

TENNESSEE VALLEY AUTHORITY  
DIVISION OF WATER CONTROL PLANNING  
HYDRAULIC DATA BRANCH

Tennessee Valley Authority  
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REGIONAL FLOODS  
IN VICINITY OF  
CHEROKEE, NORTH CAROLINA

Supplement No. 1

FLOODS ON OCONALUFTEE AND  
TUCKASEGEE RIVERS AND  
SOCO CREEK

IN VICINITY OF  
CHEROKEE, NORTH CAROLINA

Knoxville, Tennessee  
April 1960

Tennessee Valley Authority  
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REGIONAL FLOODS  
IN VICINITY OF CHEROKEE, NORTH CAROLINA

Large floods have been experienced in the past on streams in the general geographical and physiographical region of Cherokee, North Carolina. Heavy rainstorms comparable to those that caused these floods could occur over the watersheds of Oconaluftee and Tuckasegee Rivers and Soco Creek. In such event, floods would result on these streams comparable in magnitude to those that occurred on the neighboring streams. Floods of this size are designated as Regional Floods. It is therefore desirable, in connection with any determination of future floods that may occur on Oconaluftee and Tuckasegee Rivers and Soco Creek, to consider the floods that have occurred in the Cherokee region on watersheds whose topography, watershed cover, and other physical characteristics are similar to the watersheds of these three streams.

Maximum Known Regional Floods

Table 1 lists the maximum known floods experienced on watersheds comparable to those of the Oconaluftee and Tuckasegee Rivers and Soco Creek and generally within 40 miles of Cherokee. Included also are two locations in the watershed of Nolichucky River which are about 70 miles northeast of Cherokee. Streams which differ significantly in watershed characteristics from those of the Oconaluftee and Tuckasegee Rivers and Soco Creek have not been included. The discharges of the maximum known floods on the Tuckasegee and Oconaluftee Rivers and Soco Creek are given in the table.

The greatest known flood on Tuckasegee River and its principal tributaries in the vicinity of Cherokee and Bryson City occurred in May 1840. In 1896, Mr. L. M. Pindell of the Chattanooga office of the U. S. Weather Bureau, in his "A Paper on the Tennessee River and Flood System," reported the following statement of Miss Jennie Collins, special rainfall observer at Bryson City: "The oldest inhabitant states that the highest water occurred in 1840 . . . ." On the Oconaluftee River the 1906 and 1913 floods, the highest in the memory of the present residents, were also

TABLE 1  
MAXIMUM KNOWN FLOODS ON STREAMS  
IN CHEROKEE REGION

| Map<br>Refer-<br>ence<br>No. | Stream                       | Location                     | Drain-<br>age<br>Area<br>sq.mi. | Date              | Peak Discharge |                       |
|------------------------------|------------------------------|------------------------------|---------------------------------|-------------------|----------------|-----------------------|
|                              |                              |                              |                                 |                   | Amount<br>cfs  | Per<br>Sq. Mi.<br>cfs |
| 1                            | Nolichucky River             | at Embreeville, Tenn.        | 805                             | May 22, 1901      | 120,000        | 149                   |
| 2                            | Little Tennessee River       | at Judson, N. C.             | 664                             | March 1867        | 50,000         | 75                    |
| 3                            | Tuckasegee River             | at Bryson City, N. C.        | 655                             | August 30, 1940   | 61,600         | 94                    |
| 4                            | Tuckasegee River             | at Bryson City, N. C.        | 655                             | May 1840          | 90,000         | 137                   |
| 5                            | Nolichucky River             | at Poplar, N. C.             | 608                             | July 1916         | 93,000         | 153                   |
| 5                            | Little Tennessee River       | at Almond, N. C.             | 451                             | February 28, 1902 | 42,000         | 93                    |
| 6                            | Little Pigeon River          | at Sevierville, Tenn.        | 353                             | February 25, 1875 | 55,000         | 156                   |
| 7                            | Little Tennessee River       | at Iotla, N. C.              | 323                             | February 28, 1902 | 38,000         | 118                   |
| 8                            | Little River                 | near Maryville, Tenn.        | 269                             | February 1875     | 60,000         | 223                   |
| 9                            | Little River                 | near Walland, Tenn.          | 192                             | February 1875     | 50,000         | 260                   |
| 10                           | Cheoah River                 | at Johnson, N. C.            | 177                             | November 19, 1906 | 40,000         | 226                   |
| 11                           | Tuckasegee River             | at Tuckasegee, N. C.         | 143                             | August 30, 1940   | 40,800         | 285                   |
| 12                           | Oconaluftee River            | at Cherokee, N. C.           | 131                             | May 1840          | 17,500         | 134                   |
| 13                           | Cullasaja River              | at Cullasaja, N. C.          | 86.5                            | August 30, 1940   | 16,500         | 191                   |
| 14                           | E. Fk. Tuckasegee River      | near Tuckasegee, N. C.       | 80.3                            | August 30, 1940   | 30,000         | 374                   |
| 15                           | Soco Creek                   | at Mouth, Cherokee, N. C.    | 45.3                            | March 27, 1913    | 11,500         | 254                   |
| 15                           |                              |                              |                                 | November 19, 1906 | 13,000         | 290                   |
| 16                           | Deep Creek                   | at Mouth, Bryson City, N. C. | 43.9                            | May 1840          | 20,000         | 455                   |
| 17                           | W. Fk. Little Pigeon River   | at Gatlinburg, Tenn.         | 42                              | April 1, 1896     | 17,000         | 405                   |
| 18                           | Caney Fork                   | above Cowarts, N. C.         | 39.4                            | August 30, 1940   | 21,700         | 551                   |
| 19                           | M. Prong W. Fk. Pigeon River | above Spruce, N. C.          | 8.4                             | August 30, 1940   | 16,400         | 1,950                 |

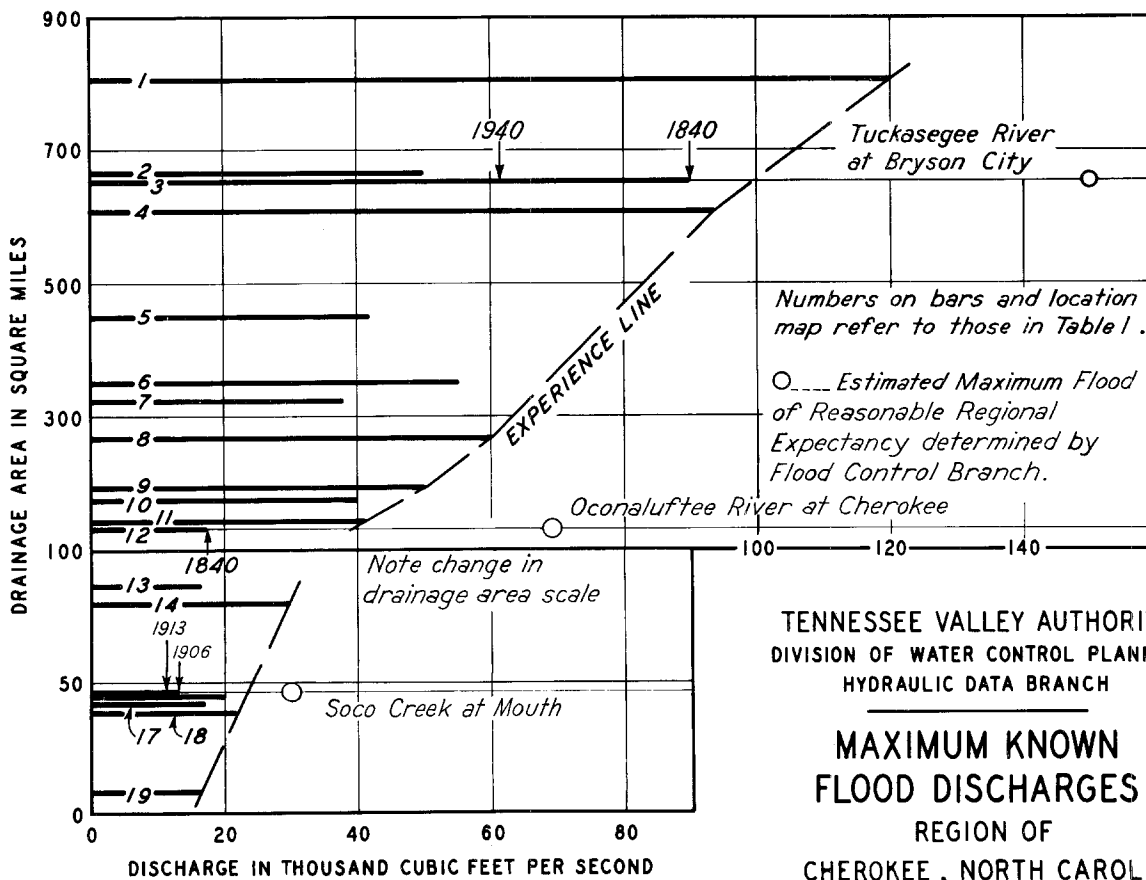
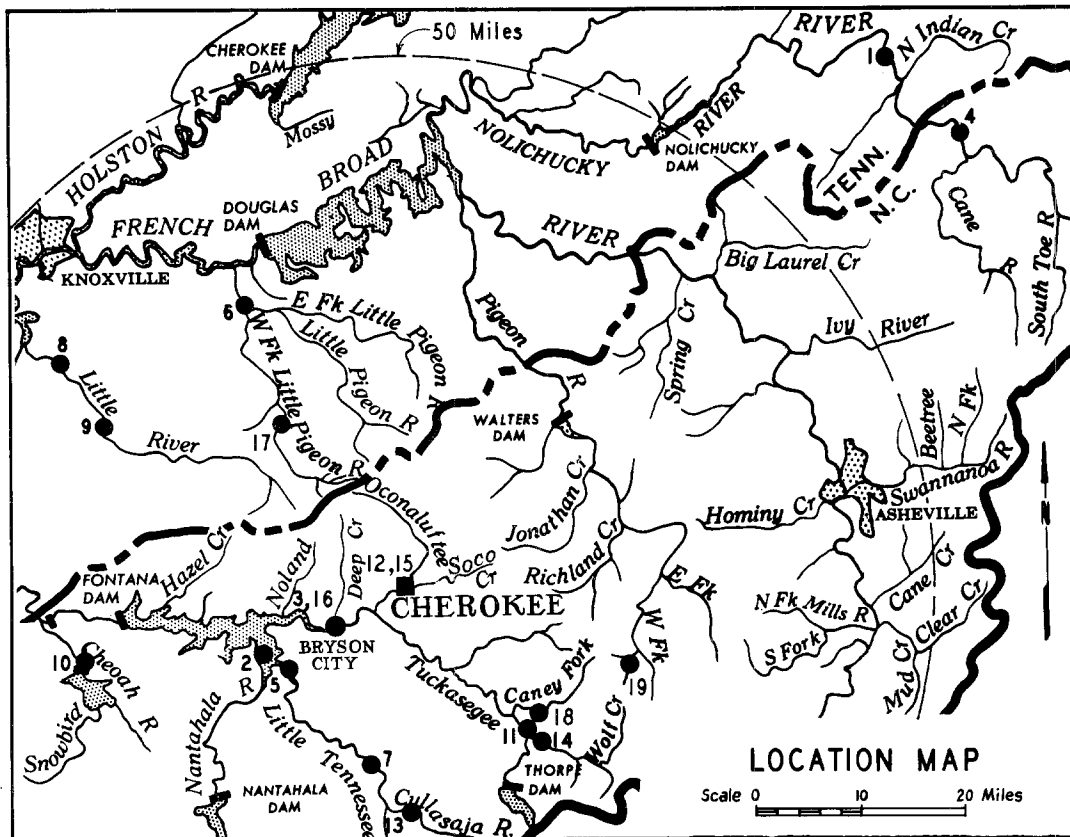
exceeded in height by the May 1840 flood according to information handed down by the Indians. No information is available on the rainfall that produced the great 1840 floods.

Another of the earliest documented large storms in this region was that of February 23-25, 1875. During this storm very heavy rainfall was experienced over the entire eastern Tennessee River watershed resulting in high floods on streams all over this territory. Cold weather preceded the storm and the rains probably fell on frozen ground, contributing to the high flood water runoff. In the vicinity of the Little River watershed rising in the Great Smoky Mountains, the rainfall totaled 8 or more inches in about two days. The resulting flood was higher than any known by the oldest inhabitants at that time and has not been exceeded since.

Another large storm occurred on May 18-21, 1901. This storm extended from the eastern Tennessee River Basin east as far as the coast. Rainfall was particularly heavy in the vicinity of the Watauga and Nolichucky Rivers where approximately 8 inches of rain fell within a 24-hour period on ground that had been saturated from earlier rains. The numerous waterspouts and landslides that were reported in the area attest to the intensity of the rainfall. The resulting flood, which became known as the "May Tide" on the Nolichucky River, is one of the highest floods that has occurred on a relatively large drainage area in the Cherokee region.

The most recent large storm that has occurred in the region was that of late August 1940. Heavy thunderstorm rains occurred along the Southern Appalachian Mountains of eastern Tennessee and western North Carolina. About  $2\frac{1}{2}$  weeks prior to this storm, in mid-August, most of the watersheds along the eastern Tennessee Valley divide from the Blue Ridge Mountains south to the Hiwassee River basin had experienced high floods from a hurricane that brought heavy rainfall to the area. Much of this same area again received heavy rainfall from the late August storm which followed. The upper Tuckasegee River watershed streams, which had been moderately flooded by the mid-August storm, rose to record heights during this latter storm. An average of over 10 inches of rain fell in approximately 24 hours on the Tuckasegee River watershed above Tuckasegee, North Carolina. The total rainfall diminished downstream from Tuckasegee, and at Bryson City the average





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**MAXIMUM KNOWN  
 FLOOD DISCHARGES**

REGION OF  
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APRIL 1960

rainfall for the watershed was approximately 7 inches. On the Tuckasegee River in the Cherokee vicinity this flood was the highest in the past 80 years or more.

All of the floods that are listed in Table 1 have occurred on watersheds in the region of Cherokee that are generally similar in physical characteristics. This indicates that floods of like magnitude, modified to take into account drainage area characteristics, may occur on the Oconaluftee and Tuckasegee Rivers and Soco Creek in the future.

#### Cherokee Vicinity Streams vs. Regional Flood Discharges

Plate 1 is a diagram of the flood discharges given in Table 1. The points on the streams for which the discharges are charted and their proximity to Cherokee are shown by the location map on this plate. Plate 1 shows that the largest known flood on the Oconaluftee and Tuckasegee Rivers and Soco Creek has been exceeded by floods on other streams in this region. However, the storms that caused the maximum floods on the streams in the Cherokee region could occur over the watershed of the Tuckasegee River, including those of Oconaluftee River and Soco Creek, in which case floods of like magnitude, modified to take into account differences in drainage area characteristics, could occur in the future on the three streams.

Using only the criteria of the experienced maximum flood discharges on streams in the Cherokee region, it would be reasonable to expect future floods on the Tuckasegee and Oconaluftee Rivers and Soco Creek of magnitudes as shown in Table 2. Floods of this magnitude are designated as Regional Floods.

#### Regional Flood Profiles

Profiles of the Regional Flood on the Tuckasegee and Oconaluftee Rivers and Soco Creek are shown on the accompanying Plates 2, 3, and 4.

#### Flood Heights for Various Discharges

Plates 2, 3, and 4 also show profiles of recent floods on the respective streams. On the Tuckasegee River, Plate 2 shows a profile of

TABLE 2  
REGIONAL FLOOD PEAK DISCHARGES

| <u>Stream</u>     | <u>Location</u>         | <u>Drainage<br/>Area<br/>sq. mi.</u> | <u>Peak<br/>Discharge<br/>cubic feet<br/>per second</u> |
|-------------------|-------------------------|--------------------------------------|---|
| Oconaluftee River | Cherokee stream gage    | 131                                  | 40,000  |
|                   | Birdtown stream gage    | 184                                  | 49,000  |
| Tuckasegee River  | Above Oconaluftee River | 401                                  | 73,000  |
|                   | Below Oconaluftee River | 589                                  | 92,000  |
|                   | Bryson City             | 655                                  | 100,000   |
| Soco Creek        | Mouth                   | 45.3                                 | 23,000  |

the August 30, 1940, flood which had a peak discharge of 61,600 cubic feet per second at Bryson City. Plate 3 shows the Oconaluftee River flood of July 9, 1955, with a peak discharge of 8,400 cubic feet per second at Cherokee. On Soco Creek, Plate 4 shows a profile for the flood on February 21, 1953, when the peak discharge near the mouth was about 2,500 cubic feet per second.

Table 3 compares these recent flood heights with the heights that would be reached on the three streams if floods of the magnitude of the Regional Flood or the Maximum Flood of Reasonable Regional Expectancy occurred, or if the greatest known flood recurred.



TABLE 3  
RELATIVE FLOOD HEIGHTS

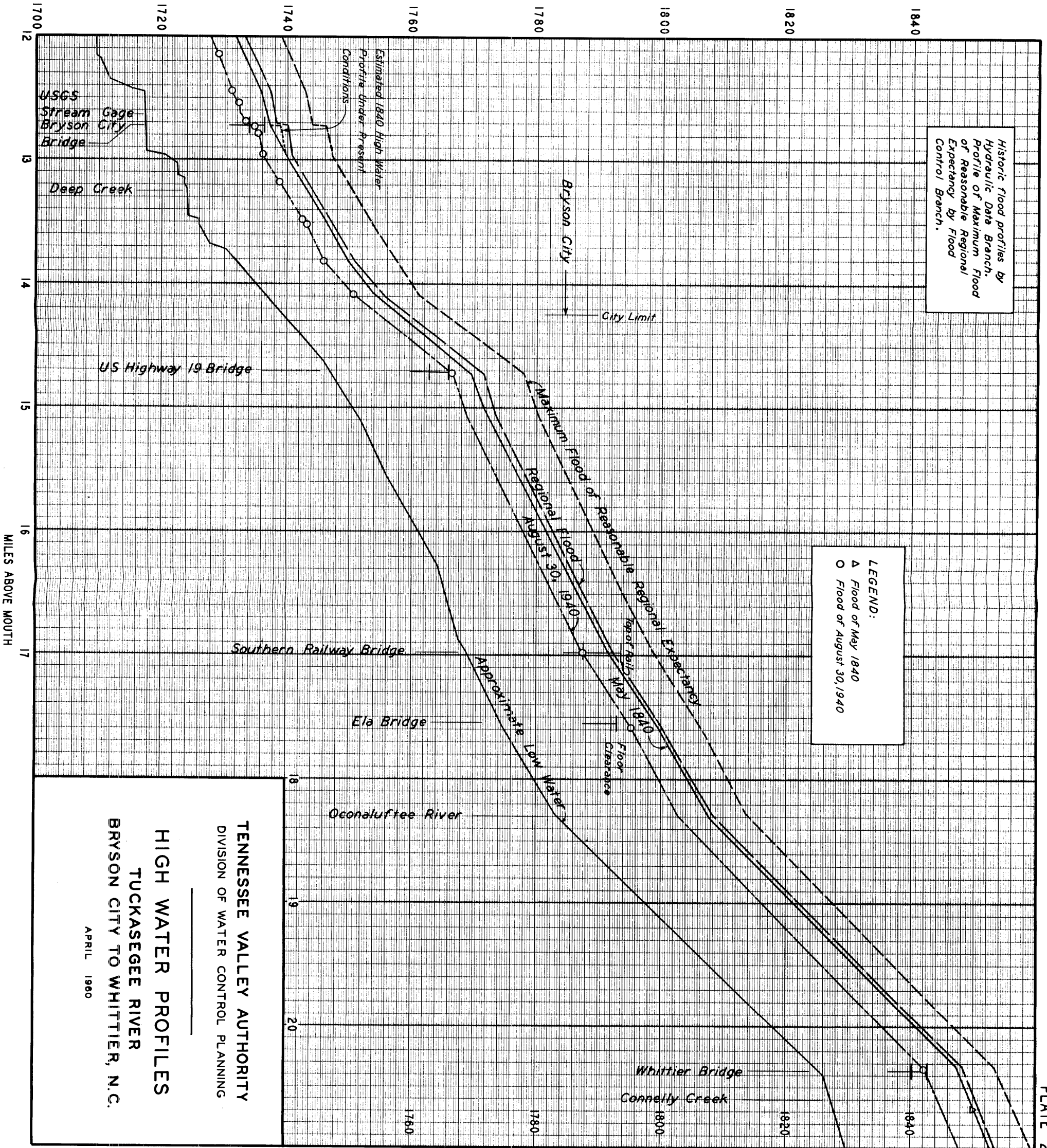
| <u>Date</u> | <u>Stream</u>     | <u>Mile</u> | <u>Estimated<br/>Peak<br/>Discharge<br/>cubic feet<br/>per second</u> | <u>Above<br/>Recent<br/>Flood<br/>feet</u> |
|-------------|-------------------|-------------|---|--|
| 1940        | Tuckasegee River  | 12.72       | 61,600  | 0  |
| 1840*       |                   |             | 90,000  | 2.5  |
| Regional    |                   |             | 100,000   | 5.4  |
| Max. R.R.E. |                   |             | 150,000   | 11.2                                       |
| 1955        | Oconaluftee River | 7.38        | 8,400   | 0  |
| 1906        |                   |             | 14,500  | 2.0  |
| Regional    |                   |             | 40,000  | 9.3  |
| Max. R.R.E. |                   |             | 69,000  | 15.0                                       |
| 1953        | Soco Creek        | 0.61        | 2,500   | 0  |
| 1906        |                   |             | 13,000  | 8.0  |
| Regional    |                   |             | 23,000  | 12.6                                       |
| Max. R.R.E. |                   |             | 30,600  | 16.0                                       |

\*The 1840 flood at this location would be about 1.8 feet higher under present conditions.

#### Acknowledgments

This supplement has been prepared by personnel of the Hydraulic Data Branch, Division of Water Control Planning, under the general direction of Reed A. Elliot, Chief Water Control Planning Engineer, and the immediate supervision of Albert S. Fry, Chief, Hydraulic Data Branch.

ELEVATION IN FEET (USC & GS 1936 SUPPL ADJ)







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