

**FLOOD OF AUGUST 1953  
IN THE VICINITY OF TYLERTOWN, MISSISSIPPI**

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## CONTENTS

|   | Page |
|---|------|
| Introduction . . . . .                          | 1    |
| General features of August 1953 storm . . . . . | 2    |
| Damage . . . . .                                | 4    |
| Meteorologic conditions . . . . .               | 4    |
| Precipitation . . . . .                         | 7    |
| Discharge . . . . .                             | 7    |
| Previous floods . . . . .                       | 12   |

## FIGURES

|          |  |    |
|----------|--|----|
| Figure 1 | Isohyetal map of flood area . . . . .  | 3  |
| 2        | Dry Creek at Tylertown, at flood crest . . . . .   | 5  |
| 3        | Dry Creek at Tylertown, at flood crest . . . . .   | 5  |
| 4        | Small tributary stream to Bogue Chitto just<br>east of bridge over Bogue Chitto on State<br>Highway 48 . . . . . | 6  |
| 5        | East Fork Hickory Flat at State Highway 24,<br>several hours after flood crest . . . . .                         | 6  |
| 6        | Map of flood area showing places where peak<br>discharges were determined . . . . .                              | 11 |
| 7        | Relation of unit discharges to size of<br>drainage area . . . . .  | 13 |
| 8        | Discharge hydrograph for Bogue Chitto near<br>Tylertown, Miss., and at Franklinton, La. . . . .                  | 14 |

## TABLES

|         |  |     |
|---------|--|-----|
| Table 1 | Rainfall August 21-22, 1953 . . . . .            | 8-9 |
| 2       | Maximum discharges, August 22-23, 1953 . . . . . | 10  |

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**INTRODUCTION**

The United States Geological Survey in cooperation with the Mississippi Highway Department has been studying the surface-water resources and problems of Mississippi as they affect the highway program. One phase of this program is the determination of flood runoff from small drainage areas.

This is the final of two reports on the August 1953 flood; the first or preliminary report was released to the Highway Department as an administrative report in November 1953.

Nearly every year some part of Mississippi experiences a flood of exceptional magnitude that usually results from an intense rainfall over a relatively small area. These storms are difficult to describe satisfactorily, for often there are no official rainfall stations within the region of most intense precipitation, and supplementary rainfall information must be obtained from local residents. Owing to the flashy nature of the floods there is rarely an opportunity for direct measurements of stage or discharge. Discharge rates must frequently be computed by indirect methods, the most common of which are open-channel slope formulas and flow through contracted openings.

Although reports dealing with cloudburst floods may be inadequate in many respects, any available information on such floods is valuable. A record of magnitude of these floods and a study of the history of previous floods is of value in designing engineering structures such as

bridges, levees, dams, and other controlling works, and in planning the complete utilization of the water resources of the region.

Field investigations incident to this report were conducted by members of the staff of the District Office, U. S. Geological Survey, Jackson, Mississippi under the direction of William H. Goines, Hydraulic Engineer. This report was prepared jointly by Mr. Goines and Harry H. Barnes, Jr., Hydraulic Engineer.

### GENERAL FEATURES OF AUGUST 1953 STORM

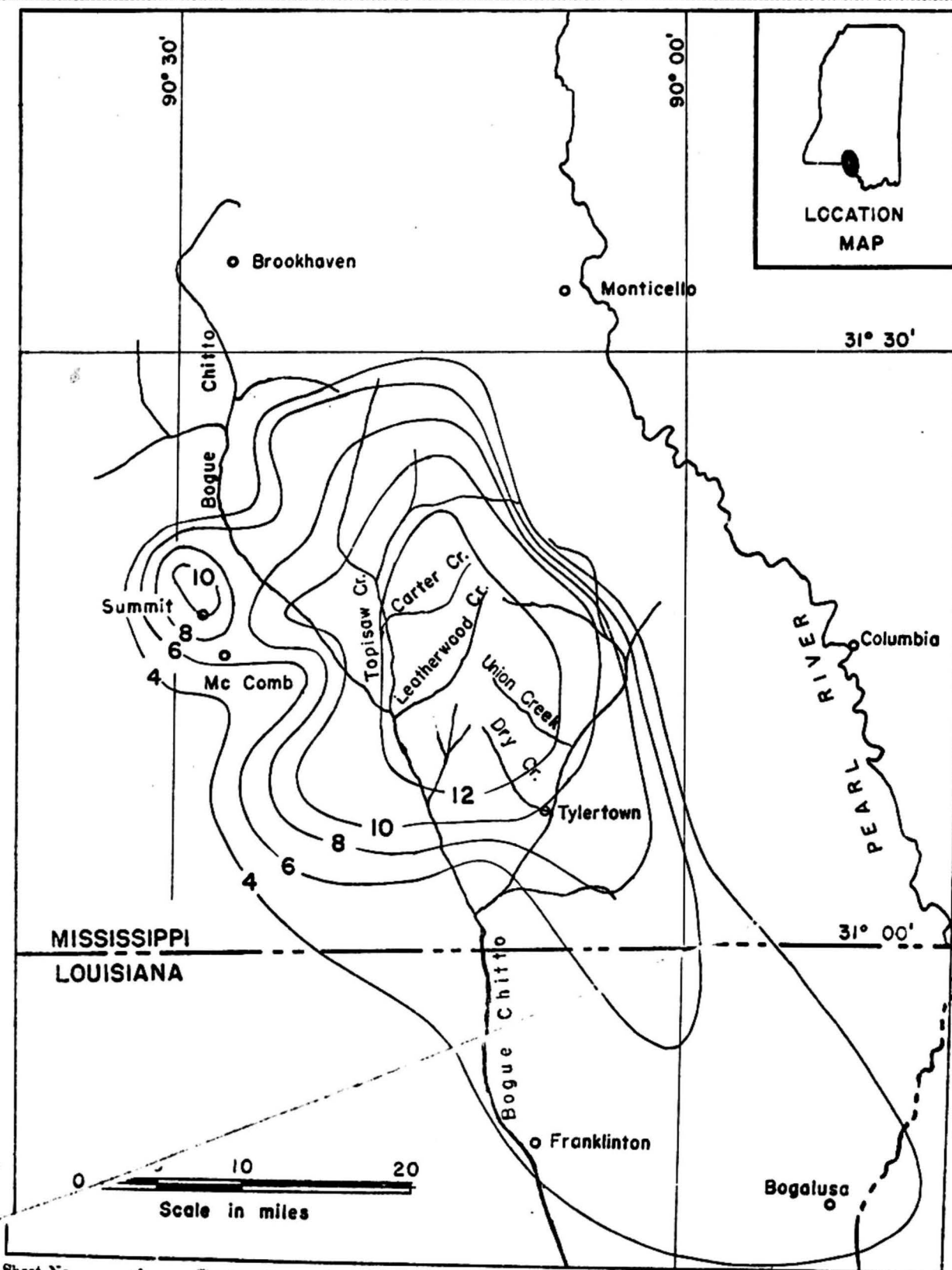
During the night of Aug. 21-22, 1953 heavy rains of cloudburst intensity covered parts of Walthall, Pike, and Lincoln Counties in Mississippi and extended into Louisiana. A field reconnaissance made Aug. 25-28, 1953 revealed that the heaviest rainfall occurred in Walthall County in the watersheds of Topisaw, Carter, Leatherwood, Union, and Dry Creeks and other small creeks in that area. The bulk of the flow at the gaging station on Bogue Chitto near Tylertown came from Topisaw and Leatherwood Creeks. The area of intense rainfall is shown on figure 1.

The following is quoted from the Aug. 27, 1953 issue of "The Tylertown Times":

Part of Tylertown and a wide surrounding area were inundated early Saturday morning by flash floods which followed a downpour of rain which had reached cloudburst proportions.

The flood hit Tylertown about 6:00 o'clock as Dry Creek burst from its banks with stunning suddenness. Earlier flash floods struck four highways leading into the city.

FIGURE 1.- ISOHYETAL MAP OF FLOOD AREA.



The floods resulted from a nightlong rain which reached its extreme between 3 and 5 o'clock. Many oldtime residents compared the flood with the "Fresh of 1900", stating that they had seen nothing like it since that year, until last Saturday.\*\*\*

As a result of flooding of the Tylertown Water Works the city was without water from Saturday morning until 6 a. m. Sunday.

Photographs taken at and near Tylertown on the morning of August 22, 1953 are shown as figures 2-5.

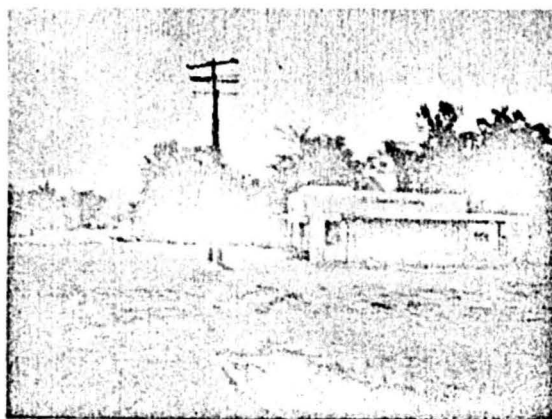
#### DAMAGE

The greatest damage was to roads and bridges; no lives were lost. Estimated dollar value of the damage in Mississippi is shown in the following table:

| Type of property              | Estimate furnished by                  | Damage          |
|-------------------------------|--|-----------------|
| Lincoln Co. roads and bridges | Chancery Clerk                         | \$ 30,000       |
| Pike Co. do do do             | do                                     | 50,000          |
| Walthall Co. do do do         | Board of Supervisors                   | 12,500          |
| Crops - - - - -               | Walthall County Agent                  | 2,000           |
| Private property - - - - -    | do                                     | 5,600           |
| Railroad                      | Fernwood, Columbia,<br>& Gulf Railroad | 10,000          |
|                               |  | <hr/> \$110,100 |

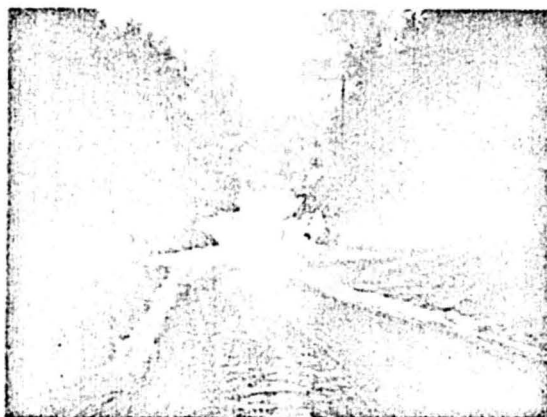
#### METEOROLOGIC CONDITIONS

The following is quoted from a letter dated Sept. 15, 1953 from George V. Fish, Meteorologist in Charge, U. S. Weather Bureau, Jackson,



**Figure 2. -** Dry Creek at State Highway 27 in Tylertown. Photograph taken at crest of flood, 6 a. m. Aug. 22, 1953.

Photo by Tylertown Times.



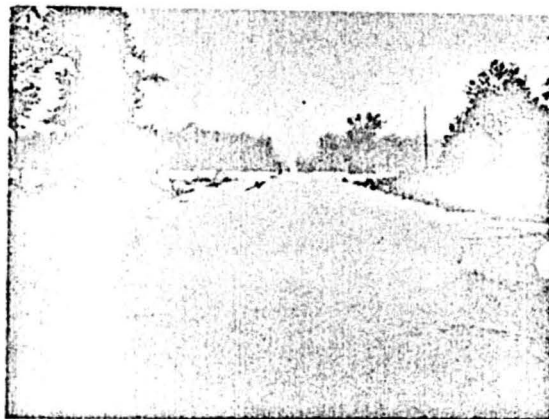
**Figure 3. -** Dry Creek a quarter of a mile downstream from State Highway 27 in Tylertown. Photograph taken at crest of flood, 6 a.m. Aug. 22, 1953.

Photo by Tylertown Times.



**Figure 4. -** Small stream tributary to Bogue Chitto just east of bridge over Bogue Chitto River on State Highway 48, Aug. 22, 1953.

Photo by Tylertown Times.



**Figure 5. -** East Fork Hickory Flat at State Highway 24, 5 miles northwest of Tylertown. At 6 a. m. August 22, 1953 the flood crest was reported to be at top of car (indicated by an arrow).

Photo by Tylertown Times.



## Mississippi:

Beginning August 21, 1953, at about 3:00 P. M., and continuing through noon August 22, concentrated heavy rain occurred over the middle reach of Bogue Chitto watershed in Mississippi and Louisiana. The greatest bulk of the rainfall occurred after midnight of August 21 and ended before daylight on Aug. 22, \*\*\* this rainfall developed from what appeared to be a relatively small and rather weak circulation aloft over South Mississippi and East Louisiana. It appeared to result from a combination of air mass thunder-showers on the 21st and thundershowers produced by isentropic lifting during the early morning of August 22. \*\*\*.

### Precipitation

Soon after the storm an extensive search was made for rainfall information to supplement data furnished by the U. S. Weather Bureau. Measurements made in cans, tubs, washpots, or other vessels are perhaps not highly accurate, but they may be used with confidence when several such measurements in the same locality are found to agree satisfactorily. At many places in the area of intense precipitation, the containers overflowed. These measurements are qualified by a plus sign, for example 12+, indicates that at that point the rain was in excess of 12 inches.

All available rainfall data are given in table 1. Figure 1 is an isohyetal map based on rainfall data given in table 1.

### DISCHARGE RECORDS

Four indirect determinations of peak discharge were made at locations shown on figure 6. Results of these determinations, and discharge at two gaging stations are given in table 2. An estimate of the peak

TABLE 1. RAINFALL AUGUST 21-22, 1953

| No. | Location                             | Type of gage             | Total rainfall (inches) | Remarks                    |
|-----|--------------------------------------|--------------------------|-------------------------|----------------------------|
| 1   | Brookhaven, Lincoln Co.....          | U. S. Weather Bureau...  | 1.90                    | Recording gage.            |
| 2   | Monticello, Lawrence Co.....         | do ...                   | 2.29                    | Non-recording gage.        |
| 3   | Ruth, Lincoln Co.....                | do ...                   | 9.47                    | Recording gage.            |
| 4   | McComb, Pike Co.....                 | do ...                   | 6.08                    | Non-recording gage.        |
| 5   | Columbia, Marion Co.....             | do ...                   | 2.57                    | do                         |
| 6   | Tylertown, Walthall Co.....          | do ...                   | 10.05                   | Recording gage.            |
| 7   | Franklinton, La.....                 | do ...                   | 4.56                    | Non-recording gage.        |
| 8   | Bogalusa, La. ....                   | do ...                   | 4.64                    | do                         |
| 9   | White Sand, Pearl River Co.....      | do ...                   | 2.90                    | Recording gage.            |
| 10  | Brookhaven, Lincoln Co., 8 miles SE. | Childs Wagon.....        | 3.1                     | Computed equivalent depth. |
| 11  | do do 11 miles SE.                   | Test-tube rain gage .... | 4.5                     | ----                       |
| 12  | do 10 miles SE.....                  | No. 2 washtub.....       | 6.5                     | Computed equivalent depth. |
| 13  | Ruth, Lincoln Co., 4 miles NE.....   | No. 3 washtub .....      | about 7                 | Tub 2/3 full.              |
| 14  | McComb, Pike Co., 8 miles NE.....    | Washpot.....             | 8.4                     | Computed equivalent depth. |
| 15  | do do 7 1/2 miles NE..               | do.....                  | 8.5                     | do                         |
| 16  | do do 7 miles NEE...                 | do.....                  | 10.4                    | Container ran over.        |
| 17  | do do 9 miles SE....                 | No. 3 washtub.....       | 11.44                   | do                         |
| 18  | do do 11 miles NE....                | do.....                  | 11.44                   | do                         |
| 19  | do do 10 miles NE....                | Washpot.....             | 10.24                   | do                         |
| 20  | do do 6 miles E....                  | No. 3 washtub.....       | 6.5                     | Computed equivalent depth. |
| 21  | do do 9 miles SE....                 | No. 2 washtub.....       | 9.64                    | Container ran over.        |
| 22  | do do 9 miles SE....                 | Home-made rain gage...   | 11.0                    | ----                       |
| 23  | do do 8 miles S....                  | No. 3 washtub.....       | 10.34                   | Container ran over.        |

TABLE 1 continued on following page.

TABLE 1. (concluded) RAINFALL AUGUST 21-22, 1953

| No. | Location                 |                        | Type of gage               | Total rainfall (inches) | Remarks  |
|-----|--------------------------|------------------------|----------------------------|-------------------------|--|
| 24  | Summit, Pike Co.,        | 4 miles E.....         | Washpot.....               | 10.1                    | Computed equivalent depth.                           |
| 25  | do                       | do 1 mile W.....       | No. 3 washtub.....         | 11.4 <del>f</del>       | Container ran over.                                  |
| 26  | do                       | do 3 1/2 miles N.....  | Washpot.....               | 8.1(a)                  | Computed equivalent depth.                           |
| 27  | do                       | do 4 1/2 miles W.....  | No. 3 washtub.....         | 6.3                     | do   |
| 28  | do                       | do 7 miles NE.....     | Washpot.....               | about 4                 | ----   |
| 29  | do                       | do 5 miles W.....      | -----.....                 | 3                       | Estimated.   |
| 30  | Tylertown, Walthall Co., | 8 1/2 miles N.         | Washpot.....               | 11.4(b)                 | Container ran over.                                  |
| 31  | do                       | do 5 miles N.....      | No. 2 washtub.....         | 10.5 <del>f</del>       | do   |
| 32  | do                       | do 7 miles NNE.....    | No. 3 washtub.....         | 10.5 <del>f</del>       | do   |
| 33  | do                       | do 13 1/2 miles NW...  | 50 lb. lard can.....       | 12.6                    | Straight sided can, near small pine tree.            |
| 34  | do                       | do 3 miles N.....      | Washpot.....               | 10 <del>f</del>         | Container ran over.                                  |
| 35  | do                       | do 4 miles N.....      | 10" bucket.....            | 13 <del>f</del>         | Bucket full at 6 a.m., estimate 3" more after 6 a.m. |
| 36  | do                       | do 3 1/2 miles N.....  | Washpot.....               | 10 <del>f</del>         | Container ran over.                                  |
| 37  | do                       | do 3 miles.....        | No. 3 washtub.....         | 10.3 <del>f</del>       | do   |
| 38  | do                       | do 5 miles NW.....     | No. 2 washtub.....         | 10.3 <del>f</del>       | do   |
| 39  | do                       | do 12 1/2 miles N..... | No. 3 washtub.....         | 10.3 <del>f</del>       | do   |
| 40  | do                       | do 4 miles SW.....     | Small tub.....             | 5.9                     | Computed equivalent depth.                           |
| 41  | do                       | do 12 miles NE.....    | 10 quart bucket.....       | 4                       | Estimated.   |
| 42  | do                       | do 7 miles SE.....     | State Forestry rain gage.. | 8.6                     | ----   |
| 43  | do                       | do 4 miles NW...       | 12" lard can               | 12. <del>f</del>        | Container ran over.                                  |
| 44  | do                       | do 9 miles NE.....     | Washpot                    | 7.4                     | Computed equivalent depth.                           |

(a) Light rain reported 2 1/2 miles north.

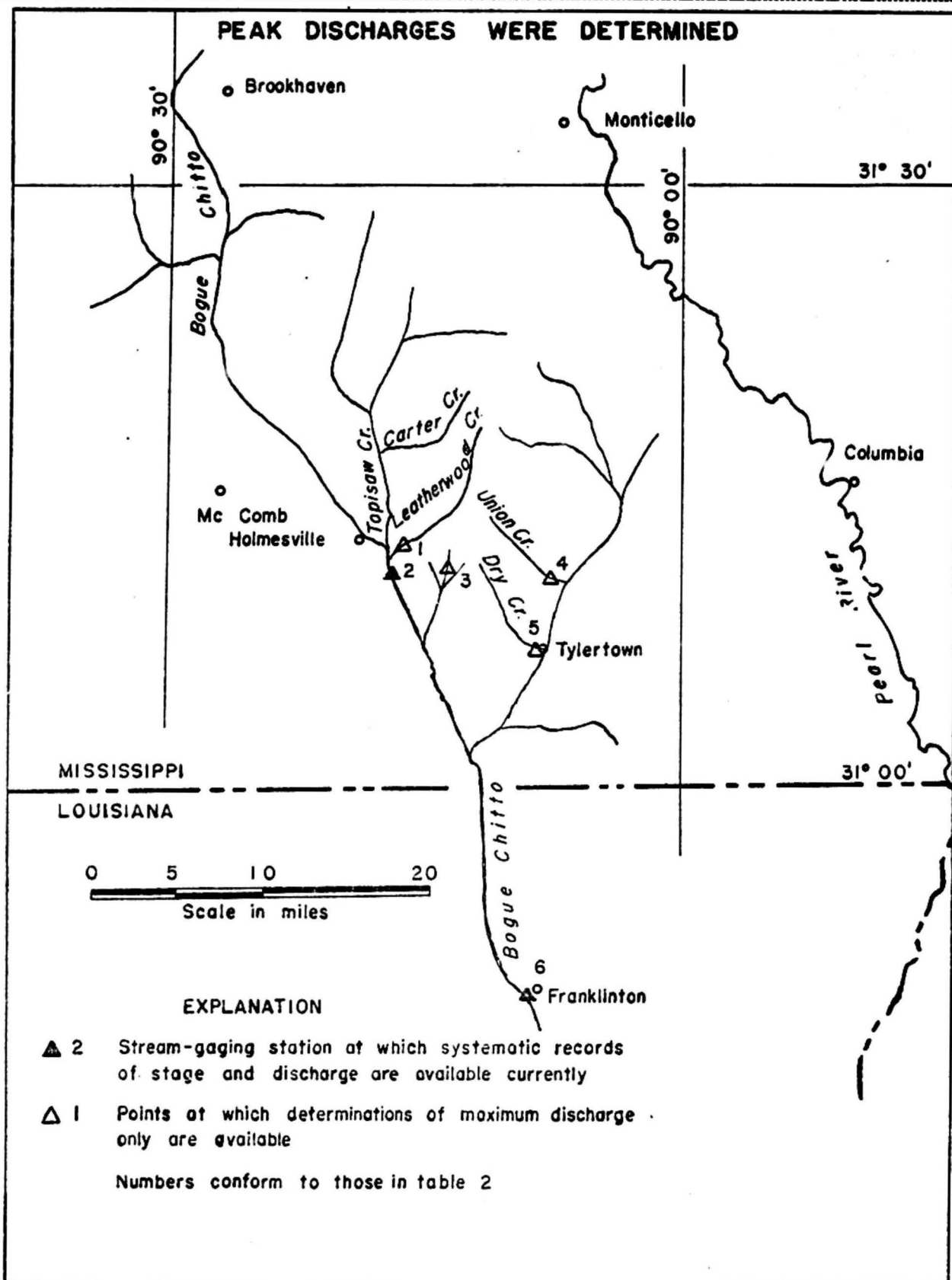
(b) 10.1 inches by 5:30 a. m., Aug. 22.

TABLE 2: MAXIMUM DISCHARGES, AUGUST 22-23, 1953

| Map number on Fig. 6 | Stream and place of determination.  | Drainage area (square miles) | Maximum discharge           |                         | Method of Determination                         |
|----------------------|---|------------------------------|-----------------------------|-------------------------|---|
|                      |   |                              | cfs                         | cfs per sq. mile        |   |
| 1                    | Leatherwood Creek, NW 1/4 sec. 26, T. 3N., R. 9E., 1 mile upstream from mouth, and 2 1/4 miles southeast of Holmesville, Pike County, Miss. | 34.2                         | 27,800                      | 813                     | Slope-area                                      |
| 2                    | Bogue Chitto, sec. 34, T. 3N., R. 9 E., 9 miles NW of Tylertown, Walthall County, Mississippi.  | 502                          | <del>27,500</del><br>34,400 | <del>54.6</del><br>68.5 | Rating curve                                    |
| 3                    | Middle Fork Hickory Flat, on line between sec. 5 and sec. 8, T. 2 N., R. 10 E., 5 1/2 miles NW of Tylertown, Walthall County, Mississippi.  | 1.37                         | 2,300                       | 1,680                   | Contracted opening.                             |
| 4                    | Union Creek, sec. 6, T. 2 N., R. 11 E., 3 miles north of Tylertown, Walthall County, Miss.  | 12.6                         | 12,800                      | 1,020                   | Contracted opening plus computed flow over road |
| 5                    | D. y Creek, sec. 24, T. 2N., R. 10 E., at Tylertown, Walthall County, Mississippi   | 8.4                          | 9,530                       | 1,130                   | Slope-area                                      |
| 6                    | Bogue Chitto, in SE 1/4 SE 1/4 sec. 26, T. 2 S., R. 10 E., three quarters of a mile west of Franklinton, La.                                | 985                          | 38,000                      | 38.6                    | Rating curve                                    |

*Revised in 1950 compilation*

FIGURE 6.- MAP OF FLOOD AREA SHOWING PLACES WHERE



discharge of Bogue Chitto 5 miles northeast of McComb, at a point upstream from the area of intense precipitation, was made by estimating the area from floodmarks, and the velocity from appearance of channel. This estimated discharge is 1,200 cfs from a drainage area of 255 square miles and is given only to give an indication of the runoff from the principal contributing area above the gaging station near Tylertown. The discharge at the gaging stations Bogue Chitto near Tylertown, Mississippi, and Bogue Chitto at Franklinton, Louisiana, was determined from rating curves. The principal contributing drainage area at the gaging station, Bogue Chitto near Tylertown, Mississippi, is the difference in area between the point where discharge was estimated and the Tylertown station, or  $502 - 255 = 247$  square miles. The runoff from this area is about 130 cfs per square mile.

Figure 7 is a graph showing the flood discharges, in cfs per square mile, which are listed in table 2, plotted against the corresponding drainage areas.

A discharge hydrograph showing the characteristics of the flood peak for the flood period has been plotted for gaging stations Bogue Chitto near Tylertown, Mississippi, and Bogue Chitto at Franklinton, Louisiana, and is shown on figure 8. It can be seen from the plot that the rise at the Tylertown station started at 2 a. m. and rose rapidly to a peak at 7 p. m. Crests on the smaller streams occurred prior to 9 a. m. indicating that their rises were much sharper than that at the Tylertown station.

#### PREVIOUS FLOODS

Information obtained from local residents indicates that on the smaller drainage areas the flood of August 22, 1953 is the highest since April 1900,

FIGURE 7.- RELATION OF UNIT DISCHARGE TO SIZE OF DRAINAGE AREA

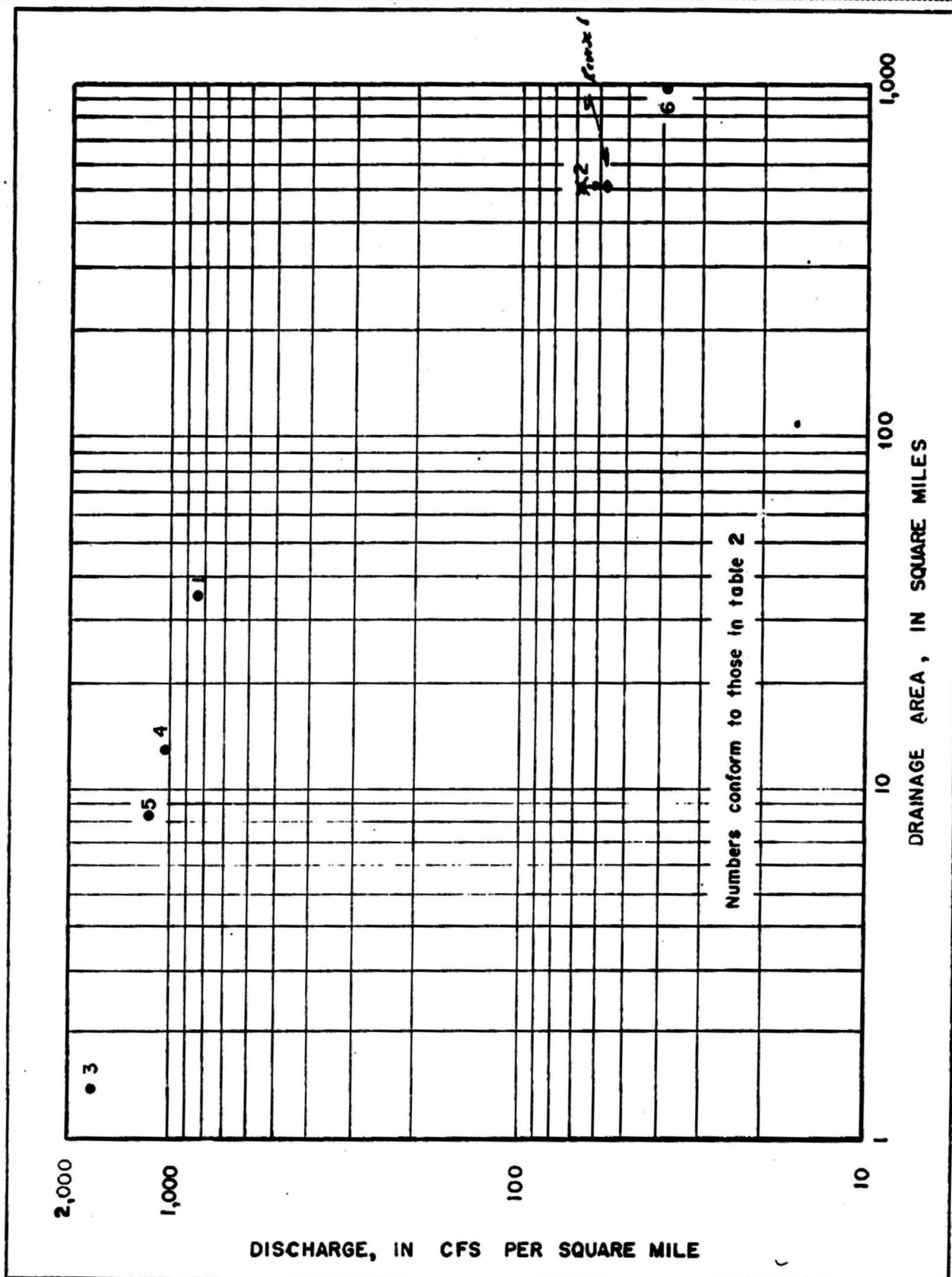
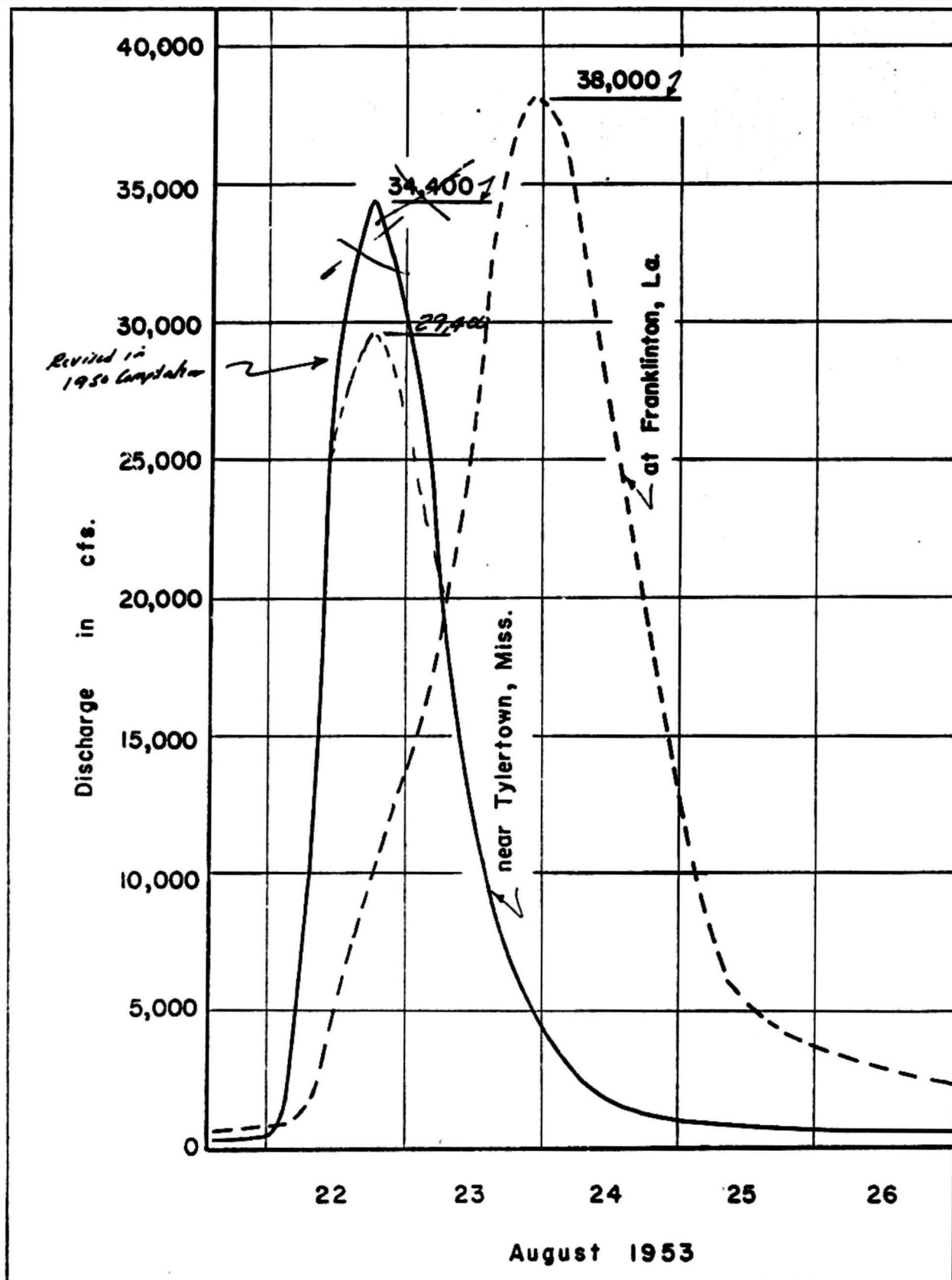


FIGURE 8.- DISCHARGE HYDROGRAPH AT GAGING STATIONS ON BOGUE CHITTO.





and, is of about the same magnitude as that flood. A flood of about the same magnitude as the 1900 flood is reported to have occurred in 1876. Other information relative to flood of 1876 is lacking.

A continuous record of stage and discharge has been obtained at Bogue Chitto near Tylertown, Mississippi, from August 1944 to date. During this period of record the maximum discharge, which resulted from general rains over a large area, occurred on January 7, 1950, with a peak discharge of 45,700 cfs.

A continuous record of stage and discharge has been obtained at Bogue Chitto at Franklinton, La. for the periods August 1928 to September 1931, and October 1938 to date. The U. S. Weather Bureau has collected gage height records in this vicinity since February 1922. The maximum discharge during period of record was 50,000 cfs on March 21, 1943. The maximum stage known occurred in April 1900, and was approximately 9 feet higher than in 1943.