clove	.25	.74	.80
Mary Smith	0	1.25	1.53
Downsville	0	.55	1.11
Harvard	0	.61	1.40
Beaver Kill:			
Balsam Lake	.10	1.91	2.35
Lewbeach	.78	.89	1.48
Craigie Clair	.03	1.49	1.45
Butternut Brook	.06	2.70	1.81
Parkston	.71	.89	1.57
Neversink River:			
Frost Valley	.18	2.20	3.20
Claryville	.10	2.21	2.07
Neversink	.10	2.27	1.48

"Snow cover *** was essentially negligible [March 19-23, 1951], the reports ranging between 'patches' 'no snow' ". 6/ Although the ground may have been saturated from the storm, snow made a negligible contribution to flood runoff.

Description of Flood

The flood conditions in the Catskill Mountain region as they apply to stream basins will be discussed in a generally north to south order. The upper Schoharie Creek basin (above Schoharie Reservoir) experienced a severe flood which, according to David Fisher, aged 85, as recalled by his son, R. W. Fisher, had been equaled only twice before at Hunter: first, about 1906 and again in 1938. Damage to roads, streamside camps, and tributary valleys was great but not of disastrous magnitude. Peak discharge in the upper reaches of the main stream, from Tannersville to Lexington, was greater than in the November 1950 flood, but at the gaging station in Prattsville the November flood was the higher by 2.3 feet. In Batavia Kill, a principal tributary that empties into Schoharie Creek just above Prattsville, the November flood was also the higher by "about 4 feet," according to a resident at Red Falls. Schoharie Reservoir had a marked effect on flows in the lower reaches of Schoharie Creek. Raymond Brandow of Gilboa quoted a city of New York employee as saying that the overflow in Gilboa Dam was the highest ever. In March 1951 the lower reaches experienced the greatest flood in at least 27 years, even though the inflow to the reservoir was substantially less than in November, because the reservoir was full as a result of the November flood.

The lower reaches of Schoharie Creek were battered by fast-moving water that flooded farms and highways on the bottomland. Overflow was extensive near Middleburg and the business district of Middleburg was shallowly innundated. The Pinder family, members of which have been resident for more than 100 years on the left bank of Schoharie Creek near Middleburg, kept the record of several floods by marks in a barn. The relative heights of three high floods, referred to an arbitrary datum, are as follows:

Flood year	Flood mark (feet)
1898	8.17
1938	7.14
November 1950	7.09

6/ New York cooperative snow survey, March 19-23, 1951, U. S. Geol. Survey, Albany, N. Y.

Water was stored first at Gilboa dam in 1924; the first overflow occurred in October 1927 7/.

The basin of Esopus Creek probably received greater damage than any other part of the flood area when streams in the highest sections of the Catskills overflowed. (See figs. 26 and 27). The effect of Ashokan Reservoir on floodwaters was similar to that of

Figure 26. --Erosion of river bank and pavement of State Route 28 along Esopus Creek near Phoenicia, N. Y.

Schoharie Reservoir; the March flood was greater than the November flood, however, in both the upper and lower parts of the Esopus Creek basin. Although Ashoken Reservoir had reserve storage capacity in November, it was full at the time of the March flood, and as a result the lower reaches of Esopus Creek experienced a severe flood in March that caused much damage at Kingston.

However, the beneficial effect of Ashokan Reservoir is shown by comparing the data on Esopus Creek in tables 5 and 6 (p. 243, 244) The peak discharge at Coldbrook, just upstream from the reservoir, was 59, 600 cfs, while at a point near Stone Ridge and downstream from the reservoir the peak discharge was only 27,900 cfs. Thus,

7/ Catskill water supply, : Board of Water Supply, City of New York, p. 28, Dec. 1928.

Ashokan Reservoir, even though it was full at the beginning of the flood, reduced the crest flow in the lower reaches by at least 53 percent. In the issue of March 31, 1951, the Kingston Daily Freemen stated that it was "*** the area's worst flood in 35 years." Storage in the reservoir was begun in 1913 and the first flow over the spillway occurred in December 1916 8/.

Flood conditions existed throughout the Esopus Creek basin. The channels and banks of many tributaries were scoured and altered.

State Route 28 was badly damaged near Phoenicia, Mount Tremper, and at other places (see figures 26 and 27). Many homes, camps,

Figure 27.--Erosion damage to a service station on State Route 28 at Mount Tremper, N. Y. Water was about 4 feet deep in garage.

and commercial establishments were damaged and, as during the November flood, traffic ceased on the Ulster and Delaware Branch of the New York Central Railroad until repairs could be made. Several highway bridges and many country road bridges left intact by the November flood were destroyed, knocked askew, or otherwise badly damaged (see fig. 28). Bridge destruction was particularly heavy in the Saw Kill basin.

8/ Op. cit.

Figure 28. --Bridge on State Route 212 across Saw Kill near Bearsville, N. Y., damaged during the flood of March 1951.

Damage also was heavy just west of Kingston, where the overflow of Esopus Creek flooded homes and other buildings in a wide valley.

The owner of Beatty Farms, on the outskirts of Kingston, said that the flood of March 1951 was exceeded by the flood in the spring of 1902, which was the worst in his knowledge.

The Saugerties Post, in its issue of April 2, 1951, stated that "more than 7 feet of water was flowing over" the dam on Esopus Creek at the head of tidewater, in Saugerties. It added, "Some oldtimers said they never had seen anything like it, but others recalled that even higher waters had surged through Saugerties before the Ashokan dam was built *** in 1912. Still other residents recalled an even worse flood *** in either 1912 or 1922 ***."

The narrow valley of Rondout Creek above Rondout Reservoir also was damaged heavily. Near Sundown, a bridge and about 2,000 feet of road were destroyed where the creek cut a new channel diagonally across the valley. Erosion was severe at many places. At Lowes Corners, the bank at the gaging station was cut back so far that the cableway was destroyed and the gage house was rendered unusable (see fig. 29). Storage of water behind Merriman Dam materially reduced the peak flow in lower Rondout Creek, and flood damage below the dam was small.

Figure 29.--Destruction of cableway at stream-gaging station on Rondout Creek at Lowes Corners, N. Y. Bank erosion on channel changes caused later abandonment of gage house and stilling well in middle distance.

The headwaters of the Neversink River again produced a damaging flood, but it was less severe than the one in November 1950. The gage at Claryville, which had been put into action again with a temporary shelter and a recorder, was entirely destroyed (see page 208). Upstream from the gage, on the West Branch, the truss bridge dropped when the left abutment collapsed.

The middle and lower reaches of Neversink River experienced moderately damaging overflow that was a little lower than the November flood. In both floods the discharge of the Neversink River was about the same at Claryville, whose drainage area is only 61.1 square miles, as it was at Godeffroy, whose drainage area is 302 square miles. Apparently increasing runoff downstream was offset by more channel storage and a decrease in discharge from tributaries.

Other streams in the southern edge of the Catskill Mountain region had severe floods, and new records of discharge were set at several gaging stations. Three persons at Livingston Manor, who had lived there between 59 and 69 years, stated that Willowemoc Creek in March 1951 was the highest that they remembered. The greatest discharge since 1913 was recorded at the gaging station

on Beaver Kill at Cooks Falls. All of Beaver Kill was in flood, and fairly high flood conditions existed in the lower reaches of the East and West Branches of the Delaware River and in the Delaware River itself from Hancock to Port Jervis. Damage was not great except in the smaller tributary basins.

The storm of March 30-31 also caused floods in other and widely scattered areas of New York. One of the hardest hit was the Watkins Glen area, where Glen Creek surged out of the glen in great volume. The Watkins Express of April 4, 1951, reported that "Much of the damage was caused by water pouring down the hillside ***."

Farther south in the Elmira area highways became flooded by stream overflow and temporarily ponded rainfall, but damage was relatively minor. Highways also were inundated near Corning, Erwins, Big Flats, Montour Falls, and Painted Post.

Flood Discharge

Peak-discharge determinations were made by indirect methods at 6 miscellaneous sites, as shown in table 5. Except for Esopus

Table 5.--Peak discharge at sites on streams in the Catskill Mountain region, New York, during the flood of March 30 and 31, 1951

Site	Stream and place of determination	Drainage area (square miles)	Date	Momentary peak discharge	
				Cfs	Cfs per square mile
	Schoharie Creek Basin:				
M	Schoharie Creek at Hunter-----	39.5	Mar. 31	13,800	350
N	East Kill near Jewett Center---	35.2	Mar. 31	6,450	183
	Esopus Creek Basin:				
O	Esopus Creek near Stone Ridge--	275	Mar. 31	27,900	101
P	Saw Kill near Sawkill----------	35.3	Mar. 30	7,800	221
	Rondout Creek Basin:				
Q	Sundown Creek at Sundown-------	5.13	Mar. 31	1,790	349
	East Branch Delaware River Basin:				
R	Mongaup Creek near Debruce-----	10.3	Mar. 30	2,430	236

Creek near Stone Ridge, these data are for smaller drainage basins and they supplement the data for the 40 stream-gaging stations in the Catskill region.

During the March 1951 flood, new peaks were established at 5 of the 40 gaging stations, as shown by the comparative data in table 6. Four of these new peaks exceeded record highs established in the flood of November 1950. The locations of the gaging stations and the sites of indirect determinations are shown on plate 3.

Table 6.--Summary of flood discharges at gaging stations in the Catkill Mountain Region, New York, during the flood of March 30 and 31, 1951

No. on pl. 3	Stream and place of determination	Drainage area (square miles)	Period of record from year shown to 1950	Maximum flood previously known				Maximum during present flood			
				Date	gage height (feet)	Discharge		Date and hour	gage height (feet)	Discharge	
						Cfs	cfs per square mile			Cfs	cfs per square mile
1	Schoharie Creek at Prattsville----	236	1907	Nov. 25, 1950	15.59	49,500	210	Mar. 31, 1 a.m.----	13.21	about 32,500	138
2	Schoharie Creek at Burtonsville---	883	1939	Mar. 31, 1940	6.77	25,200	28.5	Mar. 31, 12:45 p.m.-	8.00	37,900	42.9
3	Catskill Creek at Oak Hill--------	98	1929	Nov. 25, 1950	14.08	12,500	128	Mar. 30, 10 p.m.----	10.45	5,950	60.7
4	Esopus Creek at Coldbrook---------	192	1914	Aug. 24, 1933	20.40	55,000	286	Mar. 30, 10:30 p.m.-	20.70	59,600	310
5	Rondout Creek near Lowes Corners--	39.4	1937	July 22, 1938	a 8.2	7,600	193	Mar. 30, 9:15 p.m.--	9.60	7,200	183
6	Chestnut Creek at Grahamsville----	20.9	1938	Nov. 25, 1950	b 4.27	c 3,800	182	Mar. 30, 8:45 p.m.--	4.04	2,400	115
7	Rondout Creek near Lackawack------	100	1906	Aug. 26, 1928	-----	26,700	267	Mar. 31, 3:30 p.m.--	6.67	4,070	40.7
8	Rondout Creek at Rosendale--------	386	1926	Aug. 27, 1928	21.9	27,300	70.7	Mar. 31, 5 a.m.-----	16.80	20,900	54.1
9	East Branch Delaware River at Margaretville.	163	1937	Nov. 25, 1950	13.84	15,700	96.3	Mar. 31, 1:30 a.m.--	10.04	7,770	47.7
10	Platte Kill at Dunraven----------	34.7	1941	Nov. 25, 1950	8.01	3,810	110	Mar. 31, 12:45 a.m.-	6.31	2,110	60.8
11	Mill Brook at Arena---------------	25.0	1937	Sept. 21, 1938	a 7.6	4,500	180	Mar. 30, 11 p.m.----	8.56	2,700	108
12	Tremper Kill near Shavertown------	33.0	1937	Sept. 21, 1938	7.12	4,250	129	Mar. 31, 12:30 a.m.-	4.79	1,630	49.4
13	Coles Clove Kill near Pepacton----	28.0	1944	Mar. 22, 1948	6.41	2,400	85.7	Mar. 30, 12 p.m.----	5.32	1,390	49.6
14	Terry Clove Kill near Pepacton----	14.1	1937	May 23, 1942	5.49	4,010	284	Mar. 30, 11 p.m.----	3.23	626	44.4
15	East Branch Delaware River at Downsville.	373	1941	Nov. 26, 1950	14.52	23,900	64.1	Mar. 31, 8:30 a.m.--	12.74	13,100	35.1
16	East Branch Delaware River at Harvard.	443	1934	Sept. 22, 1938	16.93	31,400	70.9	Mar. 31, 12 m-------	13.04	15,800	35.7
17	Beaver Kill at Turnwood-----------	40.8	1948	Nov. 25, 1950	9.16	7,400	181	Mar. 30, 8:30 p.m.	8.32	5,810	142
18	Beaver Kill at Craigie Clair------	82	1937	Sept. 27, 1942	10.74	10,300	126	Mar. 30, 11:45 p.m.-	10.48	9,270	113
19	Willowemoc Creek at Debruce-------	40.9	1948	Nov. 25, 1950	6.25	7,780	190	Mar. 30, 10:30 p.m.-	7.01	9,480	232
20	Willowemoc Creek near Livingston Manor.	63	1937	Nov. 26, 1950	8.38	8,130	129	Mar. 31, 12:15 a.m.-	9.01	10,500	167

21	Little Beaver Kill near Livingston Manor.	19.8	1924	Nov. 25, 1950	6.87	2,510	127	Mar. 30, 11 p.m.----	6.45	2,220	112
22	Beaver Kill at Cooks Falls--------	241	1913	Nov. 26, 1950	15.52	29,400	122	Mar. 31, 2:15 a.m.--	16.02	31,600	131
23	East Branch Delaware River at Fishes Eddy.	783	1912	Aug. 24, 1933	20.60	53,300	68.1	Mar. 31, 5 a.m.-----	18.60	43,000	54.9
24	West Branch Delaware River at Delhi.	142	1937	Sept. 21, 1938	8.81	8,940	63.0	Mar. 31, 7 a.m.-----	6.38	3,270	23.0
25	Little Delaware River near Delhi.	49.8	1937	Sept. 21, 1938	8.5	3,280	65.9	Mar. 30, 12 p.m.----	6.66	2,410	48.4
26	West Branch Delaware River at Walton.	331	1950	Dec. 4, 1950	12.25	12,800	38.7	Mar. 31, 7:30 a.m.--	10.57	8,470	25.6
27	Trout Creek at Cannonsville-------	49.5	1940	Mar. 22, 1948	9.95	4,600	92.9	Mar. 31, 2 a.m.-----	7.00	1,710	34.5
28	Cold Spring Brook at China--------	1.51	1934	Oct. 30, 1935	4.5	335	222	Mar. 30, 8:45 p.m.--	3.34	73.4	48.6
29	Oquaga Creek at Deposit----------	66	1940	Mar. 22, 1948	9.21	4,400	66.7	Mar. 31, 2 a.m.-----	6.33	1,870	28.3
30	West Branch Delaware River at Hale Eddy.	593	1912	Mar. 22, 1948	15.69	28,900	48.7	Mar. 31, 6:30 a.m.--	11.29	13,200	22.3
31	Calliccon Creek at Callicoon------	111	1940	Aug. 17, 1947	9.68	16,000	144	Mar. 31, 12:30 a.m.-	6.00	5,020	45.2
32	Tenmile River at Tusten----------	45.0	1946	Nov. 26, 1950	6.05	1,870	41.6	Mar. 31, 4:30 a.m.--	5.41	1,430	31.8
33	Delaware River near Barryville----	2,023	1940	May 23, 1942	23.19	105,000	51.9	Mar. 31, 1:30 p.m.--	17.65	68,200	33.7
34	Mongaup River near Mongaup--------	202	1939	Apr. 9, 1940	-----	d4,240	21.0	Mar. 31----------	-----[e,f]	3,140	15.5
35	Delaware River at Port Jervis-----	3,076	1904	May 23, 1942	[g]17.76	140,000	45.5	Mar. 31, 3 p.m.-----	14.35	91,400	29.7
36	Neversink River at Claryville-----	61.1	[h] 1949	Nov. 25, 1950	12.22	22,000	360	Mar. 30 ----------[i]	11.3	18,000	294
37	Neversink River at Neversink	93	1941	Nov. 25, 1950	11.23	22,300	240	Mar. 30, abt.12 p.m.	10.70	20,700	223
38	Neversink River at Woodbourne	113	1937	Nov. 26, 1950	11.19	22,000	195	Mar. 31, 2:30 a.m.--	10.67	16,100	142
39	Neversink River at Oakland Valley-	222	1928	Nov. 26, 1950	12.62	23,300	105	Mar. 31, 7 a.m.-----	12.02	21,000	94.6
40	Neversink River at Godeffroy	302	1937	Nov. 26, 1950	11.79	20,000	66.2	Mar. 31, 8 a.m.-----	11.72	19,700	65.2

a Site and datum then in use.
b Flow of Red Brook bypassing station.
c Computed on basis of peak flow of Chestnut Creek above Red Brook and slope-area determination of peak flow of Red Brook.
d Maximum daily discharge.
e Estimated.
f Combined flows of Rio tailrace and natural channel.
g Maximum stage known, 23.1 feet Oct. 10, 1903, discharge about 205,000 cfs.
h Station discontinued March 25, 1951.
i From flood marks.

At the gaging station on Schoharie Creek near Burtonsville, the new peak was 50 percent greater than the previous maximum. However, the unit runoff of 43 cfs per square mile was small when compared with the 310 cfs per square mile discharged by Esopus Creek at Coldbrook, which was a new maximum since the records were begun in 1914 (drainage area: Burtonsville, 883 square miles; Coldbrook, 192 square miles).

The comparatively new stations on Willowemoc Creek at Debruce and near Livingston Manor had new peaks, but it was more significant that Beaver Kill at Cooks Falls experienced a peak 8 percent higher than the previous maximum for the record begun in 1913. The Neversink River was high at all 5 gaging stations but the flow was a little less than in the November flood.

Figures 30 and 31 present a broader picture of the comparative size of peak discharge at all points listed in tables 5 and 6. These may be compared with similar graphs in figures 23 and 24 (November 1950 flood) and figure 34 (Callicoon flood).

Flood Frequency

The flood-frequency study presented on pages 267-275 can be used to estimate the relative severity of the flood of March 30 and 31, 1951, which had an area of very high runoff about equal to that of the November 1950 flood. Data derived from figures 36 and 37 have been plotted on figures 31 and 32 to present graphically the severity of floods that occurred in topographic areas A and B on the average of once in every 2.33, 10, 25, and 50 years. Note that the four graphs do not show a linear relationship of frequency and discharge for a given drainage area.

The occurrence of two floods only four months apart, having an indicated recurrence interval on some streams of more than 50 years, illustrates why flood-frequency data must be used with caution. The designer, no matter what recurrence-interval he may choose for a design criterion, must accept the chance that a flood of any magnitude may occur at any time. In any case, the user must be extremely cautious about extrapolating to recurrence-intervals of greater than 50 years.

All peak discharges plotted on figure 30 show recurrence-intervals of about 2.33 years, which is the mean annual flood. The flood in the West Branch Delaware River basin thus was of minor im-importance.

More than half the peak discharges given in figure 31 plot below the 10-year curve. However, that 11 of the points plot above the

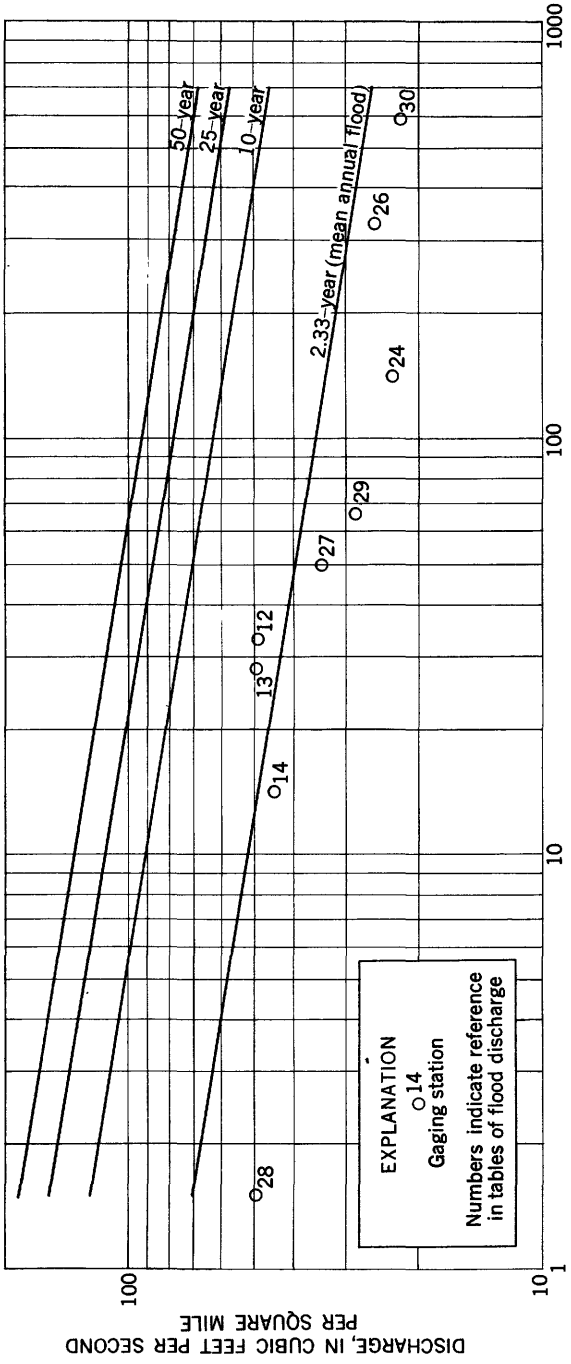

Figure 30.--Relation of unit discharge, size of drainage area, and recurrence-interval for streams in topographic area A in the Catskill Mountain region, flood of March 30 and 31, 1951.

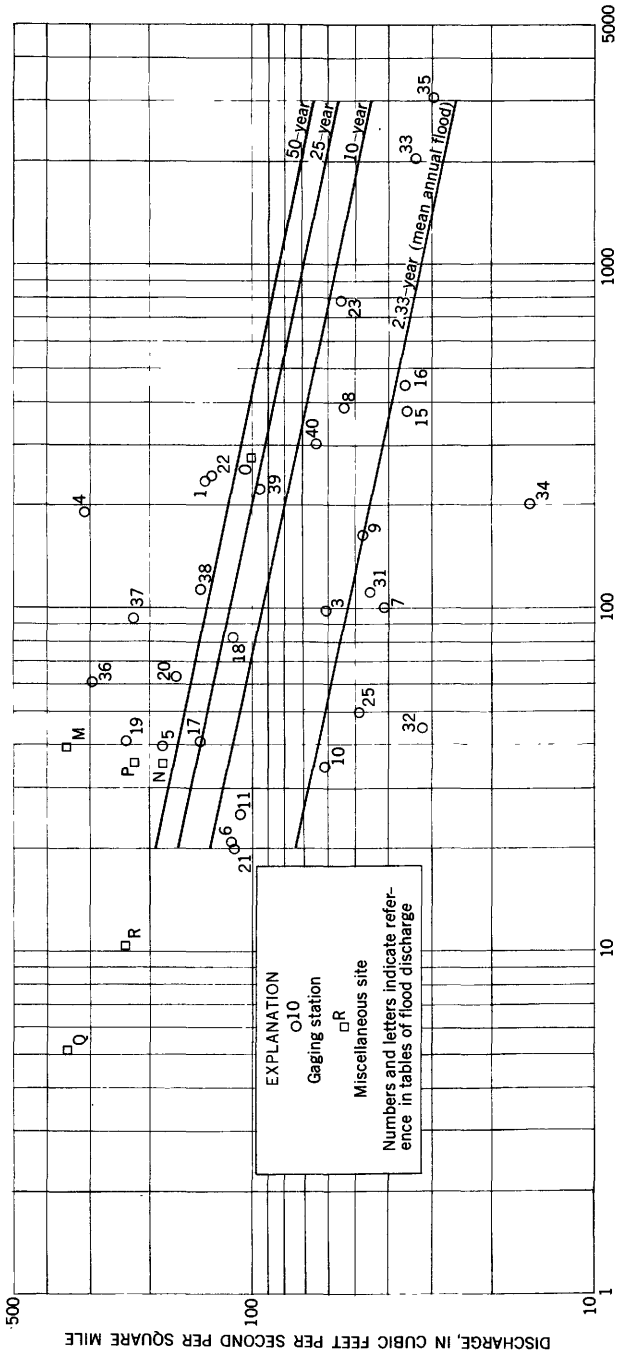

Figure 31.--Relation of unit discharge, size of drainage area, and recurrence-interval for streams in topographic area B in the Catskill Mountain region, flood of March 30 and 31, 1951.

50-year curve attests to the severity of the March 1951 flood. These 11 points represent the headwaters of streams radiating from the Slide Mountain massif and in the high upper basin of Schoharie Creek.

The influence of a large tributary is well illustrated by the points plotted in figures 31 and 32 for East Branch Delaware River, for West Branch Delaware River, and for the main stem of the Delaware. Note the low recurrence-intervals for stations 9, 15, and 16, and stations 24, 26, and 30. The sudden upward jump at stations 24, 26, and 30 was caused by the high flow of Beaver Kill, which enters East Branch between stations 16 and 23. A similar pattern may be observed in figure 31 for Beaver Kill (stations 17, 18, and 22) which was affected by high inflow from Willowemoc Creek (stations 19 and 20).

Stages and Discharges at Gaging Stations

The data presented here are explained more fully under the same heading in the discussion of the flood of November 1950 (page 217). Data on stages and discharges during the flood of March 1951 are presented for 6 gaging stations in the Catskill Mountain area.

In figure 32, the discharge, plotted against time, is given for selected gaging stations in the Catskill region. Esopus Creek rose rapidly in response to the rain, as it did in November 1950 and as is characteristic of it (see fig. 25). The peak was a little less sharp in 1951--in part, perhaps, because no dams failed. Rainfall that preceded the principal storm undoubtedly was a factor in producing conditions favorable for the flood (page 236). Four of the graphs had nearly the same time base--20 to 24 hours between the ascending and descending limbs--from the point where the main rise began.

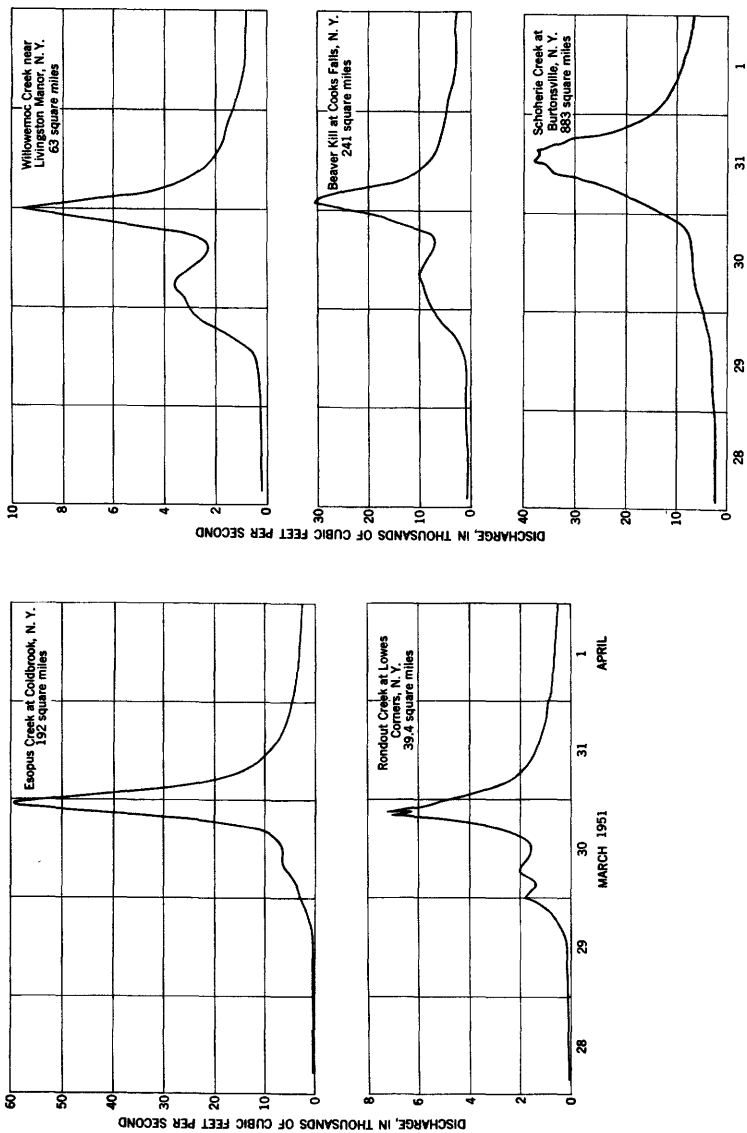

Figure 32.--Graphs of discharge for selected gaging stations, flood of March 30 and 31, 1951.

Schoharie Creek at Burtonsville, N. Y.

Location.--Lat 42°47'55", long 74°15'45", on right bank 0.4 mile south of Burtonsville, Montgomery County, 2.7 miles north of Esperance, and 13.5 miles upstream from mouth. Datum of gage is 507.98 ft above mean sea level, unadjusted.

Drainage area.--883 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 9,300 cfs and extended on basis of slope-area determination at peak stage.

Maxima.--March-April 1951: Discharge, 37,900 cfs 12:40 p.m. Mar. 31 (gage height, 8.00 ft).
1939 to February 1951: Discharge, 25,200 cfs Mar. 31, 1940 (gage height, 6.77 ft).
Floods of March 1936 and September 1938, reached stages of 10.5 and 10.2 ft, respectively. Flood of October 1903 is known to have reached a higher stage.

Remarks.--Entire flow at Gilboa (drainage area, 314 sq mi), except for spillage, diverted from Schoharie Reservoir into Ashokan Reservoir for New York City water supply.

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	2,210	Mar. 31	25,900	Apr. 3	5,220	Apr. 6	4,010
29	3,160	Apr. 1	9,430	4	4,980	7	3,680
30	7,010	2	5,790	5	4,870	8	3,140

Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8	6,617
Runoff, in inches	3.34

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28		10	3.65	6,490	10	5.69	17,900		Apr. 4	
2	2.41	2,210	N	3.70	6,700	11	5.45	16,300	4	3.38	5,380
4	2.42	2,230	2	3.75	6,920	12	5.27	15,200	8	3.29	5,020
6	2.42	2,230	4	3.79	7,100		Apr. 1		N	3.22	4,760
8	2.42	2,230	6	3.85	7,370	2	4.97	13,300	4	3.18	4,610
10	2.41	2,210	8	3.97	7,940	4	4.73	12,000	8	3.24	4,830
N	2.40	2,180	10	4.33	9,780	6	4.55	11,000	12	3.33	5,180
2	2.39	2,160	12	4.84	12,600	8	4.40	10,200		Apr. 5	
4	2.39	2,160		Mar. 31		10	4.26	9,410	4	3.36	5,300
6	2.39	2,160	1	5.13	14,300	N	4.16	8,890	8	3.32	5,140
8	2.40	2,180	2	5.38	15,900	2	4.06	8,380	N	3.25	4,870
10	2.43	2,260	3	5.62	17,400	4	3.96	7,890	4	3.18	4,610
12	2.48	2,390	4	5.89	19,300	6	3.86	7,420	8	3.15	4,500
	Mar. 29		5	6.06	20,600	8	3.78	7,050	12	3.12	4,390
2	2.54	2,560	6	6.36	22,900	10	3.73	6,830		Apr. 6	
4	2.58	2,670	7	6.63	25,000	12	3.69	6,660	6	3.09	4,290
6	2.60	2,720	8	7.00	28,300		Apr. 2		N	3.02	4,050
8	2.62	2,780	9	7.28	30,900	4	3.59	6,240	6	2.92	3,720
10	2.63	2,810	10	7.63	34,200	8	3.47	5,740	12	2.88	3,590
N	2.66	2,900	11	7.71	35,000	N	3.47	5,740		Apr. 7	
2	2.72	3,080	N	7.93	37,200	4	3.45	5,660	6	2.92	3,720
4	2.78	3,270	12:40	8.00	37,900	8	3.39	5,420	N	2.92	3,720
6	2.85	3,490	1	7.97	37,600	12	3.32	5,140	6	2.90	3,650
8	2.94	3,780	2	7.91	37,000		Apr. 3		12	2.83	3,430
10	3.06	4,180	3	7.93	37,200	4	3.28	4,980		Apr. 8	
12	3.19	4,640	4	7.69	34,800	8	3.27	4,950	6	2.77	3,240
	Mar. 30		5	7.44	32,400	N	3.31	5,100	N	2.71	3,050
2	3.34	5,220	6	7.27	30,800	4	3.39	5,420	6	2.70	3,020
4	3.46	5,700	7	6.68	25,400	8	3.44	5,620	12	2.67	2,930
6	3.54	6,030	8	6.28	22,200	12	3.42	5,540			
8	3.60	6,280	9	5.93	19,600						

Esopus Creek at Coldbrook, N. Y.

Location.--Lat 42°00'45", long 74°16'10", at highway bridge at Coldbrook, Ulster County, 1½ miles upstream from Ashokan Reservoir. Datum of gage is 621.53 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--192 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 12,700 cfs and extended on basis of slope-area determinations at gage heights, 12.39, 15.15, and 20.7 ft.

Maxima.--March-April 1951: Discharge, 59,600 cfs 10:30 p.m. Mar. 30 (gage height, 20.70 ft).
1914 to February 1951: Discharge, 55,000 cfs Aug. 24, 1933 (gage height, 20.40 ft), determined by New York City Board of Water Supply.

Remarks.--No diversion from Schoharie Creek during period, Mar. 28 to Apr. 8. (See "Remarks" paragraph on p. 251 for explanation of diversion.)

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	625	Mar. 31	13,200	Apr. 3	2,060	Apr. 6	1,040
29	1,130	Apr. 1	3,270	4	1,560	7	963
30	15,800	2	2,180	5	1,260	8	956
Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8							3,670
Runoff, in inches							8.53

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28		7	9.60	6,090	6	9.53	5,940	6	6.94	2,080
6	5.11	614	8	9.76	6,430	7	9.39	5,660	8	7.02	2,170
N	5.08	599	9	9.83	6,590	8	9.26	5,400	10	7.08	2,230
6	5.12	620	10	9.78	6,480	9	9.13	5,160	N	7.08	2,230
12	5.23	681	11	9.76	6,430	10	9.02	4,960	2	7.02	2,170
	Mar. 29		N	9.82	6,560	11	8.90	4,740	4	6.93	2,080
1	5.24	687	1	9.96	6,870	12	8.80	4,570	6	6.85	2,000
2	5.25	692	2	10.26	7,580		Apr. 1		8	6.77	1,920
3	5.25	692	3	10.68	8,650	2	8.61	4,250	10	6.70	1,850
4	5.26	698	4	11.27	10,200	4	8.42	3,940	12	6.64	1,790
5	5.26	698	5	12.20	13,200	6	8.27	3,720		Apr. 4	
6	5.27	704	6	13.28	17,100	8	8.12	3,490	4	6.54	1,700
7	5.28	710	7	15.05	24,200	10	7.98	3,290	8	6.44	1,610
8	5.29	715	8	17.15	35,400	N	7.86	3,130	N	6.36	1,530
9	5.30	721	9	19.23	48,600	2	7.74	2,970	4	6.31	1,490
10	5.31	727	10	20.54	58,300	4	7.64	2,850	8	6.27	1,450
11	5.33	739	10:30	20.70	59,600	6	7.57	2,760	12	6.22	1,410
N	5.35	751	11	20.51	58,100	8	7.51	2,690		Apr. 5	
1	5.38	769	12	19.33	49,300	10	7.44	2,610	6	6.12	1,320
2	5.43	800		Mar. 31		12	7.37	2,540	N	6.04	1,250
3	5.56	886	1	17.99	40,400		Apr. 2		6	5.96	1,190
4	5.75	1,020	2	16.65	32,600	2	7.30	2,460	12	5.90	1,140
5	5.89	1,130	3	15.54	26,700	4	7.23	2,390		Apr. 6	
6	6.08	1,290	4	14.53	22,100	6	7.17	2,320	6	5.83	1,080
7	6.38	1,550	5	13.68	18,700	8	7.12	2,270	N	5.76	1,030
8	6.66	1,810	6	12.99	16,000	10	7.06	2,210	6	5.71	992
9	6.97	2,120	7	12.49	14,200	N	7.02	2,170	12	5.73	1,010
10	7.31	2,470	8	12.00	12,500	2	6.95	2,100		Apr. 7	
11	7.62	2,820	9	11.60	11,200	4	6.90	2,040	6	5.71	992
12	7.91	3,190	10	11.25	10,200	6	6.87	2,020	N	5.66	956
	Mar. 30		11	10.93	9,300	8	6.84	1,980	6	5.61	920
1	8.12	3,490	N	10.68	8,650	10	6.82	1,960	12	5.66	956
2	8.28	3,730	1	10.44	8,020	12	6.85	2,000		Apr. 8	
3	8.41	3,930	2	10.22	7,490		Apr. 3		8	5.66	956
4	8.58	4,200	3	10.03	7,030	2	6.92	2,060	4	5.65	949
5	8.91	4,760	4	9.85	6,630	4	6.92	2,060	12	5.68	971
6	9.32	5,520	5	9.68	6,260						

Rondout Creek near Lowes Corners, N. Y.

Location.--Lat 41°51'50", long 74°29'55", 0.3 mile upstream from Sugarloaf Brook, 0.5 mile east of Lowes Corners, Sullivan County, 1.5 miles northeast of Eureka, and 2.0 miles upstream from Chestnut Creek. Datum of gage is 846.00 ft above mean sea level, datum of New York City Board of Water Supply.

Drainage area.--39.4 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,100 cfs and extended on basis of logarithmic plotting. Shifting-control method used Mar. 30, 31.

Maxima.--March-April 1951: Discharge, 7,200 cfs 9:15 p.m. Mar. 30 (gage-height, 9.60 ft).
1937 to February 1951: Discharge, 7,600 cfs July 22, 1938 (gage-height, 8.2 ft, site and datum then in use), from rating curve extended above 2,000 cfs by logarithmic plotting.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	128	Mar. 31	1,820	Apr. 3	429	Apr. 6	234
29	398	Apr. 1	626	4	328	7	219
30	2,770	2	465	5	274	8	206
Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8							658
Runoff, in inches							7.45

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28		3	4.51	1,390	10	4.15	1,580		Apr. 3	
4	1.66	123	4	4.60	1,450	11	4.06	1,500	4	2.45	442
8	1.65	121	5	4.87	1,640	N	3.95	1,410	8	2.49	459
N	1.63	117	6	5.22	1,920	1	3.87	1,340	N	2.46	446
4	1.68	126	6:45	5.32	2,000	2	3.80	1,280	4	2.40	421
8	1.78	146	7	5.30	1,980	3	3.72	1,220	8	2.34	397
12	1.80	150	8	5.19	1,890	4	3.65	1,160	12	2.28	373
	Mar. 29		9	4.99	1,730	5	3.58	1,110		Apr. 4	
1	1.80	150	10	4.85	1,620	6	3.51	1,060	6	2.20	343
2	1.80	150	11	4.80	1,590	7	3.45	1,010	N	2.14	321
3	1.81	152	N	4.79	1,580	8	3.39	969	6	2.12	314
4	1.84	159	1	4.75	1,560	9	3.33	928	12	2.08	300
5	1.85	161	2	4.86	1,630	10	3.27	887		Apr. 5	
6	1.87	165	3	5.24	1,930	11	3.21	848	6	2.04	287
7	1.88	168	4	5.67	2,290	12	3.16	816	N	2.00	273
8	1.89	170	5	6.01	2,600		Apr. 1		6	1.96	260
9	1.89	170	6	6.81	3,400	2	3.08	766	12	1.93	251
10	1.90	172	7	7.81	4,570	4	3.01	724		Apr. 6	
11	1.90	172	8	9.11	6,400	6	2.94	684	4	1.91	244
N	1.91	174	8:30	9.49	7,010	8	2.87	645	8	1.88	235
1	1.95	184	9	9.06	6,320	10	2.81	612	N	1.85	226
2	2.01	198	9:15	9.60	7,200	N	2.77	592	4	1.84	223
3	2.17	240	10	8.98	6,400	2	2.74	576	8	1.88	235
4	2.45	322	11	8.20	5,540	4	2.71	561	12	1.88	235
5	2.78	436	12	7.77	5,150	6	2.71	561		Apr. 7	
6	2.99	517		Mar. 31		8	2.72	566	4	1.85	226
7	3.17	594	1	6.94	4,280	10	2.69	551	8	1.83	220
8	3.46	731	2	6.40	3,770	12	2.65	532	N	1.81	214
9	3.80	919	3	5.92	3,230		Apr. 2		4	1.79	208
10	4.16	1,150	4	5.49	2,800	4	2.59	504	8	1.82	217
11	4.41	1,320	5	5.10	2,450	8	2.53	476	12	1.83	220
12	5.08	1,800	6	4.82	2,250	N	2.48	455		Apr. 8	
	Mar. 30		7	4.60	2,020	4	2.45	442	6	1.80	211
1	4.62	1,460	8	4.40	1,820	8	2.41	425	N	1.77	203
2	4.57	1,430	9	4.27	1,690	12	2.46	446	6	1.76	200
									12	1.78	205

Willowemoc Creek at Debruce, N. Y.

Location.--Lat 41°54'45", long 74°43'35", on right bank just downstream from Mongaup Creek, at Debruce, Sullivan County, and 0.2 mile upstream from Frog Hollow. Datum of gage is 1,637.13 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--40.9 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 2,300 cfs and extended on basis of logarithmic plotting.

Maxima.--March-April 1951: Discharge, 9,480 cfs 10:30 p.m. Mar. 30 (gage height, 7.01 ft).
1948 to February 1951: Discharge, 7,780 cfs Nov. 25, 1950 (gage height, 6.25 ft), from rating curve extended above 1,500 cfs on basis of logarithmic plotting.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	151	Mar. 31	2,040	Apr. 3	429	Apr. 6	218
29	633	Apr. 1	700	4	301	7	239
30	2,610	2	553	5	239	8	249

Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8	697
Runoff, in inches	7.60

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28		6	4.85	2,360	2	4.50	1,350	N	3.72	429
12	2.81	133	7	4.78	2,210	3	4.46	1,290	4	3.69	407
2	2.80	130	8	4.66	1,950	4	4.43	1,240	8	3.65	380
4	2.79	128	9	4.52	1,680	5	4.39	1,180	12	3.61	354
6	2.79	128	10	4.44	1,530	6	4.36	1,140		Apr. 4	
8	2.78	125	11	4.38	1,430	7	4.33	1,090	4	3.56	324
10	2.78	125	N	4.34	1,360	8	4.30	1,050	8	3.53	306
N	2.79	128	1	4.30	1,300	9	4.28	1,020	N	3.50	289
2	2.83	139	2	4.27	1,250	10	4.26	993	4	3.51	295
4	2.89	156	3	4.30	1,300	11	4.23	952	8	3.49	284
6	2.98	185	4	4.36	1,390	12	4.19	900	12	3.47	274
8	3.01	196	5	4.49	1,620		Apr. 1			Apr. 5	
10	3.03	203	6	4.80	2,250	2	4.16	863	4	3.44	259
12	3.04	207	7	5.26	3,370	4	4.11	801	8	3.42	249
	Mar. 29		8	5.61	4,360	6	4.08	767	N	3.39	235
2	3.06	214	9	5.88	5,210	8	4.04	722	4	3.38	230
4	3.08	222	10	6.28	6,600	10	3.99	668	8	3.38	230
6	3.10	229	10:30	7.01	9,480	N	3.97	648	12	3.36	222
8	3.12	237	11	6.80	8,620	2	3.96	638		Apr. 6	
10	3.14	246	12	6.38	6,980	4	3.97	648	6	3.33	209
N	3.19	267		Mar. 31		6	4.00	678	N	3.30	196
2	3.43	389	1	6.08	5,550	8	4.00	678	6	3.37	226
4	3.88	745	2	5.76	4,420	10	4.00	678	12	3.40	239
6	4.08	979	3	5.52	3,670	12	3.98	658		Apr. 7	
8	4.40	1,460	4	5.37	3,250		Apr. 2		6	3.38	230
9	4.55	1,730	5	5.25	2,930	4	3.92	599	N	3.34	213
10	4.45	1,550	6	5.13	2,630	8	3.90	579	6	3.43	254
12	4.68	1,990	7	5.02	2,370	N	3.87	553	12	3.48	279
	Mar. 30		8	4.92	2,150	4	3.84	526		Apr. 8	
1	4.73	2,100	9	4.83	1,960	8	3.85	535	6	3.42	249
2	4.72	2,080	10	4.75	1,800	12	3.83	517	N	3.37	226
3	4.65	1,930	11	4.69	1,690		Apr. 3		6	3.43	254
4	4.82	2,300	N	4.60	1,520	4	3.79	483	12	3.45	264
5	4.87	2,410	1	4.54	1,420	8	3.76	460			

Willowemoc Creek near Livingston Manor, N. Y.

Location.--Lat 41°54'15", long 74°48'50", three-quarters of a mile upstream from highway bridge in Livingston Manor, Sullivan County, and 1½ miles upstream from Little Beaver Kill. Datum of gage is 1,455.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--63 sq mi, approximately.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 640 cfs and extended on basis of slope-area determination at peak stage.

Maxima.--March-April 1951: Discharge, 10,500 cfs 12:15 a.m. Mar. 31. (gage height, 9.01 ft).
1937 to February 1951: Discharge, 8,130 cfs Nov. 26, 1950 (gage height, 8.38 ft).

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	249	Mar. 31	3,120	Apr. 3	615	Apr. 6	336
29	1,060	Apr. 1	996	4	471	7	344
30	4,020	2	749	5	395	8	361
Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8							1,060
Runoff, in inches							7.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28		2	5.57	3,290	9	4.77	2,750	N	2.05	620
4	1.40	221	3	5.62	3,340	10	4.56	2,540	6	1.97	581
8	1.37	211	4	5.75	3,490	11	4.38	2,360	12	1.86	529
N	1.36	208	5	5.92	3,690	N	4.23	2,210		Apr. 4	
4	1.49	252	5:30	5.95	3,730	1	4.11	2,100	6	1.77	488
8	1.67	318	6	5.93	3,710	2	3.99	1,990	N	1.70	456
12	1.72	337	7	5.88	3,650	3	3.88	1,890	6	1.70	456
	Mar. 29		8	5.71	3,430	4	3.82	1,840	12	1.66	438
1	1.73	341	9	5.48	3,190	5	3.76	1,790		Apr. 5	
2	1.74	345	10	5.23	2,920	6	3.68	1,720	6	1.60	412
3	1.75	350	11	5.04	2,730	7	3.61	1,670	N	1.55	390
4	1.77	358	N	4.90	2,590	8	3.52	1,600	6	1.52	378
5	1.78	362	1	4.79	2,490	9	3.45	1,540	12	1.48	361
6	1.79	366	2	4.71	2,410	10	3.37	1,480		Apr. 6	
7	1.81	374	3	4.70	2,400	11	3.30	1,420	6	1.44	344
8	1.83	383	4	4.82	2,510	12	3.22	1,360	N	1.40	328
9	1.85	392	5	5.09	2,780		Apr. 1		6	1.37	316
10	1.87	400	6	5.79	3,540	4	2.97	1,180	12	1.46	353
11	1.90	413	7	6.71	4,760	8	2.75	1,030		Apr. 7	
N	1.96	440	8	7.21	5,560	N	2.56	909	4	1.45	348
1	2.10	506	9	7.71	6,500	4	2.47	853	8	1.42	336
2	2.34	632	10	8.24	7,720	8	2.53	890	N	1.40	328
3	2.73	857	11	8.81	9,630	12	2.50	871	4	1.38	320
4	3.20	1,160	12	9.01	10,500		Apr. 2		8	1.48	361
5	3.59	1,440		Mar. 31		4	2.42	822	12	1.55	390
6	3.85	1,650	12:15	9.01	10,500	8	2.34	775		Apr. 8	
7	4.19	1,940	1	8.34	8,270	N	2.26	730	4	1.53	382
8	4.57	2,280	2	7.83	7,060	4	2.20	697	8	1.48	361
9	4.97	2,660	3	7.09	5,700	8	2.19	692	N	1.44	344
10	5.23	2,920	4	6.54	4,880	12	2.18	687	4	1.42	336
11	5.36	3,060	5	6.04	4,210		Apr. 3		8	1.48	361
12	5.48	3,190	6	5.59	3,670	6	2.11	650	12	1.52	378
	Mar. 30		7	5.28	3,310						
1	5.54	3,250	8	5.02	3,020						

Beaver Kill at Cooks Falls, N. Y.

Location.--Lat 41°56'50", long 74°58'45", 125 ft downstream from highway bridge in Cooks Falls, Delaware County, and 5½ miles downstream from Willowemoc Creek. Datum of gage is 1,151.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--241 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 13,000 cfs and extended on basis of slope-area determinations at gage heights 11.73 and 15.52 ft.

Maxima.--March to April 1951: Discharge, 31,600 cfs 2:15 a.m. Mar. 31 (gage height, 16.02 ft).
1913 to February 1951: Discharge, 29,400 cfs Nov. 26, 1950 (gage height, 15.52 ft), from rating curve extended as explained above.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1951

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Mar. 28	921	Mar. 21	13,300	Apr. 3	2,380	Apr. 6	1,270
29	2,750	Apr. 1	3,800	4	1,810	7	1,220
30	11,000	2	2,860	5	1,510	8	1,230

Mean discharge, in cubic feet per second, for period Mar. 28 to Apr. 8	3,671
Runoff, in inches	6.80

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1951

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Mar. 28			Mar. 30		10	10.27	10,700	N	5.70	2,410
2	3.72	905	1	9.72	9,300	11	9.93	9,820	4	5.61	2,310
4	3.68	883	2	9.88	9,700	N	9.57	8,930	8	5.51	2,210
6	3.65	867	3	9.93	9,820	1	9.29	8,320	12	5.36	2,060
8	3.62	851	4	10.05	10,100	2	9.06	7,830		Apr. 4	
10	3.59	835	5	10.11	10,300	3	8.86	7,410	4	5.23	1,950
N	3.57	824	6	10.19	10,500	4	8.68	7,040	8	5.10	1,840
2	3.58	830	7	10.27	10,700	5	8.52	6,720	N	5.00	1,760
4	3.64	862	8	10.34	10,900	6	8.38	6,440	4	4.95	1,720
6	3.78	939	8:15	10.38	11,000	7	8.25	6,200	8	4.96	1,730
8	3.97	1,050	9	10.30	10,800	8	8.12	5,950	12	4.93	1,700
10	4.13	1,140	10	10.21	10,500	9	7.99	5,710		Apr. 5	
12	4.22	1,200	11	10.03	10,100	10	7.86	5,480	4	4.82	1,620
	Mar. 29		N	9.78	9,450	11	7.75	5,280	8	4.72	1,540
1	4.24	1,210	1	9.55	8,890	12	7.63	5,080	N	4.65	1,490
2	4.26	1,220	2	9.35	8,450		Apr. 1		4	4.58	1,440
3	4.27	1,230	3	9.21	8,140	2	7.45	4,780	8	4.55	1,420
4	4.29	1,240	4	9.11	7,930	4	7.27	4,490	12	4.49	1,380
5	4.31	1,260	4:30	9.06	7,830	6	7.10	4,230		Apr. 6	
6	4.34	1,280	5	9.12	7,950	8	6.94	3,990	4	4.42	1,330
7	4.35	1,280	6	9.28	8,300	10	6.78	3,760	8	4.36	1,290
8	4.39	1,310	7	9.76	9,400	N	6.64	3,570	N	4.30	1,250
9	4.41	1,320	8	10.72	12,100	2	6.52	3,410	4	4.25	1,220
10	4.45	1,350	9	11.64	14,800	4	6.44	3,300	8	4.24	1,210
11	4.49	1,380	10	12.65	18,100	6	6.40	3,250	12	4.31	1,260
N	4.56	1,430	11	13.33	20,500	8	6.44	3,300		Apr. 7	
1	4.67	1,510	12	14.66	25,700	10	6.46	3,330	4	4.35	1,280
2	4.87	1,660		Mar. 31		12	6.45	3,320	8	4.30	1,250
3	5.19	1,910	1	15.42	28,900		Apr. 2		N	4.24	1,210
4	5.64	2,340	2	15.92	31,200	4	6.33	3,160	4	4.18	1,170
5	6.24	3,050	2:15	16.02	31,600	8	6.20	3,000	8	4.15	1,160
6	6.90	3,930	3	15.87	31,000	N	6.06	2,830	12	4.29	1,240
7	7.40	4,700	4	15.22	28,000	4	5.91	2,650		Apr. 8	
8	7.84	5,440	5	14.08	23,400	8	5.84	2,570	4	4.38	1,300
9	8.26	6,210	6	12.76	18,500	12	5.84	2,570	8	4.31	1,260
10	8.66	7,000	7	11.98	15,800		Apr. 3		N	4.25	1,220
11	9.09	7,890	8	11.34	13,900	4	5.80	2,520	4	4.18	1,170
12	9.41	8,580	9	10.73	12,100	8	5.78	2,500	8	4.17	1,170
									12	4.31	1,260

FLOOD OF AUGUST 1947 IN THE CALLICOON CREEK BASIN

Throughout most of the Callicoon Creek basin the flood of August 16 and 17, 1947, was the greatest in the memory of old inhabitants. The rates of peak discharge per square mile for some of the streams were among the highest known in New York. Striking in the night, the flood aroused terror in members of suddenly awakened families, and caused damage in excess of $1 million 9/. Tributaries of Beaver Kill basin, adjoining on the north, also had damaging floods.

Callicoon Creek, on the southwestern edge of the Catskill Mountains, drains into the Delaware River (see fig. 20). Its basin is a maturely eroded part of the Appalachian Plateau and the terrain is moderately rolling to steeply rolling except for a few steep-walled valleys. The range of elevation if from 2,200 feet, a few miles north of Callicoon Center, to 800 feet at Callicoon. Much of the land is farmed, but there are extensive wooded areas.

Precipitation

The flood-producing storm was preceded by two weeks of very hot weather relieved by a number of less thunderstorms. The heaviest rainfall on August 16 apparently occurred along a belt about 4 miles wide across the upper reaches of North Branch and East Branch Callicoon Creek. According to most reports, the rain began about 5:30 or 6 p.m. and continued until about 8:30 p.m. This phase of the storm caused the streams to fill; overflow occurred at many places.

A cloudburst exceeding the first phase in intensity and apparently extending over a larger area was reported to have begun about 10 p.m. and lasted more than an hour. The streams rose to much higher stages, and the timing of runoff from the two phases of the storm may have caused the particularly high rise at some places.

Surging flood waters at Jeffersonville upset the only official rain gage in the flood area, but some chance catches of rainfall were found (table 7). The depths of these as shown on table 7 are adjusted to correspond to the diameter of the openings of the receptacles, because some of the receptacles were not of uniform cross sections. Rainfall data from Weather Bureau stations are given in table 8.

9/ In its issue of Sept. 18, 1947, the Sullivan County Democrat reported about $949,000 damage to roads, bridges, culverts, and other public property.

Table 7.--Chance catches of rain in the Callicoon Creek basin, during the flood of August 16 and 17, 1947

Basin and stream	Rainfall (inches)	Observer	Receptacle
East Branch Callicoon Creek:			
Shingle Brook	8+	Hicks	Milk pail;overflowed at (9:30 p.m.)
Do	8	Hunt	Washtub.
Tributary	9	Jauernick	Straight-sided pail 13 inches deep.
Panther Rock Brook	12	Roser	Straight-sided pail 13 inches deep.
Do	9	Calkins	Milk pail; not quite full.
Do	13+	Daniels	Straight-sided pail; overflowed.
East Branch Callicoon Creek	a 3-4	Wilfert	Weather Bureau observer at Jeffersonville.
North Branch Callicoon Creek:			
The Gulf b/	9+	Wegman	Washtub; overflowed.
Sand Pond Outlet	c 21+	Wehner	Half of a wooden barrel 23½ inches deep--overflowed.
Do	8+	Hahn	Washtub (not quite level); overflowed in less than 1 hour.
Buck Brook	13+	Hornung	Straight-sided pail; overflowed.
Callicoon Creek:			
Callicoon Creek	1¼	Nudorf	Straight-sided pail.

a/ Estimated. Includes 1.80 inches measured at 8:30 p.m. before gage was washed away.
b/ Just over divide, in Beaver Kill basin.
c/ May have included precipitation accumlated for about 2 weeks before storm.

Table 8.--Rainfall in the vicinity of Callicoon Creek Basin, during the storm of August 16-17, 1947
[U. S. Weather Bureau records]

Basin and Location	Rainfall (inches)	Observer
Willowemoc Creek:		
Livingston Manor-	1.55	New York City Board of Water Supply
3 miles north of Livingston Manor-	2.61	----------do.----------
Beaver Kill:		
Craigie Clair----	1.74	----------do.----------
Mongaup River:		
Liberty----------	4.25	Rockland Light & Power Co.
Swan Lake--------	4.04	----------do.----------
Forestine--------	1.40	----------do.----------

Description of Flood

One of the worst effects of the flood was the destruction of roads and bridges. Every bridge along North Branch Callicoon Creek was destroyed or badly damaged. Because flood flows were generally less in the East Branch basin, fewer bridges were lost there even though flow passed around the ends of almost all of them.

A number of dams on North Branch and its tributaries were destroyed, but storage behind these dams were relatively small and the release of the stored water had little effect on flood conditions. Several dams on East Branch and its tributaries were topped but none of the larger dams failed.

Flood Discharge

Indirect measurements of peak discharge at 14 sites are listed in table 9. These measurements show that the Callicoon Creek flood ranks as one of the outstanding floods observed in New York. The unit rate of 1,520 cfs per square mile on Bethlehem Stream tributary is among the highest measured in the State.

Peak discharge data and comparative data for the periods of record of gaging stations in the Callicoon Creek area are presented in table 10. Only the station near the mouth of Callicoon Creek showed unusually high discharge. The peak discharge of 16,000 cfs at that station in August 1947 was the highest in the period of record which began in 1940, and it has not been exceeded to date (July 1957). Old residents report that the flood had not been exceeded in 50 years past.

Table 9.--Peak discharge at miscellaneous sites on streams in the Callicoon Creek basin, New York, during the flood of August 16 and 17, 1947

Site	Stream and place of determination	Drainage area (square mile)	Date	Momentary peak discharge	
				Cfs	Cfs per (square mile)
S	East Branch Callicoon Creek at Midway, 1.2 miles east of Youngsville.	5.25	Aug. 16	2,900	552
T	Panther Rock Brook, 1.2 miles north of Youngsville.	5.42	Aug. 16	3,000	554
U	Briscoe Lake outlet at Briscoe Dam, 3 miles southeast of Jeffersonville.	10.8	Night of Aug. 16-17	1,500	139
V	East Branch Callicoon Creek at Lake Jefferson Dam, Jeffersonville.	31.9	Aug. 17	8,100	254
W	East Branch Callicoon Creek; 1 mile north of Kenoza Lake.	44.3	Night of Aug. 16-17	8,700	196
X	Kenoza Lake outlet at Kenoza Lake -----	11.8	Aug. 17	680	57.6
Y	East Branch Callicoon Creek, 2 miles southeast of Hortonville.	69.6	Night of Aug. 16-17	7,400	106
Z	The Gulf Stream, 2.2 miles northeast of Callicoon Center.	2.11	Night of Aug. 16-17	1,700	806
AA	Bethlehem Stream tributary, 1,000 feet above mouth, 2.2 miles north of Callicoon Center.	.31	Night of Aug. 16-17	470	1,520
BB	Bethlehem Stream tributary, 200 feet above mouth, 2 miles north of Callicoon Center.	.34	Night of Aug. 16-17	430	1,260
CC	Bethlehem Stream, 2 miles north of Callicoon Center.	1.33	Night of Aug. 16-17	1,100	827
DD	North Branch Callicoon Creek at Gossweyler Dam, 1.2 miles east of North Branch.	15.2	Aug. 16	8,300	546
EE	North Branch Callicoon Creek, above Buck Brook at North Branch.	17.4	Night of Aug. 16-17	8,900	511
FF	Buck Brook, 1.2 miles north of North Branch.	4.75	Night of Aug. 16-17	2,300	484

The locations of the gaging stations and of indirect measurements are shown in figure 33. The comparative size of the peak runoff at these points during the flood as shown in figure 34 may be compared with similar graphs (fig. 23, 24, 30 and 31) for the floods of November 25-26, 1950, and March 30-31, 1951.

Details of the stage and discharge of Callicoon Creek, which were recorded at Callicoon during the flood, are presented in the following tables, the use and contents of which are explained on page 217.

Flood Frequency

The procedures used in deriving these graphs are outlined on pages 267-275. The graphs are not extended below a drainage area of 20 square miles because basic data were few for the smaller areas.

Table 10.--Summary of flood discharges at gaging stations in the Callicoon area, New York, of August 16 and 17, 1947

No.	Stream and place of determination	Drainage area (square miles)	Period of record from year shown to 1947	Maximum flood previously known			
				Date	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile
20	Willowemoc Creek near Livingston Manor.	63	1937	Aug. 11, 1938	7.87	6,200	98.4
21	Little Beaver Kill near Livingston Manor.	19.8	1924	Aug. 26, 1928	8.7	2,500	126
22	Beaver Kill at Cooks Falls.	241	1913	Mar. 13, 1936	15.02	21,300	88.4
31	Callicoon Creek at Callicoon.	111	1940	Sept. 27, 1942	6.75	6,500	58.6

No.	Stream and place of determination	Drainage area (square miles)	Period of record from year shown to 1947	Maximum during present flood			
				August 17	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile
20	Willowemoc Creek near Livingston Manor.	63	1937	1 a.m.-------	2.84	849	13.5
21	Little Beaver Kill near Livingston Manor.	19.8	1924	1 a.m.-------	4.45	900	45.5
22	Beaver Kill at Cooks Falls.	241	1913	1 a.m.-------	7.68	5,030	20.9
31	Callicoon Creek at Callicoon.	111	1940	1:45 a.m.----	9.68	16,000	144

In figure 34, the 1947 flood at the Callicoon gaging station on Callicoon Creek plots with an indicated frequency of 50 years. Three points on the southern edge of the flood area plot near or below the 10-year graph line. It is obvious that 11 of the 15 points in figure 34 plot well above the 50-year line and have a relatively small chance of recurrence. The 1947 flood in Callicoon Creek basin is one that can be expected to occur, on the average, once in 2 or 3 generations.

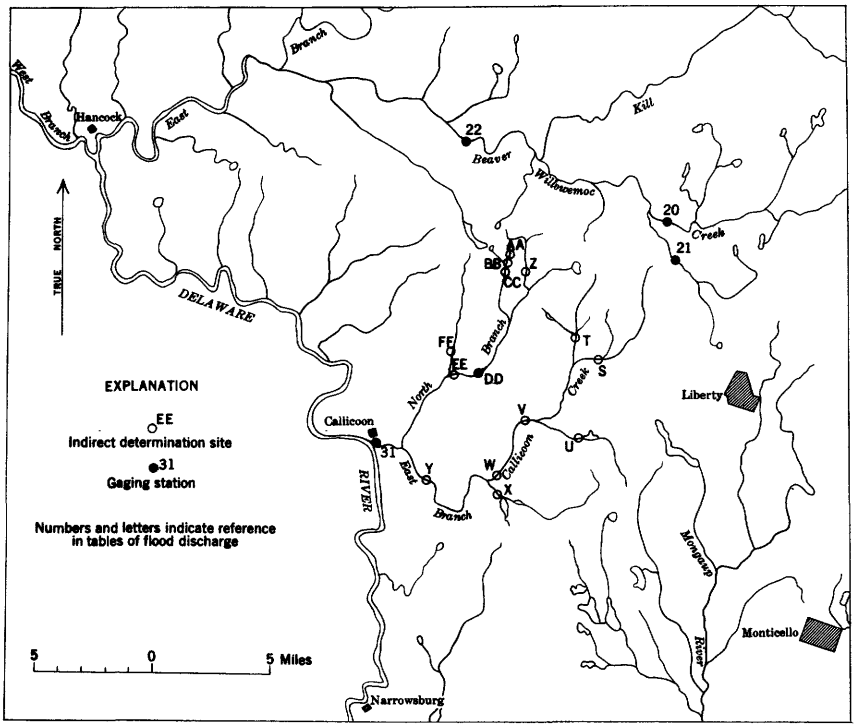

Figure 33.--Map of Callicoon area, New York, showing sites of gaging stations and discharge determinations during the flood of August 16 and 17, 1947.

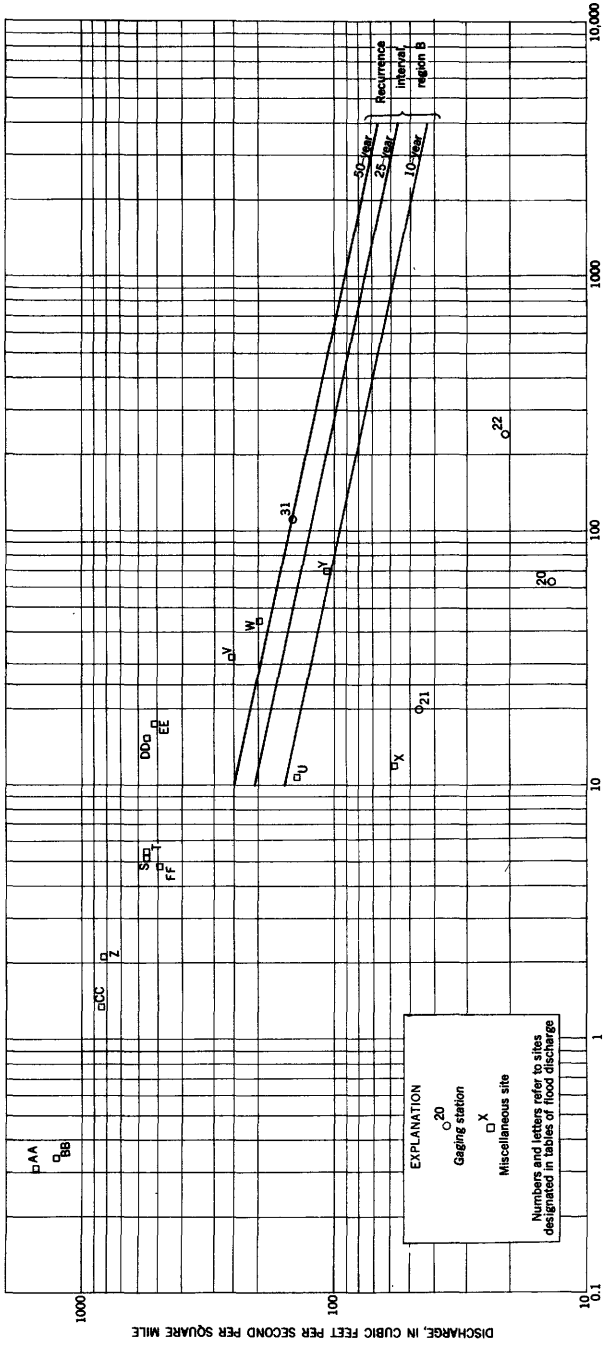

Figure 34.--Relation of unit discharge, size of drainage area, and recurrence-interval for streams in the Callicoon Creek basin, during the flood of August 16 and 17, 1947.

Callicoon Creek at Callicoon, N. Y.

Location.--Lat 41°45'40", long 75°02'55", on right bank 0.7 mile southeast of Callicoon, Sullivan County, 0.9 mile upstream from mouth, and 1.0 mile southwest of Hortonville. Datum of gage is 759.84 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Drainage area.--111 sq mi.

Gage-height record.--Water-stage recorder graph except for period Aug. 19-26, when recorded graph was doubtful and was reconstructed on basis of occasional outside-gage readings.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 500 cfs and extended on basis of slope-area determinations at gage heights 6.75 and 9.68 ft. Shifting-control method used Aug. 17.

Maxima.--August 1947: Discharge, 16,000 cfs 1:45 a.m. Aug. 17 (gage height, 9.68 ft). 1940 to July 1947: Discharge, 6,500 cfs Sept. 27, 1942 (gage height, 6.75 ft), by slope-area method.

Remarks.--Flood flow not affected by storage or diversion.

Mean discharge, in cubic feet per second, 1947

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Aug 15	123	Aug. 18	984	Aug. 21	251	Aug. 24	142
16	321	19	520	22	194	25	123
17	5,550	20	363	23	165	26	109
Mean discharge, in cubic feet per second, for period Aug. 15-26							737
Runoff, in inches							2.96

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1947

Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge	Hour	Gage height	Discharge
	Aug. 15		6	2.05	132	6	4.79	2,180	12	3.09	416
12	2.03	126	7	2.06	134	7	4.70	2,050		Aug. 20	
4	2.03	126	8	2.07	137	8	4.61	1,920	6	3.08	410
8	2.03	126	9	2.07	137	9	4.53	1,800	N	3.02	377
N	2.02	123	10	2.08	140	10	4.45	1,700	6	2.90	315
4	2.01	120	11	4.36	2,260	11	4.38	1,600	12	2.82	277
8	1.98	112	12	5.60	4,640	12	4.31	1,510		Aug. 21	
12	1.98	112		Aug. 17			Aug. 18		6	2.82	277
	Aug. 16		1	8.50	11,600	2	4.18	1,360	N	2.75	246
1	2.00	117	1:45	9.68	16,000	4	4.08	1,240	6	2.68	217
2	2.02	123	2	9.52	15,400	6	4.00	1,150	12	2.66	209
3	2.04	129	3	9.17	14,000	8	3.92	1,070		Aug. 22	
4	2.06	134	4	8.84	12,800	10	3.85	1,000	N	2.62	194
5	2.07	137	5	8.50	11,600	N	3.78	931	12	2.58	179
6	2.07	137	6	7.90	9,680	2	3.73	885		Aug. 23	
7	2.07	137	7	7.12	7,340	4	3.68	840	N	2.54	165
8	2.07	137	8	6.60	5,940	6	3.62	788	12	2.50	151
9	2.07	137	9	6.19	4,940	8	3.57	747		Aug. 24	
10	2.07	137	10	5.93	4,350	10	3.52	707	N	2.47	142
11	2.06	134	11	5.72	3,890	12	3.48	676	12	2.44	132
N	2.05	132	N	5.54	3,520		Aug. 19			Aug. 25	
1	2.05	132	1	5.39	3,230	4	3.40	616	N	2.41	123
2	2.04	129	2	5.25	2,970	8	3.33	567	12	2.39	117
3	2.03	126	3	5.12	2,740	N	3.27	526		Aug. 26	
4	2.03	126	4	5.00	2,530	4	3.18	469	N	2.36	109
5	2.04	129	5	4.89	2,340	8	3.12	433	12	2.34	104

OTHER FLOODS IN THE CATSKILL MOUNTAIN REGION

The written history of the Catskill region began when Hendrick Hudson sailed up the Hudson estuary in 1609 during his search for the Northwest Passage. The voluminous records that have accumulated since that time undoubtedly contain references to many floods but a thorough search for flood dates and narratives was beyond the scope of this report. However, references to a few historical floods are included chronologically with mention of later floods.

Catskill Village, July 26, 1819

A unique report on the fierce storm that hammered the village of Catskill in 1819 was read by its author, Benjamin W. Dwight, to the Catskill Lycaeum. The paper "An Account Of A Remarkable Storm Which Occurred At Catskill, July 26, 1819," was published In 1822 in The American Journal of Science, volume 4. An excerpt from it follows:

***The state of the weather previously to the commencement of the storm was as follows:

The sky was cloudy, the air thick, (to adopt common language) and very sultry; the clouds were low and heavy, the wind flow from the S. W. Debility and languor were generally complained of. No thermometrical, or barometrical observations were made, within my knowledge.

About half past 3 o'clock P. M. three distinct clouds, dense and black, arose in the southeast, in quick succession. A brisk shower followed. A fresh wind blew for a little period; but before 4 o'clock a calm ensued, which lasted nearly an hour. A short suspension of the rain took place soon after 5 o'clock. The whole quantity which had descended between this time, and the commencement of the storm, was considerable. About half past five, another dense and black cloud accompanied by a fresh wind, arose from the S. W. Shortly before the cloud reached the zenith, three vivid streaks of lightning issued from it, appearing like branches of the same flash. These were followed by three very sharp peals of thunder, instantaneously succeeding each other.

About the same time, or immediately after, a very thick and dark cloud rose up rapidly from the N. E. They met immediately over the town. At this instant a powerful rain commenced. The air soon after became so obscure, that trees, and buildings, and other large objects, could not be discerned at the distance of a few yards. The obscurity did

not appear to arise from a fog, of the usual kind; but from the abundance of the rain, and the low descent of the clouds, which appeared to rest upon the ground, or to hang a little above it. After the clouds met, the wind became very veriable, and blew for short periods from almost every point of the compass. At times it came with so much force as to drive the rain in a very unusual manner, through the crevices in doors and windows, and the roofs of dwelling houses. Many houses which had never before been known to leak, at this time admitted great quantities of water. In several instances the wind suddenly abated, and a calm of a few minutes ensued. The lightning and thunder were unusually severe. The thunder frequently resembled a violent crash, and was as sudden, and of as short continuance, as the sound occasioned by the firing of a cannon, or by snapping of a whip. The rain descended at times in very large drops; and at times in streams, and sheets.

During the storm four or five intermissions each of about eight or ten minutes occurred, also in the rain. In each instance it excited a hope that the storm was approaching its termination; but this hope was soon dissipated, by the appearance of fresh torrents. The extreme violence of the rain terminated before half past six o'clock, though it continued to descent with considerable briskness until about nine; and moderately until about ten; and it did not entirely cease until about eleven. The quantity which fell from the commencement to the termination of the storm, it is difficult to ascertain with exactness. It seems probable *** that it exceeded fifteen inches on a level.

A gentleman [observed that] *** the descent of rain was most copious between a quarter before 6 o'clock, and a quarter after 6. In this half hour he estimates the descent of water to have exceeded twelve inches upon a level. ***

The amount of rainfall reported by Dwight in his full account of the storm is extraordinary. It is unfortunate that more information is not available about the size of the containers and the time required to fill them. Even the relatively crude data given in the account of the storm shows that the rainfall was one of the greatest known. The 12 inches in half an hour referred to by Dwight is higher than is recorded as having fallen anywhere else within an hour, according to Linsley. 10/ It is reasonable, therefore, to assume that one of the outstanding storms of historic time occurred in 1819.

10/Linsley, R. K., Kohler, M. A., and Paulhus, J. L., 1949, Applied hydrology: McGraw-Hill Book Co., Inc., New York, p. 105.

Flood of August 1855

Floods in the Callicoon Creek basin were reported by Quinlan 11/:

> On the first of August, 1855, nearly every bridge and dam of the north and east branch of the Callicoon was destroyed by a flood. Horton & Co., William H. Curtis & Co., Inderlied Brothers, and other lumbermen and tanners were losers to large amounts. The damage was estimated at $60,000. *** Other floods occurred in 1857 and in 1869, which destroyed an immense amount of property. The surface of the country will cause the recurrence of similar disasters in this town as well as Fremont.

Chronology

The floods discussed here are included in the list of known floods cited in table 11. The data in table 11 consist of dates of occurrence, the names of streams and areas involved, the relative severity, and the source of the information (see p. 268).

FLOOD FREQUENCY

Data on flood discharge and flood stage when related to flood frequency provide the designers of bridges, highways, and other structures the hydrologic information necessary for sound planning. Designing a bridge in most cases is not a matter of simply making the bridge large enough and strong enough to withstand the greatest flood known or the greatest flood that conceivably can happen. Presumably, a bridge can be designed to withstand the greatest possible flood can be built if cost is no concern. Usually, however, the builder and designer achieve a balance between cost and the demands that will be made upon the structure. If the flood characteristics of a stream have been observed for a number of years, it is possible, by statistical procedures, to plot a flood frequency graph that shows how often a flood of a given magnitude has occurred.

Having such information and knowing that a bridge can be designed to meet any requirements, choice of the "design flood" becomes a question of economics. A designer must decide how much chance he can take that a bridge will be destroyed. Shall he take the chance of having to replace or repair a bridge on the average of once every 5 years, or once every 20 years, or once every 50 years? The initial investment in a smaller bridge may be relatively low but the

11/ Quinlan, J. E., 1875, History of Sullivan County [New York]; Liberty, N. Y., p. 177.

Table 11.--Chronology of selected floods in the Catskill Mountain region, New York

Date	Stream and locality	Source (key at end of table)	Remarks
1792	Neversink River	Quinlan, p. 525	Relative magnitude not stated
1804, Spring	Basher Kill	Quinlan, p. 534	----------
1819, July 26	Catskill Creek at Catskill	Dwight	Severe
1855, July 24	Mongaup River at Liberty	Quinlan, p. 355	----------
1855, Aug. 1	Callicoon Creek, both branches	Quinlan, p. 177	Severe
1857, Feb. 8-18	Delaware River from Callicoon to Barryville	Quinlan, p. 212	----------
	Callicoon Creek	Quinlan, p. 177	Possibly same flood as preceding
1857, May 3 or 4	----------	Quinlan, p. 213	"A considerable loss of property"
1863, Sept. 18	Beaver Kill at Lewbeach (northwest of Roscoe)	Quinlan, p. 509	Washed out cemetery on "high knoll"
1869	Callicoon Creek	Quinlan, p. 177	----------
1870	----------Windham----------	Gallt, p. 494	"A most destructive freshet"
1878, Dec. 10	Esopus Creek at Saugerties	Rafter, p. 474	"Highest known" (1905)
1898	Schoharie Creek at Middleburg	Pindar	Areal extent not known
1901, Spring	Catskill Creek at Cairo	Rafter, p. 474	"Highest known" (1905)
1901, March 21	Schoharie Creek at Schoharie Falls (930 sq mi)	Rafter, p. 483	49,600 cfs, 53 cfs/sq. mi.
1901, April 22	----------do----------	Rafter, p. 484	38,400 cfs
1902, March 1	Catskill Creek at Catskill	Gallt, section on chronology	----------
	Rondout Creek at Rosendale	Rafter, p. 474	"Highest known" (1905)
1903	Catskill Creek in Catskill and Greene County	Gallt, section on chronology	----------
1903, Oct. 10, 11	Delaware River	USGS	Possibly same flood as preceding
1933, Aug. 24	Central Catkill Mountains	WSP 915	Slide Mt. 12.89 inches rain, Peekamoose gage 15.98 inches rain Aug. 20-25; hurricane
1936, March 11-18	Many streams, Catskill region	WSP 799, 915	Storm was general in northeast
1938, July, August	Central Catskill Mountains	USGS	----------
1940, March 31, April 1	Delaware River	WSP 891	----------
1942, May 23	Delaware River below Hancock, N. Y.	Pennsylvania	Extensive in northeastern Pennsylvania; includes Callicoon Creek basin

Sources

Dwight, B. W., 1882, An account of a remarkable storm which occurred at Catskill, July 26, 1819, Am. Jour. Sci. and Arts, v. 4, art. 12.
Gallt, F. A., Dear old Greene County, Catskill, N. Y., 1915.
Pennsylvania, The floods of May 1942 in the Delaware and Lackawanna River basins, Pennsylvania Department of Forests and Waters, and U. S. Geological Survey, 1942.
Pindar, Henry, near Middleburg; family has lived (1953) on west bank of Schoharie Creek for more than 100 years.
Quinlan, J. E., History of Sullivan County, Liberty, N. Y., 1873.
Rafter, G. W., Hydrology of the State of New York, New York State Mus. Bull. 85, 1905
USGS, data available in files of U. S. Geological Survey, Albany, N. Y., and in Water-Supply Papers.
WSP, refers to series of Water-Supply Papers published by U. S. Geological Survey.

replacement and maintenance costs may be high. The initial investment in a bridge designed to withstand floods of great magnitude may be large, but the prorated cost may be small and the average annual maintenance may be less than for a smaller structure.

Actually, it is not quite as simple a problem as stated above because there are other factors to be considered, such as public convenience, safety, the economy of the area, military necessity, and appearance. However, the records of floods on a stream provide the basic data for many designs, and it may not be wise to disregard data in favor of expediency.

There are 40 stream-gaging stations in the Catskill Mountain region. Of these, 22 have records of at least 15 years and 5 of 40 years or more. The records provide an excellent base upon which to develop flood-frequency studies for the region. It is possible also to make flood-frequency graphs for each gaging station. These latter graphs are also useful, but their limitations must be recognized. It is more important to produce a composite characteristic for the entire region by combining statistically the flood records of the stations.

A flood-frequency study was made for the area shown in figure 35, but only a very general outline of the procedures used is presented here 12/. Tabulations were made of the highest flood for each year of record for the 22 gaging stations with 15 years of record (1937-52), and a frequency graph was drawn for each station. These graphs were combined to form a composite curve. A similar composite curve for the same 15-year period was made for the 5 stations that had 40 years of record. The two composite curves furnished ratios by which the short-term records (15 years) could be related to the long-term records (40 years) after separate and composite flood-frequency graphs that covered the entire 40 years of record (1912-52) had been drawn for the 5 stations. The ratios were applied to this composite curve to make a final composite curve for the 22 stations that would, in effect, attribute to each a record of 40 years. The final curve (fig. 36) is plotted with the recurrence interval as abscissa. The ordinate is calibrated in "ratio to mean annual flood"--a dimensionless notation that makes the curve generally applicable to streams in the region (within the range of drainage areas sampled).

Another graph, of mean annual flood plotted against drainage areas, is shown in figure 37. It was found that the stations group

12/ Details of the procedures will be presented in a report on floods in New York (in progress July 1957).

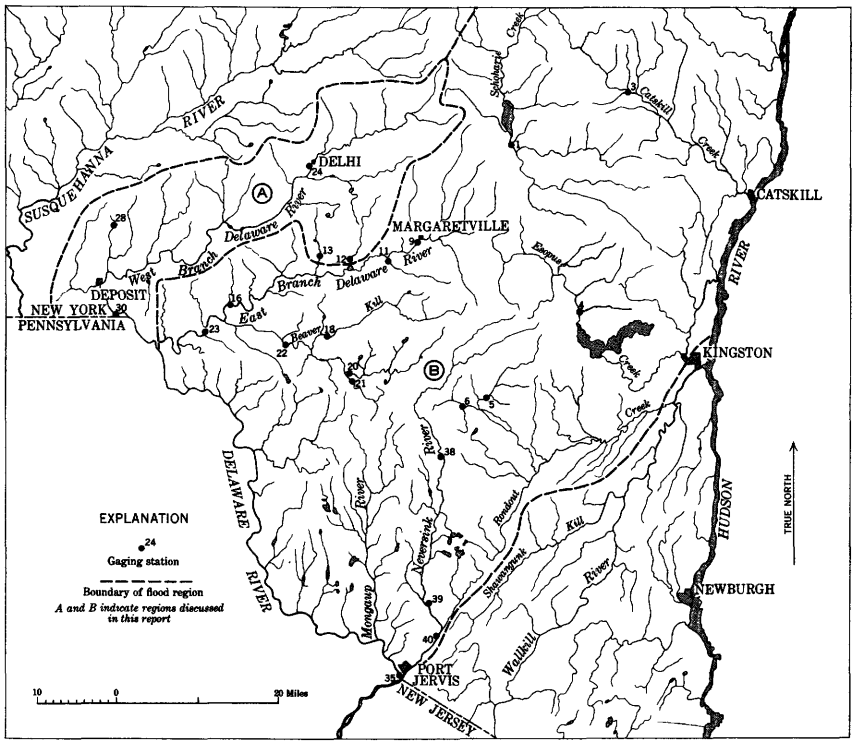

Figure 35.--Topographic flood areas in the Catskill Mountain region.

in a way that makes two graphs appropriate 13/. One curve (A) is for the West Branch Delaware River basin and part of the East Branch basin. It is possible that the proposed comprehensive flood-frequency study for New York will show that this area extends into the Susquehanna River basin. The second curve (B) is for the rest of the Catskill Mountain region. The grouping of the plotted points probably reflects differences in geology and topography. The area to which each curve is applicable is shown in figure 35.

The map and the two graphs (figs. 35-37) can be used to determine the magnitude of floods of a particular frequency for points on streams in the Catskill Mountain region. First, find the point in question on the map (fig. 35) and determine the drainage area (from topographic maps). Second, enter figure 37 with the drainage area and find the mean annual flood for the point. Third, enter figure 36 with the selected frequency and find the ratio of a flood

13/ Stations 1 and 4--Schoharie and Esopus Creeks--may define a third curve but supporting data are inadequate to define it with certainty. They plot close enough to curve A, however, to be identified with area A.

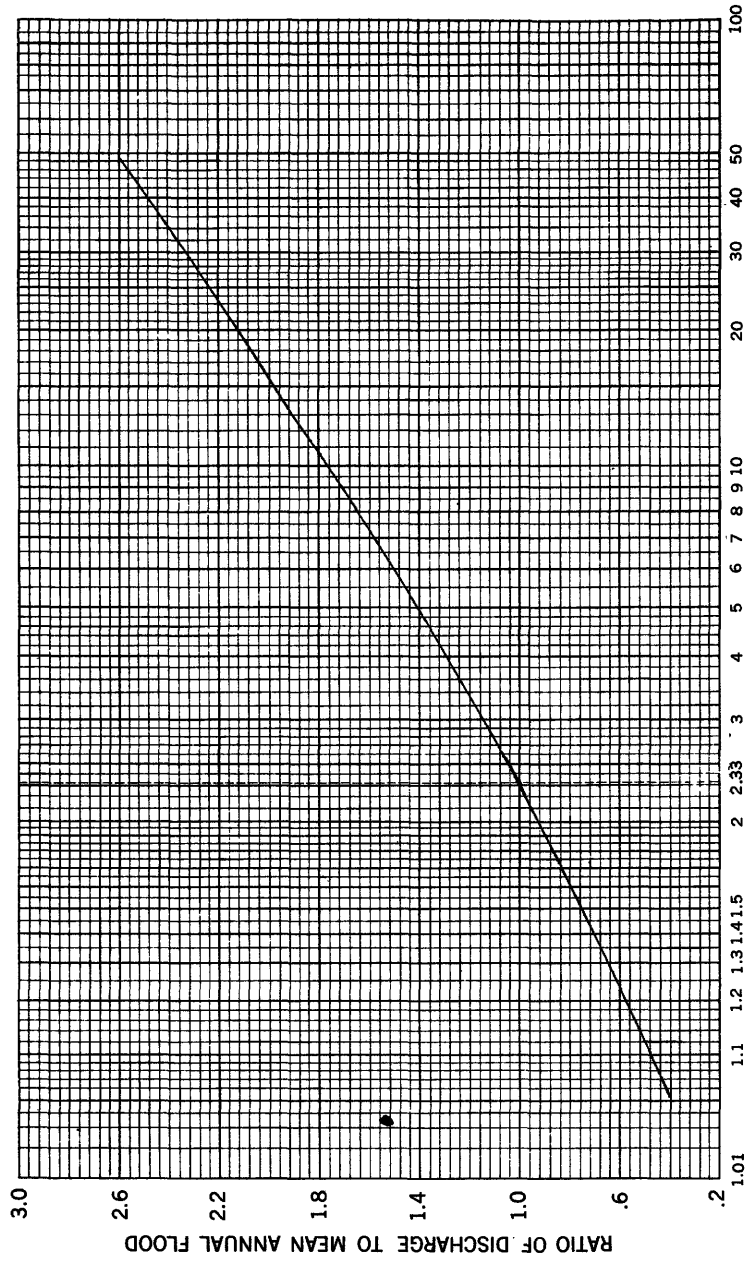

Figure 36.--Composite flood-frequency graphs for the Catskill Mountain region.

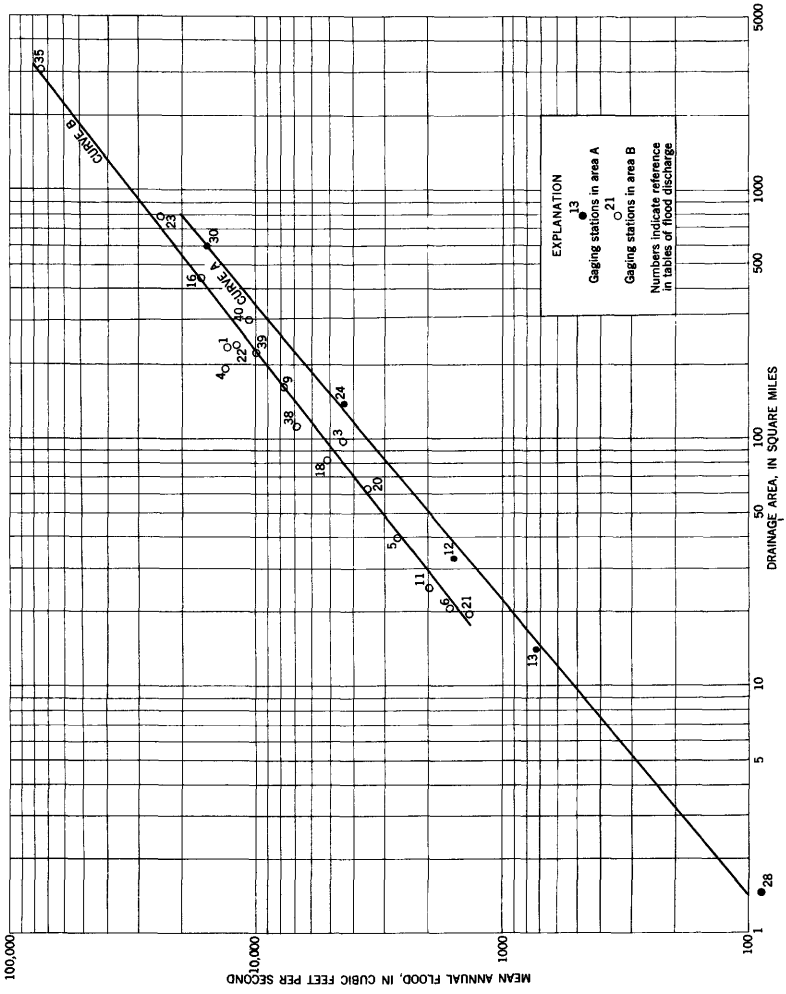

Figure 37.--Relation of mean annual flood to drainage area for topographic areas A and B in the Catskill Mountain region.

of that frequency to the mean annual flood. Finally, multiply the mean annual flood by this ratio to obtain the probable discharge of a flood of the selected frequency on the stream in question.

The use of figures 36 and 37 is subject to limitations. Curve B (fig. 37) is well defined for drainage areas as small as 20 square miles and should not be extrapolated for use with smaller areas. Curve A is defined to 1.5 square miles but should be used with caution below about 10 square miles.

The conclusions made in this restricted study are subject to possible modification during development of the comprehensive study for New York that will use all available data on this and adjoining areas. This study can be useful, however, to engineers, hydrologists, and designers who need flood-frequency information on streams in the Catskill Mountain region. Figures 36 and 37 were used in the evaluation of the several floods described in this report.

The effect of topography and geology on peak discharge of streams can be shown by comparing data for Catskill streams with data for a stream just southeast of the Catskill Mountain region. Wallkill River rises in and flows through flat to moderately rolling country, with only a small area of mountains in the basin. An areal flood-frequency study of the Wallkill River basin has not yet been made; so the graph of flood frequency at the Gardiner gaging station has been used for comparison (graph not reproduced here). This shows that the peak flow that occurred at Gardiner on the average of once in every 10 years was about 18,000 cfs from a drainage area of 711 square miles. Assuming a stream of the same drainage area in topographic area B of the Catskill region and using figures 36 and 37, the "10-year flood" is shown to be 43,000 cfs. This demonstrates that studies developed for this region should not be applied outside of it--not even to points nearby.

Another way of presenting annual flood data is shown in a graph of floods of Esopus Creek at Coldbrook (fig. 38), which was plotted on the basis of the annual maximum discharge during the water year, October 1 to September 30, from 1914 to 1951. It would be essentially the same if the calendar year had been selected as a basis except that both recent high floods would have been shown rather than just the higher--the March 1951 flood--because the November flood was the highest during the calendar year 1950 and the March flood was the highest during the calendar year 1951.

The bar graph shows much the same information as a recurrence-interval graph for a specific site, except that the recurrence-interval graph is plotted by order of magnitude and the bar graph is plotted chronologically. Comparison of the two might suggest that floods on Esopus Creek are becoming increasingly severe, but it

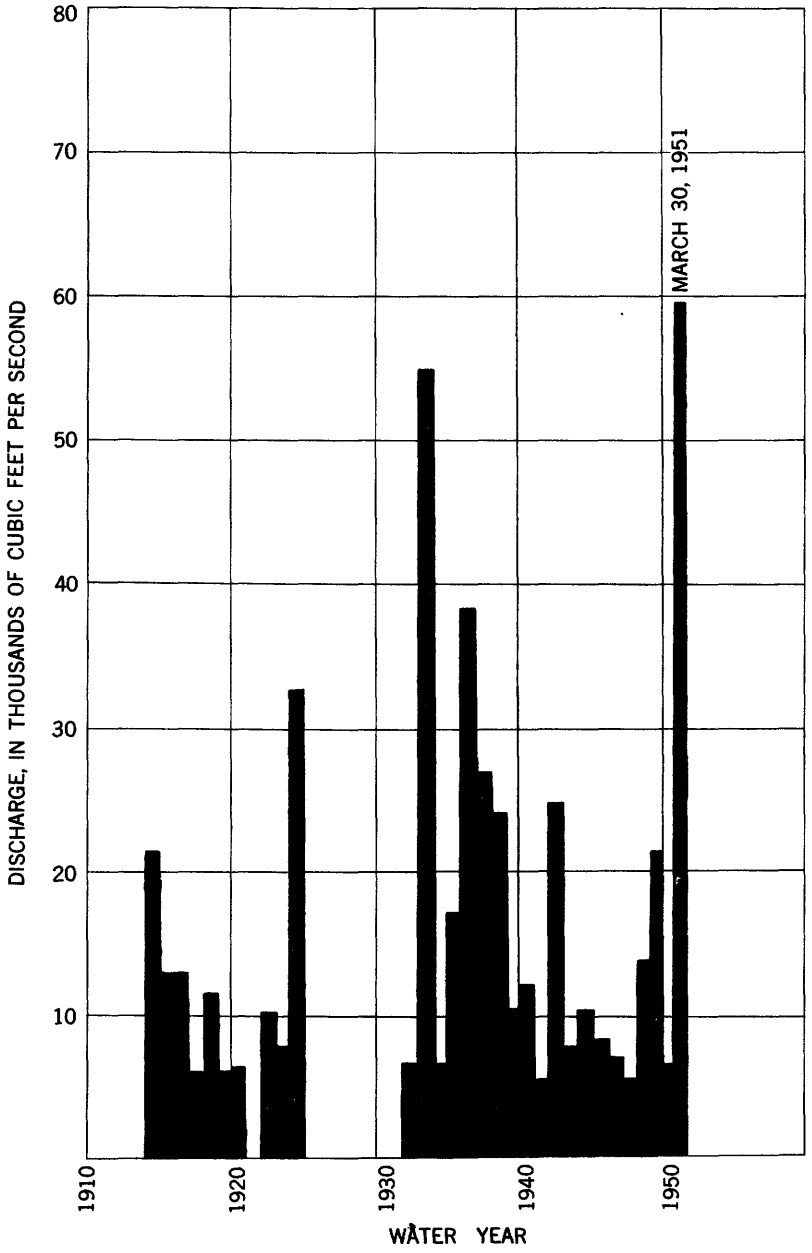

Figure 38.--Graph of the annual maximum discharge of Esopus Creek at Coldbrook, N. Y.

must be remembered that each graph has its limitations and that it would be unwise to assume increasing severity.

The record of Esopus Creek is incomplete for 1921 and 1925-31, but it is known that no flood occurred in these years that was greater than the 1951 flood. Therefore, the use of the flood of 1951 as the highest known is not invalidated.

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Summary of Floods in the United States During 1951

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch*

FLOODS OF 1951

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1227–D

Prepared in cooperation with Federal, State, and local agencies

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1957

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

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PREFACE

This report on the summary of floods in the United States during 1951 was prepared by the Geological Survey, Water Resources Division, C. G. Paulsen, chief, under the direction of J. V. B. Wells, chief Surface Water Branch.

The continuing investigations of surface-water resources in the areas covered by this report are made by the Geological Survey in cooperation with State agencies, the Corps of Engineers, the Bureau of Reclamation, and other Federal or local agencies.

The basic data and information were collected by the district offices of the Surface Water Branch, in those districts where the floods occurred.

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SUMMARY OF FLOODS IN THE UNITED STATES DURING 1951

ABSTRACT

One of the greatest and most destructive floods of the century occurred in 1951—the July flood in Kansas and Missouri. Losses caused by that flood were about five times the total flood losses in the United States during 1950. Total flood losses in the United States during 1951 were about $1 billion, according to figures compiled by the Weather Bureau from all available sources, and 51 lives were lost.

The major floods in 1951 were largely confined to a small number of States in the southeastern and midcontinental United States. Localized floods were widely scattered. One feature of the year, however, was the absence of late-season floods; no floods of any consequence occurred after mid-September.

INTRODUCTION

The purpose of this summary chapter to the series "Floods of 1951" is to assemble into a single volume information relating to all known severe floods in the United States, whether local or of wide areal extent. For floods that are described in previous chapters of Water-Supply Paper 1227 or in Water-Supply Paper 1139, in other publications of the Geological Survey, or in reports prepared by other Federal and State agencies, only brief mention, including references to the reports containing detailed descriptions, is given herein. Local floods for which no individual reports have been prepared are briefly described.

The report on the Kansas and Missouri floods of July was published as Water-Supply Paper 1139 rather than as a chapter of Water-Supply Paper 1227. The collection of field data and compilation of records presented in Water-Supply Paper 1139 were made possible through a special appropriation by the 82d Congress. For that reason it seemed preferable to issue the report as a separate water-supply paper.

According to figures compiled by the Weather Bureau from all available sources, flood losses in the United States in 1951 amounted to nearly $1,029,000,000, and 51 persons lost their lives.

Figure 39 is a map of part of the United States on which the areas covered by the chapters in this series and by Water-Supply Paper 1139 are delineated. A summary of flood peaks, listed alphabetically by States, for the floods that are not included in those reports is given (see table).

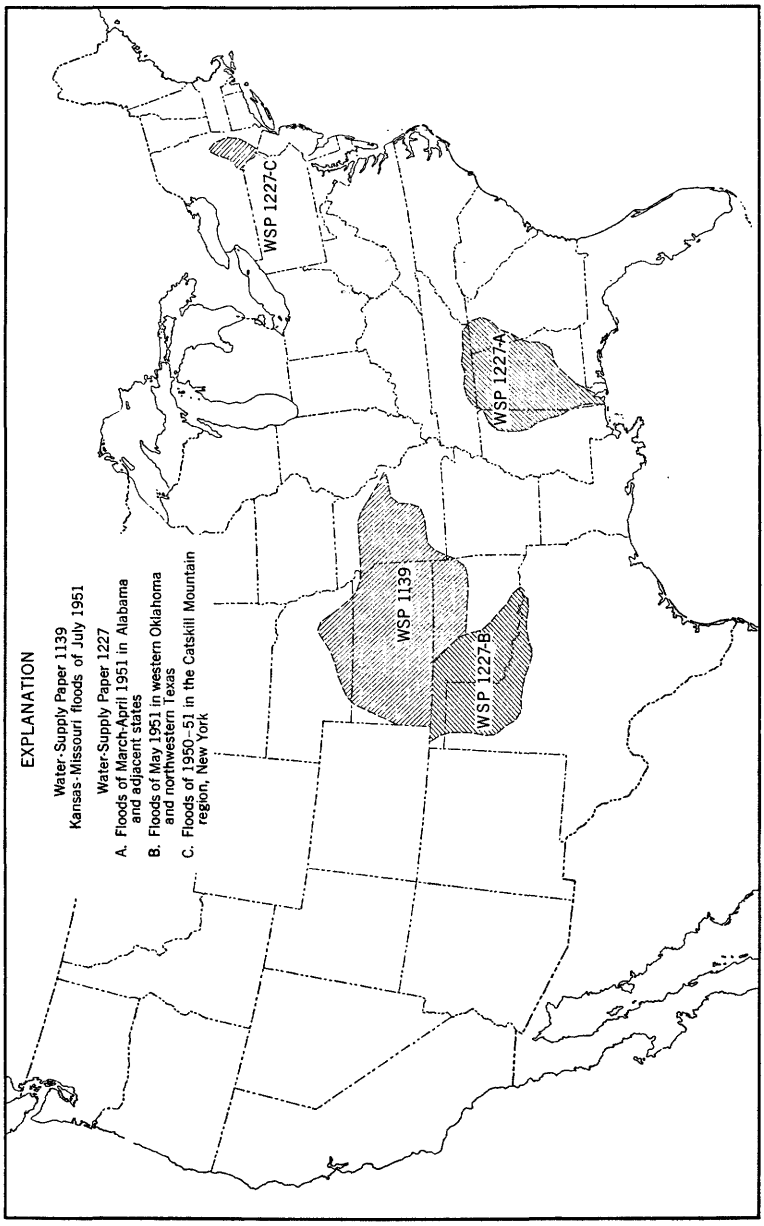

FIGURE 39.—Map of the United States showing outline of areas for which reports on floods occurring in 1951 were prepared.

SUMMARY OF FLOODS

ALABAMA

Substantial floods on many streams in Alabama and adjacent States were caused by the general storm of March 27–30. High flood crests occurred on most streams in the Mobile River basin and on several streams nearby in the basins of Tennessee, Pascagoula, Pearl, and Mississippi Rivers. At 32 gaging stations in the area the crest discharge for the flood exceeded the previously recorded maxima. These floods were the subject of Water-Supply Paper 1227–A, "Floods of March–April 1951 in Alabama and adjacent States."

CALIFORNIA

Severe thunderstorms on July 28 which followed a number of local storms in the previous week produced minor flooding on ungaged drainage basins in the Palm Springs area. Property damage to homes was heavy in the very flat alluvial fan areas near Palm Springs and Palm Desert, as well as to highways and other utilities there.

Gaging stations on Tahquitz, Palm Canyon, and Andreas Creeks, did not show excessively high flows. Although the drainage area above the gaging station on Coyote Creek near Barrego Springs has not been determined, the discharge at that point indicates that the discharge in cubic feet per second per square mile was much greater in Coyote Creek than in the other three streams (see table).

COLORADO

May.—Rainfall amounting to 8 inches in the southeastern corner of the State caused damaging floods on May 15 in the vicinity of Springfield and Holly. This rainfall was part of the same general storm that covered western Oklahoma and the Texas Panhandle, and that caused the floods described in Water-Supply Paper 1227–B, "Floods of May 1951 in western Oklahoma and northwestern Texas." The map shown on plate 2 of that report includes the southeastern corner of Colorado and shows isohyetal lines for the period May 13–19; Springfield is almost in the center of the area of Colorado shown on that map. There are no gaging stations in the immediate vicinity of Springfield, but an indirect determination of discharge of Clay Creek, a small tributary to Arkansas River, was made near Lamar and about 45 miles north of Springfield (see table).

August.—Cloudburst floods occurred on several streams in the foothill area between Fort Collins and Estes Park on August 3. Peak discharge of Buckhorn Creek exceeded the previous maximum that occurred in June 1923 (see table).

Buckhorn Reservoir was washed out; the valley below was flooded—six lives were lost and property damage was heavy. Bijou Creek near Wiggins, normally dry, reached the highest peak discharge since

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1935. The peak discharge in 1935 probably was greater, although it was not determined. The flood of May 30–31, 1935, on Bijou Creek is described in Water-Supply Paper 997, "Floods in Colorado," pages 68–71. According to an isoheytal map prepared by the Corps of Engineers, maximum rainfall of 10 to 12 inches occurred on August 2 and 3 along a narrow band running eastward for about 10 miles from the mouth of North Fork Cache La Poudre River.

On August 2, the Huerfano River near Redwing, in the Arkansas River basin, reached a peak stage 3.7 feet higher than the previous maximum in a 27-year period (see table).

FLORIDA

Floods occurred in a localized area west of Lake Okeechobee in the southern part of Florida on October 1 and 2. Fisheating Creek at Palmdale reached a peak discharge about double that of any since 1931, and the Imperial River near Bonita Spring exceeded any known peak since 1940 (see table).

Most of the Everglades was covered with several feet of water and runoff was generally high.

GEORGIA

The floods of March-April in northwestern Georgia are reported in detail in Water-Supply Paper 1227–A, "Floods of March-April 1951 in Alabama and adjacent States." (See also Alabama, page 281.) In Georgia, the flood was confined to the northwestern corner of the State, where record-high crests occurred at many gaging stations on the Coosawattee, Conasauga, Chattooga, and Oostanaula Rivers. The peak discharge of the Oostanaula River at Resaca was the greatest in 56 years of record.

ILLINOIS

June.—A series of thunderstorms climaxed by about 4 inches of rain on June 28 at Vandalia and in the Springfield area caused floods on the Sangamon and Kaskaskia Rivers. Levees along the Kaskaskia River at Vandalia were overtopped and broken at six points, flooding a large area of farmland. Near Shelbyville two lives were lost in a train wreck at the bridge over Brush Creek when the approach fill slumped as a result of rain and high water. Some local flooding occurred in Springfield, and near Mason City one life was lost when a car plunged into a creek where the bridge was washed out. The Sangamon River at Riverton and at Oakford reached the highest stage since the floods of May 1943 and April 1944, and runoff was high on tributaries in the Springfield area (see table).

July.—Record-breaking floods occurred in the Vermilion and Mackinaw River basins on July 9 and 10 following rains that exceeded 8 inches in a 6-hour period on 150 square miles of Panther Creek basin

(see table). One death was caused, and crop damage was estimated at more than $2,000,000. A report entitled "The Storm of July 8, 1951, in North Central Illinois," was prepared in cooperation with the Illinois State Water Survey Division and the Soil Conservation Service and published by the Illinois State Water Survey Division as Report of Investigation No. 14.

IOWA

April.—Major floods occurred in the northern half of Iowa during the first 2 weeks of the month as a result of melting of excessive snow cover accompanied by heavy rains. Shell Rock River at Marble Rock, Little Siuox River at Correctionville, and Big Sioux River at Akron produced record peaks (see table).

Floods on the Mississippi River in late April produced extremely high discharges, and damage in the low sections of river towns was large. At McGregor the stage of 20.83 feet was the highest known since 1880 when a stage of about 21 feet was reached. At Clinton the discharge of 221,500 cfs was the greatest since 1880 when 243,000 cfs was recorded. At Keokuk the discharge of 265,100 cfs was the greatest since that of 270,000 in 1903. Daily records of discharge for those stations as well as for other stations on the upper Mississippi River, and other pertinent data are contained in the section on "Previous floods" in Water-Supply Paper 1260–C, "Floods of 1952 in the basins of the upper Mississippi River and Red River of the North."

June.—Record-breaking floods occurred in the Iowa River basin following heavy rains on June 25 and 26 that amounted to more than 8 inches at Allison. Many highways were closed and several road fills and bridges were destroyed. Peak discharge of West Fork Shell Rock River at Finchford was more than twice the previous maximum in June 1947 (see table).

KANSAS

Above-normal precipitation in Kansas during May and June caused some local floods, and established conditions favorable for maximum runoff from subsequent precipitation. During the period July 9–13, heavy precipitation occurred throughout eastern and central Kansas, amounting to 16 inches or more at several points near the divide of the Kansas and Neosho River basins and south of Manhattan. The resulting floods in the Kansas, Neosho, and Marais des Cygnes River basins were the greatest of record although higher stages probably occurred in 1844. The July 1951 flood on the Missouri River below the Kansas River exceeded any that has occurred since 1844.

The July flood in Kansas and Missouri was among the most destructive of record. Figures of flood losses compiled by the Corps of Engineers total $870,243,000 for the Kansas River basin, the Missouri River from Rulo, Nebr., to its mouth, and the Marais des Cygnes–Osage

River basin. Statistics compiled by the American Red Cross show that 19 persons lost their lives either directly or indirectly as a result of the floods. The floods are reported in detail in Water-Supply Paper 1139, "Kansas-Missouri floods of July 1951."

The U. S. Weather Bureau published two reports on the July storm and flood: "Some aspects of the heavy rains over eastern Kansas, July 10–18, 1951," which appeared in the July 1951 issue of Monthly Weather Review; and Technical Paper No. 17, "Kansas-Missouri floods of June–July 1951." The former reference contains information on the meteorology of the storm; the latter contains data on precipitation and river stages, a summary of flood damage, and a meteorological analysis.

KENTUCKY

January.—Unusual floods occurred January 14–16 on several streams in western Kentucky, causing extensive damage at Hopkinsville where the discharge of the Little River almost equaled that of January 1937. In general the floods were greater than those of February 1949 but somewhat less than those of January 1937. Representative peak discharges in the area are shown in the table.

February.—Extreme floods occurred in the upper Cumberland River on February 1 and 2. At Pineville and at Barbourville the peak came within 3 feet of the maximum stage known, causing extensive damage at each place. The discharge in Yellow Creek near Middlesboro almost equaled that of January 1946 (see table), and caused heavy property damage.

MARYLAND

A flood due to a localized cloudburst on July 15 occurred at Pylesville on a small unnamed and ungaged tributary to Broad Creek in the Susquehanna River basin. The discharge determined from a slope-area study was equivalent to 1,110 cfs per square mile, the highest recorded in Maryland (see table). Four lives were lost; monetary loss was low.

MINNESOTA

Record-breaking floods occurred in the Minnesota River basin in April. Damage may have exceeded $10 million, according to preliminary estimates. The peak discharge of the Minnesota River at Mankato was 66,600 cfs as compared with the previous maximum of 43,800 cfs (in 1908) since record began in 1903, and a discharge of about 65,000 cfs known to have occurred in 1881. The floods were caused by melting of snow cover, which was about 28 inches above normal. All towns downstream from Montevideo on the Minnesota River were flooded and damaged. Detailed records of discharge at gaging stations on the Minnesota and Mississippi Rivers are shown in Water-Supply Paper 1260–C, "Floods of 1952 in the basins of the

upper Mississippi River and Red River of the North" in the section "Previous floods."

MISSISSIPPI

The floods of March–April 1951 in the Tombigbee River basin are reported in detail in Water-Supply Paper 1227–A. See also Alabama, page 281. Extreme flooding was confined mostly to the Tombigbee River and its tributaries along the east edge of the State.

MISSOURI

The great July flood is reported in detail in Water-Supply Paper 1139, "Kansas-Missouri floods of July 1951." See also Kansas, page 283. Although the most extensive flooding occurred in Kansas, the greatest concentration of damage was in the Kansas City area of Kansas and Missouri. Flooding from Kansas City downstream along the Missouri River was mostly confined to small communities and agricultural lands. The town of Wakenda was completely inundated. Between Kansas City and the mouth of the Missouri River, 973,000 acres of agricultural land was inundated.

NEBRASKA

May–June.—Severe flooding occurred in the basins of Wahoo and Silver Creeks and Big Blue River as a result of heavy rains on May 30 to June 1. Maximum peak discharges of record occurred at some places (see table). Heavy rains were general throughout a large part of southeastern Nebraska. More than 5 inches of rain fell in the David City and Schuyler areas on the night of May 30; and on June 1, Lincoln and an area to the south received more than 4 inches of rain. On June 27, a flood occurred on the Little Blue River near Endicott that produced the greatest discharge of record (see table).

July.—Floods of July in the Big Blue and Republican River basins are described in Water-Supply Paper 1139, "Kansas-Missouri floods of July 1951."

NEW JERSEY

Local floods occurred in the Passaic and Hackensack River basins on March 30 and 31, causing some damage to new small homes on the flood plains. The peak discharge of the Wanaque River at Wanaque was the highest in 32 years of record, and the peak discharge of the Blue Mine Brook was the highest in 18 years of record, being twice that of the previous maximum in 1938 (see table).

NEW YORK

Two notable floods occurred in the Catskill Mountain region within a period of 4 months—the first on November 25–26, 1950, and the

second on March 30–31, 1951. Some of the streams in the region were higher during the November flood and others were higher during the March flood. Estimates indicate that damage caused by each flood may have been about $2 million. These floods are described in Water-Supply Paper 1227–C, "Floods of 1950–51 in the Catskill Mountain region, New York."

Flash floods occurred at widely scattered places in the State during the summer. These floods were caused by thunderstorms, and covered both large and small areas.

July.—Thunderstorms were general over a large part of the State on July 18 and 19. The Weather Bureau reported that overall damage from wind and water exceeded $1 million, probably a major part of which was caused by wind.

Flash floods occurred in the Oneida area on July 18 and 19, and in the Deposit area on July 28 (see table). A flash flood on Newton Brook at Bainbridge on July 19 caused considerable damage to small bridges and to private property, but no determinations of discharge were made.

August.—Thunderstorms over a considerable part of the State on August 16 caused damages estimated to exceed $1 million, according to the Weather Bureau. As in the July 18 and 19 storms, much of the damage was caused by the wind. Flash floods occurred on Otsquago Creek in the vicinity of Fort Plain and in the Schenectady-Mechanicville area (see table).

NORTH DAKOTA

The floods of July 28 and 29 in the headwaters of North Fork Grand River are described under the section on "South Dakota." The results of two indirect determinations are shown in the table.

OKLAHOMA

Floods occurred in the western part of the State as a result of heavy rains during May 13–19. Near Custer City a total of 18 inches of rain fell within a 12-hour period, according to information furnished by a local resident. Although flood discharges in the major streams generally did not exceed previous floods of record, discharges on some of the smaller streams draining areas of heavy storm centers were the highest known. These floods are described in Water-Supply Paper 1227–B, "Floods of May 1951 in western Oklahoma and northwestern Texas."

SOUTH DAKOTA

March–April.—The greatest flood in recent years on the Big Sioux River in South Dakota occurred during March 30 to April 15. The flood was caused primarily by rapid melting of a heavy snow cover,

augmented by ice jams and some rainfall. The river overflowed its banks almost the entire distance from Brookings to the mouth.

About 73,500 acres of land was inundated and many miles of county and State highways were damaged. The Corps of Engineers estimated the direct damages at about $1.5 million and indirect damages at about $500,000. The major flooding occurred in and near Sioux Falls, where the airport was entirely flooded and hundreds of families were evacuated.

The maximum daily discharge at Sioux Falls on April 6 was more than twice the previous maximum in a record beginning in 1943 (see table).

July.—Unit rates of discharge in the headwaters of the North and South Forks of the Grand River were among the highest known in that region resulted from an intense rainstorm and hailstorm between 6 and 11 p. m. on July 28 (see table). There were no official rain gages in the area of downpour, which extended from about 6 miles north of the North Dakota–South Dakota State line to about 7 miles south of the line, but several observations of 5 to 7 inches of rain were made, and an observation of 10 inches was made at Table Mountain, S. Dak.

Many sections of county roads, including bridges and culverts, were washed out. The area is sparsely settled, which minimized damages. There were fairly sharp lines of demarcation at the north and south limits between the area hit by the deluge and the areas where precipitation was not enough to cause noticeable runoff.

TENNESSEE

March–April.—The floods of March-April are described in Water-Supply Paper 1227–A, "Floods of March-April 1951 in Alabama and adjacent States." The same general storm caused the highest discharge of record at two gaging stations on the Tellico River in Monroe County, outside the area covered by Water-Supply Paper 1227–A (see table).

September.—A severe storm of limited area with rainfall exceeding 4 inches in an hour occurred in the Little Pigeon River drainage basin at Mount LeConte in the Great Smoky Mountains National Park during the evening of September 1. A flash flood on West Fork Little Pigeon River came upon the tourist town of Gatlinburg without warning. The flood reached its crest between 7:15 and 7:30 p. m., and had largely receded by 8 p. m. Damage in and near Gatlinburg exceeded a quarter of a million dollars, most of which was damage to the park highways. Measurements of the flood discharge on West Fork Little Pigeon River are listed in the table.

TEXAS

May.—Floods occurred May 15–17 in the basins of the Red and Canadian Rivers, following rains that exceeded 10 inches in many places. Peak discharges were the greatest known on some of the smaller tributaries in areas of heavy storm centers, but not on the major streams. The May storm was preceded by a relatively dry period and most of the runoff was stored in the numerous small closed basins. The floods are described in Water-Supply Paper 1227–B, "Floods of May 1951 in western Oklahoma and northwestern Texas."

June.—Floods that broke all known records occurred on June 5 in tributaries to Red Deer Creek in the upper Washita River basin, and in small streams tributary to North Fork Red River (see table). One life was lost and much damage was done to highways and small dams.

September.—Floods occurred on September 14 and 15 in the coastal plains following a storm that covered all of Texas south of latitude 29° and east of longitude 99°. These floods were the greatest known at many places, particularly in the Baffins Bay drainage area; however, unit discharge was generally small owing to the flat relief of the coastal plains. Indirect determinations of discharge were made at four places (see table).

Rainfall ranging from 5 to 21 inches fell over an area of more than 26,000 square miles. Nearly all the rain fell within 48 hours during September 13–15. On September 13 as much as 7.65 inches of rain fell between 7 and 10 a. m., and 14 inches fell between 5 a. m. and midnight. Rainfall of 15 to 21 inches fell on 1,240 square miles, and more than 10 inches fell on 4,750 square miles.

Much damage was done to highways and railways, and to the towns of Alice, Kingsville, Falfurrias, Driscoll, and Bishop. The Corps of Engineers estimated total damages at $1,500,000.

WASHINGTON

Floods of considerable magnitude occurred during February 9–12 on many streams in the western part of the State, although on most streams the peaks were not as great as those of February 1932, December 1933, or November 1949 (see table). The floods were caused principally by heavy precipitation with some snowmelt, which resulted in a greater proportion of runoff at lower elevations.

Damages exceeded $3 million, according to estimates by the Corps of Engineers, with most of the damage in the lower basins of the Chehalis, Green, Snohomish, Stillaguamish, Skagit, and Nooksack Rivers.

WISCONSIN

The greatest flood since 1914 occurred in the lower Kickapoo River as a result of more than 8 inches of rain in about 6 hours at Viroqua on July 21 (see table). Six lives were lost, and 52 bridges were re-

ported damaged in Vernon County. Damage to crops was extensive in Vernon, Richland, and Crawford Counties.

SUMMARY OF FLOOD STAGES AND DISCHARGES

The table that follows is a summary of flood stages and discharges, listed alphabetically by States and chronologically within States, for local floods that are not reported in the individual chapters of Water-Supply Paper 1227 or in Water-Supply Paper 1139. The table includes results of determinations of maximum flood flows at existing stream-gaging stations and other places on streams in the areas affected by the floods.

During major floods, the maximum stage at a gaging station may be so high above the stage of the highest measurement previously obtained that an extension of the stage-discharge relation curve is not feasible; furthermore, during floods it is often impossible to obtain current-meter measurements at a gaging station for several reasons. At such gaging stations and at other points where measurement of the flood discharge was desired the maximum discharge was computed by indirect methods: contracted-opening determination; computation of flow over dams; computation of flow over embankment; and slope-area determination. In the table the figures of peak discharge for the floods of 1951 that were computed by these indirect methods are followed by a symbol that is explained in a headnote.

Gaging stations and other points can be identified in the table by the entry in the column "Period of record": a period of record is shown for all gaging stations; leaders in the column indicate that no record of discharge has been collected systematically at that point.

Figure 40 shows the flood discharges, in cubic feet per second per square mile, which are listed in the table, plotted against the corresponding drainage areas. The figure provides a convenient method for comparing flood discharges from drainage basins that differ widely in size, although it does not bring out the comparative influence of topographic or other basin characteristics that may influence flood discharge. Some of the discharges may be affected by artificial regulation. Discharges less than 10 cfs per square mile were not plotted.

Discharge is expressed in terms of some power of the drainage area, ranging from about 0.5 to 0.8 in many extreme-flood formulas. For the convenience of those who use a flood formula expressing the discharge in terms of the square root of the drainage area, lines representing ratings of 30, 50, and 100 on the Myers scale [1] are drawn in figure 40. Using the Myers scale as a measure, the discharge of Neosho River in Kansas during the great July flood was among the most outstanding of the year (see Water-Supply Paper 1139). Points for three gaging stations on Neosho River are plotted in figure 40.

[1] National Resources Committee, Low Dams, 1938, Washington, D. C., p. 32–33.

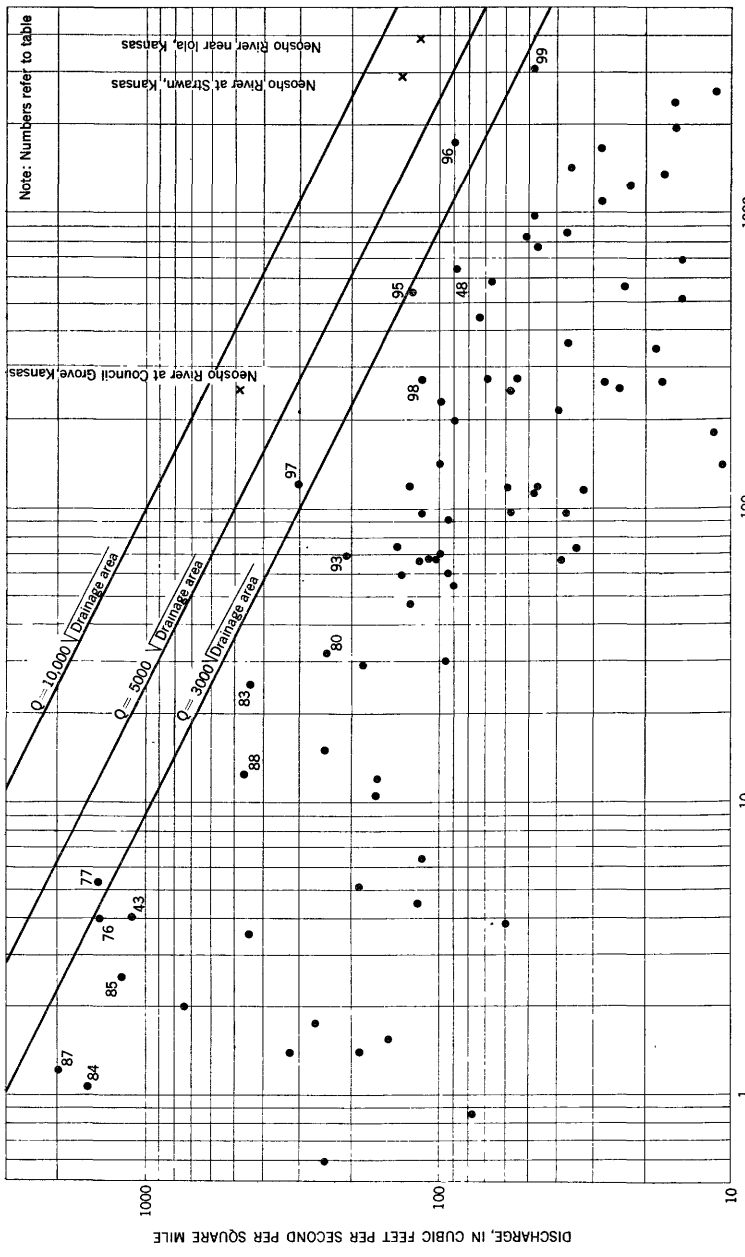

FIGURE 40.—Relation of unit discharge to size of drainage basin.

Summary of flood stages and discharges for local floods in the United States during 1951

Maximum discharges for the floods of 1951 were obtained from gaging-station records, except as otherwise indicated by the following symbols: A, slope-area determination; B, computed flow over embankment; C, contracted-opening determination; D, computed flow over dam; E, flow through culvert]

No. on fig. 40	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile			Cfs	Cfs per square mile
	CALIFORNIA										
	Salton Sea basin:										
1	Tahquitz Creek near Palm Springs		1947–51	July 22, 1948	3.92	65		July 28	4.15	102	
2	Palm Canyon Creek near Palm Springs.	94.0	1930–42, 1947–51	Feb. 6, 1937	[a] 5.60	3,850	40.9	July 28	4.88	850A	9.04
3	Andreas Creek near Palm Springs	8.78	1948–51	Feb. 6, 1950	2.22	21	2.39	July 28	2.41	50	5.70
4	Coyote Creek near Borrego Springs		1950–51					July 28	14.14	3,800A	
	COLORADO										
	Arkansas River basin:										
5	Clay Creek 5 miles east of Lamar							May 15		27,500A	
6	Huerfano River at Manzanares crossing near Redwing.	73	1923–51	July 27, 1934	4.30			Aug. 2	8.14	10,200A	140
	Platte River basin:										
7	Buckhorn Creek at Masonville	140	1947–51	June 15, 1923		[b] 10,500A	75.0	Aug. 3	13.40	14,000A	100
8	Cottonwood Creek near Pinewood	15.1	1947–51	June 4, 1949	3.11	330	21.8	Aug. 3	5.91	2,260A	150
9	Big Thompson River near Loveland.	515	1947–51	June 4, 1949	7.79	7,750	15.0	Aug. 3	9.45		
10	Big Thompson River at mouth near La Salle.	818	1914, 1927–51	June 5, 1949	7.46	4,440	5.43	Aug. 4	7.80	6,100	7.46
11	Bijou Creek near Wiggins	1,420	1950–51			[c]		Aug. 3	10.22	50,100	35.3
	FLORIDA										
	Lake Okeechobee and the Everglades:										
12	Fisheating Creek at Palmdale	435	1931–51	Sept. 19, 1947	[d] 11.06	16,400	37.7	Oct. 3	12.44	31,400	72.2
13	Imperial River near Bonita Springs		1940–51	June 15, 1936	13.4	[c]		Oct. 2	12.74	2,810	
				Sept. 12, 1940	[d] 12.45	2,890					

See footnotes at end of table.

Summary of flood stages and discharges for local floods in the United States during 1951—Continued

No. on fig. 40	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile			Cfs	Cfs per square mile
	ILLINOIS										
	Illinois River basin:										
14	Sangamon River at Riverton	2,560	1908–12, 1914–51	May 19, 1943	[f] 31.52	68,700	26.8	June 29	23.46	29,000	11.3
15	South Fork Sangamon River at Kinkaid.	510	1917–33, 1944–51	June 6, 1917	[f] 26.9	26,200	51.4	June 30	22.72	7,590	14.9
16	Flat Branch near Taylorville	268	1949–51	Jan. 5, 1950	16.77	9,400	35.1	June 29	16.02	7,350	27.4
17	North Fork Mauvaise Terre Creek near Jacksonville.	30.0	1949–51	Feb. 19, 1951	9.01	1,250	41.7	June 28	10.68	2,870	95.7
18	Kaskaskia River at Vandalia	1,980	1908–12, 1914–51	May 18, 1943	24.25	52,200	26.4	June 29		31,000	15.7
								June 29	[g] 27.39		
19	North Fork Vermilion River near Charlotte.	184	1942–51	May 18, 1943	[h] 13.54	2,400	13.0	July 9, 10	15.01	2,180	11.8
20	Vermilion River at Pontiac	568	1942–51	May 1933	[i] 17.0	[i] 11,000	19.4	July 10	[f] 17.90	13,600	23.9
21	Vermilion River at Lowell	1,230	1931–51	Apr. 25, 1950	[f, k] 11.10	23,300	18.9	July 10	12.70	27,700	22.5
22	Hickory Lake above Lake Bloomington.	10.1	1938–51	Aug. 3, 1943	7.12	1,460	145	July 9	7.57	1,690	167
23	East Branch Panther Creek near El Paso.	28.8	1949–51	July 17, 1950	9.27	916	31.8	July 8	14.21	5,300	184
				Feb. 18, 1951	9.30						
24	Panther Creek near El Paso	95.0	1949–51	July 17, 1950	9.57	2,910	30.6	July 9	15.15	10,900	115
25	Mackinaw River near Congerville	764	1944–51	Apr. 30, 1947	16.02	15,500	20.3	July 9	19.41	36,000	47.1
26	Mackinaw River near Green Valley	1,100	1921–51	Apr. 24, 1944	[f] 12.50	26,400	24.0	July 10	13.12	31,000	28.2
	IOWA										
	Iowa River Basin:										
27	West Fork Shell Rock River at Finchford.	860	1945–51	June 13, 1947	[f] 13.7	13,900	16.2	June 27	[d] 17.28	31,900	37.1
28	Shell Rock River at Marble Rock	1,330	1933–51	June 12, 1944	[m] 8.28	15,900	12.0	Apr. 7	9.35	22,700	17.1
29	Cedar River at Cedar Rapids	6,640	1903–51	Mar. 19, 1929	20.1	72,000	10.8	Apr. 11	17.22	54,100	8.15
	Big Sioux River basin:										
30	Big Sioux River at Akron	8,851	1928–51	June 4, 1942	19.23	21,400	2.42	Apr. 6	19.66	28,800	3.2
	Little Sioux River basin:										
31	Little Sioux River at Correctionville	2,450	1918–25, 1928–32, 1936–51	Aug. 5, 1945	21.93	17,000	6.94	Apr. 7	22.58	17,900	7.30

	KENTUCKY											
	Green River basin:											
32	Mud River near Lewisburg	97.3	1939–51	Feb. 14, 1949	[f] 20.8	9,070	93.3	Jan. 14	18.4	5,580	57.4	
33	Pond River near Apex	196	1940–51	Jan. 1937	19.6	(e)		Jan. 15	19.40	17,500	89.3	
				Feb. 15, 1949	18.81	14,800	75.5					
	Tradewater River basin:											
34	Tradewater River at Olney	255	1940–51	Jan. 1937	19.27	17,000A	66.7	Jan. 16	16.39	6,260	24.5	
	Cumberland River basin:											
35	Yellow Creek near Middlesboro	59.9	1940–51	Jan. 7, 1946	20.92	6,160	103	Feb. 1	20.67	5,570	93.0	
36	Cumberland River near Pineville	822	1938–51	Jan. 8, 1946	49.31	57,900	70.4	Feb. 1	46.02	41,200	50.1	
37	Cumberland River at Barbourville	972	1922–31	Mar. 24, 1929	[a] 39.20	50,300	51.7	Feb. 2	[f] 40.25	45,900	47.2	
38	South Fork Little River at Hopkinsville.	46.2	1949–51	Jan. 1937	20.4	(e)		Jan. 14	19.17	5,670	123	
39	Little River near Cadiz	249	1940–51	Feb. 15, 1949	19.58	11,400	45.8	Jan. 14	21.00	14,200	57.0	
	Tennessee River basin:											
40	East Fork Clarks River near Benton.	227	1938–51	Feb. 1937	17.8	(e)		Jan. 15	[f] 16.1	22,400	98.7	
				Feb. 15, 1949	[f] 14.9	10,800	47.6					
	Mayfield Creek basin:											
41	Mayfield Creek near Lovelaceville	211	1938–51	Jan. 1937	21.1	19,800A	93.8	Jan. 15	18.50	8,300	39.3	
				Feb. 15, 1949	19.37	10,900	51.7					
	Bayou de Chien basin:											
42	Bayou de Chien near Clinton	68.5	1939–51	Aug. 31, 1950	[f] 14.30	4,760	69.5	Jan. 15	[f] 15.00	6,880	100	
	MARYLAND											
	Susquehanna River basin:											
43	Broad Creek tributary at Pylesville.	3.96						July 15		4,410A	1,110	
	NEBRASKA											
	Platte River basin:											
44	Salt Creek at Lincoln		1949–51	May 9, 1950	26.05	[n] 27,800		June 2	26.15	28,200		
45	Wahoo Creek at Ithaca	272	1949–51	Feb. 28, 1950	[d] 21.08	5,430	20.0	May 31	22.34	18,900	69.5	
46	Silver Creek at Ithaca	72	1949–51	Feb. 28, 1950	10.80	940	13.0	May 31	12.22	2,450	34.0	
47	Salt Creek near Ashland	1,640	1947–51	May 6, 1949	[d] 14.14	26,100	15.9	June 2	14.72	46,200	28.2	
	Little Nemaha River basin:											
48	Little Nemaha River at Auburn	664	1949–51	May 9, 1950	27.65	164,000BC	247	June 2	24.96	56,800BC	85.5	
	Missouri River main stem:											
49	Missouri River at Rulo	418,905	1949–51	1881	22.9	(e)		June 3	20.9	175,000	.42	
				Apr. 29, 1950	[p] 21.6	185,000	.44					
	Kansas River basin:											
50	Big Blue River near Crete	2,680	1945–51	July 10, 1950	28.74	27,600	10.3	June 3	28.3	25,500	9.51	
51	Little Blue River near Endicott	2,340	1908–15, 1929–51	June 9, 1941	16.23	31,000	13.2	June 27	[q] 16.82	36,800	15.7	
	NEW JERSEY											
	Hackensack River basin:											
52	Hackensack River at New Milford	113	1921–51	Mar. 12, 13, 1936	5.08	2,800	24.8	Mar. 31	6.14	3,660	32.4	

See footnotes at end of table.

Summary of flood stages and discharges for local floods in the United States during 1951—Continued

No. on fig. 40	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile			Cfs	Cfs per square mile
	NEW JERSEY—Continued										
	Passaic River basin:										
53	Cupsaw Brook near Wanaque	4.38	1934–51	Mar. 11, 1936	2.94	536	122	Mar. 30	2.64	521	119
54	West Brook near Wanaque	11.8	1935–51	Mar. 11, 1936	5.80	1,450	123	Mar. 30	6.6	1,900	161
55	Blue Mine Brook near Wanaque	1.71	1934–51	Sept. 21, 1938	1.66	229	134	Mar. 30	2.15	458	268
56	Wanaque River at Wanaque	90.4	1912–15 1919–51	Apr. 7, 1924	[r] 8.01	5,050	55.9	Mar. 31	9.12	8,470	93.8
57	Ramapo River near Mahwah	118	1903–6 1922–51	Oct. 9, 1903 Sept. 22, 1938	[s] 9.8 10.4	[j] 12,400	105	Mar. 31	10.67	6,940	58.8
58	Pompton River at Pompton Plains	355	1940–51	July 23, 1945	16.29	9,690	27.3	Mar. 31	18.75	13,100	36.9
	NEW YORK										
	Streams tributary to Lake Ontario:										
59	Oneida Creek at Oneida	112	1949–51	Mar. 28, 1950	13.78	7,440	66.4	July 18	12.53	5,270	47.1
60	Taylor Creek near Sherrill	3.76						July 19		222E	59.0
61	Ostrander Brook near Jewell	1.35						July 19		437E	324
62	Mud Creek tributary near Bennett Corners.	.85						July 19		65.5E	77.1
	Delaware River basin:										
63	Oquaga Creek at Deposit	66	1940–51	Mar. 22, 1948	9.21	4,400	66.7	July 28	7.11	2,530	38.3
64	Tuscarora Creek tributary at Damascus.	1.35						July 28		255E	189
65	Big Hollow Creek at Deposit	5.00						July 28		932A	186
	Hudson River basin:										
66	Otsquago Creek at Fort Plain	59.2	1949–51	Aug. 31, 1950	8.24	9,030	153	Aug. 16	7.94	8,000	135
67	Otsquago Creek tributary at Van Hornesville.	.074						Aug. 16		53.2E	719
68	Hudson River tributary near Mechanicville.	6.21						Aug. 16		710E	114
69	Hudson River tributary near Waterford.	3.41						Aug. 16		1,530C	449
70	Heck Creek at Niskayuna	.58						Aug. 16		141E	243
	NORTH DAKOTA										
	Grand River basin:										
71	North Fork Grand River near	114						July 28–29		5,300C	46.5

	Bowman.											
72	Tributary of North Fork Grand River near Bowman.	14.9						July 28–29		3,600A	242	
	SOUTH DAKOTA											
	Big Sioux River basin:											
73	Big Sioux River near Dell Rapids		1948–51	Apr. 1, 1950	[t] 11.87	2,800		Apr. 4	14.36	12,300		
74	Big Sioux River at Sioux Falls	5,550	1943–51	Feb. 26, 1944	10.24	5,250	.95	Apr. 6	14.3	[u] 10,600	1.91	
	Grand River basin:											
75	Crooked Creek near Ludlow	67.4						July 28–29		6,800C	101	
76	Middle Fork Crooked Creek near Karinen.	3.9						July 28–29		5,700C	1,460	
77	Camel Creek near Ladner	5.2						July 28–29		7,500A	1,440	
	TENNESSEE											
	Tennessee River basin:											
78	Tellico River at Tellico Plains	118	1925–51	Jan. 20, 1947	11.56	11,300	95.8	Mar. 29	12.82	15,100	128	
79	Tellico River near Vonore	271	1948–51	{Nov. 29, 1948 {Mar. 13, 1950	23.8	11,100	41.0	Mar. 29	25.38	14,900	55.0	
	Little Pigeon River basin:											
80	West Fork Little Pigeon River near Gatlinsburg.	31.5						Sept. 1		7,600A	241	
81	West Fork Little Pigeon River at Banner.	65.0						Sept. 1		7,700A	118	
82	West Fork Little Pigeon River at Banner.	66.7						Sept. 1		7,260D	109	
	TEXAS											
	Arkansas River basin:											
83	Bluff Creek at Miami	24.7						June 5		10,900A	441	
84	Red Deer Creek tributary near Miami.	1.03						June 5		1,610E	1,560	
	Red River basin:											
85	Hackberry Creek west tributary near Wheeler.	2.44						June 5		2,920A	1,200	
86	Hackberry Creek tributary No. 1 at Wheeler.	1.98						June 5		1,460C	737	
87	Hackberry Creek tributary No. 2 at Wheeler.	1.18						June 5		2,340E	1,980	
88	Hackberry Creek near Wheeler	12.1						June 5		5,560A	460	
	Minor Coastal basins:											
89	San Diego Creek 1 mile upstream from Alice.	349						Sept. 14		6,370A	18.3	
90	San Diego Creek at Adam Street in Alice.	353						Sept. 14		[v] 4,350A		
91	Tranquitas Creek at Kingsville	54						Sept. 15		4,790C	88.7	
92	Cibolo Creek at Falfurrias	95						Sept. 15		3,520C	37.1	

See footnotes at end of table.

Summary of flood stages and discharges for local floods in the United States during 1951—Continued

No. on fig. 40	Stream and place of determination	Drainage area (square miles)	Period of record	Maximum flood previously known				Maximum during present flood			
				Date	Gage height (feet)	Discharge		Date	Gage height (feet)	Discharge	
						Cfs	Cfs per square mile			Cfs	Cfs per square mile
	WASHINGTON										
	Chehalis River basin:										
93	Wynoochee River at Oxbow, near Aberdeen.	68	1925–51	Jan. 22, 1935	30.3	18,000	265	Feb. 9, 10	21.1	14,200	209
	Lake Washington basin:										
94	Sammamish River near Redmond	140	1939–51	Mar. 6, 1950	8.35	1,360	9.71	Feb. 11	9.17	1,520	10.9
	Snohomish River basin:										
95	Skykomish River near Gold Bar	535	1928–51	Dec. 21, 1933	21.3	79,000	148	Feb. 10	18.87	65,600	123
96	Snohomish River at Snohomish	1,720	1941–51	1906	[w] 35[j]	[e]		Feb. 10	[x] 30.12	153,000	88.9
	Stillaguamish River basin:										
97	South Fork Stillaguamish River near Granite Falls.	119	1928–51	Feb. 26, 1932	[f] 19.7	26,700	224	Feb. 9, 10	18.10	36,800	309
98	North Fork Stillaguamish River near Arlington.	269	1928–51	Feb. 26, 1932	12.7	27,700	103	Feb. 9	13.46	30,600	114
	Skagit River basin:										
99	Skagit River near Mount Vernon	3,060	1940–51	Nov. 28, 1949	34.21	114,000	37.3	Feb. 11	36.85	144,000	47.1
	Nooksack River basin:										
100	Nooksack River at Deming	580	1935–51	Oct. 25, 1945 Nov. 27, 1949	14.74 15.11	38,000	65.5	Feb. 10	15.69	38,500	66.4
	WISCONSIN										
	Wisconsin River basin:										
101	Kickapoo River at La Farge	266	1938–51	Mar. 27, 1950	11.90	4,260	16.0	July 21	12.32	4,620	17.4
102	Kickapoo River at Steuben	690	1933–51	Aug. 8, 1935	[s] 12.30	8,600	12.5	July 21	13.66	10,300	14.9

[a] Datum then in use.
[b] 1½ miles above station.
[c] Maximum discharge known probably occurred May 31, 1935 (see Water-Supply Paper 997, p. 67–71).
[d] Observed.
[e] Not determined.
[f] From graph based on gage readings.
[g] High stage due to breached levees; discharge of 31,000 cfs occurred about 6 hours later.
[h] Gage height of 13.78 feet occurred on Aug. 4, 1943.
[i] Reported to be highest stage in 30 years prior to establishment of station.
[j] About.
[k] Maximum stage known, about 16 feet during ice jam, date unknown.
[m] Gage height of 8.56 feet occurred Feb. 28, 1948.
[n] May have been equaled or exceeded in discharge by flood of July 6, 1908, which reached a stage of 33.6 feet. Channel changes since 1908 have materially changed stage-discharge relation.
[p] Occurred on April 30, 1950.
[q] Gage height at time of maximum discharge was 16.36 feet.
[r] Site then in use.
[s] Site and datum then in use.
[t] Backwater from ice.
[u] Main channel only.
[v] Not total flow; does not include flow in channel through city of Alice.
[w] From flood profile furnished by Corps of Engineers; no information concerning possible backwater from tide.
[x] Backwater from tide.

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